Streamlining Denmark’s Immigration Process

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Abstract

Denmark, known for its high happiness index, faces challenges associated with an aging population and labor shortages, particularly in sectors like construction. This paper explores potential solutions within its innovative landscape and the government’s positive policy environment for AI. Key stakeholders to consider in the analysis include the immigrant and resident workforce, hiring companies, government institutions, and local communities. Potential solutions include policies to attract foreign immigrants and innovative strategies to address economic growth and social security. Possible country partners and AI tools are suggested to aid in addressing labor shortages, with an emphasis on construction workers. The proposed AI solution, an AI-powered chatbot named Ella, aims to provide accurate information to potential immigrants and streamline the immigration application process. The implementation plan, business model, and alignment with UN Sustainable Development Goals are outlined. The solution is expected to reduce repetitive queries, contributing to economic growth by increasing the construction workforce. The paper concludes with a discussion on the potential impact of AI on immigration services, emphasizing efficiency, data support for policy-making, and personalized services. Future considerations include the expansion of AI capabilities, such as voice assistance and cultural support, to enhance the overall immigration experience in Denmark.

Keywords: Denmark, Aging population, Labour shortage, Construction industry, AI-powered chatbot, political environment

1.0 Introduction

Denmark is a sovereign country in Northern Europe and the northernmost country in the world. It is located in northern Europe, bordered by Germany, Norway, Finland, and Sweden. The capital of Denmark is Copenhagen.

Denmark is one of the happiest nations in the world, landing in second place. What puts the country in this position is based on multiple factors such as GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity, and freedom from corruption. As a result, Denmark is a country with rich soil for growing innovation.

One of the issues currently plaguing the world, including Denmark, is aging populations. As the average age increases, GDP growth slows due to older individuals retiring and using more government services such as pension and healthcare services (Lee & Mason, 2017). As a result of declining populations, industries with many older individuals experience labor shortages as more and more retire.
With this information, how can Denmark remain as one of the happiest nations in the world while maintaining their GDP growth and lifestyle?

2.0 Denmark’s Existing Problem

Denmark has been collecting data to support a multitude of initiatives to support the 17 United Nation’s Sustainable Development Goals (SDGs). One of the focuses is on the 8th SDG: Economic growth (Statistics Denmark, n.d.). One of the key sectors currently experiencing an aging workforce and labour shortage is the construction sector. One of the initiatives Denmark has already implemented is to increase the retirement age to “promote longer working lives”. However, policymakers and employers must be mindful that construction work requires manual labor, which takes a physical toll on individuals. Furthermore, employers must be aware of and avoid seeing old age as a bias when hiring, if an older individual does choose to apply for a physical job.

3.0 Analysis

3.1 Innovations

Denmark’s Vikings were not only interested in conquests; they were great innovators 1000 years ago with the design of long boats, the magnetic compass and portable tents. Today, Danish companies continue this tradition of innovation. Some of the innovations Denmark is known for include:

- Green Energy and Sustainability: Denmark gas been pioneering the world in renewable energy, especially wind energy generated by wind turbines. It has been heavily invested in wind power infrastructure and sustainable energy practices (Ministry of Foreign Affairs of Denmark, a).
- Life Sciences and Biotechnology: The biotechnology sector has been thriving with heavy investments in research and development with multiple Danish pharma companies recognized globally (Ministry of Foreign Affairs of Denmark, b).
- Design and Architecture: Denmark is pioneering in architecture witch Copenhagen considered a hub for urban planning and architecture. Also, Danish designers are well known for their contribution to the furniture and industrial design (Ministry of Foreign Affairs of Denmark, c; Ministry of Foreign Affairs of Denmark, d).
- Economic Performance: Denmark has a very strong and stable economy ranking coming in at number 9 with the GPD per country and capita. It has a well-functioning healthcare and education system (Worldometer, 2023).
- Technology and Startups: Denmark is considered a good environment for growing startups, especially in the technology fields with an increasing focus on health tech, biotech and fintech (The Innovation Fund Denmark & McKinsey & Company, 2019).

3.2 Technological advancements

One of the key goals Denmark is focused on is having the “public sector use of artificial intelligence to offer world-class services” (Carraro, 2022). Furthermore, in 2021, the EU became the first government to create regulations surrounding the development of AI (Berglind et. al, 2022). Denmark is invested in leveraging AI (see Figure 1) to drive efficiencies and boost the economy. Experts believe by 2023, AI could boost Denmark’s economy by over $5 billion USD in additional GDP (The Innovation Fund Denmark & McKinsey & Company, 2019). This would increase the overall citizen’s life by 0.4%. There is also a growing demand for those with AI skills.
3.3 Challenges

Denmark’s population aging trend is intensifying, with the proportion of elderly people aged 65 and over accounting for about 19.4% of the total population (see Figure 2). The future growth path of universal supply is threatened with aging populations. This could have implications for Denmark’s healthcare system services, social security system, and labour market.

According to Statistics Denmark, 41% of companies in the construction sector, 38% in the service sector, and 38% in the industrial sector reported labour shortages. Some companies have had to reduce orders due to labour shortages, which could have an impact on Denmark’s economic growth (see Figure 3).
Furthermore, with the Ukraine-Russia war, Denmark had over 100,000 immigrants in 2022 (Statistics Denmark, n.d.). From this, it can be implied that many immigrants had many questions during the application process. It's important to develop efficiencies to ensure when immigration volume nearly doubles from previous years, that the existing processes can support the increase.

Source: Statistics Denmark, n.d.

Figure 3. Number of people immigrating to Denmark from 2012 to 2022, by citizenship.

3.4 Policy environment

Denmark’s policy environment for AI is very positive. In recent years, the Danish government has strengthened its strategic deployment and action layout in the field of artificial intelligence, aiming to promote the development of AI and digital projects, enhance the development of social public transport, and focus on environmental resilience and economic sustainability (The Innovation Fund Denmark & McKinsey & Company, 2019).

The Danish government has set a total budget of 200 million euros to promote the development of AI and digital projects, hoping to enhance the development of social transport based on AI. In addition, the Danish government is also concerned about privacy, security and transparency in AI applications, hoping to set a benchmark for responsible and ethical AI applications worldwide.

There are at least 127 AI startups in Denmark (Minevich, 2021). These companies carry out innovation and research and development in the field of artificial intelligence, providing new impetus for Denmark’s economic development. Denmark has a very positive policy environment for AI with government funding, programs, and ethical concerns for AI applications, as well as numerous independent organizations helping to raise awareness about sustainable AI and digital development.

4.0 Data Analysis

4.1 Stakeholder Analysis

Immigrant Workforce:
The immigrating labour for the construction field in Denmark is required to be provided with what meets their expectations when it comes to opportunities. This includes, but is not limited to:
• Immigration related paperwork and process
• The issue of official document
• Opportunity to have secure jobs
• Labour rights
• Expectation to have their different needs met such as training, housing, healthcare, pension, inclusion in society, equal rights, and services

Resident Workforce:
The already existing workforce requires their jobs to be preserved and the immigrating workforce not to compete with their existing roles and pays, but to fill the missing gaps.

Hiring Company:
To have the right skilled workers that are legally available and hold the required skills that can meet the Danish standards and to have fair practices.

Government Institutions:
Different institutions are required to consider and integrate this immigrating workforce within their operations such as the department of immigration, the labour sector, the national security, the health sector … etc. to provide the Danish society with the required workforce that will achieve their growth and development goals and to provide the immigrating workforce with their required rights, expectations, and services.

Local Communities:
The local community will be expecting the migrating workforce to be able to blend in the society and not to affect the values and norms in addition to receive the expected high value service from the workforce.

4.2 Possible solutions

To solve the problem of labour shortage, policies can be adopted to attract foreign immigrants. Denmark can develop relevant policies, such as simplifying visa procedures, providing better job opportunities and vocational training, to attract more immigrants to work in Denmark.

In response to the problem of aging, active population policies can be adopted. Denmark can formulate relevant policies, such as encouraging childbirth, providing better elderly health care services, supporting the employment of the elderly, etc., to ease the pressure of the aging population.

The problem of economic growth can be addressed with innovation-driven policies. Denmark can increase investment in scientific and technological innovation and research and development, encourage enterprises to carry out technological innovation and industrial upgrading, to enhance Denmark’s industrial competitiveness and economic growth potential.

To solve the problem of social security, sustainable development policies can be adopted. Denmark can increase investment in the social security system, improve the level of social security, and pay attention to the sustainable development of the social security system to protect the rights and interests of the elderly and vulnerable groups.

4.3 Possible country partners

• Kazakhstan:
  Construction workers are concentrated in major cities such as Astana and Almaty. According to Statistics Kazakhstan, about 270,000 people were employed in the construction industry in 2019. Reference: Statistical Office of Kazakhstan (https://www.stat.gov.kz/)

• Uzbekistan:
  Construction workers are mainly concentrated in large cities such as Tashkent and Fergana. According to the National Bureau of Statistics of Uzbekistan, about 1.5 million people were employed in the construction industry in 2019. Reference: National Bureau of Statistics of Uzbekistan. (https://www.stat.uz/)
    a. Chamber of Commerce and Industry of Uzbekistan: The association aims to promote the economic development of Uzbekistan and strengthen cooperation between domestic and foreign enterprises. (https://www.stat.uz/)
b. Association of Construction Companies of Uzbekistan: 
   The Association focuses on the construction industry in Uzbekistan, including design, construction and material supply. ([https://www.stat.uz/](https://www.stat.uz/))

- Kyrgyzstan:  
  Construction workers are mainly concentrated in major cities such as Bishkek and Osh. According to the National Bureau of Statistics of Kyrgyzstan, about 150,000 people were employed in the construction industry in 2019. References: National Statistical Office of Kyrgyzstan ([https://www.gks.gov.kg/](https://www.gks.gov.kg/))

- Tajikistan:  
  Construction workers are mainly concentrated in Dushanbe, Kuzhan and other big cities. According to Tajikistan’s National Bureau of Statistics, about 100,000 people were employed in the construction industry in 2019. Resources: Tajikistan, the National Bureau of Statistics ([https://www.tjstat.gov.tj/](https://www.tjstat.gov.tj/))

- Turkmenistan:  
  Construction workers are concentrated in major cities such as Ashgabat and Barkan. According to the National Bureau of Statistics of Turkmenistan, about 80,000 people were employed in the construction industry in 2019. References: Turkmenistan National Bureau of Statistics ([https://www.stat.gov.tm/](https://www.stat.gov.tm/))

4.4 Possible AI partners and tools

The following AI tools were reviewed to ensure they satisfy the requirements of this project, including the ability to train the AI on government-specific websites and low code platforms:

1. UseChat ([https://usechat.ai/](https://usechat.ai/)): The costliest custom AI-powered/ChatGPT chatbot tool
2. Zapier AI Chatbot: The most cost effective AI-powered chatbot tool

5.0 Proposed Solution

5.1 The innovative solution

The solution is to develop and launch an AI-powered chatbot (see Figure 4). To build trust and a sense of personality, the chatbot will be called Ella. Ella will focus on providing users with information based on Denmark’s government website information only. This reduces the risk of providing incorrect and/or biased information to users interested in learning more about the immigration application process. It also ensures applicants complete and submit the right documents required for immigration. Ultimately, this solution is designed to increase Denmark’s populace and construction labour workforce.

As with any AI tool, there is a risk of human displacement or that the AI solution will replace the work humans are currently performing. To manage this change, it’s recommended to cross-train existing agents and analysts on monitoring the tool, handling escalation requests when users want to speak to an agent, and reviewing and updating article pages.

5.2 Implementation

In order to implement this tool, the first three months would focus on developing the AI tool and connecting with local construction association groups to begin building relationships. During the development process, it’s recommended to recruit some individuals who are willing to pilot the tool with an open mind. This will encourage adoption and support prior to launching the tool.

After the first quarter, it’s important to develop some digital advertising and marketing material. Furthermore, it’s important to identify where and how key metrics will be captured and monitored. These metrics including the number of immigrants recruited and the current value of the construction industry compared to the actual future value.

Finally, after six months, the partnerships should be more established so Denmark can successfully recruit construction worker within a year of implementing this solution.
5.3 Business Model

This solution is expected to reduce time spent answering repetitive, common questions. It’s expected that 60-80% of questions are repetitive (Viliavin, 2023).

5.4 Alignment with UN Sustainable Development Goals

This solution focuses on the 8th SDG: Economic growth. This solution will increase Denmark’s construction workforce and increase overall GDP growth long term. Overall, introducing AI solutions to the public sector could increase GDP percent by 12-15% long term (Berglind et al., 2022).

6.0 Conclusions & Discussions

6.1 Impact on Humanity

First, immigration assistance AI can provide more efficient and accurate immigration identification services. By using biometric technologies such as fingerprint data, retinal scans and facial recognition, AI can identify people’s vein and blood vessel patterns, ear shape and gait, among other things, allowing for rapid and accurate identification of migrants. At the same time, technologies such as face recognition, image recognition and video structuring trained by AI algorithms can be used for network text, picture, video and voice content recognition, monitoring and classification, providing auxiliary tools for various scenario-based applications of network technology, so as to effectively improve the ability of immigrant identity recognition and give better judgment results according to relevant information.

Secondly, immigration assistance AI can provide data support and prediction for immigration policy making. Through the analysis and mining of a large amount of data, AI can extract the characteristics and trends of relevant immigrant groups to provide decision-making basis for policy makers. At the same time, AI can also predict and analyse future population flows based on historical data and population migration laws, helping the government to formulate more scientific and effective immigration policies.
In addition, immigration assistance AI can also provide more personalized services to migrants. For example, AI can provide immigration services more tailored to the needs of immigrants by understanding their background, language, culture, etc., including providing language translation, cultural adaptation and other help.

6.2 Future considerations

An immigration AI assistant can influence many aspects of humanity including enhanced identification efficiency, data-driven support and predictions, and personalized services. As technology advances, it will play a crucial role in future immigration work. Successful implementation of AI-powered chatbot Ella opens avenues for future features, such as:

- Provide more inclusive access including introducing AI-powered voice capabilities
- Provide individuals with responses to culture and language related questions to empower immigrants to feel comfortable when moving to Denmark
- Reduce friction during the onboarding process after successful application submissions
- Reduce friction during the onboarding process when joining a new construction company

References

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Judges and Biographies – In Alphabetical Order

Cameron Welsh, Professor and Case Competition Director at the University of Calgary
Cameron Welsh, a Senior Instructor at the Haskayne School of Business, University of Calgary, brings over two decades of dedication to academia and impactful business leadership. His remarkable achievements include numerous Haskayne service and case team coaching awards, notably the Dean’s Award for Outstanding Service Leadership for Faculty (2011-2013). Cameron’s coaching prowess is reflected in multiple Faculty Advisor of the Year awards at JDC West and consecutive Best Coach honors at the Engineering Commerce Case Competition. In addition to his teaching and coaching roles, he is a respected researcher with publications in esteemed journals and has received accolades, including the Best Paper in Entrepreneurial Theory Award. Cameron, actively engaged in environmental stewardship, serves as Vice President of the Crowsnest Forest Stewardship Society and contributes to Castle Special Places Working Groups. Outside academia, he finds solace in outdoor pursuits like fly fishing, hiking, biking, and photography.

Hélène Tremblay, International Author and Researcher
Hélène Tremblay, a world-renowned researcher, author, photographer, and inspirational speaker, has captivated global audiences with her exploration of daily life in 111 countries. Her 15 published books, distributed internationally, offer intimate portraits of diverse families. Engaging over 100,000 participants in conferences spanning continents, Hélène excels in bringing audiences into the heart of humanity. As a skilled photographer, her thematic works, exhibited at the United Nations and the Cultural Foundation of Abu Dhabi, capture life’s ritualized moments across cultures. Hélène Tremblay’s impactful legacy celebrates shared human experiences, inspiring strength and spirit in a global context.

Juan Villaescusa, MBA Social Impact Measurement Expert
Mr. Villaescusa obtained his MBA from Corvinus University of Budapest, Hungary. Today, he is a Credit Risk Associate at Morgan Stanley. Mr. Villaescusa is engaged in sustainability projects around social and environment, providing guidance and consultancy services, as well as, facilitating the delivery of education. He has been a mentor to students living abroad as well as a judge on international case competition projects. Mr. Villaescusa has extensive experience in the analysis of administrative and commercial processes, audit planning, and performance management (LinkedIn: https://www.linkedin.com/in/juan-alberto-villaescusa-prades54124117a)

Miklos Kozma, Dr. Professor in Strategy and MBA Director at Corvinus University in Budapest
Miklos Kozma is a distinguished academic and business professional, currently serving as the Full-time MBA Program Director at Corvinus University of Budapest. He earned his MSc in Business Administration from the same institution in 2000 and later completed his PhD in 2012. With a career spanning both academia and corporate advisory roles, Kozma has held various positions at Corvinus University of Budapest, including Associate Professor and Academic Director of the Central European Case Competition. His international engagement extends to being a Board Member at the European International Business Academy (EIBA) and his leadership role in the AMBA accreditation process. Beyond academia, Kozma has enriched his experience as an advisor and manager at KPMG Advisory Ltd. from 2000 to 2013. His commitment to the field is reflected in numerous accolades, such as coaching teams to victory in prestigious case competitions and receiving awards for talent management and excellence in teaching. Kozma’s multifaceted career showcases his dedication to advancing education, fostering international collaborations, and contributing significantly to the fields of business and organization science.

Paul Nguyen, Program Director at Scotia Bank
Mr. Nguyen graduated from Concordia University, later joining Scotiabank, and achieving a Level 1 CFA candidate. Responsible for delivering performance and improving customer experience, Mr. Nguyen comes with a wealth of experience from the banking sector. Highly motivated and result driven, Mr. Nguyen brings to the case competition many years of experience in FinTech, Project Management, and process Improvement (LinkedIn: https://www.linkedin.com/in/nt-paul-nguyen/).

Raafat Saadé, Dr. Professor and Chair at Beijing Institute of Technology
Dr. Raafat SAADÉ completed his Natural Sciences and Engineering Research Council of Canada award at McGill University, Canada, in 1997. With over 33 years of academic and industry experience, he joined the Beijing Institute of Technology (BIT), Beijing, China, in 2021, at the rank of Chair Professor. Dr. Saadé has extensive consulting experience on international projects from the Canadian International Development Agency, and the International Civil Aviation
Organization, where he assumed several advisory roles to senior management, primarily entailing organizational transformation and change. Dr. Saadé founded the International Network of Digital Innovation Research & Education (IN-DIRE) in 2020, and has recently joined the International Association for Green Aviation as a founding member. He is multi-disciplinary and has sustained active research with many publications in top ranked journals. He is currently Chief Scientist of the BIT Global Aviation Development Academy (GADA), and a member of the Executive Board of the School of Global Governance. Dr. Saadé’s current newly established research interests include the International Network for Digital Innovation, Research & Education, Internet of Things in Education, and Aviation Climate Change (LinkedIn: https://www.linkedin.com/feed/)

Rocco Matteo, Retail Executive Expert, President at E3-Consulting
With over 25 years in retail, Rocco Matteo leverages his expertise to propel organizations to peak performance. Specializing in sales growth, operations, and organizational development, he’s a catalyst for success and strategy execution. A sought-after speaker at top universities on Business Management and industry trends, Rocco is also a Lead Judge at the John Molson MBA International Case Competition. Personally, and professionally impactful, he’s dedicated to coaching and mobilizing the younger generation through mentorship. Rocco’s commitment extends to community welfare, organizing regular fundraisers to combat poverty in the city. His energy, passion, and proven success make him a dynamic force in any team.

Samie Ly, Dr. Co-creator of Innovatank, Co-chair at The World Case Committee
Samie Ly, Dr. co-creator of Innovatank and co-chair at The World Case Committee, is an award-winning researcher and educator specializing in innovation within the realms of data analytics and project management. With a robust background as a project manager and technology lead in both industry and academia, Samie is also a seasoned professor in analytics (Undergrad to EMBA level). Having participated in over 12 international and national competitions, she brings a wealth of practical experience to her role. Samie holds an MBA with a focus on strategy and competition, complemented by a Ph.D. in Immersive Learning and Technological Processes. Recognized for her teaching innovation and distinguished research, she leads Innovatank, orchestrating hands-on learning experiences for students through the integration of data analytics and collaborative ventures with corporate entities.

Stavros Athanasoulias, Co-creator of Innovatank and Co-chair at the World Case Committee
Stavros Athanasoulias, MBA, is a dynamic entrepreneur, co-creator of Innovatank, and co-chair at the World Case Committee. With diverse education businesses emphasizing sustainability, Stavros, also an experienced coach, serves as partnerships director, connecting industry and students for soft skills recruitment analytics. His leadership bridges academia and business, fostering impactful collaborations for positive change in education and sustainability. Actively engaged in education and coaching programs for newcomers in Canada, he seeks to support their success in the Quebec environment.

About The World Case Committee
The World Case Committee (WCC), an Innovatank initiative, blends education and philanthropy to globally elevate talent through the case methodology. Focused on setting a standard in impact learning, it guides partner organizations in hosting international and national events, including case competitions, pitch contests, and hackathons, bridging academia and industry. The committee annually organizes inclusive seminars and events, providing access to impact learning for all. Committed to United Nations Sustainable Development Goals, its pillars include Education for All, Soft Skills Development, Mentorship Empowerment, Inter-generational Achievements, and Impact Learning. WCC fosters connections, skills development, mentorship, and knowledge creation for a better world. https://theworldcase.com/