

# Advancing Senior Living: SWOT Analysis for Smart Retirement Village

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## ABSTRACT

Ageing population and increasing urbanization has become a phenomenon globally and the world is looking at equipping the future elderlies with a living that supports active ageing. The advent of smart technologies has the potential to revolutionize senior living, where retirement village is becoming a popular debate in many developed countries. This research paper conducts a comprehensive SWOT analysis to evaluate the strengths, weaknesses, opportunities and threats associated with smart retirement villages. Utilizing an integrative literature review, this study synthesizes current research and data on technological advancement and the trend of retirement village. The findings highlight the significant strengths such as improved quality of life, enhanced security and safety. However, challenges including high costs, technological complexity and privacy concerns are identified. The analysis also reveals promising opportunities for growth driven by ageing population and potential partnership, alongside threats like cybersecurity risks and regulatory hurdles. This study offers valuable insights for developers, investors and policymakers, by providing strategic recommendations to leverage strengths and opportunities while addressing inherent weaknesses and threats. The research emphasizes the transformative potential of smart technologies in senior living and lays the groundwork for future innovation and development in the industry

**Keywords:** Retirement Village, Senior Living, Independent Living, Technology

## INTRODUCTION

As the global population ages, the demand for innovative and sustainable solutions for senior living has become increasingly urgent. According to [1], the swift increase in the ageing population has led to increased attention on the development of retirement villages. Malaysia's elderly population are projected to account for 15% of the total population by 2030 [2], thus presenting a significant opportunity to establish retirement villages in the country. There are various options for the elderly, options, however retirement villages have become a popular living option for the future elderly. Along with the advance technology, retirement villages are evolving to incorporate advanced technologies to improve the quality of life. A retirement village is a community that provides housing along with various facilities and services tailored to the diverse needs of its residents [3]. Independent living and an age-appropriate environment have emerged as pivotal attractions of retirement villages, playing a crucial role in the well-being and health of the elderly [4]. In Malaysia, there are a variety of housing alternatives for the elderly, including multi-generational houses, retirement resorts and high-density housing [5]. The integration of advanced technologies into retirement villages is known as smart retirement villages. A smart retirement village is a type of housing that offers tailored accommodations to simplify daily living [6]. These modern facilities leverage cutting-edge technologies such as the Internet of Things (IoT), artificial intelligence (AI) and telemedicine, which help to enhance the quality of life of the elderly.

Smart retirement villages are designed for the unique needs of older adults by integrating smart home devices,

health monitoring systems and automated services that promote safety, independence and social engagement. From voice-activated assistants that help with daily tasks to wearable devices that monitor health metrics in real time, these innovations offer a promising future for senior living. Advancements in information and communication technologies (ICT) have made smart communities or villages a rapidly growing phenomenon as they can help improve the quality and aspect of life. Ambient assisted living technologies embedded in smart retirement villages substantially reduce the risk of falls and other accidents [7]. However, the transition to smart retirement villages is not without its challenges. The implementation of sophisticated technologies involves significant challenges. The implementation of sophisticated technologies involves significant investments and concerns about technological literacy among older residents, data privacy and the potential for social isolation. According to [8], a lack of technological knowledge is the biggest obstacle to technology adoption. Hence this research paper aims to conduct a comprehensive SWOT analysis to explore the strengths, weaknesses, opportunities and threats associated with smart retirement villages. By identifying these key factors, stakeholders can better understand the potential benefits and pitfalls of adopting smart technologies in senior living environments. Other than that, this analysis will provide valuable insights for policymakers, developers and healthcare providers.

## METHOD

This study employs an integrative literature review to identify the key strengths, weaknesses, opportunities and threats for smart retirement villages. The review process followed a systematic approach, starting with the formulation of a clear research question to guide the literature search. Two databases, including Scopus and Web of Science, were searched using keywords such as “smart retirement village”. Inclusion criteria were established to select relevant studies, focusing on only smart retirement villages and articles published between 2014 to 2024. The articles were then evaluated for content and data were extracted and systematically analysed to identify the strengths, weaknesses, opportunities and threats of the topic. The synthesis of these findings provided a holistic view of a smart retirement village.

## RESULTS AND DISCUSSION

Active ageing and ageing in place are a concept that emphasizes the importance of older adults maintaining a high quality of life by staying physically, mentally and socially active. It involves engaging in regular physical exercise, adopting a balanced diet and participating in social and recreational activities. It involves a process of optimizing opportunities for health, participation and security to enhance quality of life [7]. To support active ageing, retirement village has been introduced aim to cater the needs of the increased of ageing population in developed and developing country, including Malaysia.

### Smart Retirement Village

Retirement Village is a residential community designed to meet the needs of older adults, offering a range of amenities and services to support their well-being. Retirement village supports the concept of ageing in place by creating services and facilities that will let a person remain in their home or other preferred environment. The purpose of introducing retirement village is to manage healthcare needs in a community setting, aiming to improve health quality of life of the elderlies. As a person aged, they may face difficulties where most older adults will reach their limit where they can no longer live without support and assistance [7].

Table I Retirement Village Features and Services

(Yassin, Masram, H., & Khim, 2018)

Retirement Village	Green Acres Retirement Village	Eden of the Park
Location	Ipoh, Malaysia	Kota Samarahan, Sarawak
Facilities	<ul style="list-style-type: none"> <li>• Clubhouse &amp; communal areas</li> <li>• 24-hour security</li> <li>• Extensive onsite facilities within the village</li> <li>• Perimeter fencing</li> <li>• Constant gate monitoring &amp; village patrolling</li> <li>• 24-hour emergency call system</li> </ul>	<ul style="list-style-type: none"> <li>• Ready access to golf course</li> <li>• Private pristine jungle track</li> <li>• Private restaurant &amp; catering service</li> <li>• Bar &amp; music lounge</li> <li>• Gymnasium</li> </ul>

	<ul style="list-style-type: none"> <li>• Intercom connection to reception and guardhouse</li> </ul>	<ul style="list-style-type: none"> <li>• Activity &amp; health programs</li> <li>• Housekeeping services</li> </ul>
Features	<ul style="list-style-type: none"> <li>• 1- &amp; 2-bedroom villas</li> <li>• Fully fitted with custom cabinetry, stepless interior, senior friendly design, natural light, storage spaces, well-appointed kitchen</li> <li>• 30-year renewable lifetime lease</li> <li>• Fitness &amp; social activities</li> <li>• Promotes independent living</li> </ul>	<ul style="list-style-type: none"> <li>• 8.5-acre development</li> <li>• Subsidised monthly basic maintenance fee</li> <li>• Dual key design</li> <li>• 2 acre of forest park and lake garden</li> <li>• High speed internet connection</li> <li>• Age-friendly apartment and villas</li> <li>• Access to professional nursing and care services</li> <li>• 24-hour security system</li> <li>• Indoor gym &amp; outdoor exercise stations</li> <li>• Outdoor activities (kayak)</li> <li>• Hobbyist garden</li> </ul>

Retirement villages are designed to provide a supportive, independent and community-oriented living environment for seniors. There is limitation on the development in which one of the most significant drawbacks is the reliance on the caregiver or the village manager to manage their living. Therefore, technology can facilitate the development and therefore decreases the demand for nurses, creating an independent living.

The ageing population and the growing demand for quality senior care have led to “smart” retirement villages that leverage technology to enhance the lives of older residents. These communities integrate intelligent systems and IoT-enabled features to create a more comfortable, safe and engaging environment for the elderly. The “smart” terms used refers to the integration of technology in the development of retirement village to enhance the quality of senior living. It represents a significant evolution in senior living, integrating advanced technologies to enhance the quality of life for older adults. Previous research has explored various facets of traditional retirement communities, focusing on aspects such as social interaction, healthcare services and physical environment. However, the advent of smart technologies has introduced new dimensions to senior living, including the use of the Internet of Things (IoT) devices, artificial intelligence (AI) and automated systems for daily living support.

### SWOT Analysis on Smart Retirement Village

Based on the literature review, the strengths, weaknesses, opportunities and threats of smart retirement villages were identified. The identification is as follow:

Table 2 Literature Summary on Swot for Smart Retirement Village (2014-2024)

Author	Strength (S)	Weaknesses (W)	Opportunities (O)	Threats (T)
Building designs and barrier-free public spaces enhance the mobility and independence of individuals with limited mobility and functional impairments [7]	•		•	
Social living environment in the village will help to alleviate social isolation and loneliness [9]	•		•	
Technology can facilitate development of telehealth and telecare services [10]			•	

Provide companionship for the elderly while reducing pain, inconvenience and mobility limitations [11]	•		•	
High initial costs of implementing such as technologies and potential resistance from residents [11]		•		•
Can raise privacy issue and residents may feel uncomfortable with the level of monitoring and data collection involves [12]		•		•
Positive step towards improving elderly quality of life [13]	•		•	
Cybercrime and warfare have become a tactic in global politics [14]		•		•

### Strengths

The strengths of smart retirement villages lie in their ability to promote independence, wellness and social participation for older adults. These communities are designed with barrier-free environments, single-story construction and user-friendly layouts to enable residents to navigate their surroundings easily and safely. The integration of smart home technologies, such as voice-controlled assistants, automated lighting and security systems can help residents maintain their independence by simplifying daily tasks and providing a sense of security. Ambient assisted living technologies embedded in smart retirement villages can significantly decrease the risk of falls and other accidents [7], hence enabling the elderly to be more independent without worry. Accessible building designs and barrier-free public spaces enhance the mobility and independence of individuals with limited mobility and functional impairments [7]. Additionally, smart retirement villages often feature shared amenities and communal spaces that encourage social interaction and foster a sense of community. Social living environment in the village will help to alleviate social isolation and loneliness [9], in which the elderly are much related with. These villages also leverage technology to enable remote monitoring and telehealth services, allowing residents to receive medical attention and support without the need for frequent visits to healthcare facilities. Technology can facilitate development of telehealth and telecare services [10]. The aim of smart home technologies is to provide companionship for the elderly while reducing pain, inconvenience and mobility limitations [11].

### Weaknesses

Smart retirement villages integrate advances technologies to enhance the living experiences, hence it involves the high initial costs of implementing such as technologies and potential resistance from residents. Morris et al. (2013) [11] state that the cost of integrating of technology in the development such as Smart Home is high and represents a barrier to access for low-income owners. The development and setup of smart retirement village require significant investment in infrastructure and technology which make them more expensive for developers and residents. The use of smart devices and systems that collect data can raise privacy issue and residents may feel uncomfortable with the level of monitoring and data collection involves, as mentioned by [12], there are concerned on the inconveniences caused by sensors in which causing discomfort, lack of comfort, complexity and privacy issue. Heavy dependance on technology can be problematic, especially if systems fail and or require maintenance. This may disrupt their daily lives due to technical issues. Other than that, it is noted that not all elderly individuals are tech-savvy, and some may find it is challenging to adapt and use the advanced technology used in the villages. Some residents may resist the adoption of new technologies, due to unfamiliarity, fear of change as they prefer a traditional method of living. According to [15], older adults may believe that smart technologies are difficult to control or impractical to use.

### Opportunities

Smart retirement villages present a wealth of opportunities to enhance the lives of older adults and improve the efficiency and appeal of senior living communities. By integrating advanced technologies, these villages can offer enhanced quality of life through increased comfort, safety and conveniences. According to [13], smart retirement village is a positive step towards improving elderly quality of life. There is abundant opportunity that can be highlighted in the innovation of smart retirement village, including the growing aging population that is increasingly tech-savvy, potential partnerships with tech companies and the ability to offer personalized healthcare and wellness programs. The integration of smart technologies in retirement villages can drive innovation in the real estate and healthcare sectors, creating new market opportunities and setting new

standards for senior living. Therefore, regional and local authorities should support the development of smart facilities [7].

### Threats

Despite the numerous benefits, smart retirement villages face several threats that could impact their success and sustainability. One major threat is cybersecurity, as integrating smart technologies exposes these communities to potential cyber-attacks and data breaches. Threats encompass cybersecurity risks, rapid technological obsolescence and potential regulatory challenges related to data privacy and healthcare compliance. Smart systems are susceptible to cyber threats. According to [12], the personal information gathered through the smart systems has made security as a main challenge to integrate the technology into the villages. Security and privacy are the primary concern in the adaptation of technology in the development, as stated by [14], in today's era where cybercrime and warfare have become a tactic in global politics.

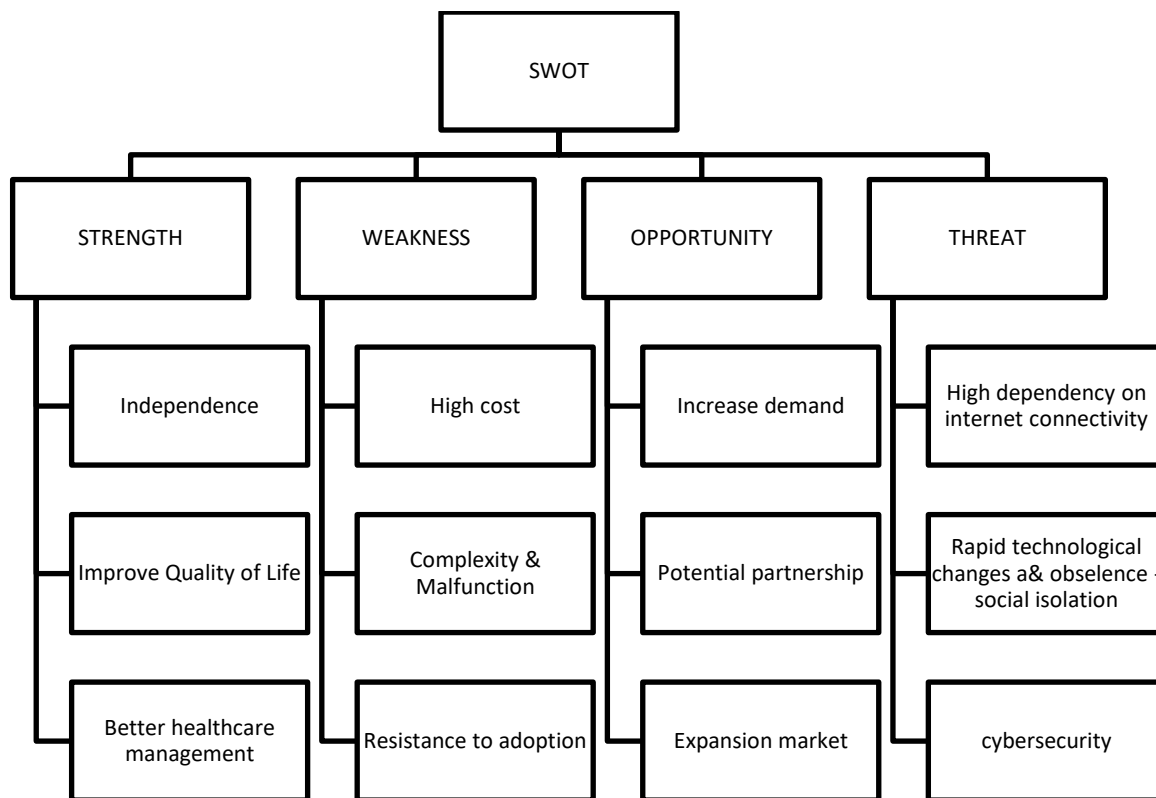


Fig. 1 SWOT analysis on Smart Retirement Village

### CONCLUSION

In conclusion, the advancement of smart retirement villages presents a promising evolution in senior living, addressing the unique needs and preferences of older adults through the integration of technology. A SWOT analysis reveals that while these villages offer significant strengths such as enhanced quality of life, increased independence and operation efficiencies, they also face weaknesses related to high costs and technology reliance may contribute to social isolation. Opportunities abound in areas like personalized care, health monitoring and sustainable living, as well as potential partnership and expanding market. The threats such as cybersecurity risks, rapid technological obsolescence, and regulatory challenges must be carefully managed. Future recommendation includes focusing on developing robust cybersecurity measures to protect residents' data and privacy. Training programs for both residents and staff are essential to ensure smooth adaptation to new technologies and bridged the digital literacy gap. It is also crucial to maintain a balance between technology and human interaction to prevent social isolation.

A limitation of this study was the lack of conceptual information in the articles found. Hence, the keyword search could be expanded to include more articles such as smart houses. Additionally, this study focuses only on literature, therefore, future research may include primary data on smart retirement village through case study.



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