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The Arabic Language Learning Industry: Economic Influence and Contributions to Global Economic Communication

Dr. Jawharah Saeed Alasmari

Assistant professor of linguistics- Faculty of Art- Princess Nourah bint Abdulrahman University - Saudi

analasmary@pnu.edu.sa

Abstract

This article examines the contribution of the language industry to the technological development of the national economy and society. The article evaluates economic data from 2013 and 2021 to assess the contribution of the Arabic language industry to the country's gross domestic product under the Kingdom's Vision 2030, which aims to reduce the country's dependence on the oil economy. The comparison between the economic data of sectors involved in the Arabic language industry in 2021 and 2013 shows an increase in the number of Saudi and non-Saudi government and private sector employees in 2021. In addition, the unemployment rate decreases in 2021 compared to 2013. In accordance with Vision 2030, the Kingdom has established the King Salman Global Academy, whose main aim is to promote the Arabic language and develop innovation in the Arabic language sector using artificial intelligence technology. The academy has developed a language strategy for Saudi government agencies. The contributions of the Arabic language industry align with the Kingdom's 2030 objective of transforming the country into a tech powerhouse. To achieve this goal, Saudi Arabia is investing in computer programming using the Arabic language and utilizing technology to foster progress in the education sector. Through AI and its application in the education industry, students' skills are being improved. This will allow pupils to gain the necessary skills for future employment.

Keywords: Global Communication, Arabic Language, Artificial Intelligence, Saudi Vision 2030, King Salman Academy.

ملخص البحث

تبحث هذه المقالة في مساهمة صناعة اللغة في التطور التكنولوجي للاقتصاد الوطني والمجتمع. يقيِّم المقال البيانات الاقتصادية لعامي 2013 و 2021 لتقييم مساهمة صناعة اللغة العربية في الناتج المحلي الإجمالي للدولة بموجب رؤية المملكة 2030، والتي تهدف إلى تقليل اعتماد الدولة على الاقتصاد النفطي. تظهر هذه الدراسة أن مساهمة صناعة اللغة العربية في اقتصاد المملكة العربية السعودية متعددة الأوجه. تخلق صناعة اللغة السعودية وظائف جديدة لخفض معدل البطالة في البلاد. تماشيا مع رؤية 2030، أنشأت المملكة أكاديمية الملك سلمان العالمية، التي تتمثل مهمتها الوحيدة في تعزيز اللغة العربية وخلق الابتكار في صناعة اللغة العربية من

خلال استخدام تقنيات الذكاء الاصطناعي. كما قامت هذه الأكاديمية بصياغة سياسة لغوية للمؤسسات الحكومية السعودية. تتوافق مساهمات صناعة اللغة العربية مع هدف المملكة 2030 المتمثل في تحويل البلاد إلى قوة تقنية. لتحقيق هذا الهدف، تستثمر المملكة العربية السعودية في برمجة الكمبيوتر باستخدام اللغة العربية واستخدام التكنولوجيا لتعزيز التقدم في قطاع التعليم.

الكلمات المفتاحية: الاتصالات الاقتصادية العالمية، اللغة العربية، الذكاء الاصطناعي، رؤية المملكة 2030، أكاديمية الملك سلمان.

Introduction

This article analyzes the expected changes brought to Saudi Arabia's economy by the development and implementation of the Saudi Vision 2030, a programmatic document stating the need to diversify the country's economy and setting the conditions for a numebr of interventions aimed at such diversification. The core of this tranformation of Saudi Arabia's economy is technology and, in particular, the development of artificial intelligence (AI). As a crucial component of this strategy, Vision 2030 aims at integrating Arabic into technology. The role of the language industry into this techonological tranformation of the country's economy (and society) is the main focus of this paper. The article will start reviewing the spread of AI and its contributions to Saudi Vision 2030 and will continue by exploring the interconnections between AI and the Arabic language.

The notion of AI, which has been well-known for many years now, has become even more influential recently (Dignum, 2018). Claude Shannon proposed the idea of computing gaming with a computer playing chess in 1950 (Shannon, 1950, Giri et al., 2022). Gradually, artificial intelligence became mainstream in the 1960s (Schaeffer & Van den Herik, 2002). Marvin Minsky stated that the problems with AI simulations would be solved within a decade (see Bengio, 2016). During this period, AI applications have appeared in various fields. AI research is sometimes referred to as "Smart Agent" studies, which include any program or system that sees and acts in a way that maximizes its chances of accomplishing its goals (Bryndin, 2021).

Various first humanoid robot designs are supposed to have been used in ancient Greece (Alhashmi et al., 2019). The example of Daedelus, the creator of wind mythology and artificial humans, might be appropriate (Sawday, 2007). Modern AI aims at explaining human thinking (How & Hung, 2019). In addition to its use in engineering, information technology, finance, accounting, medicine, agriculture, human resource management, space science, and customer service, AI also efficiently performs tasks (Matsa & Gullamajji, 2019). Siri, Google Now, Alexa, and Cortana are digital assistants

that enable users check their schedules, search the web, and command other apps. These applications learn from every user contact using AI. Deep learning, a form of AI, is implemented in self-driving and parking automobiles to detect the space surrounding the vehicle. An AI system is used by the vaccum robot to measure the size of a room, detect any potential obstacles, and recall the most efficient cleaning path.

Contributions of AI to Saudi Vision 2030

In 2016, following the election of King Salman bin Abdulaziz Al Saud as the 23rd king of Saudi Arabia, Mohammed bin Salman Al Saud (crown prince) unveiled an ambitious economic and social reform plan aimed at reducing Saudi Arabia's dependence on oil and developing a robust private sector (see Rahman & Al-Borie, 2021).

With the announcement of Vision 2030, which includes the transition to digitization as one of the critical goals, Saudi Arabia has taken measures to employ technology in various sectors (Al-Jehani et al., 2021). To achieve this goal, it considers AI a valuable strategic option, fulfilling its desire to be ranked among the AI-advanced nations and even giving citizenship to robots (Huang & Rust, 2018). The Nala application robot is an example of the use of AI in the medical field. It was the first application in Saudi Arabia to use AI to provide healthcare services by communicating in Arabic. It was developed in 2019 to provide simple recommendations based on health information, book appointments, and answer questions about health problems (Giri et al., 2019).

The author of this study assessed the approach and progress of the Vision 2030 reform program using Vision 2030 KPIs, Saudi Arabia's economic data, and comparative national surveys. Several notable achievements have been made in the Vision 2030 reforms in Saudi Arabia, including the stabilization of finance and macroeconomic management, the development of the capital market, the development of the banking system, and the digitization of government services (Grand & Wolff, 2020).

As a key component of Vision 2030, the Kingdom of Saudi Arabia (KSA) planned to diversify its economic base away from oil and hydrocarbons. Most importantly, according to the document, AI is at the heart of this strategy. To highlight the impact of AI on Saudi Arabia's economic growth, the Saudi government hosted the Global Artificial Intelligence Summit 2020. At the behest of Crown Prince Mohammed bin Salman, this summit was expected to become a major international forum dedicated to promoting AI. The second

World Summit on Artificial Intelligence, organized by "SDAYA" under the patronage of His Royal Highness Prince Mohammed bin Salman, Crown Prince and Chairman of the Board of Directors of the Saudi Data and Artificial Intelligence Authority "SDAYA," was attended by about 10,000 policymakers, experts, and specialists in AI from 90 countries at the King Abdulaziz International Conference Center in Riyadh in from 13 to 15 September 2022. The result of agreements exceeded 40 and created a unique partnership between the public and private sectors to invest AI techniques in the development of government services, which improves quality of life and human service worldwide. In addition, 10 local and international initiatives between global companies and institutions to improve international cooperation were announced. Muzn, the foremost Saudi company in AI technology, has developed the biggest and most effective language model for understanding and interpreting Arabic.

Currently, Saudi Arabia aims to become a global player and a centre of expertise in the field of AI. This technology promises to create a civilization leap for humanity, which is how the KSA hopes to capitalize on AI emerging trends (Carey & Nereim, 2017).

Saudi Arabia's Data and Artificial Intelligence Authority (SDAIA) advisor Majid Al-Shehry spoke at GITEX Technology about the kingdom's "ambitious plans" for AI. One way to achieve KSA's technology goals is to localize A, including text, emoji, acronyms, and abbreviations used in online chat, speech, and more, and integrate Arabic into technology by adapting technological products, services, and content to the requirements of a local market (see Diaz, 2020; Senbekov et al., 2020).

The market for artificial intelligence is expected to reach $90 billion by 2025, with an average annual growth rate of 45 percent (see Pai et al., 2022; Statista, 2019). Moreover, AI is expected to contribute an additional $15.7 trillion to the global GDP by 2030, a growth rate of 14 percent (see Alshahrani et al., 2021; PwC, 2017; Shingare & Kanoi, 2020). Likewise, AI represents a very significant commercial opportunity for Saudi Arabia, which has already demonstrated its commitment to this cause with several grand gestures. Sophia, a humanoid robot with artificial intelligence, is the first robotic citizen in the world to be granted citizenship by the KSA. The government of Saudi Arabia is building a new megacity called "Neom" (a combination of Arabic and Greek, meaning "new future"). Located in Tabuk Province

in northwestern Saudi Arabia, the will extend into Egypt and Jordan and cover a total area of about 26,500 square kilometers. There will be approximately 17 times more people in this city than in London, which is only marginally smaller than the entire Belgium. Neom will integrate AI features, adopting numerous technologies and being a smart city with smart hospitals, schools, and houses. The most essential use of AI will be in the infrastructures for the services, such as smart water, energy, and roads. In Neom, the Crown Prince stated that AI will be integrated into everything, including the Internet of Things.

The construction of Neom has already begun. A new international airport is being built in the new city. A residential area is being built in the bay of Neom, which could be home to 30,000 people in the next few years (Farag, 2019). The Saudi government has undertaken a far-reaching institutional reform to prepare for AI and this period of economic transition beyond building infrastructure where the desert once stood. In the summer of 2019, a royal decree established the Saudi Authority for Artificial Intelligence and Data Analytics. This new institution includes a National Data Management Office, which is probably a new name for the National Information Center, previously. All three institutions, the King Abdullah bin Abdulaziz International Center for Arabic Language Service, the King Salman bin Abdulaziz International Complex for the Arabic Language, and the Saudi Authority for Data and Artificial Intelligence are developing a governance and organizational structure for digitization and artificial intelligence. The government will also implement educational reforms in primary and secondary schools to ensure that children have access to digital skills. In a traditionally conservative and rent-seeking state.

In Saudi colleges, AI has been subdivided into numerous specialities, the most important of which are robotics, data extraction, computer science, and language technology. There is also a specialization in intelligent applications. These and other AI specialities in Saudi Arabia are regarded as the most significant qualitative leaps in the evolution of life. The establishment of three significant institutions, namely the King Abdullah bin Abdulaziz International Center for Arabic Language Service, the King Salman bin Abdulaziz International Complex for the Arabic Language, and the Saudi Authority for Data and Artificial Intelligence, will contribute significantly to the integration of the Arabic language into AI applications, focusing on documentation systems, information storage and

classification methods, the production of electronic dictionaries, machine translations, the transfer of scientific material, programs for teaching Arabic to non-native speakers, spelling checkers, and so on. The purpose of developing innovations in each of these areas, from renewable energy to improving daily life, is to reduce economic outflow from the Kingdom and the region. AI and robotics are expected to be a driving force for innovation in the Kingdom. The integration of AI will facilitate the Kingdom's transition from a conservative economy to one that thrives on innovative technology.

From an economic standpoint and an economist's perspective, language offers "added value" to economic transactions. Economic life cannot exist without transactions, connections, and interactions, and the usage of the national language (which is often the mother tongue) will be the cheapest, easiest, safest, and most lucrative. Being the raw material of the creative industries, notably the cultural ones, and given the integration and complexity of this sector, language generates economic value. Being among the "intangible assets," and representing a public good, language might be considered an economic good. Investing money, time, and effort in the acquisition of a language is analogous to making a long-term investment in an asset. Compatibility between written and spoken language is directly proportionate to a country's economic growth. For example, some studies trace the strength of Germany's economy compared to Italy to the fact that the former adopts and speaks a more standardized dialect than the latter (Muryati, 2008; Alsaeed, 2015).

The ease of exchanging goods and services for intangible assets (exchange of productive knowledge) across nations via language (scientific and technological) is similar to the ease of exchanging goods and services for physical assets through money or currency. Economic growth is directly proportional to informal, economic performance. Linguistically fragmented countries are predominantly poor. To address this issue, in Singapore and Malaysia, for example, scientific outputs are officially translated. Some countries are eager to teach their children another language beyond their mother tongue because of the corresponding economic returns in international relations. For example, Saudi Arabia sought to integrate the Chinese language into its curriculum; Turkey reintroduced Arabic in its educational curriculum as an optional second language and encouraged its use in tourist areas crowded with Arabs; South Korea teaches Arabic in six universities and

has made it an official subject for admission to universities. The destiny of languages (and peoples) become economically dependent. The more dynamic a language's economy, the higher its diffusion and demand. The predominant languages are strongly associated with economically-advanced countries and the most significant languages in the world reflect larger economies; thus, the language of economically weak nations remains locked away (Muryati, 2008; Alsaeed, 2015).

AI's contribution to GDP by 2030

IDC forecasts spending on AI and cognitive systems in the Middle East and Africa (MEA) to increase by 32% over the next five years, from $37.5 million in 2017 to more than $ 100 million in 2021. As shown in Figure 1, the UAE, Saudi Arabia, and Qatar are committed to developing and implementing AI technology (PwC, 2017). Consequently, companies have invested significantly in new technologies supported by governments as early adopters. Outside the Gulf states, however, growth has been less rapid.

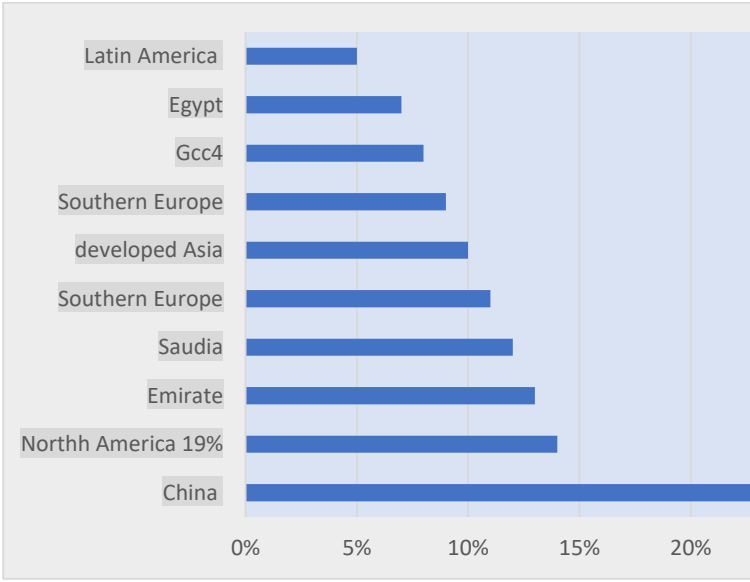

Fig. 1 Al contribuation to GDP by Rigion, 2030 (PwC, 2017)

Artificial Intelligence and the Arabic Language

AI systems are becoming an increasingly significant part of modern life. They enhance awareness and understanding of more traditional aspects of our lives and cultures.

AI offers significant benefits to the Arabic language through applications that support teaching and learning and help develop dictionaries and programs so that millions of people can learn and use the Arabic language.

In an interview with Arab News, Abdullah Al-Washmi, the secretary general of the King Salman Global Academy for Arabic Language, said that the academy aims to

serve as a global reference resource for the Arabic language by providing the tools needed to promote, teach, learn, and encourage the use of the Arabic language, in accordance with Vision 2030 and the Kingdom's Human Capabilities Development Program.

In addition to accelerating research on the Arabic language, the academy also plans to use AI tools to aid understanding as part of its strategy.

By enabling different learning patterns that allow students to learn Arabic in different ways that suit their needs, AI has become a significant enabler for language teaching and learning, according to Al-Washmi. Moreover, AI will tailor each student's learning experience to their particular needs by identifying and addressing their weaknesses and capitalizing on their strengths by observing their preferences and adapting the learning material accordingly.

Recently, an agreement was signed between THIQAH Business Services and the academy to develop applications for the Arabic language by creating linguistic data sources and tools for archiving and analyzing Arabic language data and making it accessible to academics, experts and students. By improving the quality of Arabic content, this project aims to improve knowledge and awareness of the Arabic language.

Key Initiative in the Field of Arabic Language

According to the Council of Ministers' decree number (34), King Salman Global Academy for the Arabic Language was established on January 13, 1442, H, corresponding to September 1, 2020. The goal is to highlight the importance of the Arabic language as an expression of the linguistic depth of both Arab and Islamic cultures and to contribute to the development of the Arabic language in the region and worldwide. In addition to promoting the Kingdom's Vision 2030, the Academy's initiatives are also part of the human capacity development program. Some of the academy's important initiatives are outlined below.

Computational Linguistics

The field of computational linguistics strives to develop linguistic dictionaries of all kinds and for all purposes. Whether they are general, specialized, or historical dictionaries, as well as electronic and paper-based dictionaries, an application program interface (API) access to applications shall be provided. In addition, this area shall provide the necessary equipment, including linguistic corpora and tools for analysis and research, as well as computer technologies that support the

creation and use of electronic dictionaries. These include morphological analysis, which focuses on word analysis. Morphemes—prefixes, suffixes, and base words—are the smallest meaningful units. Phonics—reading, spelling, vocabulary, and comprehension—depends on morphemes. Lexical assets are automatically collected from corpora of real language use, then post-processed by lexicographers or included in the published dictionary, indicated as automatically generated. Meaning networks enable data sharing between PCs, servers, mainframes, network devices, peripherals, and other devices.

In its first project in this area, the King Salman Global Academy is creating a high-quality contemporary Arabic lexicon based on scientific corpora that will serve as a tool for Arabic readers, learners, and researchers in theoretical and computational linguistics for research in artificial intelligence.

The Lexicon's objectives are as follows:

1. Establishing a linguistic resource that scientifically and reliably represents contemporary Arabic vocabulary.
2. Providing support for linguistic research: Tools that facilitate the search for and retrieval of linguistic information in an easy and accessible manner for researchers.
3. Building lexical-based computer models and facilitating the implementation of AI.

The current Arabic corpora, launched on January 24, 2022, uses a specialized electronic platform to monitor linguistic occurrences and analyze language for research, retrieval, and training artificial intelligence models) The King Salman Global Academy for the Arabic Language © 2022). The corpora focus on contemporary Arabic language in the last 100 years, benefiting Arab readers, learners, and researchers in computing the language. Dr. Abdullah Al-Washmi, Secretary-General of the King Salman International Complex for the Arabic Language, stated that)Abdullah, 2022) the establishment of the corpora is consistent with the complex strategic objectives of the country and aims at achieving the global reference in the fields of the Arabic language and its applications, and its mission of raising the status of the Arabic language globally, intensifying its technical contribution to the scientific and cultural fields, in line with the objectives of the Kingdom's Vision 2030. The linguistic corpora identify scientific and cultural patterns, creating a broad collection of common vocabulary, phrases, and sentences, upon which the monitoring of language events is based. Al-Washmi added that the monitoring of vocabulary and language packages depends on the size of the corpora and the nature of the

tributaries that provide it; if a corpora is analyzed in the field of commerce, for instance, a set of linguistic phenomena and observations related to the market, the economy, and others can be identified.

By providing reliable linguistic sources for use and analysis, the field of computational linguistics contributes to accelerating scientific research in Arabic and improving the value of scientific methods by enhancing linguistic resources. As one of the most reliable methodological sources for the scientific study of languages, linguistic corpora are also essential for the development of artificial intelligence techniques, as they provide excellent building standards and content that can be highly relied upon for linguistic representation.

The processing of the Arabic language requires the availability of linguistic data of excellent quality and sufficient volume to meet the requirements of the functions and tasks for which these data will be used. By using a specialized electronic platform that facilitates research, retrieval, and analysis, and is useful for training and testing artificial intelligence models, the Contemporary Arabic Language Corpus project hopes to become one of the leading linguistic resources for facilitating the use of artificial intelligence, developing computer applications, observing linguistic phenomena, and analyzing language.

To facilitate the use of language by computers and a linguistic presence within computing platforms and applications, the Computational Linguistics Sector aims to establish a center focused on the study of the Arabic language using artificial intelligence technologies. This will be achieved through the development of scientific and research tools and computer applications, such as the AI Center for Arabic Language Processing, which deals with the Arabic language study, utilizing artificial intelligence approaches, developing scientific and research tools and computer applications to help computers handle language on computer platforms and applications. In addition, the King Salman Academy in Arabic Language Processing aims to solve language computing problems and develop current technologies with the participation of unlimited groups of researchers, experts, and hobbyists in those fields, which accelerates the development of these technologies and applications and increases the chances of benefiting from them in more advanced research and applications.

Computational Linguistics aims to organize events that help invest expertise and coordinate efforts to strengthen research, development, and innovation in Arabic

language informatics, including the establishment of a hackathon. With the participation of a wide range of researchers, experts and hobbyists in these fields, the aim is to solve current problems in language informatics and develop new technologies. This will greatly accelerate the development of such technologies and applications and improve our ability to benefit from them in future research and applications.

The objectives of the center are as follows:

- In the first step, support research and innovation by implementing practical solutions and digital initiatives that will increase the use of technology in Arabic language courses.
- Increase the Kingdom's international presence in Arabic language processing.
- An influential community – fostering interactions and synergies among researchers and those interested in Arabic language processing.

The domains of the hackathon are:

- Automated Arabic language processing.
- The development of Arabic linguistic data.
- Enhancing support for Arabic in public libraries and open-source software.

Intended Audience:

- Males and females in Saudi Arabia, the Gulf, the Arab world, and other institutions.
- Researchers in artificial intelligence, computational linguistics, and Arabic language processing.
- Startups in the field of language processing.
- Members of the general public who are passionate about serving the Arabic language.

Methodology

This research is both qualitative and quantitative. In this study, the economic data of Saudi Arabia for the years 2013 and 2021 were compared to show the contribution of the Arabic language industry before and after the announcement of the Vision 2030 plan by the Kingdom. This study shows the effectiveness of investment in computer programming in Arabic.

Data Collection

Data were collected from official interviews and yearly economy reports for 2013 and 2021. Official reports issued by Saudi Central Bank on the economy were used for this purpose. Apart from these reports, an interview with Abdullah Al-Washmi, Secretary-General of King Salman Global Academy for the Arabic language, was used to show the effectiveness of computer programming in

the Arabic language. In addition, the King Salman Global Academy's Language Policy Guide was used to show the contribution of the Arabic language to the achievement of Vision 2030. Tables are used to compare economic data from 2013 and 2021. A pie chart is also drawn to show the difference between the economic data from the annual economic reports of the two years.

Data Analysis

Table 1

Economic data of 2013

Sectors	Values
Non-oil GDP	140.8 Bn
Education and Vactional Training Sector	187K
Employment (Government)	Saudis: 643k Non Saudis: 37.1k
Employment (Private)	Saudis: 1,331,600 Non Saudis: 4,331,110
Unemployment	12.8
Technology	64Bn
Telecommunication Sector	70Bn

Table 1 shows that the non-oil sector contributed 140.8 billion to the Saudi economy in 2013. A total of 187,000 students graduated from the higher education and vocational training sectors. In 2013, 643,000 Saudis worked in the state sector, while 37,000 non-Saudis were employed. The unemployment rate was reported at 12.8 in 2013. In addition, the technology and telecommunications sectors generated 64 billion and 70 billion, respectively.

Table 2

Economic data of 2021

Sectors	Value
Non oil GDP	332Bn
Education and Vactional Training Sector	508k Graduate
Employment (Government)	Saudis: 1,227,698 Non Saudis:49,599
Employment (Private)	Saudis: 1,746,741 Non Saudis: 6,280,156
Unemployment	7.4
Technology	81.3 Bn
Telecommunication Sector	82 Bn

Table 2 shows the economic contribution of the sectors associated with the Arabic language industry in 2021. First, the non-oil GDP is 332 billion euros. In 2021, 508,000

students will graduate in education and training. In 2021, 1,227,698 Saudis work in the government sector, while 49,599 non-Saudis are employed. On the other hand, 1,746,741 Saudis work in the private sector, while 6,280,156 non-Saudis are employed. The unemployment rate was 7.4 in 2021, while the technology and telecom sectors contributed 81.3 billion and 82 billion, respectively.

Table 3

Comparison Between 2013 and 2020 Economic Data

Sectors	2013	2020
Non oil GDP	140.8 Bn	332Bn
Education and Vactional Training Sector	187K	508k
Employment (Government)	Saudis: 643,000 Non Saudis: 37.1k	Saudis: 1,227,698 Non Saudis:49,599
Employment (Private)	Saudis: 1,331,600 Non Saudis: 4,331,110	Saudis: 1,746,741 Non Saudis: 6,280,156
Unemployment	12.8	7.4
Technology	64 Bn	81.3 Bn
Telecommunication Sector	70Bn	82 Bn

Table 3 compares economic data for 2013 and 2021, showing that the non-oil GDP of 2021 is 172 billion higher than that of 2013. In addition, 187,000 students graduated from college and vocational programs in 2013, while 508,000 students will graduate from college and vocational programs in 2021. In 2013, 643,000 Saudis andV! 37000 non-Saudis working in the government sector. By contrast, in 2021, 1,227,668 Saudis and 49,000 non-Saudis work in the government sector. While in the private sector, 1,331,600 Saudis and 4,331,110 Non-Saudis were working in 2013, and 1,746,741 Saudis and 6,280,156 Non-Saudis were working in 2021. The unemployment rate in 2013 was 12.8, and in 2021, it was 7.4. Technology and telecommunication contributed 64 Billion and 70 Billion in 2013, while they contributed 81.3 and 82 Billion in 2021, respectively (Figure 2).

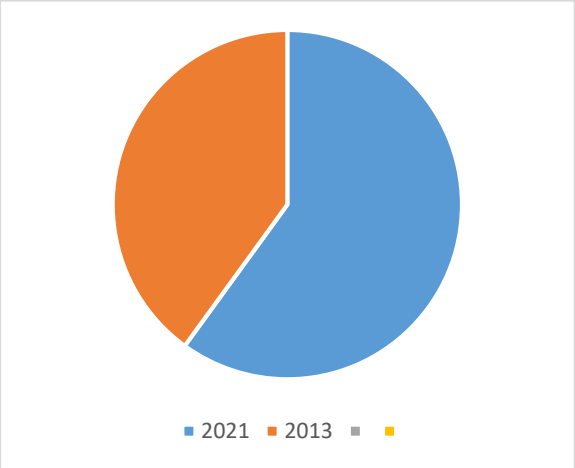

Fig. 2 Comparison of Language industry's contribution to GDP in 2013 and 2020

Role of King Salman Global Academy in Language Policy and Contribution to Economy

The King Salman Global Academy has developed a draft language policy guide for Saudi government institutions in Arabic. Under this initiative, government agencies will be informed about linguistic decisions and employees will be made aware of the importance of linguistics in the context of various decisions and regulations. In a statement, the academy also hopes to provide policies and procedures to maintain the position of Arabic in government institutions. As part of the Academy's long-term plan to preserve the integrity of Arabic and develop policies, strategies, plans, and programs, this project will support the integrity of Arabic in speech and writing ().

An overview of Saudi language policy and a guide to language editing in government institutions are presented. The project, which aims to train more than 1,000 employees in more than 20 ministries and government agencies, is one of the initiatives of the Human Capacity Development Program, one of the programs of Vision 2030. A total of 40 training courses will teach writing skills for administrative employees and the basic rules of Arabic script. A study of the specific need for functional language led to the selection of these two topics.

In coordination with the Ministries of Culture, Education and Islamic Affairs, several courses were held as part of the project's first training course. The training courses usually last two days and are accompanied by eight hours of instruction.

Effectiveness of Investment in Computer Programming of Arabic Language

According to Al-Washmi, secretary general of the King Salman Global Academy, artificial intelligence is helping Arabic speakers develop their skills by providing tools to learn Arabic grammar differently than with traditional books.

"AI allows students to choose the method they want to use to learn a language, such as simulation, dialogue, or other methods that will meet their needs in addition to

using techniques and educational methods that fit their needs."

AI's high-performance computing devices and the amount of data they can process can provide excellent solutions. By automatically detecting and correcting pronunciation, assessing reading levels, and assisting with reading, speaking, and listening speed, the program can help people learn Arabic and improve their reading skills. Correcting spelling, grammar and semantics and generating complete sentences can improve writing skills (Giri et al., 2019).

Al-Washmi said AI could improve communication skills through the use of intelligent dialog systems. In addition to summarizing and translating, users can also improve their search, detect fraud, plagiarism and rumors, identify hate speech and answer questions. All contributions in this area are grouped under the term natural language processing or computational linguistics, which brings together specialists in intelligence and language.

The use of robots has gained wide appeal in educational circles around the world, and he said when talking about modern ideas for teaching Arabic through AI. Students can use these robots to apply scientific principles and design, implement and test their ideas. They can also conduct research with them.

Al-Washmi explained that AI enables robots to better communicate, follow instructions, answer questions, teach lessons, and perform Arabic customs, which benefits students of the Arabic language.

He noted that virtual worlds offer an exciting and rewarding opportunity to enhance the learning and teaching of Arabic. Moreover, it provides a virtual Arabic-language environment in which students can immerse themselves.

Discussion

This study shows a significant difference in the economic data for the year 2013 and the year 2021 from the sectors related to Arabic language. Overall, the language industry performed better in 2021. The results show a significant difference in the economic data for 2013 and 2021.

The non-oil GDP of 2021 is 172 billion higher than in 2013. In addition, 187,000 students completed their higher education and vocational training in 2013, while 508,000 students will complete their higher education and vocational training in 2021. Overall, 321,000 more students will graduate from higher vocational education institutions in 2021.

In the labor force, 643,000 Saudis and 37000 non-Saudis worked in the government sector in 2013. In contrast, in 2021, 1,227,668 Saudis and 49,000 non-

Saudis will work in the state sector. This is a total increase of nearly 600,000 Saudis and 12000 non-Saudis in the state sector in 2021.

Whereas in the private sector, 1,331,600 Saudis and 4,331,110 Non-Saudis were working in 2013, and 1,746,741 Saudis and 6,280,156 Non-Saudis were working in 2021. It is a total increase of almost 400,000 Saudis and 1,900,000 Non-Saudi workers in 2021.

In addition, the unemployment rate was 12.8 in 2013 and 7.4 in 2021, with a decrease of 5.4 in 2021. On the other hand, technology and telecom contributed 64 billion and 70 billion in 2013, while they will contribute 81.3 billion and 82 billion in 2021, respectively. Technology and telecommunications recorded a total increase of 17 billion and 12 billion respectively in 2021.

This study also shows that the use of artificial intelligence in computer programming has multiple benefits. As Al-Washmi, secretary general of the King Salman Global Academy, explains, AI can effectively translate Arabic, improve research, detect fraud, and identify plagiarism. He further stated that using robots can help in conducting research and helping students. In addition, King Salman Global Academy has launched the project to train 1000 employees in more than 20 ministries on Vision 2030. This includes a total of 40 training courses. These courses include writing skills for administrative staff and the rules of the Arabic language.

Conclusions

This study compared economic data from 2013 and 2021 to determine the contribution of the Arabic language industry to the country's GDP in the Kingdom's Vision 2030 to make it less dependent on the oil economy. The economic data of the sectors related to the Arabic language industry showed a significant difference in 2021 compared to 2013, revealing that the number of Saudi and non-Saudi workers would increase in 2021 in both the government and private sectors. Also, the unemployment rate would be lower in 2021 than in 2013. In addition, the economic data from the technology and telecommunications sectors showed a significant difference in 2021.

This study shows that the contribution of the Arabic language industry to Saudi Arabia's economy is multifaceted. The Saudi Arabian language industry is creating new jobs to reduce the unemployment rate in the country. In line with Vision 2030, the Kingdom has established the King Salman Global Academy, whose sole mission is to promote the Arabic language and create innovation in the Arabic language industry through the use of AI techniques. This

academy has also drafted a language policy for Saudi government institutions. It will inform government agencies about linguistic decisions and raise awareness among employees about the importance of linguistics. It will also provide policies and procedures to maintain the position of Arabic in government institutions.

The Arabic language industry's contributions are in line with the Kingdom's 2030 vision of turning the country into a tech giant. Saudi Arabia is investing in computer programming of the Arabic language and using technology to implement reforms in the education sector to achieve its Vision 2030 goal. Students' skills are being enhanced through AI and its use in the education sector. This will enable students to acquire the skills they need for a job.

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