

SWOT analysis of telecenter development as a rural community empowerment strategy



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ABSTRACT

This research investigates the effects of using information and communication technology (ICT) as a method to empower the community in Pos Balar, a rural area inhabited by the Orang Asli people. The method used for this study is a SWOT analysis, which looks into the strengths, weaknesses, opportunities, and threats of setting up a telecenter in the area. To gather information, the study involved detailed interviews with ten individuals and a group discussion with local leaders. The results indicate that establishing a telecenter can offer new ways of communication, serve as a central point for information, and improve the efficiency of local authorities. This can lead to new possibilities and skill development within the community, and the telecenter could become a symbol of community progress. However, there are several challenges, such as a lack of technical skills in ICT, a gap in digital access and understanding, language barriers, inconsistency in community unity, frequent changes in administration, infrastructure issues, and misuse of technology. The study also points out opportunities, including forming partnerships, enhancing access to education and health services, improving connections to markets, and offering online government services. On the other hand, threats like limitations in road infrastructure, market challenges, concerns about privacy and security, and the impact on traditional ways of earning a living were identified. Overall, this research underlines the significance of rural ICTs, as seen through a SWOT analysis. It shows the value of using new communication technologies to build networks and partnerships across various sectors and stakeholders. The study stresses the necessity of a united, collaborative, and inclusive approach in the local community. This is crucial for ensuring sustainable and fair development in rural areas, aided by advancements in ICT.

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1. Introduction

Information and communication technology (ICT) has emerged as a vital tool for promoting community development, particularly in rural and remote areas (Okon, 2015). Its integration into our daily lives has transformed how we communicate, work, and exist. ICT's role as a driver of development is widely recognized globally. WBG (2012) highlighted the significance of ICT infrastructure as a vital

instrument for fostering social, political, and economic growth. Moreover, ICT can facilitate the advancement of other sectors, enhance human capacity, and address current societal needs (Saif et al., 2022). Additionally, the ITU (2018) acknowledged the profound impact of ICT development in realizing the United Nations' Sustainable Development Goals. As a result, ICT development has become an indispensable aspect of modern life and a critical component of government and global development agendas.

Like many other nations, Malaysia has made substantial investments in ICT infrastructure in the last two decades. These investments have led to significant growth in digital services, applications, and infrastructure, which has had far-reaching effects on the economic and social development of the nation. The percentage of Malaysian households

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with internet access rose to 95.5% in 2021, up from 91.7% in 2020, as reported by DSM (2021). In addition, internet usage among Malaysians aged 15 and older rose by 7.2% to 96.8% in 2021 compared to the previous year. The Malaysian government has also targeted achieving nationwide Internet connectivity of 100% by 2025 through the National Digital Plan (JENDELA) introduced in 2020. In Malaysia, there has been a strong focus on enhancing ICT in rural regions. This is demonstrated by a report from the MRRD (2020), which showed that internet access in these areas reached 83.9%. This data highlights the country's commitment to expanding digital connectivity in less urbanized locations. Various names have been assigned to the ICT initiatives in rural Malaysia, such as Mini Rural Transformation Centres (Mini RTCs), 1Malaysia Internet Centres, Public Access Internet Centres, Village Knowledge Centres, Community Technology Centres, Community Multimedia Centres, Community Telecenters, or Community Service Centres (Malek and Tahir, 2017). Collectively, these names represent telecenters, which serve and function as community empowerment and development tools by providing ICT resources and services in rural areas. Establishing these initiatives involved collaboration between government departments, private businesses, non-governmental organizations, and relevant researchers, intending to bridge the digital divide and achieve balanced development between urban and rural. Additionally, the development of telecentres has been designated as a part of the effective development plan outlined in the Rural Development Policy 2020, specifically within its core area 4, which strives to provide comprehensive and advanced infrastructure to rural areas (MRRD, 2020).

Numerous studies have examined the potential benefits of ICT advances for rural and community development, including improved access to information, education, and healthcare, increased economic opportunities, and enhanced community engagement and political participation. Rashid and Hassan (2012), for instance, demonstrated the potential benefits of ICT for rural communities in Malaysia, such as balancing urban and rural development by bridging the digital divide, improving access to information, increasing economic opportunities, saving time and money, empowering the community, and enhancing the quality of rural community life. Similarly, Bala and Tan (2021) have highlighted that the development of ICT in rural areas has increased the ability of rural communities to access information through digital collaboration, created low-cost platforms for knowledge sharing, promoted local capacity building, and increased the confidence of local communities, as well as reducing dependence on technology from external sources. Additionally, telecenter development in rural areas has provided adequate access to government applications and current information and issues (Gomez et al., 2012), generate employment and business opportunities

(Bailey and Ngwenyama, 2013), serve as an entertainment platform (Sey et al., 2013), and function as a management tool (Sey et al., 2013; Tahir et al., 2016).

However, despite the potential benefits of integrating information and communication technology (ICT) into rural communities, there are significant challenges and threats associated with this process. For instance, Sari et al. (2018) identified various weaknesses in ICT development within rural areas of West Java, Indonesia, encompassing limited budget allocation for constructing necessary ICT infrastructure, insufficient local human resources, and prevailing attitudes in rural communities that may not prioritize digital development. In Malawi, a study by Kapondera and Namusanya (2017) revealed that a lack of sufficient ICT infrastructure leads to competition for the limited available resources among rural communities. This situation results in an uneven distribution of ICT facilities, which may contribute to social challenges within these communities. This finding underscores the importance of equitable ICT development to prevent such disparities and associated social issues. A comparable situation occurred in Bulawayo, Zimbabwe, where the absence of supportive ICT tools for small and medium businesses and poor and expensive internet access hindered positive business opportunities (Maphosa and Maphosa, 2022). In addition, other previous studies have identified issues such as illiteracy, limited English language proficiency, and a lack of ICT skills among rural communities (Imani et al., 2012), which have made it challenging to utilize ICT facilities and reap various benefits effectively. Moreover, in the Malaysian context, Tahir et al. (2016) have reported that the introduction of ICT to rural communities has the potential to widen the social and economic gap as the study documented a low level of acceptance of digital development, the occurrence of social problems due to the unhealthy influence of ICT among youth and children, and the dissemination of false information. On the other hand, Rashid and Hassan (2012) have documented issues such as damage to ICT infrastructure, outdated software, and limited infrastructure speed, highlighting the need for proper maintenance and upgrades of ICT facilities in rural areas.

The scholarly literature widely discusses the potential advantages, barriers, and challenges of ICT development in rural areas. However, more detailed and thorough research is needed to evaluate rural ICT development effectively. This study aims to use SWOT (strengths, weaknesses, opportunities, and threats) analysis to examine these aspects in depth. SWOT analysis, known for its effectiveness in analyzing and setting development strategy priorities, is selected for this purpose (Hallajian and Atf, 2016). Additionally, this research intends to explore how such development impacts the quality of life of rural communities in Malaysia, particularly in Pos Balar, Kelantan. It focuses on the Orang Asli

community's experience with ICT facilities and services provided through the development of a telecenter, considering the mixed effectiveness of past rural empowerment programs (Lyndon et al. 2011).

This research aims to evaluate the strengths and weaknesses of telecenter development in Pos Balar and identify the external opportunities and threats in the environment. The goal is to suggest optimal strategies for sustainable telecenter development that benefit the community. To guide the research, specific questions are established: 1) identifying strengths of current ICT facilities and services for the Orang Asli in rural areas; 2) recognizing weaknesses; 3) exploring opportunities for improvement or expansion; and 4) addressing threats to enhance and extend ICT infrastructure and services. Through SWOT analysis, this comprehensive evaluation will provide insights into the impact of ICT on the livelihood of the Orang Asli rural community.

2. Pos Balar and its telecenter as a community empowerment strategy

Rural areas, especially rural hinterlands, often need more communication processes and face challenges when acquiring information (Malecki, 2003). The implementation of rural development is made more difficult because of this limitation. This situation is similar to the situation experienced by the Pos Balar community, where they have been marginalized from development, especially ICT development, due to geographical factors. Pos Balar is a settlement of the Temiar ethnic subgroup of the Senoi Orang Asli, located about 90 kilometers from the nearest municipality, Gua Musang, Kelantan. The estimated travel time is between three to five hours by four-wheel drive or motorcycle, depending on the condition of the road, as the primary access route to Pos Balar is an unpaved road used by logging and plantation companies. Furthermore, the community also encounters a scarcity of ICT infrastructure accessibility, encompassing Internet connectivity and telecommunication signals.

Before introducing ICT in Pos Balar, the community relied heavily on traditional economic activities like cultivation and forest product collection as their primary income sources. These activities frequently depended on the availability of natural resources and seasonal shifts. The community also depended on intermediaries who purchased and resold their goods in urban markets. This situation made the community susceptible to exploitation by intermediaries who could set prices that did not reflect the products' actual worth. Moreover, the Pos Balar community depended on outsiders for knowledge and expertise due to a need for more access to information. Due to this reliance, decisions regarding agricultural practices and other economic activities were frequently made without active community participation. In addition, the lack of information made it difficult for the community to keep up with market changes, adopt new

technologies, and stay informed about government policies. Furthermore, constraints of having limited information access to the community's daily life have significantly impacted the community's social environment. The limitation has created barriers in their daily lives, particularly during emergencies and when attempting to connect with friends and family outside the village. The community also faced restrictions in new opportunities for knowledge and skill development. Consequently, a sense of isolation has permeated the community, limiting their potential growth and development as they had limited exposure to the external world.

Due to the constraints encountered by the Pos Balar community, precisely its location and reliance on outsiders due to a lack of information access, the Malaysian government has begun ICT development by constructing a telecenter. Since 2017, this telecenter development has been the community's first digital initiative (EPU, 2018). The concept of telecenters in ICT development has become an effective tool for empowering local communities' social and economic aspects in an integrated manner and functions as a general strategy for rural development (Tan et al., 2020; Breitenbach, 2013; Harris and Harris, 2011). Telecenters have been accepted as a tool to alleviate poverty, bridge the development gap between urban and rural areas, and open opportunities for rural communities to participate in development (Mohd Noor and Ambali, 2014; Harris and Harris, 2011). For deeper insights, it is essential to note that a telecenter serves as a shared physical space with computer and Internet connections installed for affordable use by communities, mainly rural communities that lack the financial means to acquire their personal ICT infrastructure (Tahir et al., 2016).

Establishing the telecenter in Pos Balar is a significant initiative to support rural Orang Asli communities by providing public access to ICT-based services and applications for development processes. As per the EPU's (2018) report, the telecenter was established to address rural communities' challenges in accessing essential information required for development. The telecenter serves as a training center for the local community and offers various services and applications for education, healthcare, tourism, agriculture, business, personal use, preserving traditional Orang Asli knowledge and culture, and other socio-economic activities. These offers are tailored to the local community's needs and aim to empower the community (EPU, 2018).

This initiative highlights the Malaysian government's commitment to bridging the digital divide and employing ICT as a catalyst for socioeconomic advancement to enhance the quality of life for rural communities. This commitment aligns with the government's goal of ensuring comprehensive infrastructure and utilities to prevent rural communities from falling behind in the era of rapid societal transformation and preparing them for the advent of the Fourth Industrial Revolution (4IR) (MRRD, 2020). The telecenter at

Pos Balar boasts a diverse array of ICT facilities, such as mobile phones, computers, iPad tablets, email services, and the Internet, with Wi-Fi coverage for the community, alongside essential office equipment such as a printer and photocopier. The telecenter is also furnished with multimedia hardware and software, including television, projector, speaker, and Astro, and offers dedicated meeting spaces for local community business activities and training purposes.

3. SWOT analysis techniques and data process

This study assessed the implications of ICT as a community development strategy for the Orang Asli community in Pos Balar, Kelantan, using a SWOT analysis as a strategic planning method. By identifying strengths, weaknesses, opportunities, and threats associated with the projected ICT project, this study aims to make a valuable contribution by establishing an effective long-term strategy. As highlighted by Rozmi (2018), the SWOT analysis is a valuable tool for evaluating internal and external factors that shape the growth and development of an organization. By applying the SWOT analysis to the context of ICT development in rural areas, this study enables a comprehensive examination of resource availability, infrastructure development potential, and opportunities for stakeholder engagement. This analytical approach helps identify significant challenges and opportunities specific to rural areas, thereby providing insights into the optimal strategy for implementing an ICT solution that aligns with the community's unique needs. Using the SWOT analysis framework holds promise in suggesting policymaking and improving future initiatives (Leiber et al., 2018).

This study acquired primary data via in-depth interviews and a group discussion with the Orang Asli in Pos Balar, including local leaders, the telecenter caretaker, a few women, and youth. The interview questions focused on the strengths, weaknesses, opportunities, and threats posed by the ICT development of the Orang Asli in their community. A total of 10 in-depth interviews were done, with each lasting between 20 and 30 minutes. Besides, this study arranged a group discussion with local leaders, and the meeting lasted approximately 90 minutes. The acquired data was evaluated using a thematic analysis method. This analysis required the identification of common themes and patterns across the interview data and the categorization of the replies into the four categories of strengths, weaknesses, opportunities, and threats. The outcomes of the thematic analysis were then utilized to develop a thorough SWOT analysis of the consequences of ICT for the Orang Asli communities in Pos Balar.

This study is limited by the small sample size of 10 and a group discussion, which is the subjective nature of the data collected through qualitative methods. Additionally, the study focused solely on

the Orang Asli in Pos Balar, and its findings may not apply to other indigenous communities or rural communities in other locations. Notwithstanding these constraints, this study thoroughly investigates the implications of ICT as a community development strategy to empower the rural Orang Asli community in Pos Balar using a SWOT analysis. The findings of this study can guide future research on the integration of ICT in rural and indigenous communities and provide policymakers, community leaders, and experts in the fields of ICT and community development with significant insights.

4. Findings and discussions

Establishing a telecenter in Pos Balar has been a crucial development for the Orang Asli community, providing them access to ICT services and tools. The telecenter narrows the digital divide between rural and urban areas, recognizing that the Orang Asli community is one of Malaysia's most underprivileged and marginalized indigenous groups. The introduction of the telecenter has significantly impacted the community, bringing about both positive and negative implications that need further examination.

This study aims to identify the strengths and weaknesses of the telecenter development in Pos Balar and determine the opportunities and threats associated with this development. The strengths and the opportunities must be utilized while minimizing the existing weaknesses and threats to balance the internal and external situation (Madsen, 2016). Fig. 1 presents the study's thematic analysis results of the SWOT technique. This investigation seeks to contribute to the body of knowledge on the implications of ICT development as a community development approach among the Orang Asli in West Malaysia.

4.1. Strengths of telecenter development

4.1.1. New communication services

The Orang Asli community residing in Pos Balar, a historically marginalized group, has encountered difficulties accessing essential services, including healthcare, education, and communication facilities, primarily due to limited communication access. Establishing the first digital advancement in the community via telecenter has presented an opportunity to address this issue. The telecenter has various communication resources, such as Internet access, mobile phone charging facilities, computers, and other ICT devices. These provisions have enabled the community to establish connections within their community and with the broader external world. Consequently, establishing the telecenter has provided access to various ICT services, facilitating new communication services for the Pos Balar community. The telecenter has promoted and enhanced interaction and connectivity

beyond their immediate geographical boundaries. This beneficial ability has emerged as a practical approach to address communication obstacles and promote rural development among the Orang Asli community. Notably, the Pos Balar community has

embraced popular communication applications, including WhatsApp, Facebook, and Telegram, reflecting a growing similarity to the communication practices observed in urban populations.

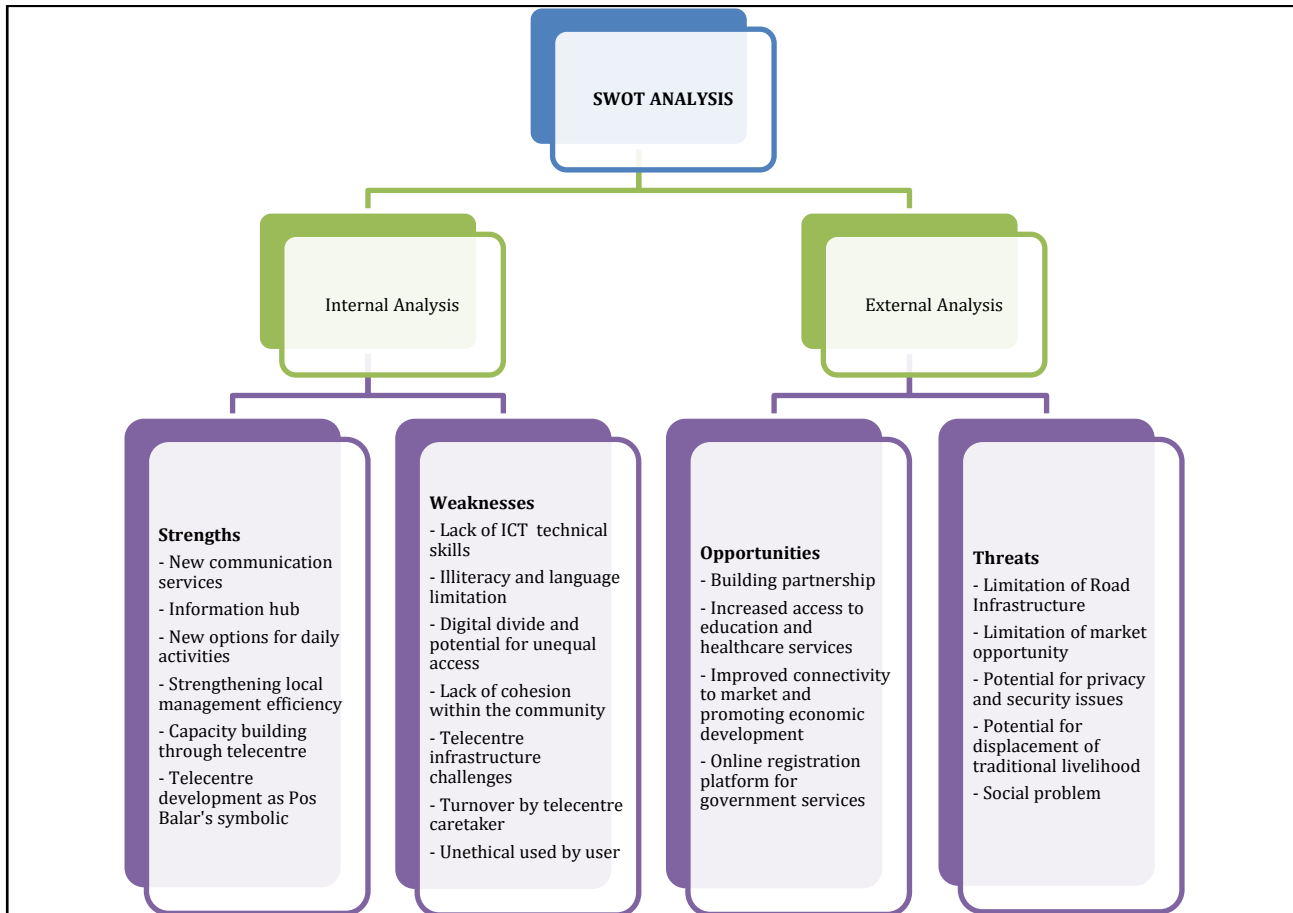


Fig. 1: Summary of SWOT analysis: Identification of strengths, weaknesses, opportunities and threats

Additionally, the Orang Asli use these communication tools for emergencies, allowing them to seek urgent assistance when necessary. For instance, community members have been able to use the telecenter to call flying doctors for medical emergencies and help the community receive timely and life-saving medical attention. This strength has dramatically improved the overall health and well-being of the community. The results of this study are consistent with previous research by [Rashid and Hassan \(2012\)](#) and [Bala and Tan \(2021\)](#), which have shown that the telecenter model can effectively empower rural communities such as the Orang Asli by providing them with access to modern communication facilities. This strength, in turn, has the potential to contribute to the overall well-being and development of the community.

4.1.2. Information hub

Telecenter development in Pos Balar has developed as an information hub for the community. With the establishment of telecenters, the Orang Asli now have access to information on essential services, education, healthcare, agriculture, and emergency services. This access to information has been crucial

in addressing the challenges faced by the community in accessing essential services. For example, the telecenter offers information on government services, such as registration for government aid; healthcare services by providing information on vaccinations, medication, and health check-ups; and education services by getting information and opportunities about vocational training and government-sponsored education programs. Furthermore, the telecenter serves as an essential source of information on agricultural practices, encompassing sustainable farming methods, weather patterns, crop cultivation, and market prices for produce. These advantages have also been reported by [Rashid and Hassan \(2012\)](#), highlighting the significance of the telecenter model in enhancing the rural community's agricultural knowledge and promoting sustainable practices. The telecenter has also been instrumental in providing information on tourism opportunities and cultural heritage sites in the area. Notably, during natural disasters such as floods or landslides, the telecenter can disseminate critical information on emergency rescue and relief supplies, contributing to the safety and well-being of the Orang Asli community.

4.1.3. New options for daily activities

The ICT telecenter at Pos Balar has become a significant asset to the rural community by providing access to new technologies, thus offering new options for daily activities. The telecenter has diversified the range of activities available to the community and has become a popular gathering place for socialization, meetings, and information exchange. Additionally, the telecenter has provided a platform for local entrepreneurs, farmers, and artisans to sell their products and services, thus creating new economic opportunities and improving the overall standard of living. Besides economic benefits, the telecenter has also contributed to the educational development of children in the community. By providing access to online educational resources, children visited the telecenter to expand their knowledge, access online learning material and educational videos, and improve their academic performance. Like [bin Noordan and Yunus \(2022\)](#) and [Hasin and Nasir \(2021\)](#), the studies discovered that integrating ICT in teaching and reading has improved students' performance and attitudes and increased a student's learning potential, especially in rural schools. The telecenter has also offered a source of entertainment, as community members can watch benefit videos and other informative content. As a result, the ICT telecenter at Pos Balar has become an essential resource in the community, facilitating growth and development in various aspects.

4.1.4. Strengthening local management efficiency

The Pos Balar telecenter has played a significant role in enhancing the efficiency of local management through various means. Firstly, the telecenter enables local leaders to disseminate information quickly and efficiently to the community through modern communication applications such as WhatsApp. The facilities available in the telecenter have significantly reduced the time and costs of traditional methods like print media. Secondly, the telecenter has facilitated the automation of administrative processes, thereby reducing the workload on local leaders. By remotely accessing online government services and programs and digitizing community documents, community members no longer need to travel to government offices, which saves time and reduces costs for all parties involved. Thirdly, the telecenter has promoted collaboration between community members, local leaders, outsiders, and other organizations by providing a common communication platform. This strength can lead to more effective decision-making and problem-solving, as well as efficient management of local resources and programs. Hence, the telecenter has emerged as a valuable tool for enhancing local governance and management in Pos Balar, consistent with the findings of [Gomez et al. \(2012\)](#), [Er et al. \(2012\)](#), and [Tahir et al. \(2016\)](#).

4.1.5. Capacity building through telecenter

The telecenter has successfully addressed the gap in ICT skills between urban and rural communities by providing training programs and capacity-building initiatives that cover various ICT skills, including computer literacy, digital marketing, and information search. The participation of community members in these programs has resulted in the development of new skills and improved existing ones, creating potential employment or entrepreneurial opportunities. These findings are consistent with [Bailey and Ngwenyama's \(2013\)](#) study, which emphasized the vital role of a telecenter in developing local capacity and generating employment and business opportunities in rural areas.

The telecenter's training programs have contributed to practical decision-making among community members by providing information on appropriate crop varieties, cultivation techniques, and market trends, leading to improved agricultural practices, increased productivity, and enhanced food security. The study's findings indicate that the telecenter's training programs have significantly impacted the community, leading to the pursuit of new opportunities in crop plantation and fish farming. The interviews conducted during the research revealed that more than 30 community members have actively engaged in these new ventures. The community has demonstrated a proactive approach by utilizing the resources provided by the telecenter, particularly the training videos, as valuable sources of information and guidance in pursuing these new endeavors.

Moreover, the telecenter has implemented digital marketing training initiatives specifically designed to promote the sale of agriculture, forest, and handicraft products. These comprehensive programs equip participants with the knowledge and skills to effectively utilize social media and e-commerce platforms as strategic marketing channels. By leveraging these platforms, community members can make informed decisions regarding product placement and pricing, enhancing their prospects for successful sales. Particularly, Facebook has become a powerful platform for promoting and selling agricultural, forest, and handicraft products. In addition, the community has embraced WhatsApp as a direct communication channel, allowing sellers to engage with potential buyers without intermediaries.

4.1.6. Telecenter development as Pos Balar's symbolic

Another strength of the telecenter development at Pos Balar is its symbolic significance in raising the community's profile to outsiders. As the first digital program in the area, the telecenter has put Pos Balar on the map and highlighted its potential as a hub for rural development. By bringing digital infrastructure to the area, the telecenter has demonstrated the

community's ability to adapt to new technologies and embrace innovation, thereby changing outsiders' perceptions of the community. This new perception can lead to opportunities for investment, partnerships, and collaborations with other organizations. Furthermore, the telecenter's symbolic significance has inspired community members to take pride in their community and take ownership of the telecenter, ensuring its sustainability and long-term success. In this way, the telecenter has become a symbol of the community's resilience, ingenuity, and progress, providing a positive image that can attract new opportunities and resources to the area.

4.2. Weaknesses of telecenter development

4.2.1. Lack of ICT technical skills

ICT technical skills among the rural community at Pos Balar are a significant area for improvement in the telecenter development. Despite the telecenter's efforts to provide digital literacy training and resources to the community, many individuals still need to gain the necessary technical skills to utilize the technology available to them fully. For instance, while the telecenter has provided access to computers and the internet, some community members may need to learn how to navigate online platforms, such as email or social media, or use software applications for tasks like word processing and spreadsheet management. This lack of technical skills can lead to several challenges. For example, community members need help accessing critical information or online services, such as government aid applications or job postings.

Additionally, the community may miss opportunities to connect with others and build relationships, which can be essential for social and economic development. Furthermore, needing more technical skills can create a digital divide between those who can access and use digital technologies effectively and those who cannot, leading to unequal opportunities and outcomes. However, it is essential to note that the lack of technical skills in the community may be attributed to the fact that the telecenter development is the first digital development in the area, and some members of the community may still be unclear about the primary function of the ICT advancement.

4.2.2. Illiteracy and language limitation

The study conducted by [Imani et al. \(2012\)](#) shed light on the weaknesses of rural communities concerning ICT development, including IT illiteracy and language barriers. Similarly, in Pos Balar, ICT illiteracy and language barriers have been identified as significant weaknesses in the community's adoption of ICT in this study. These weaknesses are attributed to the fact that most of the community has a low level of education and is primarily fluent in

their mother tongue, which is the Temiar language. This situation presents a significant challenge in implementing ICT as a means of community development, as many of the available digital resources and services are available in the national language, Bahasa Malaysia, or English. As such, efforts to introduce ICT to the community must be accompanied by measures to address this issue, such as providing language training or developing localized digital content in the Temiar language. The imperative to tackle the issue of illiteracy within rural communities arises from the need to foster social progress, as noted by [Rosniza Aznie et al. \(2018\)](#). Failure to address this weakness may limit the potential benefits of ICT implementation in the community and lead to further marginalization of the Orang Asli people in the broader Malaysian society.

4.2.3. Digital divide and potential for unequal access

The digital divide is a recurrent issue of unequal access to digital technology and the Internet across different societal groups. In Pos Balar, this divide is particularly evident due to various factors, such as the distance of the telecenter from the community and demographic issues, precisely the age of the population and level of education. The telecenter's location presents a significant challenge to some community members, as the 11 villages within Pos Balar are at varying distances from the facility. This distance can be a significant barrier to accessing the resources and services the telecenter provides, particularly for individuals with limited mobility, such as the elderly, disabled individuals, or parents with young children and no means of transportation. Hence, these individuals may be unable to access the benefits of digital technology and the Internet, such as educational opportunities, employment options, and healthcare services. Moreover, demographic factors such as age and education level also contribute to unequal access to digital technologies and the Internet. For instance, the community's older adults may need help to utilize the telecenter's resources due to their unfamiliarity with digital technology. Similarly, those with lesser levels of education may need more technical abilities to use the telecenter's resources and services entirely.

4.2.4. Lack of cohesion within the community

The telecenter development in Pos Balar has encountered a significant obstacle due to the need for more community cohesion. Despite the telecenter's provision of digital technology and resources, the community's lack of coherence has impeded its progress. One of the primary causes of this issue is the need for a shared interest and low awareness regarding the significance of ICT development. Establishing a unified vision for the progress of the telecenter in Pos Balar poses a considerable challenge due to community members'

diverse needs and priorities. Moreover, certain individuals' limited enthusiasm and participation, stemming from a lack of appreciation for the value of acquiring new ICT skills and exploring online resources, can impede their engagement with the telecenter's services. This reduced level of involvement not only hampers the cohesiveness within the community but also engenders a sense that community members require a greater sense of ownership to foster the telecenter's success.

4.2.5. Telecenter infrastructure challenges

One major area for improvement the telecenter faces is better connectivity, which may manifest in slow or unreliable Internet compared to urban areas. As a result, community members may need help engaging in online activities such as video conferencing or downloading large files. Similar findings were reported by [Rashid and Hassan \(2012\)](#), where the study noted the challenges of limited and unreliable Internet services and infrastructure in rural areas. This situation can be particularly problematic for individuals who depend on the Internet for their work, education, or healthcare needs. Another critical challenge is the unstable power supply, which can be attributed to the reliance on solar power. This issue becomes more pronounced during the rainy season when there is less sunlight to generate the required power. This unstable power supply can disrupt the operation of the telecenter, leading to downtime and limiting community members' access to digital technology and the Internet during periods of high demand. Furthermore, insect and lizard problems significantly challenge the telecenter infrastructure. Insects and lizards entering the television and projector systems have caused damage and impaired their functionality. This issue causes inconvenience and increases the telecenter's maintenance costs.

4.2.6. Turnover by telecenter caretaker

The telecenter in Pos Balar is confronted with the challenge of caretaker turnover, which represents a significant weakness. The rural community's limitations make it challenging to find qualified and experienced caretakers, and even when they are available, high turnover rates occur due to the volunteering work system and personal or family reasons. Consequently, the telecenter's management needs more continuity, hindering its ability to deliver services and support to the community. For instance, the telecenter had to replace its caretaker several times within a year due to personal health issues, family problems, and better job opportunities. Recruitment and training of a replacement take several weeks, disrupting the telecenter's operations and services to the community. Additionally, the new caretakers may possess a different level of knowledge and experience than their predecessors, resulting in decreased service quality.

4.2.7. Unethical use by user

The telecenter's development in Pos Balar has brought to light a notable weakness concerning the excessive and inappropriate use of technology, particularly among the youth. Such activities as non-stop video-watching, prolonged gaming, and accessing inappropriate content like pornography can adversely affect the users' physical and mental health, social skills, and academic or work performance. These unhealthy influences by ICT facilities can also cause social problems, as highlighted in the study conducted by [Tahir et al. \(2016\)](#). Moreover, excessive ICT use can lead to addiction and poor sleep quality, resulting in further negative consequences. Thus, addressing these ethical concerns and promoting responsible and balanced use of technology among all users, regardless of their age or demographic, is imperative.

4.3. Opportunities for telecenter development

4.3.1. Building partnership

Implementing a telecenter in Pos Balar offers a unique opportunity to foster partnerships with diverse external stakeholders, including government agencies, non-governmental organizations (NGOs), volunteer groups, business entities, tourists, and other community organizations. These collaborative relationships hold the potential for a range of positive outcomes, such as enhanced access to education and healthcare services and economic development within the community. Government agencies, NGOs, and volunteer groups can contribute significantly by providing financial support, conducting workshops and training sessions, and offering ongoing assistance to telecenter staff and community members. Furthermore, the community can consider collaborating with tourism agents to introduce visitors to Pos Balar and enrich the community's knowledge base and valuable skills. Besides, private businesses and community organizations can play a vital role by providing funding, employment opportunities, and community-driven initiatives that enhance the socioeconomic well-being of the community. Thus, forging strategic partnerships with external stakeholders is paramount for telecenter operators and community leaders, as it optimizes the benefits derived from ICT development in Pos Balar.

4.3.2. Increased access to education and healthcare services

The Pos Balar rural area has the opportunity to develop partnerships with external groups, enhancing access to educational and healthcare services. The local telecenter offers online access to educational materials and healthcare professionals, potentially transforming access to these services in

this remote area. It allows the implementation of online learning and connections with educators outside the local community, providing modern educational methods like live streaming and video calls. This development can empower the community, overcoming the lack of nearby educational institutions. The telecenter in Pos Balar enables community members to access online healthcare services, allowing them to consult with healthcare professionals remotely. This feature is particularly beneficial as it saves them from making long and difficult journeys to see a doctor. Overall, the telecenter significantly improves access to education and healthcare, which enhances the community's quality of life and promotes knowledge and skill development. These benefits lead to a more prosperous, self-reliant community, opening up more opportunities for comprehensive growth and progress.

4.3.3. Improved connectivity to the market and promoting economic development

The telecenter in Pos Balar offers a chance to strengthen market connections and boost economic growth. It provides training for marketing local products like agricultural goods, handicrafts, and jungle items online. This opens up wider market access and audience reach for the community. Online platforms allow for exploring new sales avenues and enhancing economic development. The telecenter's presence enables remote transactions, promoting sustainable economic progress, wider market access, and increased income. Additionally, it helps in marketing local products, leading to better demand and overcoming geographical limits. The telecenter also promotes tourism through online showcasing of cultural practices and activities, leveraging digital platforms in tourism. This enhances the community's economic growth and market connectivity.

4.3.4. Online registration platform for government services

Pos Balar's telecenter development gives the community a unique opportunity to use an online registration platform for government services. This opportunity will provide the Orang Asli community with convenient access to essential government services without requiring them to go to distant government offices. Additionally, registration for these services can be simplified and improved through the application of technology. With the telecenter's online platform, community members can register or update their information for services such as MyKid or Mykad registration, government aid, and other relevant services from the comfort of their place. In addition, using digital documentation can lessen the danger of missing or misplaced records, which is typically a concern in rural areas with limited technological access. Implementing a telecenter at Pos Balar represents a valuable opportunity for the government to increase rural

community access to essential services while modernizing and streamlining government operations via technology.

4.4. Threats of telecenter development

4.4.1. Limitation of road infrastructure

The poor road infrastructure linking Pos Balar to the nearest town poses a significant threat to the area's ICT implementation success. This road condition restricts the potential opportunities generated by the telecenter's development. For instance, the telecenter can expand the agricultural, forestry, and handicraft markets. Due to the poor condition of the roads, however, the cost of transportation is high, and the price of the items will rise, making it impossible to compete with similar products from other areas. This threat, in turn, reduces the possibility of economic growth and impacts the income of local sellers. Also, road conditions impact Pos Balar's tourism industry. Due to the restricted transportation options and the necessity for increased transport fees, Pos Balar is expensive to reach. In addition, there is an excellent likelihood that the road would be impassable during the rainy season, causing severe delays to transportation and the local economy. As a result of the increased cost of transportation, the cost of goods and services will also increase for tourists. As a result, tourists may be discouraged from visiting Pos Balar, reducing the area's potential for tourism-driven economic growth.

4.4.2. Limitation of market opportunity

In addition to the road infrastructure issue, the community of Pos Balar confronts limited market opportunities. The distance between Pos Balar and the nearest village or town makes it difficult for community members to access larger markets for their products. Moreover, Pos Balar's economic structure needs to be developed, with a small consumer base and limited demand for local-specific goods and services. The area is predominantly agricultural, with many sellers of agricultural products in the district, including many from the other Orang Asli community. This threat generates substantial competition for sellers in Pos Balar and can limit their ability to earn a living from agriculture. Additionally, inadequate skill in other sectors further restricts the community's capacity to diversify its economic activities. In conjunction with the road infrastructure issue, these factors can make it difficult for community members to generate sufficient revenue from their economic activities and limit their capacity to use the telecenter's potential.

4.4.3. Potential for privacy and security issues

The potential for privacy and security issues is a significant threat to ICT implementation at Pos Balar,

mainly concerning personal information and sensitive data. In the digital age, information is easily accessible, and community members may not be aware of the risks associated with sharing personal information online. There have been cases at the other location nearby Pos Balar, where some members of the rural community have easily believed in other individuals and established relationships, leading to sharing personal information and even intimate pictures. Such actions violate their privacy and put them at risk of exploitation or blackmail. Moreover, insufficient awareness and knowledge about cybersecurity measures among community members can expose them to cyber-attacks such as hacking and phishing, which raises privacy and security concerns. For instance, community members may need more awareness of creating solid passwords or recognizing suspicious links, which can lead to phishing attacks and other cybercrimes. The absence of proper security measures in the telecenter can also result in data breaches, compromising personal and sensitive information. Since the telecenter might store confidential data such as banking details, it is critical to ensure the security of the telecenter is not breached. Therefore, it is essential to raise awareness among community members about cybersecurity measures and to implement proper security measures in the telecenter.

4.4.4. Potential for displacement of traditional livelihood

Pos Balar's community's traditional way of life and means of subsistence may be changed by establishing a telecenter. Modern technologies may replace traditional jobs and practices with ones requiring different skills and expertise. This threat may result in losing traditional livelihoods and cultures passed down for generations. Adopting modern agricultural methods, for instance, may lead to the demise of Pos Balar's traditional farming traditions. As the community adopts newer, more efficient methods with less physical labor, its reliance on traditional agriculture may lessen. Also, adopting new technologies may result in a shift in cultural values and standards. The introduction of new values and customs connected with advanced technologies may pose a threat to the community's traditional beliefs and practices. This issue may result in cultural heritage and identity loss, undermining the community's sense of belonging and social cohesion.

4.4.5. Social problem

Pos Balar's telecenter implementation may result in several social issues, such as misunderstandings and conflicts with outsiders. Such concerns may result from the telecenter's incapacity to oversee unethical technology use, resulting in reputational harm to the community. The presence of inappropriate content being viewed or shared at the

telecenter may result in disputes with local authorities and law enforcement. To avoid these issues, the telecenter must implement the necessary policies and laws to regulate its actions and prevent harmful effects on the community. In addition to the social issues, the introduction of ICT in Pos Balar has given reason for worries regarding unethical and immoral conduct against individuals outside the community. Reportedly, some community members have used ICT to engage in activities that disrupt the sanctity of marriages and other personal relationships. This conduct not only violates ethical and moral principles but can potentially harm the reputation and image of the community. Thus, the telecenter must take the appropriate steps to prevent such behaviour and to ensure that its use of ICT has no negative impact on non-community members.

5. Conclusion and recommendation

This study offers an overview of the possible effects of ICT on Pos Balar's Orang Asli community. It examines the complex aspects of ICT implementation through SWOT analysis, highlighting strengths like new communication services and capacity building and weaknesses such as limited skills and infrastructure. Opportunities include forming partnerships and enhancing education and healthcare access, while potential negatives involve road access limitations and privacy concerns. The study stresses the importance of careful planning and community involvement in telecenter development.

Based on thematic analysis, the study proposes strategies for the sustainable development of the telecenter to empower the rural community. It uses SWOT analysis to examine strengths, weaknesses, opportunities, and threats. Key strategies include using new communication technologies for networking and partnerships, enhancing skills in education, health, agriculture, and tourism, and collaborating with stakeholders like government, schools, and businesses. These strategies aim to improve livelihoods, increase economic activities, and alleviate poverty.

The study suggests integrating telecenter development with schools and government agencies to address its weaknesses. Providing ICT education in rural areas is crucial for technical skill development, overcoming literacy and language barriers, understanding ICT's purpose, and promoting its ethical use. This education is key for empowering the community. It also recommends raising awareness about security issues through expert talks, encouraging community collaboration and information sharing, and enhancing unity and problem-solving abilities.

In the strengths-threats analysis, the study shows the telecenter's symbolic value to the community and how ICT aids in their development. It stresses the need for security awareness and expert advice to handle threats. The weaknesses-threats analysis

focuses on reducing weaknesses and threats, involving adults in ICT monitoring, setting clear telecenter rules, and urging policymakers and NGOs to integrate telecenter development with other initiatives, thereby enhancing ICT's effectiveness.

The study recognizes its limitations, notably its focus on Pos Balar. This suggests the need for more research across varied rural areas for a broader understanding of ICT's impact. The study's qualitative nature, based on community discussions, calls for quantitative data to validate its findings. Future research should involve larger samples and a mixed-methods approach for a deeper understanding of ICT's effects in rural communities.

The SWOT analysis in this study offers insights and strategies for developing telecenters in rural areas. It stresses understanding each community's unique challenges and opportunities in ICT projects. The study highlights the importance of collaborative, inclusive approaches to enhance living standards, economic activities, sustainable development, and empowerment in rural communities.

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Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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