KARYA ILHAM PUBLISHING
CONNECTING MINDS, BRIDGING IDEAS, INSPIRING READERS

International Journal of Advanced Research in Computational Thinking and Data Science

Journal homepage:
https://karyailham.com.my/index.php/ctds/index
ISSN: 3030-5225

Harnessing AI for Comprehensive Retirement Planning and Preparation (AIRP2): A Multidimensional Approach to Financial, Career, Health, Social, Leisure, and Spiritual Well-being

Dayang Kartini Abang Ibrahim[1,*], Mohamad Hardyman Barawi[2], Ahmad Shauffi Mohamad Sharkawi[3]

[1] Department of Human Resource Development, Faculty of Cognitive Sciences & Human Development, Kota Samarahan, Jln Datuk Mohammad Musa, 94300 Kota Samarahan
[2] Department of Cognitive Sciences, Faculty of Cognitive Sciences & Human Development, Kota Samarahan, Jln Datuk Mohammad Musa, 94300 Kota Samarahan
[3] Director of ASL Engineers Sdn Bhd, Jalan Simpang Tiga, 93300 Kuching

ARTICLE INFO

Article history:
Received 29 October 2024
Received in revised form 15 November 2024
Accepted 10 December 2024
Available online 31 December 2024

Keywords:

Retirement planning and preparation; multidimensional approach; elements in retirement planning; Artificial Intelligence (AI)

ABSTRACT

This paper investigates the transformative potential of Artificial Intelligence (AI) in revolutionising retirement planning and preparation in Malaysia by integrating six critical dimensions: health, career, finance, interpersonal relationships, leisure, and spiritual well-being. The paper aims to examine the current state of retirement planning in Malaysia, identify prevailing gaps and challenges, and propose an AI-driven model for holistic retirement planning. This integrated approach addresses the multifaceted needs of employees, fostering a secure and fulfilling post-retirement life. Retirement planning is a pressing global concern, and Malaysia is no exception. As the population ages, there is a growing urgency for comprehensive retirement strategies that extend beyond conventional financial preparedness. Traditional methods often overlook essential aspects such as health management, career transitions, interpersonal relationships, leisure engagement, and spiritual well-being, leaving retirees vulnerable to multidimensional challenges. This conceptual paper has two primary objectives: (1) to analyse the multidimensional nature of retirement planning and its integration with AI; and (2) to develop a robust framework that incorporates AI technologies into retirement planning to enhance its overall effectiveness. The paper draws on theoretical insights and primary data, synthesising perspectives from peer-reviewed literature and foundational studies in the field. By bridging theoretical constructs with innovative AI applications, this research contributes to a deeper understanding of retirement planning, offering practical implications for addressing the evolving needs of Malaysia's ageing workforce.

* *Corresponding author.*
E-mail address: aidkartini@unimas.my

https://doi.org/10.37934/ctds.4.1.4052a

1. Introduction

The arrival of artificial intelligence (AI) is revolutionising numerous sectors, including finance, healthcare, and education. One area where AI's transformative potential is increasingly recognised is retirement planning and preparation. As populations worldwide, including in Malaysia, face the challenges of an ageing demographic, the demand for innovative, efficient, and personalised retirement planning and preparation solutions has never been greater. Retirement planning and preparation is a critical issue in Malaysia, where an ageing population poses significant challenges for individuals and the government. A comprehensive retirement plan must integrate various aspects of life, including health, career transitions, financial stability, interpersonal relationships, leisure activities, and spiritual well-being. This paper aims to address these multifaceted elements and explore how artificial intelligence (AI) can enhance the efficiency and effectiveness of retirement planning and preparation (AIRP2).

1.1 The Multidimensional Approach of Retirement Planning

Retirement is a significant life transition that impacts various aspects of an individual's life. According to Noone *et al.*, [14] and Petkoska *et al*., [15] from previous study mentioned effective retirement planning and preparation need consider the following elements:

1.1.1 Health

Health is a vital concern for retirees. Chronic illnesses and healthcare costs can significantly impact the quality of life in retirement. Proactive health management and planning, including regular health check-ups, fitness systems and a healthy lifestyle, are essential components of retirement planning and preparation. Studies which are taken from [3,5,7,14] have shown that employees who actively manage their health experience better outcomes and higher satisfaction in retirement. In Malaysia, common health issues among retirees include diabetes, hypertension, heart disease, and arthritis. These conditions can significantly affect quality of life and require substantial medical expenses. Individuals need to consider regular health check-ups, a balanced diet, regular exercise, and adherence to medical advice. Preventive healthcare measures, such as vaccinations and screenings, are also crucial. Moreover, understanding and planning for potential future health issues can mitigate their impact.

1.1.2 Career transitions

Career transitions often impacts an individual's identity and sense of purpose as mentioned in previous study [16,20]. Effective retirement planning and preparation should include strategies for a smooth career transition, such as phased retirement, part-time work, or pursuing a second career. These strategies can help individuals adapt to retirement, maintain a sense of purpose, and continue contributing to society. For many individuals, work is not only a source of income but also a significant part of their identity and social life. The sudden loss of this structure can lead to feelings of emptiness and depression. Therefore, effective retirement planning and preparation should include strategies for a smooth career transition. One approach is phased retirement, where individuals gradually reduce their working hours while transitioning into retirement according to Wang [20]. This allows them to adjust to the new lifestyle gradually. Another option is pursuing a second career, part-time

work, or volunteer opportunities that align with their interests and skills which mentioned by [2,16]. These activities can provide a sense of purpose, keep them engaged, and supplement their income.

1.1.3 Financial Preparedness

Financial stability is the foundation of retirement planning and preparation. In Malaysia, financial literacy remains a significant barrier, with many individuals unprepared for the financial demands of retirement. Comprehensive financial planning should include savings, investments, and pension plans. It is essential to have a clear understanding of one's financial situation, including income, expenses, assets, and liability, AI can provide personalised financial advice as mentioned in [8,11] which can help individuals make informed decisions and optimise their decisions. Creating a retirement budget is a crucial step in financial planning. This budget should account for daily living expenses, healthcare costs, travel, leisure activities, and potential emergencies. Additionally, individuals should consider various income sources, such as pensions, savings, investments, and government benefits. Diversifying income sources can reduce financial risk and provide a more stable income stream according to Lo *et al*., [10].

1.1.4 Interpersonal relationships

According to Petkoska [15], strong interpersonal relationships are crucial for emotional well-being in retirement. Retirement can affect family dynamics and social connections. Strategies to maintain and strengthen these relationships, such as family counselling, community involvement, and social activities, should be integrated into retirement planning and preparation. These strategies can enhance social support and reduce the risk of isolation and loneliness. Maintaining close family ties and nurturing friendships can provide emotional support and enhance the quality of life. Individuals can engage in social activities, join clubs or community groups, and participate in volunteer work to build and maintain social connections. Family counselling and support groups can also help address the emotional challenges associated with retirement which previous study [2] has been mentioned regarding on the subject matters.

1.1.5 Leisure activities

Engaging in leisure activities is important for retirees' physical and mental health according to [14]. Identifying popular and beneficial leisure activities can help retirees plan fulfilling post-career lives. Activities such as hobbies, travel, volunteering, and lifelong learning can provide structure, purpose, and enjoyment in retirement. Leisure activities should be tailored to an individual's interests and physical abilities. For instance, those who enjoy physical activities can participate in sports or fitness classes, while those who prefer intellectual pursuits can engage in reading, writing, or attending educational courses. Travel and exploration can also enrich individuals’ lives by providing new experiences and opportunities to learn about different cultures.

1.1.6 Spiritual Well-being

Spirituality can provide a sense of purpose and fulfilment in retirement. Practices such as meditation, religious activities, and community service can enhance spiritual well-being. Integrating spiritual practices into retirement planning can contribute to overall life satisfaction and well-being. For many retirees, spirituality and religious beliefs play a significant role in their lives. Engaging in

regular spiritual practices, attending religious services, and participating in community service can provide a sense of belonging and purpose. Ibrahim *et al.,* [2] suggests that spiritual retreats and meditation can also promote inner peace and emotional stability.

1.2 The Role of Artificial Intelligence in Retirement Planning

Artificial intelligence (AI) has the potential to revolutionise retirement planning and preparation by providing personalised, data-driven insights. AI applications in personal finance, health management, and life planning demonstrate significant benefits. In the context of retirement planning and preparation, AI can:

1.2.1 Personalised financial advice

AI can analyse an individual's financial data, including income, expenses, savings, and investments, to provide personalised financial advice based on study by [4]. AI-driven financial planning tools can help individuals optimise their financial resources, plan for future expenses, and ensure financial stability in retirement. By offering easy-to-understand insights and recommendations, these tools can improve financial literacy and empower individuals to make informed decisions. For example, AI algorithms can assess an individual's financial situation and suggest personalised investment strategies, budgeting tips, and retirement savings plans. These tools can also provide real-time updates and alerts, helping individuals stay on track with their financial goals suggested by [11].

1.2.2 Health management

AI can assist in proactive health management by monitoring health metrics, predicting potential health issues, and recommending preventive measures. Wearable devices and health apps powered by AI can provide real-time health data, helping retirees maintain their health and manage chronic conditions effectively. For example, AI-powered health apps can track vital signs, monitor medication adherence, and provide personalised health recommendations. These tools can also alert users to potential health risks and suggest preventive actions, such as lifestyle changes or medical consultations.

1.2.3 Career transition support

AI can support career transitions by identifying suitable second career opportunities, providing training and development resources, and matching individuals with part-time or volunteer work that aligns with their skills and interests. AI-driven career counselling can help retirees navigate the transition from full-time work to retirement. For example, AI algorithms can analyse an individual's skills, experiences, and interests to suggest potential second careers or volunteer opportunities. These tools can also provide personalised training and development resources, helping individuals acquire new skills and adapt to new roles.

1.2.4 Interpersonal relationship management

AI can enhance social connections by recommending social activities, facilitating communication with family and friends, and connecting retirees with community groups and support networks. Social

media platforms and AI-powered communication tools can help retirees stay connected and engaged with their social circles. For instance, AI-powered social platforms can suggest events, activities, and groups based on an individual's interests and preferences. These tools can also facilitate communication with family and friends, helping individuals maintain strong social connections.

1.2.5 Leisure activity planning

AI can suggest leisure activities based on an individual's preferences, health status, and available resources. It can provide information on local events, travel opportunities, and recreational activities, helping retirees plan enjoyable and fulfilling leisure pursuits. For example, AI algorithms can analyse an individual's interests and suggest personalised leisure activities, such as travel destinations, hobbies, or fitness classes. These tools can also provide real-time updates on local events and activities, helping retirees stay active and engaged.

1.2.6 Spiritual Well-being

AI can support spiritual well-being by offering resources for meditation, religious activities, and community service. AI-driven apps and platforms can provide guided meditation, access to religious texts and services, and opportunities for volunteer work, enhancing spiritual fulfilment in retirement. For instance, AI-powered meditation apps can provide personalised meditation practices and techniques, helping individuals achieve inner peace and emotional stability. These tools can also offer access to religious texts, services, and community service opportunities, promoting spiritual well-being.

Despite the growing interest in retirement planning and preparation, existing literature often focuses narrowly on financial preparedness, overlooking the multidimensional aspects such as health, interpersonal relationships, leisure, and spiritual well-being. Moreover, while the integration of AI into retirement planning has shown promise in domains like financial advising or health monitoring, there is a lack of comprehensive frameworks that address these dimensions holistically. Additionally, to explore the potential of AI to offer tailored solutions that reflect the unique socio-cultural and demographic contexts of regions like Malaysia is crucial. This research aims to bridge these gaps by developing an AI-driven retirement planning framework (AIRP2) that integrates six critical dimensions—health, career, finance, interpersonal relationships, leisure, and spiritual well-being. By addressing these multifaceted needs, this study contributes to the evolving discourse on retirement planning and provides actionable insights for policymakers and practitioners.

2. Problem Statement

The global landscape of retirement planning and preparation is undergoing a significant transformation due to advancements in artificial intelligence (AI). AI technologies promise to enhance the accuracy, efficiency, and personalisation of retirement planning, addressing the complexities associated with predicting future financial needs, investment strategies, and healthcare costs. However, the adoption and integration of AI in retirement planning and preparation present unique challenges and opportunities, particularly in different regional contexts such as Malaysia. The rapid pace of technological advancement also raises concerns about data privacy, security, and the displacement of human advisors, necessitating a balanced approach that integrates both AI and human expertise.

In Malaysia, the retirement planning and preparation landscape faces unique challenges. The country is experiencing demographic shifts with an aging population, which intensifies the need for effective retirement planning strategies. However, the adoption of artificial intelligence (AI) in this area is still in its emerging stages. Limited awareness and understanding of AI technologies, coupled with concerns over data privacy and security, hinder the widespread acceptance of AI-driven retirement planning and preparation solutions. Furthermore, Malaysia's financial sector is characterised by a reliance on traditional methods of financial planning and advisory services. This cultural preference for human interaction and trust in traditional advisors presents a significant barrier to the adoption of AI technologies. Additionally, the regulatory framework in Malaysia may not be fully equipped to address the ethical and privacy concerns associated with the use of AI in the multidimensional approach in retirement planning and preparation.

Despite the importance of retirement planning and preparation, many Malaysians lack comprehensive strategies that incorporate all essential life aspects. Current practices often focus narrowly on financial preparedness, neglecting other critical factors such as health and interpersonal relationships as discussed by [2] from previous study. Additionally, there is a lack of tools that leverage AI to provide personalised, holistic retirement planning solutions.

3. Literature Review

Most of the theories focus on retirement thoughts, behaviors, attitudes or goals undertaken to fulfill the retirement planning, but they have not integrated the behavioural components of preparing for retirement in this manner according to Noone *et al.,* [14]. The cognitive aspect in Retirement Planning and Preparation is in understanding what retirement means to employees before they can set goals and activities within the process of preparation [14]. This has constrained the way that retirement planning and preparation can be conceptualized. This paper enhanced the relationship of retirement planning and preparation behaviours comprehensively by identifying the employees' effort not only towards retirement planning but also towards preparation. The theories that build in this study will help to understand more on how the stages in RPP can help individual to plan and prepare for their retirement. The theories are based on Theories Acceptance Model (TAM), Life Cycle Theory, Integrative Life Planning Theory, Life Course Perspective Theory and the Model is by adapting [14] measurement of Retirement Planning Scale, the items help individuals to think about problem solving throughout their lives and implementation of intentions. Most of the theories focus on retirement thoughts, behaviors, attitudes or goals undertaken to fulfil the planning for retirement, but it does not guide how cognitions can emerge into goal setting or preparing behaviors for retirement discussed by Noone *et al.,* [14].

3.1 Theoretical Framework of the Study

The study's theoretical framework is based on Sunny Hansen's [3] foundational research framework. The framework was specifically chosen due to its ability to deconstruct different aspects of life and explain how they interconnect and form a cohesive and meaningful whole [3]. By adopting this framework, we aim to perceive retirement as a process that begins with planning and necessitates thorough preparation prior to the culmination of one's professional career. The developmental aspect of this theoretical framework highlights that, for individuals, developing an understanding and a positive attitude towards planning and preparation is a challenge that needs to be nurtured and sustained over time until the point of retirement. Initially, the theory focused on adult career development, presenting a holistic approach to life and career planning [3]. By

integrating this framework into this study, it aims to bridge the gap in addressing the various dimensions of retirement planning beyond financial aspects, encompassing a broader spectrum of considerations. Life planning is inherently interconnected with retirement planning since all dimensions are integral to an individual's life trajectory. Ideally, effective retirement planning, should commence early in life. However, research reveals that this period often coincides with other significant life priorities, such as children's education, housing, car payments, and caregiving responsibilities for elderly parents, diverting attention and resources away from retirement planning [2].

Life Course Perspective (LCP) theory holds that preparation develop over a life- time, with goals improving or diminishing based in part on exposure to risk [2]. LCP emphasises the importance of cumulative and long- term impacts both within an individual's life span and across generations. At the first stage, the planning process should emphasise linking or integrating cognitive representation on environment across the life span in order to minimise the risk at planning level. This includes the greater focus on Retirement Planning and Preparation promotion from the youngest age forward. The role of employer and employee in influencing Retirement Planning and Preparation toward future well- being should be considered. LCP theory is relevant to age group when correlates with retirement planning. Life is full of such transition especially when deals with age such as getting a job, leaving home, retiring and so on. When it concern on Retirement Planning, employees might change their views, beliefs and perception where they become knowledgeable and skillful when age increases. This will affect their goals and decisions in the planning process. In contrast, a trajectory involves a longer view of long-term patterns of stability and change in a person's life, involving multiple transitions based on the analysis from previous studies [2, 20]. In Retirement Planning, it is not expected trajectories to be a straight line, but some continuity is expected towards the direction. For example, an employee is assuming that once he or she started to plan for retirement, he or she will set forth on a path of increased knowledge of retirement and might decline to uphold his planning strategies due to multiple transitions involving financial instability or family disruption [20].

The Life Cycle Theory provides a comprehensive framework for understanding the economic behavior of individuals over their lifetime offers a strong framework for understanding how individuals can plan their consumption and savings over their lifetime to maintain financial stability. However, retirement planning from a holistic perspective goes beyond financial behavior to encompass health, social connections, and lifestyle preferences. By integrating these elements, individuals can ensure a well-rounded and fulfilling retirement, addressing both their financial needs and overall well-being. This comprehensive approach underscores the importance of early and thoughtful planning to achieve a balanced and rewarding retirement experience. While the traditional interpretation of the Life Cycle Theory emphasises financial behavior, a holistic approach to retirement planning expands beyond mere economic considerations.

Financial Stability: A central belief of the Life Cycle Theory is financial planning, which involves saving and investing during working years to ensure sufficient resources during retirement. Effective financial planning includes diversified investment portfolios, insurance coverage, and careful debt management.

Health and Well-being: Health is a crucial component of holistic retirement planning. As individuals age, healthcare needs and associated costs tend to increase. Proactive health management, including regular check-ups, a healthy lifestyle, and adequate health insurance, can mitigate the financial burden of medical expenses in retirement. Long-term care insurance is also an important consideration to cover potential costs of extended care needs.

Social Connections: Maintaining and developing social relationships is essential for mental and emotional health. This can involve community engagement, volunteer work, and staying connected

with family and friends. Social isolation can have harmful effects on both psychological and physical health, highlighting the need for an active and connected retirement lifestyle.

Lifestyle Preferences: Retirement planning must also consider individual lifestyle preferences, which can vary widely. Some may prioritise travel and leisure, while others may focus on home improvement or starting new ventures. Understanding personal desires and planning accordingly ensures that retirement is not only financially secure but also enjoyable and fulfilling.

The Technology Acceptance Theory provides a valuable framework for understanding the factors influencing the adoption of AI in retirement planning and preparation. The theory posits that two main factors influence technology adoption: perceived usefulness (PU) and perceived ease of use (PEOU). PU refers to the degree to which a person believes that using a particular system would enhance their job performance, while PEOU refers to the degree to which a person believes that using a system would be free from effort. By focusing on perceived usefulness and ease of use, and addressing social influences and facilitating conditions, AI can be effectively integrated into retirement planning and preparation. This holistic approach ensures that retirees not only achieve financial stability but also maintain their overall well-being, leading to a fulfilling and secure retirement. As AI continues to progress, its potential to transform retirement planning will only grow, making it an necessary tool for future generations. Integrating AI into retirement planning from a holistic perspective involves considering not only the financial aspects but also the broader well-being of individuals.

3.2 Model Development of the Study

As mentioned earlier, most of the theories focus on retirement thoughts, behaviors, attitudes or goals undertaken to fulfil the planning for retirement, but it does not guide how cognitions can emerge into goal setting or preparing behaviors for retirement [14]. In other words, the cognitive and behavioural components of planning have not been integrated in a significant way towards Retirement Planning in most of the current research. This has limited the way that planning for retirement can be conceptualised and led to unprepared in retirement as discussed by Noone *et al.,* [14]. In order to make planning, people need to analyse the subject matter before making any decision and expectation about the situation. The complexity of these processes does not allow a fixed description of them, but it is clear that the theory has revealed the distinction between planning a course of action and making preparation about such a course of action.

The decision to focus on retirement planning and preparation is also realistic. By adapting Noone's measurement of Retirement Planning Scale, the items help individuals to think about problem solving throughout their lives and implementation of intentions. Noone's, 2010 [14]research is more towards developing new assessment tools for planning in retirement. As for the present study is looking at the effort of an individual to plan prepare for their retirement by integrating artificial intelligence (AI) within the process.

3.3 Artificial Intelligence (AI) in Retirement Planning and Preparation

AI has the potential to transform life planning by providing personalised, data-driven insights. AI applications in personal finance and health management demonstrate significant benefits, suggesting that AI could similarly enhance retirement planning by integrating various life aspects into a cohesive plan such as discussed by [1,4,8,10,12,17] :

3.3.1 AI in financial planning

Studies have shown that AI-driven financial advisors, provide personalised investment advice that is often more accessible and cost-effective than traditional human advisors. Predictive analytics powered by AI can forecast future financial needs and optimise retirement savings strategies by analysing vast amounts of data.

3.3.2 AI in career development

AI tools help individuals align their career trajectories with retirement goals by recommending skill development, job changes, and income projections. Impact studies have shown that AI-driven career planning significantly impacts long-term financial stability.

3.3.3 AI in health and wellness

AI applications in health monitoring can predict potential health issues and recommend preventive measures. Wearable devices and health apps powered by AI provide real-time health data, helping retirees maintain their health and manage chronic conditions effectively. AI-based wellness programs support healthy aging by providing personalised health recommendations.

3.3.4 AI in interpersonal relationships and community engagement

AI tools enhance social interactions and community involvement by recommending social activities, facilitating communication with family and friends, and connecting retirees with community groups and support networks. Studies have shown that AI-driven platforms improve the quality of life for retirees by facilitating social interactions and community involvement.

3.3.5 AI in leisure and lifestyle management

AI applications recommend hobbies, travel plans, and leisure activities based on an individual's interests and budget. Lifestyle analytics provided by AI-driven tools enhance retirement satisfaction by suggesting personalised leisure activities.

3.3.6 AI in spiritual and emotional well-being

AI tools also support spiritual growth and emotional health by offering resources for meditation, spiritual readings, and community service.

4. Future Directions and Empirical Validation

While the conceptual framework of the AI-driven retirement planning model (AIRP2) provides a comprehensive approach, future iterations of this research will prioritize empirical validation. This will involve conducting surveys and interviews with key stakeholders, including retirees and financial planners, to assess the model's effectiveness in real-world scenarios. Surveys could measure the practicality, ease of use, and perceived value of the AI tools, while interviews could provide deeper insights into user experiences, expectations, and challenges. The integration of empirical findings will not only validate the framework but also guide refinements, ensuring that the AI-driven solutions

address the multidimensional needs of retirees effectively. This approach aligns with the call for evidence-based methodologies to support policy recommendations and technological adoption in retirement planning.

5. Comprehensive Understanding

This paper will provide a good understanding of the current state of retirement planning in Malaysia, highlighting gaps and challenges. It will offer valuable insights into the diverse needs and preferences of retirees, helping policymakers and planners design more effective retirement strategies. An AI-based tool can be developed, offering personalised, holistic retirement planning solutions. It will integrate various aspects of retirement planning, providing individuals with tailored recommendations and support.

Based on the findings on this paper later on, the recommendations will be made to policymakers to improve support for comprehensive retirement planning in Malaysia. These recommendations will address the need for greater financial literacy, better healthcare planning, and enhanced support for career transitions and interpersonal relationships. The findings from this research can inform government policy on retirement planning in Malaysia. By highlighting the potential of AI to enhance retirement planning, the study can support the development of policies that promote the adoption of AI technologies in the financial sector. Additionally, the research can provide insights into how government programs can better support retirees in managing their health, finances, and overall well-being.

Retirement planning is a universal concern, particularly for countries experiencing rapid demographic shifts due to aging populations. This section provides a comparative analysis of approaches to retirement planning in countries facing similar challenges to Malaysia, offering insights that can inform the adoption of AI-driven models like AIRP2.

5.1 Japan: A Technology-Driven Approach

Japan, with one of the world's oldest populations, has embraced technology in retirement planning. AI applications in Japan include financial that provide automated investment strategies tailored to retirees' needs. Additionally, wearable health devices integrated with AI platforms help retirees manage chronic conditions, promoting active aging. However, Japan's reliance on technology also emphasizes the importance of addressing digital literacy among older generations, a lesson applicable to Malaysia.

5.2 Singapore: A Comprehensive Retirement Framework

Singapore employs a multi-pillar approach to retirement planning, combining a national pension scheme (Central Provident Fund) with private savings and investments. The government has integrated AI into public retirement planning services, which uses AI to recommend second career opportunities for retirees. Malaysia could learn from Singapore's integration of AI into public services while ensuring financial literacy initiatives reach all socio-economic groups.

5.3 Australia: A Focus on Financial Preparedness

Australia's retirement planning framework emphasizes financial security through mandatory retirement contributions and government support schemes. AI is increasingly used in Australia to

provide retirees with personalized financial advice, particularly in optimizing retirement accounts. Australia's experience highlights the potential of AI to enhance financial literacy and empower individuals to make informed decisions, a critical consideration for Malaysia's diverse population.

5.4 South Korea: Bridging Generations

South Korea has introduced innovative programs combining intergenerational learning and retirement planning. AI platforms facilitate knowledge sharing between younger and older generations, promoting skills exchange and emotional well-being. Malaysia could adapt such initiatives to its cultural context, leveraging AI to strengthen community bonds and address challenges in rural areas.

5.5 Insights for Malaysia

By examining these countries, Malaysia can identify strategies that align with its unique socio-economic and cultural landscape. For instance, like Australia and Singapore in financial preparedness Malaysia can leverage AI to enhance financial literacy and optimize retirement savings. Drawing from Japan in health integration, incorporating AI-driven health monitoring into retirement planning can promote proactive healthcare among retirees. Adapting South Korea's intergenerational programs in community engagement can address social isolation and foster skill-sharing in Malaysian communities.

6. Limitations and Challenges

While the integration of AI in retirement planning holds significant potential, it is not without limitations and challenges. This section explores the ethical considerations, regulatory requirements, and strategies to mitigate risks associated with the use of AI in this domain.

6.1 Ethical Considerations

The use of AI raises ethical concerns, particularly related to data privacy and algorithmic bias. Retirement planning often involves sensitive personal information, such as financial, health, and lifestyle data. If inappropriately managed, the misuse or breach of this data could have severe consequences for individuals. Moreover, AI systems may unintentionally spread biases in training data, leading to unequal recommendations for different demographic groups. Addressing these issues requires implementing strong data techniques and regularly auditing AI systems to ensure fairness and inclusivity.

6.2 Need for Regulatory Frameworks

The adoption of AI in retirement planning demands a supportive environment. Many regions, including Malaysia, currently lack comprehensive guidelines governing the use of AI in personal finance and retirement planning. Regulatory frameworks should address issues such as accountability for AI-generated decisions, compliance with data protection laws, and transparency in algorithmic processes. Collaborations between policymakers, technology developers, and financial institutions are essential to establish clear standards and build trust in AI-driven solutions.

6.3 Technical Limitations

AI systems are only as good as the data they are trained on. Inaccurate, outdated, or incomplete data can compromise the effectiveness of AI recommendations. Additionally, while AI excels in pattern recognition and prediction, it lacks the contextual understanding and empathy often required in retirement planning. Combining AI with human advisors can alleviate this limitation, ensuring a more holistic approach.

6.4 Risk of Over-Reliance on Technology

There is a risk that individuals may too dependent on AI tools, neglecting their own critical thinking and decision-making abilities. This could lead to poor outcomes if the AI system malfunctions. To counter this, users should be educated on the limitations of AI and encouraged to consult human experts when necessary.

7. Conclusion

Retirement planning is a complex and multifaceted process that requires a holistic approach. In Malaysia, addressing the elements of health, career transitions, financial preparedness, interpersonal relationships, leisure activities, and spiritual well-being is essential for effective retirement planning. Artificial intelligence (AI) offers a powerful tool to enhance these plans by providing personalised, data-driven insights and recommendations. By integrating AI into retirement planning, individuals can achieve a comprehensive and fulfilling retirement, improving their quality of life and overall well-being. The potential of AI to transform retirement planning draw attention to the importance of embracing technological advancements to address the challenges and opportunities of an aging population.

Acknowledgement

This paper was not funded by any grant. On the other hand, we would like to express our sincere gratitude to Ir. Mr Ahmad Shauffi Bin Mohamad Sharkawi (Director of ASL Engineers Sdn Bhd) for his invaluable insights as a practitioner and as an individual who has great interest in Retirement Planning, which greatly enriched this paper. His contributions provided critical ideas that shaped the foundation of this work, and his guidance was instrumental in the development and clarity of the paper's content. This research would not have been possible without his support, and we are deeply appreciative of the time and effort he invested in helping to bring this conceptual paper to be completed.

References

[1] Clark, Robert L., Robert G. Hammond, and Christelle Khalaf. "Planning for retirement? The importance of time preferences." *Journal of Labor Research* 40 (2019): 127-150. ttps://doi.org/10.1007/s12122-019-09287-y

[2] Ibrahim, Dayang Kartini Abang, and Nor Wahiza Abdul Wahat. "A new pathway towards retirement preparation: Integration of holistic life planning." *European Journal of Social Science Education and Research* 2, no. 4 (2015): 154-160. https://doi.org/10.26417/ejser.v5i1.p154-160

[3] Hansen, L. Sunny. "Integrating work, family, and community through holistic life planning." *The Career Development Quarterly* 49, no. 3 (2001): 261-274. https://doi.org/10.1002/j.2161-0045.2001.tb00570.x

[4] Hasan, Zahid, Daicy Vaz, Vidya S. Athota, Sop Sop Maturin Désiré, and Vijay Pereira. "Can artificial intelligence (ai) manage behavioural biases among financial planners?." *Journal of Global Information Management (JGIM)* 31, no. 2 (2022): 1-18. https://doi.org/10.4018/JGIM.321728

[5] Hershey, Douglas A., John C. Mowen, and Joy M. Jacobs-Lawson. "An experimental comparison of retirement planning intervention seminars." *Educational gerontology* 29, no. 4 (2003): 339-359. https://doi.org/10.1080/713844333
[6] Ingale, Kavita Karan, and Ratna Achuta Paluri. "Retirement planning–a systematic review of literature and future research directions." *Management Review Quarterly* (2023): 1-43. https://doi.org/10.1007/s11301-023-00377-x
[7] Ingale, Kavita Karan, and Ratna Achuta Paluri. "Retirement planning–a systematic review of literature and future research directions." *Management Review Quarterly* (2023): 1-43. https://doi.org/10.1007/s11301-023-00377-x
[8] Irlam, Gordon. "Machine learning for retirement planning." *The Journal of Retirement* 8, no. 1 (2020): 32-39. https://doi.org/10.3905/jor.2020.1.067
[9] Krijnen, Job MT, Marcel Zeelenberg, Seger M. Breugelmans, and Anna Van Der Schors. "Intention and action in retirement preparation." *Behavioural Public Policy* 6, no. 2 (2022): 191-212. https://doi.org/10.1017/bpp.2018.39
[10] Lo, Andrew W., and Jillian Ross. "Can ChatGPT plan your retirement?: Generative AI and financial advice." *Generative AI and Financial Advice (February 11, 2024)* (2024). https://doi.org/10.2139/ssrn.4722780
[11] Leal, Cristiana Cerqueira, and Benilde Oliveira. "Nudging financial behavior in the age of artificial intelligence." In *Artificial Intelligence in Production Engineering and Management*, pp. 115-144. Woodhead Publishing, 2024. https://doi.org/10.1016/B978-0-12-819471-3.00002-1
[12] Nay, John J. "Large language models as fiduciaries: a case study toward robustly communicating with artificial intelligence through legal standards." *arXiv preprint arXiv:2301.10095* (2023). https://doi.org/10.2139/ssrn.4335945
[13] Noor Azima, A., M. Jariah, and I. Rahimah. "Domains of pre-retirement planning: Experiences of never-marries Malay women retirees of the Malaysian Civil Service." *The Macrotheme Review* 2, no. 5 (2013): 79-96.
[14] Noone, Jack H., Christine Stephens, and Fiona Alpass. "The Process of Retirement Planning Scale (PRePS): development and validation." *Psychological assessment* 22, no. 3 (2010): 520. https://doi.org/10.1037/a0019512
[15] Petkoska, Jasmina, and Joanne K. Earl. "Understanding the influence of demographic and psychological variables on retirement planning." *Psychology and aging* 24, no. 1 (2009): 245. https://doi.org/10.1037/a0014096
[16] Shultz, Kenneth S. "Bridge employment: Work after retirement." *Retirement: Reasons, processes, and results* (2003): 214-241.
[17] Stone, Dianna L., Kimberly M. Lukaszewski, and Richard D. Johnson. "Will artificial intelligence radically change human resource management processes?." *Organizational Dynamics* 53, no. 1 (2024): 101034. https://doi.org/10.1016/j.orgdyn.2024.101034
[18] Braithwaite, Virginia A., and D. M. Gibson. "Adjustment to retirement: What we know and what we need to know." *Ageing & Society* 7, no. 1 (1987): 1-18. https://doi.org/10.1017/S0144686X00012265
[19] Wang, Mo. "Retirement: An introduction and overview of the handbook." *The Oxford handbook of retirement* (2013): 3-9. https://doi.org/10.1093/oxfordhb/9780199746521.013.0013
[20] Wang, Mo, and Kenneth S. Shultz. "Employee retirement: A review and recommendations for future investigation." *Journal of Management* 36, no. 1 (2010): 172-206. https://doi.org/10.1177/0149206309347957