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The Role of Substituting Workforce to Innovative Technology and its Impact on Employee Displacement, Employee Well-Being and Employee Up-Skilling in Service Industry, UAE

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Abstract

This study attempts to develop a practical understanding of the role of substituting workforce to innovative technology and its impact on employee displacement, employee well-being, and employee up-skilling in service industry, UAE. The introduction of AI has led to a paradigm shift in how service industries operate and deliver value to customers. However, this shift towards innovative technology-driven processes has brought insecurity questions concerning the role of the workforce in this evolving landscape such as job loss, negative employee well-being, and employee displacement. The aim of study was to identify the negative impacts of innovative technology (AI) in the service industry in the UAE. Quantitative research framework used to gather and analyze data. Survey research was used as a strategy, questionnaires was used a data collection tool, quantitative was used as a data method. Sample size of 65 participants from service industry. The research revealed significant negative effects of implementing AI in the service industry, including employee displacement, a rise in unemployment rates, and a decline in employee well-being due to job insecurity, mental health problems, and social instability. Additionally, employees are facing difficulties in staying relevant to AI due to limited financial resources to fund their AI courses or up-skilling programs.

Keywords: *Innovative Technology or Artificial Intelligence, Employee Displacement, Employee Well-Being and Employee Up-Skilling.*

INTRODUCTION

The introduction of innovative technologies, such as artificial intelligence (AI), automation, data analytics, and robotics, has led to a paradigm shift in how service industries operate and deliver value to customers (Shariff, S. H. 2016). These technologies promise increased efficiency, improved quality of services, people's lives, and enhanced customer experiences (Demin, S. S.2016). However, this shift towards technology-driven processes also brings about insecurity questions concerning the role of the workforce in this evolving landscape such as job loss or it increases unemployment rate. (Topf, D. 2020).

This research aims to identify the negative effects of innovative technology despite its positive contributes to businesses on how organizations' employment behavior and operation are changing and how these differences impact the world economy (Yakubovich, V. 2019).

There is no denying the tremendous positive contribution of technology to businesses, and its presence illustrates the endless possibility of innovation in developing how business works and operates. Technology has been an outstanding tool in completing tasks conveniently, effectively, and efficiently and as an instrument on tasks that cannot be completed naturally. The invention of computers and the internet is a breakthrough that changes how employees and businesses work, and nowadays, it is rare for a company not to use computers, smartphones, and other technological devices in their business (Gupta, S.2021).

These technological breakthroughs have brought countries closer, allowing businesses to expand their trading territory, grow their product lines, reach more target consumers, increase their profitability, and more without physically establishing their presence in the area. It also creates new business opportunities in the market, developing innovative business industries and professions; opening new job opportunities (Gastaldi, L.2020).

Background of Study

The background of a study helps to explain its significance and relevance. The historical, theoretical, and empirical foundations that drive the research are usually included. It

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also describes the issue, identifies information gaps, and supports further inquiry (Zobel, J. 2017).

Overview of the service industry in the United Arab Emirates

The service industry in the UAE is a significant and constantly developing sector that holds a crucial position in the country's economy. According to the (World Bank 2021), the service industry made a significant boost to the United Arab Emirates' gross domestic product (GDP) in September 2021. Estimates indicate that this contribution ranged from 70% to 80%, highlighting its considerable significance (Bala, S., Khalid, M. N., Kumar, H., & Shukla, V. K.2022).

Prominent economic sectors in UAE encompass tourism and hospitality, characterized by the presence of renowned establishments like the Burj Al Arab Hotel, as well as a flourishing tourism industry. Additionally, the retail sector has upscale shopping locations like the Dubai Mall, while the financial services sector is concentrated around the Dubai International Financial Centre (DIFC). Furthermore, the United Arab Emirates government has been actively engaged in the implementation of many projects and policies with the objective of encouraging the adoption of technology and promoting innovation within the service sector. The aforementioned policies have exerted a substantial influence on the development and configuration of the technological environment within the country.

i. **UAE Vision 2021:** Is a comprehensive national agenda that prioritizes innovative technology. UAE has ambitious objectives to become a knowledge-based economy and a global leader in technology and innovation (Byat, A. B., & Sultan, O.2014).
ii. **Smart Dubai Initiative:** The Smart Dubai program uses innovative technology to transform Dubai into a smart city to improve the well-being and enjoyment of residents and visitors. This initiative promotes digital technology adoption in government, healthcare, transportation, and other areas through a variety of projects and methodologies (Al-Debei, M.2021).
iii. **Abu Dhabi Economic Vision 2030:** The primary objective is to diversify the economy through a strategic emphasis on sectors such as technology, innovation, and advanced industries (Low, L,2012).

In September 2021, the UAE embraced technological innovation across several areas, including the service industry. The table below shows UAE service industry trends and plans to replace workers with innovative technologies.

Table 1. Workforce-Technology Substitution-UAE Trends

Smart Cities and Infrastructure	• The UAE, especially cities like Dubai and Abu Dhabi, has been at the forefront of implementing smart city initiatives. • These initiatives involve integrating technology into various Service Sectors including transportation, healthcare, utilities, and government services. • Use of automation, AI, and data analytics to optimize service delivery and improve efficiency.
Digital Government Services	• Offering various online platforms and mobile apps for citizens and businesses to access government services and complete transactions seamlessly.
Tourism and Hospitality	• The UAE's tourism and hospitality sectors have been adopting innovative technologies to enhance guest experiences. • Providing AI-powered chatbots for customer queries to contactless check-ins and smart room controls in hotels
Retail and E-Commerce	• The retail industry in the UAE has seen the rise of e-commerce platforms and digital payment solutions.
Healthcare Innovation	• The UAE has invested in healthcare innovation, with the integration of telemedicine, electronic health records, and AI-powered diagnostics
Financial Technology (FinTech)	• UAE's financial sector has embraced FinTech solutions, including mobile banking, digital wallets, and blockchain-based applications for financial transactions and services.
Transportation and Logistics	• The UAE has been exploring technologies for smart transportation systems, including autonomous vehicles, traffic management, and efficient logistics operations.
Education and EdTech	• The education sector has been adopting digital learning platforms and technologies to facilitate remote learning and skill development.

1. Research Questions

What is the impact of innovative technology and automation in the employee displacement, employee well-being, and workforce up-skilling in the service industry?

2. Research Objectives

1. To investigate the role of innovative technology and automation in the employee displacement in the service industry
2. To determine the effect of innovative technology and automation in the employee well-being in the service industry
3. To examine the impact of innovative technology and automation in the workforce up skilling in the service industry.

LITERATURE REVIEW

Innovative Technology and Workforce Relations in the Service Industry, UAE

Several researchers have consistently shown that the integration of innovative technology, such as artificial intelligence (AI) and automation, into the service industry has significant implications for the relationship between technology and the workforce. (Gartenstein,2018) the utilization of current technology is of paramount significance for organizations of all sizes in the present era. While technology adoption can streamline operations and improve service quality, it can also lead to workforce displacement.

One notable illustration is the utilization of Artificial Intelligence (AI) and automation within the field of customer support operations. UAE-based telecommunications giants Etisalat and Du have implemented chatbots powered by artificial intelligence to manage routine customer inquiries (bin Zayyad, S., & Keenan, T. P.2020). These chatbots can respond to customer inquiries, provide information, and even conduct basic transactions with speed and accuracy. This innovation changed the customer service positions within these organizations. While some traditional customer service positions have been removed, there is an increasing demand for chatbot development, maintenance, and training specialists (Naqi, A. (2010).

A research investigation was conducted to examine the impact of self-service kiosks on the customer experience within fast-food chains in UAE. The study revealed that customers expressed a favorable response towards the convenience and decreased waiting durations connected with self-ordering

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kiosks. Furthermore, (Khalifa and Al-Farsi 2019) demonstrated a significant positive relationship between the efficiency and accuracy of order processing facilitated by technological systems and the overall level of customer satisfaction. Researchers have demonstrated that the implementation of technological advancements, demonstrated by the integration of self-checkout kiosks into retail establishments, has been associated with a decline in the availability of cashier roles. The utilization of surgical robots in hospitals within the United Arab Emirates has necessitated the acquisition of specific training by surgeons and technicians to ensure proficient operation, thus highlighting the imperative for upskilling (Al-Hajri et al., 2020).

Workforce Transition and Upskilling

The adoption of innovative technology in the service industry of UAE has caused a significant workforce transition and necessitating upskilling among employees. This transition is evident in the shift from labor-intensive, routine tasks to roles that require innovative technology expertise.

(Katranci, A,2021) The introduction of self-checkout kiosks in supermarkets and hypermarkets like Carrefour and financial intuitions like Dubai Islamic Bank ATMS has led to a reduction in cashier positions. These kiosks allow customers to scan and pay for their items independently (Al-Farsi & Rahman 2020). While this technological innovation has reduced the demand for cashiers, it has simultaneously created new positions focused on technology maintenance, troubleshooting, and assisting customers with self-checkout procedures. Employees who previously worked as cashiers are now being upskilled to take on these new roles, which involve a deeper understanding of technology and customer interaction. (Al-Hajri, R., & Khan, S.2023) The implementation of Electronic Health Records (EHR) systems in the healthcare sector of UAE necessitates medical personnel to acclimate themselves to the practice of digital record-keeping and data management. Healthcare institutions allocate resources towards the implementation of training initiatives aimed at equipping healthcare workers with the necessary skills to proficiently navigate and operate electronic health record (EHR) systems.

Impact on Job Elimination and Creation

The integration of cutting-edge technologies within the service sector of UAE encompasses more than just the displacement of jobs; it also generated innovative job opportunities (Khan, A., & Rajan, A.2020). Although automation may replace certain traditional jobs, the introduction of technology frequently gives rise to innovative employment within the areas of technology management, maintenance, and customer support.

The healthcare sector of the UAE, according to (Abugabah, A., Nizamuddin, N., & Alzubi, A. A.2020). the introduction of electronic health records (EHRs) and telemedicine platforms has led to the creation of new roles, such as EHR administrators, telemedicine coordinators, and IT support specialists. These positions are crucial for the efficient operation of digital health systems and ensuring a seamless experience for patients. As a result, individuals with expertise in healthcare technology and information systems have found new job opportunities in the industry (Abdulla, A. S. M. H., & Al-shami, S. A.2023).

Elimination of job opportunities

The introduction of innovative technology in the UAE has resulted in the elimination of jobs within the service industry especially the expatriates who does not have professional qualifications for technological equipment's and knowledge (Hirzallah, M., & Alshurideh, M.2023). This displacement has been attributed due to automation and streamlining of diverse duties and procedures. This phenomenon of displacement arises when innovative technological advancements supplant the tasks that were once executed by human laborers (Smith, A., & Al-Mansoori, S. 2023).

The UAE is witnessing a growing adoption of automation technologies, including robotics, artificial intelligence (AI), and advanced software systems, within diverse service sectors. These novel technologies effectively execute tasks that were previously performed by human workers, resulting in a decrease in the need for certain job positions. In pursuit of enhanced efficiency, cost reduction, and heightened production, enterprises may opt to adopt technological solutions that either substitute or supplement human labor.

Technology adoption can boost productivity and growth, but not for all workers. Technological innovations and automation have reduced job security for some individuals, especially manual laborers. This displacement has created economic inequities, with those with technical skills who are benefiting more. (Abdul, R., et al. (2023) Automated delivery vehicles and warehouse automation technologies have displaced manual labor in the UAE's logistics business. Those without the abilities to use and maintain new technology may have trouble finding work, contributing to economic inequities.

Global Trends and Challenges

(Al-Hajri, R., & Smith, J.2020) Substituting the workforce with innovative technology in UAE service industry has contributed to global trends and challenges, particularly in the context of the Fourth Industrial Revolution (Industry 4.0) and the globalization of technology-driven services (Al-Hajri, R., & Smith, J.2020). The increase use of robotics and artificial intelligence (AI) in sectors like logistics, manufacturing, and customer service in UAE, companies like FedEx and Amazon. ae have deployed automated robots in their warehouses to speed up order fulfillment and delivery of FedEx packages (Bala, S., Khalid, M. N., Kumar, H., & Shukla, V. K.2022). This trend has had global implications, as it reflects the broader shift towards automation and its impact on employment patterns worldwide. As more countries and industries adopt similar technologies, it creates a global challenge of workforce displacement and the need for international discussions on labor market adaptation (Berezina, K., Ciftci, O., & Cobanoglu, C.2019).

RESEARCH METHODOLOGY

INTRODUCTION

Quantitative research framework will enable systematically gather and analyze data to provide valuable insights into the

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impact of substituting the workforce with innovative technology on employee displacement, well-being, and up-skilling in the service industry in the UAE. (Goertzen, M. J.2017) Quantitative research framework is ideally suited for this project title because it allows to present the survey findings in a structured, objective, and statistically rigorous manner which includes; measuring the impact numerically, large-scale data collection, comparative analysis, objective data, statistical analysis, hypothesis testing, data visualization, efficiency, policy and decision making (Farheen, Z. 2019).

Hypothesis

H1. There is a positive relationship between innovative technology and automation in employee displacement in the service industry.

H2. There is a positive correlation between innovative technology and automation in employee mental well-being in the service industry.

H3. There is a relationship between employee up-skilling due to AI implementation and job displacement.

Strategy: Survey Research

The study adopted survey research strategy because it allows for the systematic collection of quantitative data from a large sample of employees and management in the UAE service industry. Closed-ended questions are adopted (Melnikovas, A.2018). This research has a set of questionnaires and the participants can easily answer independently and where the researchers' presence is not required; the set of questions both contributes to quantitative and qualitative data (rodrigo, 2017). The research adopts a cross-sectional time horizon, capturing data at a single point in time, to provide insights into the current state of technology adoption and its impact (Melnikovas, A.2018). Quantitative data collection is chosen to gather numerical information that can be analyzed statistically, aiding in the investigation of the research questions (Iovino, F., & Tsitsianis, N. (2020). Data is collected through a structured questionnaire to effectively and efficiently gather responses from employees and management about their perceptions and experiences related to workforce substitution with technology. Online-based survey was used to hand out questionnaires (Beretta, 2018) (Steenkamp, P.2021). Questionnaires were distributed from the 7th of November,2023 through various platforms such as online, email, social media, and google survey forms links (Beretta, 2018) (BOECKELMAN, 2020).

Sample

This study targets employees and management personnel working in the service industry in the UAE as the primary population of interest (Alturki, R.2021). The participants chosen are from various service industries so as to have more realistic data, and to understand which jobs are being affected in through innovative technology replacement; to prove that both unskilled and skilled workers are affected. These service industries include, healthcare, hospitality, logistics, aviation, educational, financial, Security, telecommunications, and retailer industries. In order to facilitate statistical analysis and obtain a representative sampling of the population, a sample size of 50 participants is selected. Convenience sampling is utilized due to practical considerations, such as ease of access to participants within the service industry (Awadallah, R.2020) (Creswell & Creswell, 2017).

Data Analysis

To identify patterns and relationships in the collected data, the Statistical Package for the Social Sciences (SPSS) software is utilized to conduct data analysis, including correlation and regression analyses (Kalitanyi, V.2023). Correlation and regression analyses are conducted using SPSS to explore the associations between workforce substitution with innovative technology and employee displacement, well-being, and upskilling in the UAE service industry (Kalitanyi, V.2023).

DATA COLLECTION, ANALYSIS AND FINDINGS

Data Screening

Data screening in SPSS is the process of inspecting and organizing a dataset in preparation for analysis. (Djajadikerta, H. G.2021). The process involves examining for errors, outliers, and missing values, as well as evaluating the distribution of variables. By conducting a thorough examination of the data, you guarantee its integrity and appropriateness for statistical analysis, which enhances the precision and dependability of the outcomes.

During this research study, a data screening was conducting and the data results proves that there's not missing data values.

4.1. Missing Data Analysis

Missing data analysis in IBM SPSS involves the process of identifying and managing missing values within a dataset (Graham, J. W.2012). The process involves evaluating the scope and patterns of missing data, identifying the causes of missingness, and using suitable methods like imputation or exclusion to handle missing values, ensuring reliable statistical analyses (Maxwell, H.2014).

Table 2. Missing Data Analysis

	N	Missing	
		Count	Percent
AI	65	0	.0
ED	65	0	.0
EWB	65	0	.0
EUS	65	0	.0
Gen	65	0	.0
Age	65	0	.0
MS	65	0	.0
Occ	65	0	.0
Exp	65	0	.0
Edu	65	0	.0
Race	65	0	.0

Findings

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Based on IBM SPSS Univariate statistics results, the univariate statistics does not indicate the presence of missing data. However, a potential indicator is the consistent sample size (N = 65) across all variables.

Normality Analysis

Normality analysis in SPSS involves evaluating whether the distribution of a variable adheres to a normal distribution. If the dots fall somewhere near the black line, then your data are normal If you see some of your data points are located far away from the line, it means your data may not be normal (Arkkelin, D.2014).

The AI test of normality, employing both Kolmogorov-Smirnov and Shapiro-Wilk tests with Lilliefors Significance Correction, was applied to all four variables (AI, ED, EWB and EUS). The low p-values (<.001) across all variables in both tests suggest a departure from normality. (Test of normality graphs are found in Appendices B as follows; AI= **Error! Reference source not found.** & **Error! Reference source not found.**, ED= **Error! Reference source not found.** & **Error! Reference source not found.**, EWB= **Error! Reference source not found.** & **Error! Reference source not found.**, EUS= **Error! Reference source not found.** & **Error! Reference source not found.**).

Outlier Analysis

In SPSS, outlier analysis refers to the process of identifying and managing extreme values, also known as outliers, within a dataset (Babinec, A. J.2017). Detecting and addressing outliers is crucial for accurate statistical analyses as they can have a significant impact on the results. SPSS offers a range of tools for outlier analysis, which include graphical methods like boxplots and quantitative methods like calculating Z-scores or using statistical tests. (Test of outlier graphs found in Appendix B as follows; **Error! Reference source not found.**, **Error! Reference source not found.**, **Error! Reference source not found.** & **Error! Reference source not found.**)

Frequency Test for Demographics

The "Frequency" procedure in SPSS is frequently utilized to analyze the distribution of categorical variables, particularly those associated with demographics (Morgan, G. A.2013). The Frequency procedure is used to create a frequency table which shows the number and percentage of cases for each category or value of a variable (Gloeckner, G. W.2019). This helps in comprehending the distribution of responses or characteristics within a dataset.

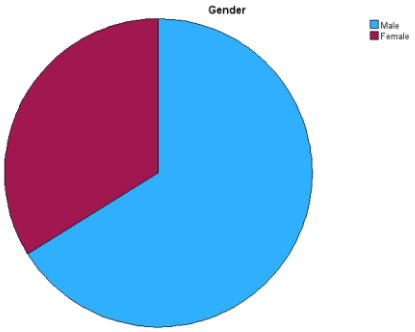
Gender

The composition of the study participants shows the frequency distribution majority of respondents are male (66.2%), while 33.8% are female within the sample of 65 respondents.

Table 3. Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	43	66.2	66.2	66.2
	Female	22	33.8	33.8	100.0
	Total	65	100.0	100.0	

Figure 3



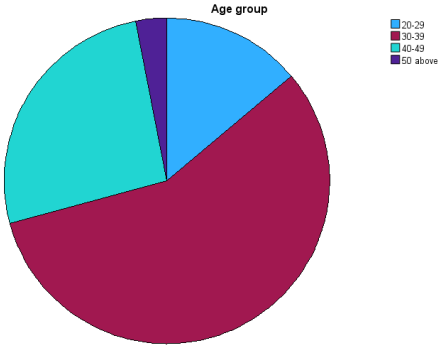
This imbalance is a reflection of the gender distribution in the researched population, which can be attributed to factors such as the prevalence of service sector or company norms, recruitment practices, and societal expectations.

Age Group

Table 4. Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-29	9	13.8	13.8	13.8
	30-39	37	56.9	56.9	70.8
	40-49	17	26.2	26.2	96.9
	50 above	2	3.1	3.1	100.0
	Total	65	100.0	100.0	

Figure 4



The age group distribution reveals a predominantly middle-aged sample, with 56.9% falling in the 30-39 range. The cumulative percent illustrates that 96.9% of respondents are aged 40 and below, suggesting a relatively homogeneous age distribution.

Marital Status

Table 5. Marital Status

	Frequency	Percent	Valid Percent	Cumulative Percent

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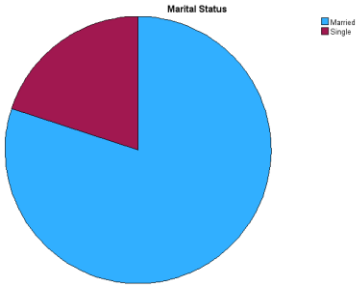
Valid	Married	52	80.0	80.0	80.0
	Single	13	20.0	20.0	100.0
	Total	65	100.0	100.0	

Figure 5



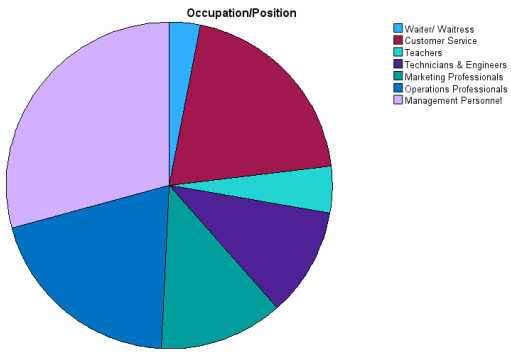
The marital status distribution indicates a majority of respondents are married (80%), while 20% are single. This data highlights the predominance of married individuals in the sample, providing valuable demographic context for potential influences on the study variable.

Occupation/Position

Table 6. Occupation/Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Waiter/ Waitress	2	3.1	3.1	3.1
	Customer Service	13	20.0	20.0	23.1
	Teachers	3	4.6	4.6	27.7
	Technicians & Engineers	7	10.8	10.8	38.5
	Marketing Professionals	8	12.3	12.3	50.8
	Operations Professionals	13	20.0	20.0	70.8
	Management Personnel	19	29.2	29.2	100.0
	Total	65	100.0	100.0	

Figure 6



Findings: Occupation/Position

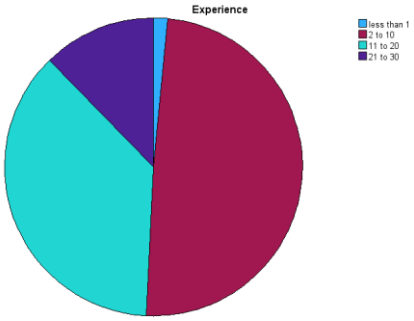
The occupation findings reveal a diversified sample. "Management Personnel" has the highest frequency (29.2%), indicating leadership jobs. According to the cumulative percent, 70.8% of respondents work in operations, marketing, waiters/ waitress / teachers, customer services, technicians and engineers. The varied sample is important for understanding how professional backgrounds may affect research variables.

Experience

Table 7. Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 1	1	1.5	1.5	1.5
	2 to 10	32	49.2	49.2	50.8
	11 to 20	24	36.9	36.9	87.7
	21 to 30	8	12.3	12.3	100.0
	Total	65	100.0	100.0	

Figure 7



IBM SPSS experience statistics show that 49.2% of respondents had 2–10 years of experience. The cumulative percent shows that 87.7% of respondents have 20 years or less experience. This data helps explain potential relationships between experience levels and research variables by revealing the sample's professional tenure.

Education

Table 8. Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Certificate	5	7.7	7.7	7.7
	Diploma	9	13.8	13.8	21.5
	Bachelor Degree	28	43.1	43.1	64.6
	Master Degree	23	35.4	35.4	100.0
	Total	65	100.0	100.0	

Figure 8

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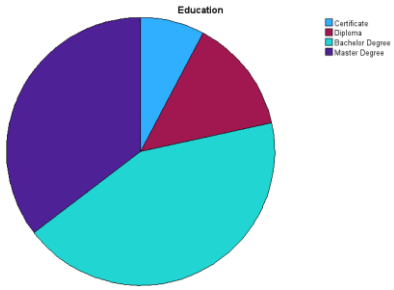


IBM SPSS education analysis, indicates a diverse educational background within the sample. The majority hold a Bachelor's degree (43.1%), followed by those with a Master's degree (35.4%). The cumulative percent highlights that 64.6% of respondents have completed at least a Bachelor's degree.

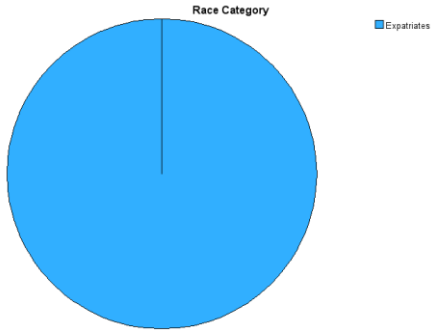
This data enables for deeper analysis of the relationship between education and study variable connections.

Race Category

Table 9. Race Category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Expatriates	65	100.0	100.0	100.0

Figure 9



IBM SPSS statistics shows (100%) of expatriates who participated and responded.

Descriptive Statistics Variables

A frequency test of demographics was conducted to show variables' relationship.

Response scale ranges from 1 to 5 for all variables. (1=strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strong disagree). The "Valid N (listwise)" shows that all 65 respondents completed AI variable data.

AI Variable Statistics

Table 10. AI Variable Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AI1	65	1	5	4.02	1.082
AI2	65	1	5	2.91	1.114
AI3	65	1	5	3.06	1.236
AI4	65	1	5	3.46	1.147
AI5	65	1	5	3.12	1.111
AI6	65	1	5	2.85	1.215
Valid N (listwise)	65				

i. Mean values

- The mean values range from 2.85 to 4.02 across variables AI1 to AI6.
- The highest mean (4.02) is for AI1, indicating a relatively strong agreement or positive sentiment regarding this AI-related item.
- The lowest mean (2.85) is for AI6, indicating poorer agreement or positive.

ED Variable Statistics

Table 11. ED Variable Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ED1	65	1	5	3.29	1.221
ED2	65	1	5	3.37	1.180
ED3	65	1	5	3.63	1.024
ED4	65	1	5	3.26	1.035
ED5	65	2	5	3.34	.973
ED6	65	1	5	3.35	1.067
ED7	65	1	5	3.72	1.139
Valid N (listwise)	65				

i. **Mean Values**

- The mean values range from 3.26 to 3.72 across variables ED1 to ED7.
- These means suggest a moderate to moderately high level of agreement or positive sentiment regarding the different aspects represented by each variable.

EWB Variable Statistics

Table 12. EWB Variable Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
EWB1	65	1	5	2.69	1.185
EWB2	65	1	5	2.92	1.254
EWB3	65	1	5	2.63	1.098
EWB4	65	1	5	3.17	1.153
EWB5	65	1	5	3.05	1.152
Valid N (listwise)	65				

Respondents shows a moderate positive perception related to the "EWB" variables, with variability in responses.

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i. Mean Values

- The mean values range from 2.63 to 3.17 across variables EWB1 to EWB5.
- These means suggest a moderate level of agreement or positive sentiment regarding different aspects represented by each variable, with EWB4 having the highest mean.

EUS Variable Statistics

Table 13. EUS Variable Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
EUS1	65	1	5	4.23	.932
EUS2	65	1	5	3.15	1.049
EUS3	65	1	5	3.85	.795
EUS4	65	1	5	3.78	.800
EUS5	65	1	5	4.18	.950
Valid N (listwise)	65				

The respondents show a positive perception related to the "EUS" variables, with variability in responses.

ii. Mean Values

- The mean values range from 3.15 to 4.23 across variables EUS2 to EUS1.
- These means suggest a range of agreement or positive sentiment regarding different aspects represented by each variable, with EUS1 having the highest mean.

Reliability Analysis

Reliability analysis in SPSS evaluates the internal consistency and reliability of a group of items or scales in a measurement instrument (Mallery, P.2018). Cronbach's alpha is commonly used as a coefficient to indicate the degree to which the items measure the same underlying construct (Connelly, L. M.2011). Higher alpha values indicate higher levels of reliability in the measurement (Brownlow, C.2014).

AI Reliability Statistics

Table 14. AI Reliability Statistics

Cronbach's Alpha	N of Items
.793	6

A Cronbach's Alpha coefficient of 0.793 indicates that the items assessing Artificial Intelligence in the questionnaire show internal consistency, suggesting that they are measuring a similar underlying construct.

ED Reliability Statistics

Table 15. ED Reliability Statistics

Cronbach's Alpha	N of Items
.829	7

A Cronbach's Alpha value of 0.829 indicates that the items assessing Employee Displacement in the questionnaire demonstrate internal consistency, suggesting that the measure of the construct is reliable.0.829 is considered high, signifying that the items collectively provide a dependable measure of the Employee Displacement construct.

EWB Reliability Statistics

Table 16. EWB Reliability Statistics

Cronbach's Alpha	N of Items
.865	5

A Cronbach's Alpha value of 0.865 indicates that the items assessing Employee Well-Being in the questionnaire are internally consistent, suggesting a measure of the construct that is highly reliable. Cronbach's Alpha of 0.865 for the Employee Well-Being scale indicates a very high level of internal consistency, providing researchers and organizations with strong confidence in the reliability of the measure for assessing perceptions related to employee well-being.

EUS Reliability Statistics

Table 17. EUS Reliability Statistics

Cronbach's Alpha	N of Items
.745	5

The Cronbach's Alpha coefficient of 0.745 indicates that the items assessing Employee Upskilling in the questionnaire show internal consistency, suggesting a moderately reliable measure of the construct.

Correlation

Pearson Correlations between multiple variable AI, ED, EWB and EUS

Table 18. Pearson Correlations between multiple variables AI, ED, EWB and EUS

	Mean	Std Deviation	AI	ED	EWB	EUS
AI	19.42	4.85	1			
ED	23.97	5.39	.720**	1		
EWB	14.46	4.71	.393**	.649**	1	
EUS	19.43	2.24	0.137	0.103	0.059	1

** Correlation is significant at the 0.01 level (2-tailed).

The above IBM SPSS results shows Pearson correlation coefficients between four variables: AI (Artificial Intelligence), ED (Employee Displacement), EWB (Employee Well-being), and EUS (Employee Upskilling) in IBM SPSS. Here's the interpretation:

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i. AI and ED

According to IBM SPSS Pearson correlation results (r = .720, p-value=<.001) indicates that artificial intelligence and employee displacement has statistically strong positive linear relationship between AI and ED. Hence, H1 was supported.
This shows that an increase in artificial intelligence implementation in service industry will lead to a higher employee displacement. (positive correlations suggest that as one variable increases, the other tends to increase as well)

The strong correlation coefficient of 0.720 indicates a robust association between these two variables. The p-value (<0.001) indicates a statistically significant.

ii. AI and EWB

There is a moderate positive correlation (r =0.393) between AI and EWB. The correlation is statistically significant (p =0.001).

The results shows that an increase in artificial intelligence in service industry work places will also increase the negative employee well-being due to fear of job loss, ethical concerns and lack of control caused by artificial intelligence.

iii. AI and EUS

There is a weak positive correlation (r =0.137) between AI and EUS, but the correlation is not statistically significant (p =0.276). If a service industry company implement AI, employees with more positive attitudes toward AI might end up having a slight tendency to be more open to up-skilling opportunities, but the association is not substantial.

iv. ED and EWB

There is a strong positive correlation (r =0.649) between ED and EWB. The correlation is statistically significant (p <0.001).

This implies that as employee displacement increases, well-being tends to decrease. For example, a company implementing layoffs may observe a significant negative impact on the overall well-being of affected employees.

v. ED and EUS

There is a weak positive correlation (r =0.103) between ED and EUS, but the correlation is not statistically significant (p =0.413).

For instance, an organization experiencing employee displacement may not necessarily see a significant impact on upskilling efforts among remaining employees because of being uneducated or they might not be enough initiatives in place to offer affected employees opportunities for up-skilling.

vi. EWB and EUS

There is a very weak positive correlation (r=0.059) between EWB and EUS, and the correlation is not statistically significant (p =0.639).

For instance, an organization focusing on employee well-being initiatives may not necessarily observe a significant impact on the upskilling efforts of its employees.

Regression Analysis.

Model Summary

In IBM SPSS, the Model Summary provides a concise overview of a regression model's goodness of fit (Singh, A.2015).

Table 19. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.823[a]	.677	.661	3.13645	.677	42.555	3	61	<.001

a. Predictors: (Constant), EUS, EWB, AI

To analyze the hypothesis, the researcher implemented the multiple linear regression analysis at 95% confidence intervals. The R Square value of 0.677 indicates that around 67.7% of the variation in the dependent variable can be accounted for by the predictors (EUS, EWB, AI). Adjusted R Square (0.661) takes into account predictor count to prevent overfitting. The analysis shows a good model fit: F (3,61) =42.56 is highly significant (*P*<.001), indicating that the overall model is statistically significant in predicting the dependent variable.

Table 20. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4.856	3.649		1.331	.188	-2.440	12.152		
	AI	.611	.089	.550	6.890	<.001	.433	.788	.833	1.201
	EWB	.494	.090	.433	5.464	<.001	.313	.675	.846	1.183
	EUS	.006	.176	.002	.032	.975	-.347	.359	.981	1.019

a. Dependent Variable: ED

HYPOTHESIS FINDINGS

H1. AI (Artificial Intelligence)

There is a positive relationship between Artificial Intelligence or innovative technology and automation in employee displacement in the service industry.

- The coefficient is significant (p < 0.001) and positive (0.611), supporting the hypothesis that positive attitudes toward AI (Artificial Intelligence) implementation in service industry is associated with higher employee displacement (ED).

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- Based on IBM SPSS regression AI statistics (β=0.550, t=6.890, *P*<.001) confirms that hypothesis 1 was accepted.
- The p-value, which is less than or equal to 0.001, indicates that this effect is statistically significant.

H2. EWB (Employee Well-being)

There is a positive correlation between innovative technology and employee mental well-being in the service industry. The coefficient is significant (p < 0.001) and positive (0.494), indicating that higher levels of negative employee well-being (EWB) are associated with increased employee displacement (ED). For instance, in the context of research, innovative technology in service industry workplace will result for workforce to feel job insecure, stress, burnout, anxiety, poor work balance and dissatisfaction leading to employee displacement or job loss.

- Based on IBM SPSS regression employee well-being (EWB) statistics (β=0.433, t=5.464, *P*<.001) confirms that hypothesis 2 was accepted.

H3. EUS (Employee Up-skilling)

The coefficient is not significant (p = 0.975), suggesting that attitudes toward employee up-skilling (EUS) do not significantly predict employee displacement (ED) in the context of the study. The non-significant p-value indicates that there is no strong evidence to reject the null hypothesis, supporting the idea that attitudes toward employee up-skilling do not significantly predict employee displacement.

- Based on IBM SPSS regression employee up-skilling (EUS) statistics (β=0.002, t=0.032, P<.975). This supports the hypothesis that there is no significant relationship.
- Hypothesis 3 is accepted.

4.1. Summary of Accepted and Rejected Hypothesis

Table 21. Summary of Accepted and Rejected Hypothesis

Hypothesis	Coefficient	Accepted	Rejected
H1. AI Implementation	< 0.001	✓	
H2. Employee Well-Being (EWB)	< 0.001	✓	
H3. Employee Up-Skilling (EUS)	p = 0.975	✓	

Conclusion

The study examined how the service industry is affected by the use of innovative technology to replace workers, specifically looking at how employees perceive and experience this change (Miremadi, M.2016). Data was collected using a quantitative survey (Woolner, P.2012) and analyzed using IBM SPSS. The analysis included data screening, analysis of missing data, examination of normality and outliers, examination of demographics, calculation of descriptive statistics, assessment of reliability, examination of correlation, and conducting regression analysis (Babinec, A. J.2017).

APPENDICES A : Research Questionnaires

Dear respondent,

I would be very grateful if you could take some minutes of your time out to complete the following questionnaire regarding **"The Role of Substituting Workforce to Innovative Technology and it's Impact on Employee Displacement, Employee Well-Being and Workforce Up SkillinginServiceIndustry,UAE".**

Your answers will be kept secret and strictly confidential. Your name and other identity will not be ✓ disclosed as part of ethical protocols of University (City University of Malaysia)

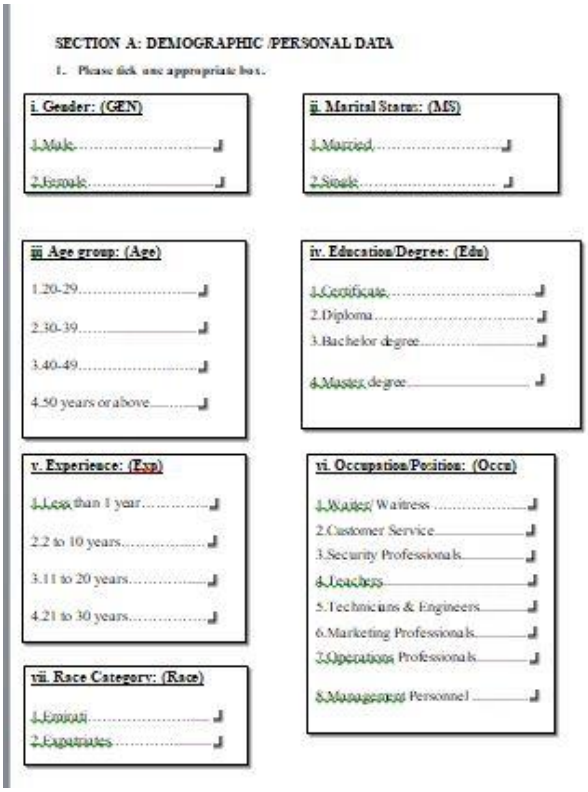
The questionnaire contains (NUMBER OF QUESTIONS) examining various statements which will take about 30-40 minutes to complete.

Please read each statement carefully and tick one box answer that corresponds in the best way to your agreement or disagreement.

Should you require any further assistance whilst filling in the questionnaire, please do not hesitate to contact me at:

Looking forward and thank you for your cooperation!

Information of student



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SECTION B: AI / INNOVATIVE TECHNOLOGIES (AI)

Please indicate your agreement or disagreement with the following statements. Select the best answer on the scale below.

	Question Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
AI 1	Do you see your company investing in more innovative technology/AI in the future?	1	2	3	4	5
AI 2	Do your company lay-off employees because innovative technology which made their work redundant?	1	2	3	4	5
AI 3	Do you see your company laying-off more employees to replace them with innovative technology solutions?	1	2	3	4	5
AI 4	The implementation of innovative technology eliminated new job opportunities in service industry, UAE?	1	2	3	4	5
AI 5	Innovative technology used in your business requires minimal human intervention	1	2	3	4	5
AI 6	Is your company's investment in innovative technology driven by a desire to reduce labour costs and replace human workers?	1	2	3	4	5

SECTION C: EMPLOYEE DISPLACEMENT (ED)

Please indicate your agreement or disagreement with the following statements. Select the best answer on the scale below.

	Question Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
ED 1	Employees are experiencing job displacement due to the adoption of innovative technology in the service industry in the UAE?	1	2	3	4	5
ED 2	Do you think innovative technology has reduced UAE's service industry's demand for human labour?	1	2	3	4	5
ED 3	In your opinion, has the increased use of technology affected job prospects in traditional service roles in the UAE?	1	2	3	4	5
ED 4	Do you believe that employee displacement resulting from the adoption of innovative technology is a major problem for the service sector employees in the United Arab Emirates?	1	2	3	4	5

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ED 5	Is employee displacement an unavoidable consequence of incorporating cutting-edge technology into the service sector of the United Arab Emirates?	1	2	3	4	5
ED 6	Do you believe that employee displacement has led to a decrease in job satisfaction and overall employee morale in the service sector of the UAE?	1	2	3	4	5
ED 7	To what extent do you believe employee displacement has resulted a sense job insecurity and anxiety among workers in the service industry in the UAE?	1	2	3	4	5

SECTION D: EMPLOYEE WELL-BEING (EWB)

Please indicate your agreement or disagreement with the following statements. Select the best answer on the scale below.

	Question Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
EWB1	Has the implementation of cutting-edge technology in the service industry of the UAE negatively impacted your overall sense of well-being?	1	2	3	4	5
EWB2	The changes in job roles and work processes due to innovative technology adoption have caused a noticeable negative effect on your work-life balance in the UAE's service sector.	1	2	3	4	5
EWB3	Have you experienced a decline in job satisfaction and morale due to adoption of innovative technology at your work environment?	1	2	3	4	5
EWB4	Has the integration of innovative technology led to increased stress and anxiety among workers in the service industry of the UAE?	1	2	3	4	5
EWB5	To what extent do you believe that the adoption of artificial intelligence has contributed to the deterioration of employee overall well-being in the service industry of the UAE?	1	2	3	4	5

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SECTION E: EMPLOYEE UP-SKILLING (EUS)

Please indicate your agreement or disagreement with the following statements. Select the best answer on the scale below.

	Question Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
EUS1	Do you endorse the ideology of training or up-skilling opportunities to adapt to new technologies in your role in the UAE's service industry?	1	2	3	4	5
EUS2	Do you believe that businesses in the UAE are offering sufficient up-skilling programs to help employees cope with technological changes?	1	2	3	4	5
EUS3	Do you agree that, up-skilling initiatives has improved your job skills and competencies in your workplace?	1	2	3	4	5
EUS4	Has up-skilling improved your overall employability in the UAE's service industry?	1	2	3	4	5
EUS5	Is up-skilling necessary to keep pace with technological advancements and stay competitive in the service industry in the UAE?	1	2	3	4	5

< End of Questionnaires>

APPENDICES B : IBM SPSS DATA SET

Table 22. AI: Test of Normality

AI -Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
AI1	.294	65	<.001	.774	65	<.001
AI2	.208	65	<.001	.905	65	<.001
AI3	.176	65	<.001	.910	65	<.001
AI4	.296	65	<.001	.862	65	<.001
AI5	.247	65	<.001	.882	65	<.001
AI6	.265	65	<.001	.874	65	<.001
a. Lilliefors Significance Correction						

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Figure 10. Normal Q-Q Plot of A1

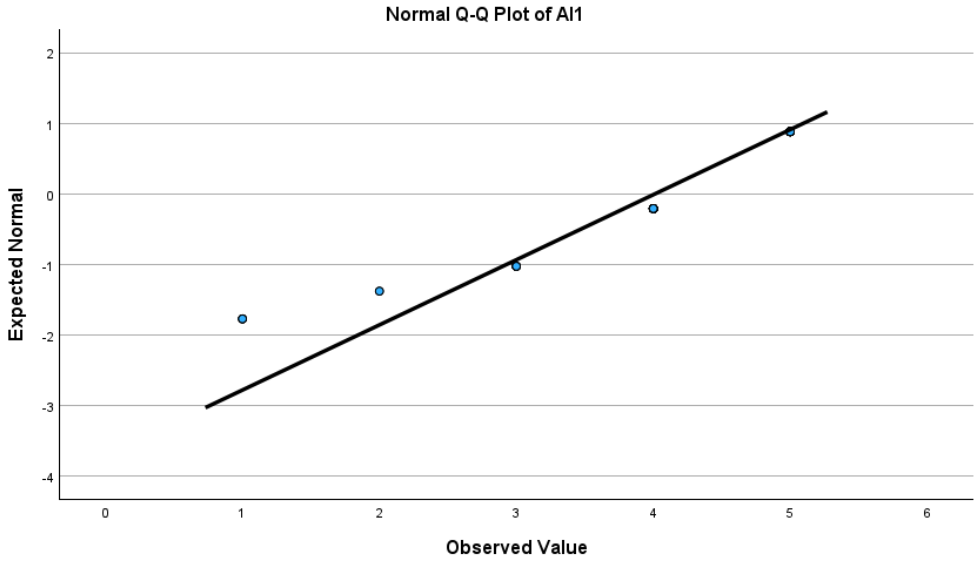

Table 23. ED Test of Normality

ED-Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ED1	.319	65	<.001	.834	65	<.001
ED2	.288	65	<.001	.867	65	<.001
ED3	.318	65	<.001	.839	65	<.001
ED4	.285	65	<.001	.841	65	<.001
ED5	.290	65	<.001	.825	65	<.001
ED6	.266	65	<.001	.864	65	<.001
ED7	.319	65	<.001	.816	65	<.001
a. Lilliefors Significance Correction						

Figure 11.ED Normal Q-Q Plot of ED1

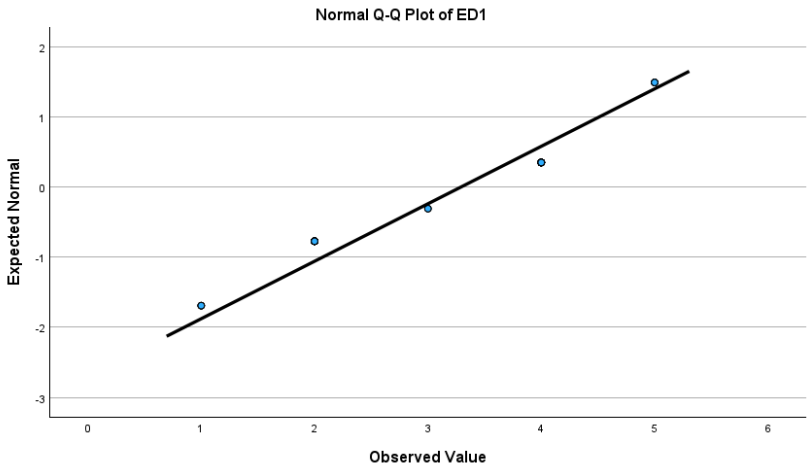

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Table 24 .EWB: Tests of Normality

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EWB1	.336	65	<.001	.807	65	<.001
EWB2	.292	65	<.001	.848	65	<.001
EWB3	.225	65	<.001	.897	65	<.001
EWB4	.226	65	<.001	.883	65	<.001
EWB5	.203	65	<.001	.902	65	<.001
a. Lilliefors Significance Correction						

Figure 12. Normal Q-Q Plot of EWB

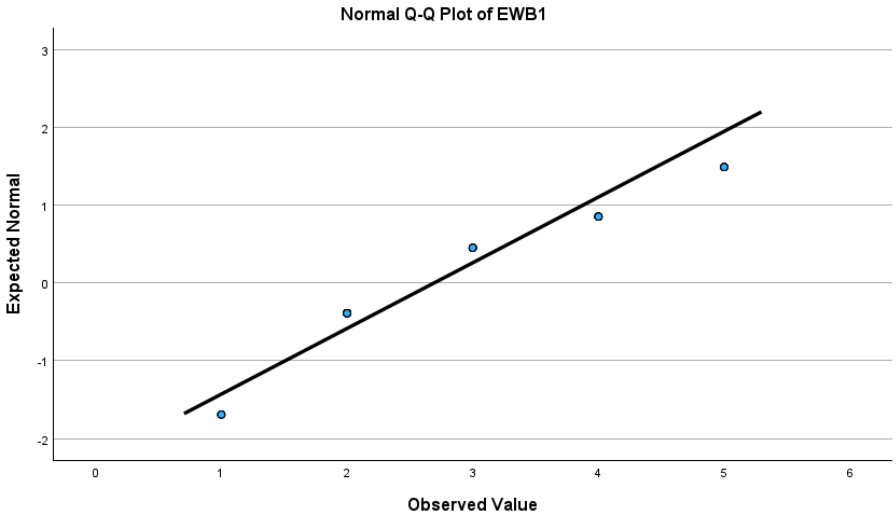

Table 25. EUS: Test of Normality

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EUS1	.294	65	<.001	.699	65	<.001
EUS2	.298	65	<.001	.813	65	<.001
EUS3	.346	65	<.001	.794	65	<.001
EUS4	.375	65	<.001	.737	65	<.001
EUS5	.315	65	<.001	.704	65	<.001
a. Lilliefors Significance Correction						

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Figure 13. Normal Q-Q Plot of EUS1

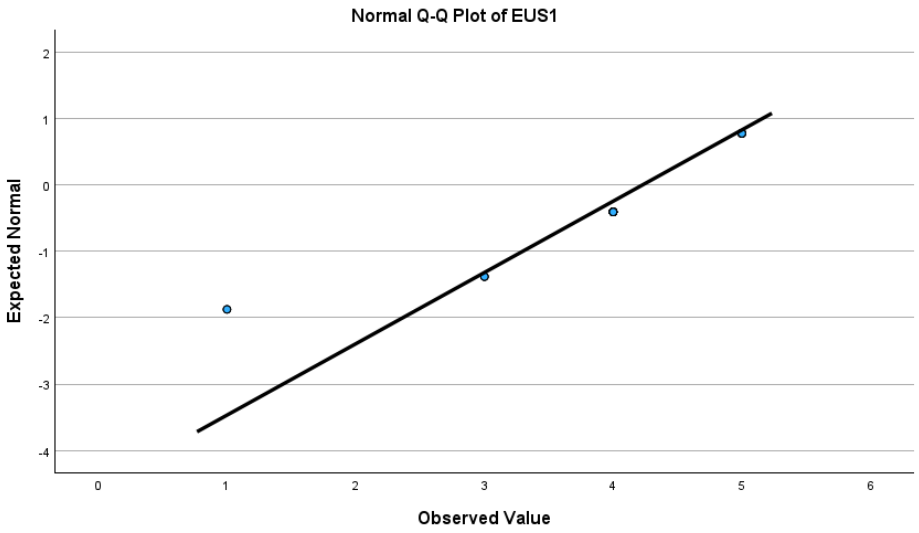

Figure 14. Outlier AI

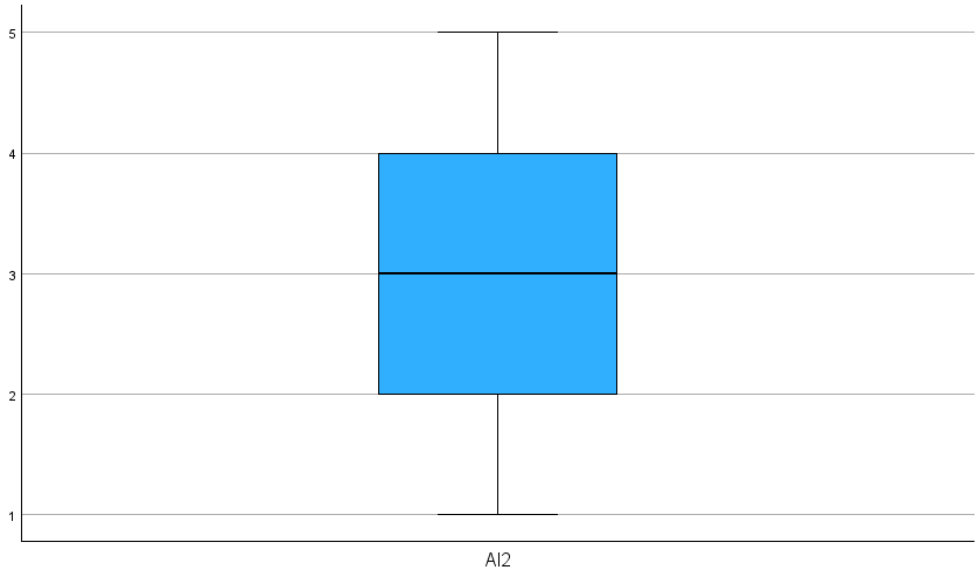

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Figure 15. Outlier ED 1

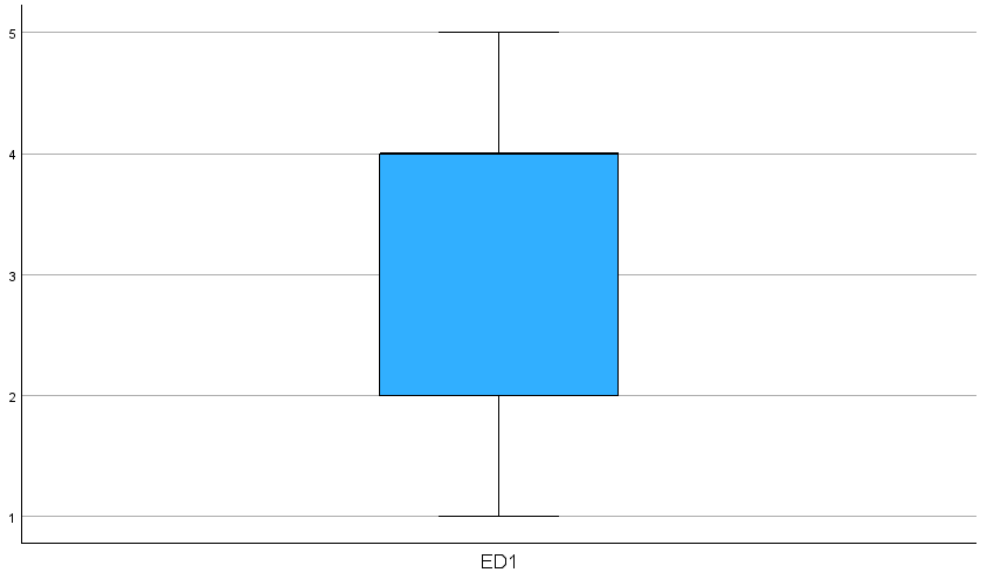

Figure 16. Outlier EWB1

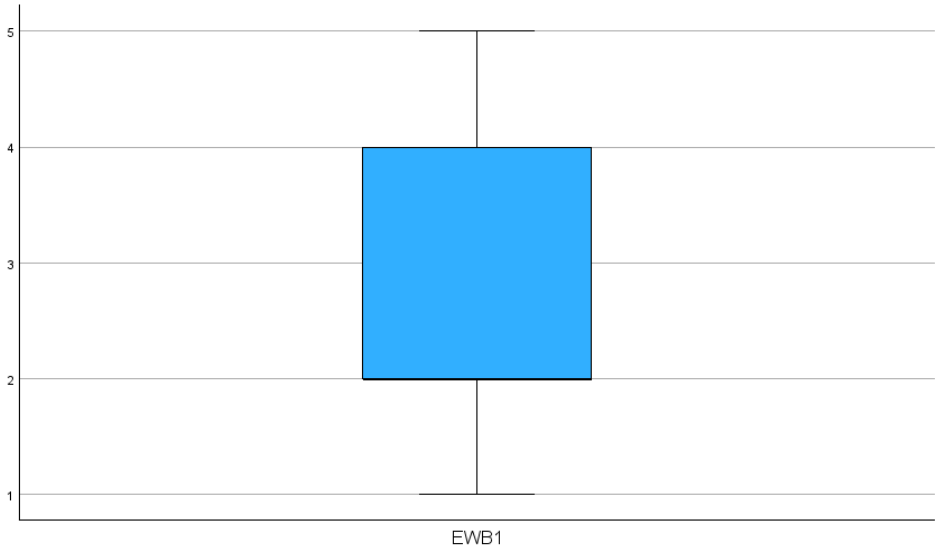

Figure 17. Outlier EUS

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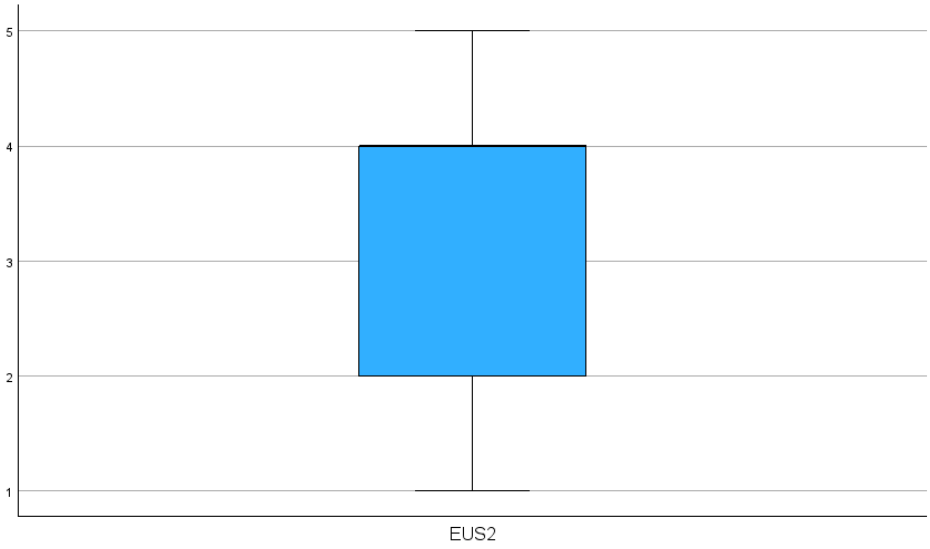

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