Strategic Policies to Support the Independence and Interaction of Older Adults: A Leadership Model That Is Inclusive of Local Businesses

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Abstract: *This study employs qualitative analysis techniques for text mining, and its primary focus is on interview data collected from 105 elderly residents living in Mihama City, Fukui Prefecture. The overarching goal of this research is to uncover valuable insights into the specific needs and requirements of the elderly population in this region. Through text mining, several key elements have surfaced, shedding light on important aspects of the elderly residents' lives. These findings underscore the significance of spaces designed to facilitate social interaction, as well as the indispensable role that policy support plays in ensuring the mobility and accessibility of the elderly within the community. Leveraging advanced cluster analysis techniques, a robust conceptual model has emerged. This model offers a comprehensive perspective on the myriad factors that are vital for nurturing an environment in which elderly individuals can not only exist but thrive in contentment and security. One of the significant contributions of this research is the proposal of a holistic leadership model. This model does not merely advocate for policy implementation; it also strongly emphasizes fostering collaboration with the local business sectors. The foundation of this model is built on the principles of continuous engagement with and listening to the evolving needs of the elderly population, rigorous policy implementation, periodic review, and an ongoing commitment to making iterative improvements. The findings of this study underscore the immense importance of actively involving various stakeholders and local businesses in the city planning process. The ultimate objective is to create an environment finely tuned to optimize the overall well-being of older adults, ensuring that they can enjoy a fulfilling and secure lifestyle within the community.*
Keywords: age-friendly urban development, social interaction, policy support and leadership, local businesses, text mining.
JEL Classification: R52, R58, I38.

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1. Introduction

1.1 Background of the Study. As global populations continue to age, the significance of creating age-friendly urban environments that cater to the needs of older adults is becoming increasingly pronounced. The complex interplay between urban development, policy leadership and local business engagement in shaping such environments has garnered attention from scholars and practitioners alike. This paper delves into the dynamic landscape of age-friendly urban planning, aiming to explore the multifaceted strategies that contribute to the well-being and inclusion of older adults within urban spaces. The unique challenges and opportunities associated with urbanisation and an ageing demographic have underscored the importance of examining how policies and collaborations can effectively support the independence, mobility and quality of life of the ageing population. As older adults seek to age in a place of belonging while maintaining social interactions and accessing essential services (Nguyen and Levasseur, 2023), the role of policy frameworks and community engagement becomes paramount (Berley et al., 2023).

This paper not only investigates the theoretical underpinnings of age-friendly urban development but also seeks to bridge the gap between theory and practice by shedding light on practical strategies. By leveraging qualitative data and exploring the interplay between policy leadership and local business participation, this study offers insights into creating holistic and sustainable urban environments that foster the well-being and sense of belonging of older adults. Through an in-depth exploration of the intersections between policy, local business engagement and age-friendly urban development, we provide valuable insights for policymakers, urban planners and stakeholders invested in creating vibrant, inclusive and age-friendly cities. The practical contributions of this research, its limitations and potential directions for future research are discussed at the end of the paper.

1.2 Uniqueness of the Study. The uniqueness of this study lies in its focus on policy authorities and local business leadership, encapsulated within the framework of an 'age-friendly urban development leadership model'. Here, the authors directed their attention to the roles of policy authorities and local businesses' leadership in shaping age-friendly urban environments and modelled their interaction. This model showcases strategies for enhancing the mobility, social interactions and independence of older adults, with an emphasis on fostering community empathy and collaboration. By demonstrating the effective interplay between policy and business collaborations in enhancing the quality of life for older adults, this approach offers valuable insights for sustainable urban planning. Above all, it is a practical guide for future age-friendly urban development, providing a foundation for cooperation among policymakers, practitioners and community stakeholders.

2. Literature Review

2.1 Ageing Society and City Development. Previous studies have emphasised the urgency of addressing challenges posed by ageing populations in urban contexts. Greenfield and Buffel (2022) underscored the necessity for urban planning that considers the health and social cohesion of older adults, while Szewczenko et al. (2023) highlighted the significance of barrier-free infrastructure to empower older adults to utilise urban environments for self-fulfilment. Prior research has examined various aspects, such as accessible public spaces, transportation networks and opportunities for social engagement. However, the unique focus on collaborative efforts between policy authorities and local businesses, encapsulated within the age-friendly urban development leadership model, remains limited. Black and Oh (2023) explored sectoral reach in age-friendly communities as an innovative approach, suggesting practical methods for meeting the needs of older adults through collaboration with the local business sector. It indicated the potential for synergistic interactions between policy and business collaborations to effectively enhance the quality of life of older adults, yielding valuable insights for sustainable urban planning (Wirtz and Muller, 2023).

Researchers such as Salmistu and Kotval (2023) emphasise the importance of considering collaborative efforts in urban development strategies. While this approach was anticipated to provide practical guidance for future age-friendly urban development, subsequent shifts in policy priorities due to events like the COVID-19

pandemic have hindered smooth and continuous practical implementation (Knill and Steinback, 2022). Consequently, a trajectory is leading to the present day, where empirical and ongoing research has been impeded. Nonetheless, there remains a demand for up-to-date research findings that can offer a foundation for cooperation among policymakers, practitioners and community stakeholders, addressing the evolving landscape and challenges of age-friendly urban development.

2.2 Mobility and Accessibility of Ageing People. Within an ageing society, the amplification of mobility and accessibility for the ageing population emerges as a multifaceted and imperative theme that demands comprehensive consideration. The augmentation of mobility among elderly individuals assumes a position of paramount significance, resonating deeply with the fabric of societal engagement and interconnectedness (McFarland et al., 2023). This theme, namely the mobility and accessibility of ageing people, encapsulates the intricate web of challenges and opportunities that emerge as populations age and societal dynamics evolve. At the crux of this discourse lies the intricate interplay between mobility, social interaction and the holistic well-being of senior citizens. The enhancement of mobility transcends mere transportation, branching into physical health, mental resilience and emotional satisfaction (Bjerregaard et al., 2023). By enabling seniors to access essential services, medical care and recreational pursuits, sustained mobility becomes a conduit through which their overall quality of life is elevated. It resonates particularly strongly in the face of prevalent issues such as isolation and loneliness, which disproportionately affect the elderly (Johansson-Pajala et al., 2023). Social engagement, facilitated by enhanced mobility, becomes a powerful antidote against the adverse effects of social disconnect, offering not only companionship but also opportunities for personal growth and cognitive stimulation.

2.3 Social Milieu and Connectedness. The intricate interplay between ageing individuals and the broader social milieu underscores the urgency of enacting policy initiatives that focus on enhancing the well-being and connectedness of seniors. Among these initiatives, the prioritisation of accessible transportation options, the creation of pedestrian-friendly infrastructure and the establishment of community-based activities uniquely catered to the elderly have a heightened significance. Such initiatives serve as pillars that support a thriving and cohesive society, acknowledging the central role that mobility and engagement play in the lives of seniors (Hariam et al., 2023). By emphasising the value of sustained mobility and robust social interactions, societies have the potential to unlock the treasure trove of experience and wisdom held by the elderly. This symbiotic relationship, where both seniors and their communities stand to benefit, ushers in a more holistic, resilient and tightly knit societal fabric (Kesselring et al., 2023). The elderly become active participants, not only in their own lives but also as valued contributors to the larger collective community or society. As society grapples with the realities of an ageing demographic, the imperative to uphold the dignity and vitality of seniors takes centre stage. The synthesis of enhanced mobility and tailored engagement opportunities paints a vivid picture of a society that truly values the contributions of its ageing members. By recognising and acting upon this vital connection between mobility, social interaction and a robust societal landscape, societies embark on a transformative journey towards an inclusive and harmonious future (Holt-Lunstad et al., 2023).

2.4 Ageing People and the Holistic Societal Landscape. The implications of this theme extend beyond individual well-being, reverberating throughout the societal landscape. The preservation of social ties and the facilitation of interactions with peers and diverse generations hold the potential to bridge generational gaps, engender mutual understanding and foster harmonious coexistence. The collective wisdom and experiences of the elderly can enrich communities, contributing to a tapestry of shared narratives that span lifetimes. The intricate interactions between mobility and intergenerational relationships thus pave the way for a more inclusive and resilient societal framework. As societies grapple with the multifaceted challenges posed by an ageing demographic, the discourse surrounding the mobility and accessibility of ageing people crystallises into a call for concerted efforts (Ali and Kamraju, 2023). Policy initiatives geared towards infrastructural adaptations, inclusive transportation options, and community-oriented programmes stand as pillars for addressing the needs of the elderly. By embracing the imperative nature of this theme, societies can navigate the complexities of demographic shifts and elevate the ageing experience into one characterised by vitality, connectivity and a profound sense of belonging.

3. Methodology

3.1 Data Collection. A door-to-door interview survey was conducted, with individual visits made to each neighbourhood in Mihama Town on February 7–8, 2023, where the purpose of the survey was explained to the respondents. Students conducted structured interviews with those who agreed to be interviewed. The

number of datasets collected was 105. Following the question guidance developed based on the literature review, we aimed to help provide evidence to explore which policies would effectively encourage people (mainly the elderly) to come out in front of the station.

3.2 Analysis Method. A thematic method was applied to the text data of the 105 samples collected via the survey method, and text mining was used to decipher the subconscious phases of the respondents. Co-occurrence maps and word clusters were created, and through their interpretation, policy implications for supporting the elderly to sustain their lives and age-friendly urban development were uncovered. The open-source software UserLocal, was used for the text mining.

4. Findings and Analysis

4.1 Frequently Stated Words. Table 1 presents details on the most frequently stated words. The analysis of commonly used terms reveals that the primary concern of respondents is their interest in places where people gather. Elderly residents perceive social interactions as essential aspects of their daily lives and express expectations for spaces that facilitate these interactions. Furthermore, they exhibit a sense of nostalgia for connecting with nature, seeking psychological fulfilment and a sense of security through their interactions with others and the natural environment. Figure 1 also demonstrates the word cloud, which indicates a mindset of the interviewees' perception and thoughts towards the town.

Table 1. Word Frequency

Word	Frequency
Place	26
People	21
Nature	15
Transportation	11
Station	10
Supermarket	9
Food	9
Restaurant	8
Fish	7
Hospital	7
Vegetable	6
Time	6
Café	5
Shopping	5
Lunch	4
Shop	4
Product	4
Sea	4
Event	4
Road	4
Roadside	3
Elderly	3
Neighbourhood	3
Facility	3
Clothes	3
Mountain	3
None	3
Store	3
Train	3
Space	3
Town	3
Car	3

Source: Compiled by the authors

Figure 1. Word Cloud of the Comments Made by the Interviewees

Source: Compiled by the authors

4.2 Understanding Elderly Needs and Strategies for Response Through Co-occurrence. Co-occurrence refers to the occurrence of certain words in the same context within a text or sentence. In other words, it indicates a relationship in which one word is often used together. Co-occurrence is widely used in text mining and natural language processing to help understand the relationships and patterns among words (Hong et al., 2023). Specifically, co-occurrence is related to the following aspects (Smith & Johnson, 2022).

➢ Co-occurrences help us understand the context in which words are used. Words that are frequently used together in the same context are more likely to be related to a certain theme or topic.

➢ Finding associations: Co-occurrences can be analysed to identify associations or semantic connections between words. For example, if 'ocean' and 'wave' occur together frequently, these words may pertain to topics related to the ocean. Co-occurrences can help interpret the meaning and usage of a word. When a word is used together in a particular context, the meaning and nuances of the word may become apparent.

➢ Ultimately, co-occurrence maps also suggest document clustering and topic modelling, which are presented via co-occurrence information to group documents with similar themes or topics. It allows for effective organisation and insight into large amounts of textual data. Here, the co-occurrence map created using UserLocal was used to visualise the relationships between words in the text within the context of elderly citizens and their needs regarding city design (Yasutake et al., 2021). It allowed for gaining insight from the textual data and grasping the relevance of specific topics and themes (Figure 2).

Figure 2. Co-occurrence Map

Source: Compiled by the authors

The text mining analysis revealed significant insights into the expectations and needs of the elderly population concerning urban development. Through careful analysis of co-occurrences, a coherent pattern emerged, shedding light on pivotal factors that resonate within their aspirations. Notably, the senior demographic places great importance on combining elements that collectively contribute to their well-being and social integration (Lee et al., 2024). The recurring theme of 'place' stands out prominently, signifying the desire for spaces conducive to community and interaction. Alongside this, the emphasis on 'accessibility' to various locations within the city was evident, indicating a shared aspiration for improved mobility, which is closely linked to the quality of life for the elderly. In addition, the consistent mention of 'connections with others' and 'opportunities for engagement' underscores their yearning for venues that facilitate social interaction and support networks (Sedighi, 2016).

This analysis unearthed a multifaceted landscape of expectations, underscoring the necessity for comprehensive urban planning that addresses not only physical accessibility but also the social and emotional dimensions of ageing individuals. The amalgamation of these themes suggests that urban development initiatives should prioritise the creation of spaces that amalgamate convenience, social cohesion and opportunities for intergenerational interaction. Ultimately, these insights accentuate the requirement for inclusive urban design that caters to the unique needs of the elderly, thereby fostering an enriched urban environment that harmonises their lives with the evolving urban landscape.

4.3 Hierarchical Clusters. The process of grouping words with similar occurrence patterns into clusters, ordered by their degree of similarity, is illustrated through hierarchical clustering (Allahyari et al., 2017). Similar to the dendrogram representations used in biological evolution, similar entities are branched together in proximity (left), while dissimilar ones are branched further apart (right). This approach enables the hierarchical interpretation of clusters comprising words that exhibit similar occurrence tendencies (Figure 3). The proximity (similarity of occurrence patterns) between individual words and clusters during the aggregation of clusters is reflected by the position of the vertical lines used for grouping. The further to the left the aggregation point is located on the graph, the closer the association between the elements. Conversely, if the aggregation point is toward the right side of the graph, this indicates relatively dissimilar occurrence patterns, suggesting the preference to treat them as separate clusters.

Hierarchical clustering offers a comprehensive perspective on the interrelationships between words, enhancing the understanding of semantic affinities and contextual co-occurrences (Hu and He Pan, 2015). Such an approach holds the potential for unravelling intricate patterns and structures within linguistic datasets. The needs of elderly urban planning, which include (1) spaces for social interaction and (2) securing mobility and accessibility through policy support, were extracted through qualitative text mining. By subjecting the data to cluster analysis, a conceptual model further emerged, highlighting additional elements essential for creating a region where the elderly can live happily and securely.

These elements encompass:

➢ the significance of collaborative social development planning involving local business sectors;

➢ leadership in its execution;

➢ continuous attention to the needs of the elderly, policy implementation, review and preparation for a loop of improvement.

Taking the example of hierarchical clusters, let us give an overview of the background calculation in generating clusters by text mining, i.e., measuring the distance for each word and illustrating the hierarchical type of association of related terms. Regarding the distance measurement of hierarchical clusters, the text mining software used in this study, UserLocal, usually uses Euclidean distance. However, other typical distance measurement methods, such as Euclidean distance or the centre-of-gravity method, are also used to generate the hierarchy by calculating Euclidean distance is the distance between two points. The Euclidean distance is the straight line distance between two points and is the most common distance calculation method (Danielsson, 1980).

The Euclidean distance between two points can be calculated from the following formula:

$$d(p,q) = d(q,p) = \sqrt{((q1-q2)^2 + (q2-p2)^2 + \cdots + (qn-pn)^2)} = \sqrt{\sum_{n=1}^{n}(q1-p1)^2} \tag{1}$$

The Euclidean distance, simply put, is the straight line distance between two points and is the most common method of distance calculation. Next, let us take a closer look at how to calculate the distance between clusters. In addition to the "center-of-gravity" method, various other distance calculation methods are also used. The shortest distance between samples in each cluster is used as the distance between clusters. The advantage of this method is that it requires less computation, whereas its disadvantages are low classification sensitivity.

It is susceptible to outliers and to the chain effect (a phenomenon in which clusters become banded).

$$d(C_1, C_2) = \min\big(d(x,y)\big) \tag{2}$$

The "centre-of-gravity method", which calculates the centre of gravity of the samples within each cluster and uses the distance between centres of gravity as the distance between clusters, is also used in this software in the background calculation box.

$$d(C_1, C_2) = d\left(\frac{1}{m}\sum_{x\in C_1}^{m} x, \frac{1}{m}\sum_{y\in C_1}^{n} y\right) \tag{3}$$
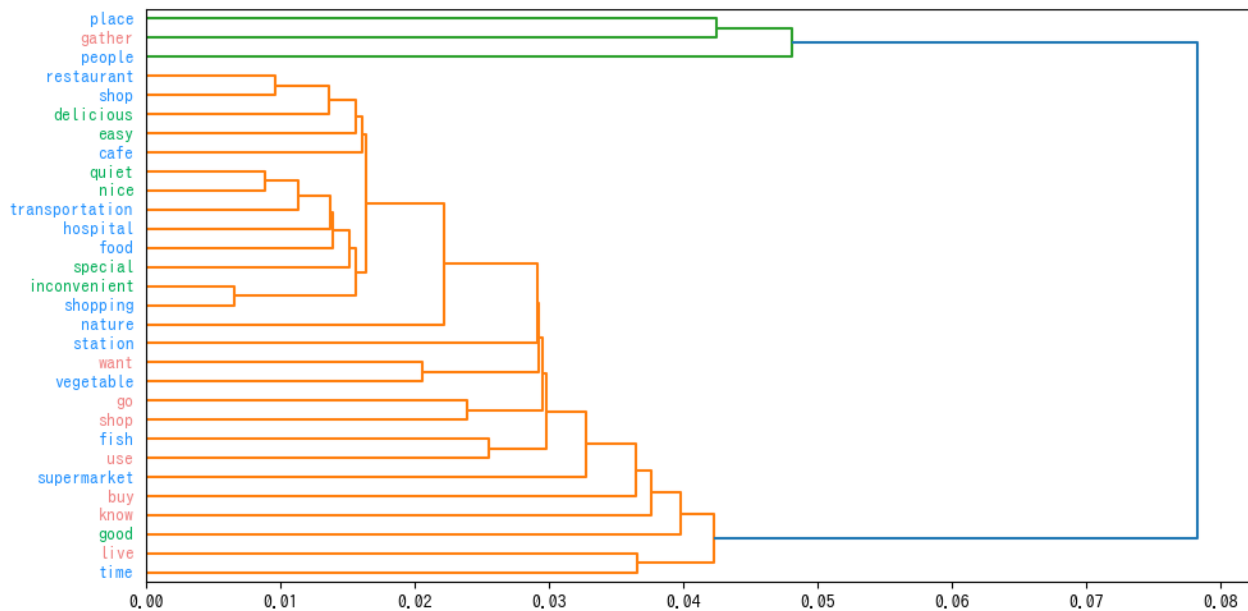
Figure 3. Clusters Developed from Text Mining

Source: Compiled by the authors

4.4 Discussion. With the ageing of the global population, the imperative to design urban spaces that cater to the needs of the elderly is becoming increasingly vital. This discourse delves into the intersection of age-friendly urban development, policy leadership and local business engagement, seeking to unearth effective strategies for creating environments that promote the well-being and inclusion of older adults. Age-friendly urban development demands an understanding of the diverse needs of the elderly. Leveraging qualitative data gathered from 105 elderly residents in Mihama City, Fukui Prefecture, the text mining analysis revealed various crucial aspects, such as spaces for social interaction and the vital role of policy support in ensuring mobility and accessibility (Buffel & Phillipson, 2016). Through cluster analysis, a comprehensive model emerged, accentuating the role of local businesses in collaborative social development planning.

Effective policy leadership holds the key to orchestrating age-friendly urban transformations. Strategic policies are pivotal in nurturing independence and interaction among older adults. The proposed leadership model encompasses continual attention to the needs of the elderly, policy implementation, review and preparation for iterative enhancements (Canel et al., 2022). This iterative process reinforces the integration of local business sectors into urban planning, recognising that collaboration with local enterprises is integral to a successful, age-friendly city (Greenfield & Buffel, 2022). The integration of local businesses augments the fabric of age-friendly urban development. Involving local businesses in collaborative initiatives fosters a sense of belonging and community cohesion (Szewczenko et al., 2023). A multifaceted approach necessitates visionary leadership to navigate the complexities of this evolving landscape (Whyte et al., 2022).

In conclusion, crafting age-friendly urban environments necessitates a holistic approach, encompassing policy leadership, local business engagement and the integration of the elderly's perspectives. This discourse underscores the significance of addressing the unique needs of older adults while harnessing the collaborative endeavours of policymakers, local businesses and the wider community to cultivate spaces that enable them to thrive and flourish in their later years.

5. Conclusion

5.1 Theoretical Contributions. This paper focused on exploring effective strategies for creating environments that promote the well-being and inclusion of older adults within age-friendly urban development. It delved into the intersection of policy leadership, local business engagement and the imperative to design urban spaces catering to the needs of the elderly. The aim was to foster holistic urban transformations that prioritise the unique requirements of ageing populations while fostering collaboration between policymakers, local businesses and the wider community.

5.2 Practical Contributions. This study leveraged qualitative data to reveal the vital role of policy support in ensuring mobility and accessibility for the elderly, alongside the importance of social interaction spaces. In addition, the proposed leadership model emphasises the integration of local business sectors and continuous engagement with the elderly's needs to create iterative enhancements. Integrating local businesses would strengthen the fabric of age-friendly urban development, reinforcing the sense of belonging and community cohesion for older adults. In conclusion, the discourse highlights the significance of addressing the multifaceted aspects of age-friendly urban planning, combining policy leadership and local business participation to cultivate environments enabling the elderly to thrive and flourish in their later years. This implication will serve as a concrete and practical guideline for collaborative efforts among stakeholders in many urban planning endeavours affected by the age factor. It pertains to age-friendly urban development, and it underscores the importance of creating environments that cater to the elderly.

5.3 Limitations and Further Research Opportunities. The present study has limitations but paves the way for future research endeavours:

➢ Expanding the data sample size would enhance the robustness of the findings.

➢ Investigating the applicability of the proposed model in different regions would validate its effectiveness and adaptability.

➢ Constructing quantitative models would further refine and concretise the implications drawn from this study.

These steps will collectively contribute to a more comprehensive understanding of age-friendly urban development, offering insights for practical implementation and policy formulation.

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