Original Article

Navigating Workforce Localization and Operational Challenges in Oman's Logistics Sector: A Case Study

Faustino Taderera[1], Amuthakkannan Rajakannu[2], Jawaher Al Yaarubi[3], Abeer Al Saadi[4], Manahel Al Araimi[5], Noura Al Zadjali[6]

[1,2,3,4,5,6]*Department of Mechanical and Industrial Engineering, National University of Science and Technology, Muscat, Sultanate of Oman.*

[2]*Corresponding Author : amuthakkannan@nu.edu.om*

Abstract - The Sultanate of Oman is focusing on the logistics/supply chain sector as part of its Vision 2040 initiative, which aims to make Oman a logistics hub at the regional and international levels. However, effective workforce localisation, or Omanisation, remains a challenge due to operational, skills, and sustainability gaps. This document examines the issues logistics companies in Oman encounter regarding workforce localisation and the efficiency of their operations. The author employed a qualitative multiple-case study methodology and obtained information through semi-structured interviews with participants from the logistics sector, including managers, human resources personnel, and policymakers. The author found that, despite Omanisation policies, the logistics sector continues to rely on expatriate labour. Omanisation challenges include a lack of local employees' technical skills, insufficient vocational training, and over-reliance on expatriate labour. Additionally, the author discusses how operational inefficiencies and the reluctance to adopt digital tools hinder the localisation process. The author discusses a strategic alignment framework that integrates workforce localisation, process improvement, and digital enhancement to improve localisation outcomes. The author's findings contribute to the body of knowledge in logistics and supply chain management by providing insight into the potential operational integration of nationalisation policies aimed at achieving sustainability in Oman.

Keywords - Omanisation, Logistics, Supply Chain Management, Human Capital Development, Strategic Alignment, Oman Vision 2040.

1. Introduction

Emerging economies tend to focus on logistics and supply chain management as they try to reduce their reliance on oil revenue. Oman is among the few countries considering logistics integration in Oman Vision 2040 [1] and the National Logistics Strategy (Oman Vision 2040), which seeks to place the country at the heart of a global logistics centrepiece connecting Asia to Africa and the Middle East [2] (MTCIT 2021). With growth in the logistics sector comes the potential for employment, innovation, and overall economic advancement for the country. However, these positive effects of sector growth hinge on the successful implementation of employment Omanisation (a policy targeting increased local workforce participation in a sector). Launched in the 1980s, Omanisation is a pillar of Oman's nationalisation programme and aims to empower the citizen populace, reduce reliance on foreign professionals, and develop local capacity [3]. Nationalisation policies have been relatively successful in the public administration, banking, and telecommunications sectors. The logistics services sector, however, is slow to adapt. The logistics sector requires a broad range of technical and operational skills, as well as global integration, making

localisation more difficult [4]. Thus, a substantial number of logistics firms in Oman face a dual challenge: satisfying the government's localisation demands whilst still competing on an operational level from a global perspective. Digitisation, automation, and sustainability converge to shape and transform how logistics and supply chains operate worldwide [5]. Closing these gaps requires a highly educated workforce in new tools and technologies, such as digital tracking and warehouse automation, image-based packing and product detection, Artificial Intelligence (AI), and more data-driven approaches [6].

The absence of locally available, technically oriented professionals in Oman impedes the implementation of such innovations. Although there have been advancements in the range of logistics programs offered by universities and vocational training organisations, the knowledge and skill gaps in the workforce remain due to the operational realities (Al Jabri, A.M.A et al., 2021). Logistics firms, therefore, face an increasing reliance on a foreign workforce, which, in turn, creates a contradiction between the policies' aims and the capabilities of the operational workforce. The continued

reliance on foreign professionals impedes the localisation of the workforce, operational capabilities, or a balance between the two.

Many logistics organisations have sought to achieve this balance by aligning HR strategy, organisational objectives, and policy objectives. Organisations must navigate a complex set of regulations requiring workforce Omanization (Rees et al.). This has to be done in an environment of increased competition, technological change, and a demand for more efficient organisational processes, to avoid compromising the organisation's performance and the development of the country's workforce. Research on the nationalisation of workforces in the Foreign Gulf Cooperation Countries (GCC) has identified the same barriers across the board: employee retraining, declining retention rates of local hires, and perceptions of work in the private sector [3]. However, one area that has received very little attention is the logistics and supply chain sector, which relies on the uninterrupted flow of goods, efficiency, and responsiveness to customer needs. This is the case with available studies that examine Omani (Omanization) from either a very narrow policy perspective or a macroeconomic view, with very few studies in the field that address the constructs of within-firm, the managerial framework in host countries, and the outcomes [7]. All Fields or Areas of Integrated Transport in the Sultanate of Oman (GEO) are part of Oman's Transport and Communications. All Fields or Areas of Transport and the integrated logistics systems of all Transport systems. All Areas of Transport are integrated logistics systems that are mandatory for any country. Omani companies report they are unable to attract and retain Omani employees due to widespread industry knowledge gaps and a lack of interest in acquiring the industry skills required for a growing logistics career [8].

Additionally, these problems are compounded by operational inefficiencies, weak work-process cohesion, and limited digitalisation. In logistics and supply chain management, many modern techniques are applied, such as federated learning to enhance cybersecurity [9]. The combination of a lack of work systems and a lack of digitalisation results in reduced productivity, further compounded by a lack of a national workforce. This is the case in Oman, where the combination of a lack of civil working systems, processes, and digitalisation, and a lack of a nationalised workforce results in reduced operational productivity. In these systems, productivity is reduced, as is the digitalisation of the work processes. In these systems, a digitised workforce is required to operate processes that achieve high efficiency. This is the case in Oman, where a lack of civil working systems, processes, and digitalisation, and a lack of a national workforce, result in reduced operational productivity. In these systems, productivity is reduced, as is the digitalisation of the work processes. In these systems, a digitised workforce is required to operate processes that achieve high efficiency. In these systems, a digitalised

workforce is necessary to work processes that provide a high degree of efficiency. This is the case in Oman, where a lack of civil working systems, processes, and digitalisation, and a lack of a nationalised workforce, results in reduced operational productivity. The purpose of this study is to explore how logistic companies in Oman handle and strategically and operationally tackle the issues of workforce localisation. More specifically, it focuses on the elements of strategy, frameworks, and management practices that address the paradox of maintaining Omanisation while achieving operational performance. A qualitative case study approach is used to elicit organisational experiences and adaptive strategies, which are captured in depth through semi-structured interviews with managers, human resource specialists, and policymakers from the logistics sector.

1.1. Research Gap

Existing research on Omanisation in GCC countries is largely policy-driven and macro-level, with limited focus on sector-specific and firm-level implementation, particularly in the logistics and supply chain sector, which is central to Oman Vision 2040. Despite the industry's strategic importance, empirical evidence on how logistics firms manage competing demands for workforce localisation, operational efficiency, global competitiveness, and service continuity is sparse. Also, while the reliance on foreign labour and skills gap have been acknowledged, the absence of organisational strategy, HR framing, and managerial practice to mitigate these gaps is a gap in the literature. The interaction between Omanisation and digital transformation—automation, AI, and data-driven logistics—has received minimal scholarly attention, particularly in emerging economies such as Oman. Lastly, there is a lack of qualitative, case-based research focused on the everyday experiences and adaptive approaches of logistics firms. This study begins to fill these gaps by examining how strategic and operational logistics firms in Oman manage the paradox between Omanisation and operational performance.

1.2. Research Objectives of the Study
1. Examine the condition of workforce localisation within Oman's logistics sector and examine significant barriers to its implementation.
2. To study the operational and organisational constraints that impede effective Omanisation.
3. To study the managerial and organisational practices used to achieve coherence between workforce localisation and operational performance.

4. To develop a strategic coherence model that incorporates workforce localisation, sustainable process improvement, and enhanced digital capabilities.

This success can be attributed to two types of plausibility. First, the theory of workforce mobilisation in logistics and supply chain management combines advances in human capital and operational efficiency. On the other hand, this

work provides policymakers and business leaders with evidence-based approaches to localisation to improve vocational education and strengthen the collaborative triad between the public and private sectors for human capital development. As Oman moves toward the Vision 2040 goals of innovation, sustainability, and human development as foundational to competitiveness [2], the current findings are invaluable. The logistics workforce localisation is not simply a matter of policy compliance in the business sector; instead, it is a matter of long-term business competitiveness. Building a skilled, enthusiastic, and flexible domestic workforce will enable organisations to improve operational efficiency, reduce reliance on foreign workers, and create greater value in the supply chain. More importantly, for this purpose, systemic collaboration among educational institutions, industry, and the government is desirable. In the final analysis, the logistics sector in Oman is at a crossroads and needs to tackle both localisation and operational excellence simultaneously. Increasing Omani employment is, of course, an issue, but the sector needs improvement in genuine participation, professional mobility, and skill and capability development. This paper addresses the problem more specifically by examining how operational entities navigate the intersections among workforce localisation, operational management, and strategic manoeuvring in the rapidly changing logistics sector. The core of the paper is a literature review, research methodology, a subset of the analysis, which is a case study, and a final contribution in the form of a strategic framework intended to enhance, in a meaningful way, the effectiveness and operational sustainability of the logistics and supply chain sector in Oman. The issue of workforce localisation, particularly in Oman's logistics sector, is both a strategic opportunity and an administrative challenge. Omanisation will succeed, in the final analysis, only if the national goals are seamlessly integrated with the organisational aspirations, bridging the operational and motivational systems around a skilled workforce required to lead the logistics transformation. This work aims to clarify the argument and support Oman in achieving sustainable localisation objectives, thereby enhancing Oman's position as a significant player in the Gulf region's logistics sector.

1.3. Novelty of the Work

The following are the novelties of the paper related to the project's execution.

- sector-focused study on Omanisation in Oman's logistics and supply chain industry.
- Shifts analysis from policy to practice by examining firm-level strategies and managerial decision-making.
- Introduces the Omanisation–performance paradox, empirically exploring localisation versus operational efficiency.
- Links workforce localisation with digitalisation, automation, and AI in logistics operations.
- Uses qualitative case-based evidence to capture real organisational adaptations and challenges.

- Provides actionable managerial insights aligned with Oman Vision 2040 and the National Logistics Strategy.

2. Literature Review

2.1. Concept of Workforce Localisation and Omanisation

Regarding Oman and the Gulf Cooperation Council, workforce localisation, or Omanisation, refers to recruiting and training qualified Omanis for jobs previously held by foreign nationals [10]. Omanisation emerged in the 1980s, when the Oman government sought to develop an economic reform policy focused on diversifying the country through the Oman Vision 2040 [1]. The policy requires a certain percentage of the workforce to be Omani. It encourages companies to invest in training Omanis to fill positions that expats have long occupied. When assessing the rationale for Omanisation, it is not only for employment purposes, but also to build a workforce with the skills to sustain a country with a knowledge- and tech-based environment. Despite its enhancements, the policy has been applied unevenly across specific economic sectors. For example, in banking and telecommunications, there has been a great deal of localised workforce. However, in logistics, construction, and manufacturing, the country's economy still faces gaps due to a shortage of qualified workers [4].

2.2. Localisation of the Workforce in the Context of the GCC

The labour market in the GCC region has a dual structure, with the predominance of foreign workers in the private sector and nationals in the public sector [11]. This structural imbalance is the cause of numerous socio-economic challenges, which is why the nationalisation policy aims to increase public-sector employment. Nevertheless, despite over 40 years of policy efforts, the localisation of the workforce continues to face several obstacles, including mismatches in the education system, cultural stigma surrounding manual labour, and insufficient motivation to work in the private sector [12]. Empirical work shows that the success of workforce localisation depends on both the government and the private sector. For example, Alsaif, A. et al. (2025 indicate that, to achieve the most positive and sustainable outcomes, localisation should become a primary focus of the long-term corporate strategy, complemented by customised training, mentoring, and other reward mechanisms. Conversely, it is these private-sector employers, paradoxically, who have the lowest employee retention and productivity and approach nationalisation as a mere compliance requirement.

2.3. Workforce Localisation in Oman's Logistics Sector

Logistics and supply chain are also among Oman's growing business sectors and are among the most valuable contributors to Oman's non-oil GDP [2]. However, there remains a challenge in localising the workforce. There is a large number of employees in the logistics sector. According to Al Jabri, A.M.A et al., 2021 [8], most of them, at the technical, operational, and managerial levels, are foreigners

because there are not enough Omanis with the required qualifications and experience in freight forwarding, transport management, warehousing, and port operations. Additionally, limited knowledge of the logistics field and low interest in pursuing it further exacerbate the situation [4]. One more industry concern is the discrepancy between the skill sets of the incoming workforce and those required by the industry. Oman has many graduates from university and technical college programs in logistics and supply chain. However, practitioners say that the majority of these graduates are educated in theory rather than in practical work in the field. Therefore, graduates are not operationally equipped and lack the technical, analytical, and digital skills required in today's logistics environment [13]. Students lack experience due to inadequate internship programs and weak collaboration between industry and education.

2.4. Development of Human Capital and Skills Gaps

Oltulular (2025) examined Oman's human capital theory, which states that enhancements in education, training, and development increase employee productivity and organisational performance [14]. This theory supports Omanisation as a potential Development of Human Capital as the primary fundamental component for successful localisation in the long term. However, numerous studies indicate that Omani nationals' difficulty in adapting to the private sector is attributed to the lack of management of organisational culture and explicit work expectations [3]. There is a gap in education and training in Oman that can only be filled by the government, education providers, and the private sector working together. It is the government that is best placed to remove barriers through collaboration by adjusting the national curriculum to align with national strategic employment priorities, particularly in promoting vocational training in the allied fields of logistics and supply chain management [11]. Additionally, advocating for private-sector investment in employee education, coaching, and structured advancement opportunities is essential for increasing retention and minimising turnover. The concept of meaningful localisation is achieved when human resource management approaches place a premium on developing capacity rather than on numbers [15].

2.5. Operational Challenges in Logistics Localisation

According to Christopher's 2020 [5] research, operational efficiency is the key focus for any organisation in the logistics and supply chain management industry. Most organisations trying to identify and recruit staff in Oman still face operational grey areas and the Omanisation paradox. For example, hiring local untrained recruits to replace expatriate professionals will, in most cases, lead to reduced productivity, operational failures, and client delivery delays [8]. Logistics firms in Oman also have limited margins and significant cost pressures, leaving them with very little room to absorb the costs of training programs or productivity losses during the localisation process. A few operational issues include

technological adaptation, resistance to change, and insufficient digital literacy, which, in turn, delay the assimilation of local employees into advanced technological systems [4].

2.6. Strategic Alignment Between Localisation and Performance

With recent research Ziadah, R. (2017) [11] demonstrating the growing need for strategic workforce localisation, it is essential to note that successful localisation is not the outcome of the organisation's human resources function, but of the organisation's overall strategy Embedding localisation into the organisational strategies of talent management, leadership, and process optimisation will help to close the gap between the workforce and operational performance. For instance, organisations that apply strategic HRM principles, particularly competency-based recruitment, succession planning, and systematic skills development, are more likely to achieve localisation goals and report improved operational performance [15]. In addition, Christopher 2020 [5] argued that adopting elements of digital transformation, such as automating supply chains, leveraging data analytics, and implementing innovative logistics systems, has the potential to redefine job roles and increase the productivity of local employees. Thus, localisation strategies must continue to adapt to the changing technologies.

2.7. Conceptual Framework

Until recently, there has been little to no empirical study within Oman's Logistics sector that combines the Localisation of the Workforce, Operational Performance, and success of the organisation, despite the literature suggesting that Localisation of the Workforce and Operational Performance exist in the same sphere of success for the OrganisationWhile previous research has addressed Omanisation to varying degrees, and more often than not at the macroeconomic and/or policy level, research at the organisational level remains scarce [16]. As such, the lack of empirical evidence, particularly at the managerial level, has stifled the creation of practical evidence-based frameworks that reconcile the operational and localisation paradox. This research aims to begin filling this void by exploring the duality of operational and workforce localisation challenges faced by Omani logistics organisations from a strategic management perspective. The study is anchored in a conceptual framework with the following three components:

- Human capital development: education, training, and career progression of Omani nationals;
- Operational excellence – the optimisation, efficiency, and level of sophistication of technology applied to logistics processes; and
- Strategic alignment – the level of intentionality of the organisation in embedding workforce localisation into its performance management and policy framework over time.

This comprehensive examination will help understand the extent to which the logistics sector in Oman can sustain its operational localisation and competitiveness in light of the dynamic global supply chain.

3. Research Methodology

3.1. Research Problem

The primary aim of Oman Vision 2040 is to diversify the hydrocarbon economy [17]. The logistics sector is one of the most essential initiatives under Oman Vision 2040. Despite Omanisation policy efforts to promote employee retention, the localisation of Oman's logistics sector has proven unsustainable. Oman is facing a paradox of attritional dependency of local employees, an expatriate dependency on operational key tasks, and a shortage of (managerial and technical) Omanis [18]. To make things more challenging, companies need to be operationally effective. There is a paradox: Omani Logistics companies need to figure out how to position themselves within the proper framework to balance localisation with operational effectiveness [19]. This is where the research focuses on the interrelationships between Omanisation and the operational and managerial (organisational) components of the country's supply chain and logistics. Literature in this field forms the basis for localising the workforce within the GCC.

However, this literature tends to be more macro in nature, focusing on analyses of country-specific policies and public-sector employment [15]. There has been limited empirical research on workforce localisation in the private sector, particularly within the Logistics and Supply Chain Management domains; this sector operates under fierce market competition and faces global demand for services [20]. Moreover, the literature appears to lack an examination of the extent to which organisational strategy, digital readiness, and the value and development of human capital collectively affect the success of national workforce localization [21]. There is also a gap in the operational effects of localising the national workforce: what are the impacts on operational productivity, process efficiency, and innovation of the logistics systems? [22]. Accordingly, this study aims to fill this gap regarding logistics companies in Oman, primarily, and to offer a context-specific examination of the operational and technological issues associated with workforce nationalisation. The study also advances the theory by establishing a link between work localisation and supply chain performance, while benefiting practitioners by integrating policy, strategy, and human capital development.

This has formed the primary gap to be addressed by this study, which has been framed into the following research objectives:
- To analyse the status quo and challenges of workforce localisation within the logistics sector of Oman.
- To assess the operational and managerial constraints on the implementation of Omanisation policies.
- Describe how workforce localisation in practice impacts operational efficiency.
- Describe the impact of training, leadership, and digital on localisation outcomes in practice.
- Construct and explain a localisation strategy quadrant that integrates workforce localisation, process efficiency, and digital capability enhancement localisation outcome.

3.2. Hypotheses Development

Within the domain of strategic management and the human resource development theory, the following hypotheses have been developed:

H1: Operational efficiency and workforce localisation in logistics companies are direct and positive.

H2: The relationship between localisation and operational performance is affected by the investment in training and skills development.

H3: The success of Omanisation initiatives is positively and significantly affected by leadership and the organisational culture.

H4: The existence of a digital workplace positively impacts workforce localisation and organisational performance.

H5: The greater the misalignment of organisational strategy and the localisation policy objectives, the lower the operational efficiency.

These hypotheses will be tested through primary data collected from logistics companies, using qualitative and, when necessary, quantitative methods. Soft data will be complemented with complex data for hypothesis testing.

3.3. Conceptual / Research Model

As shown in Figure 1, the conceptual framework for this study will approach localisation from four perspectives.

The study's Independent Variable is Workforce Localisation (Omanisation, local recruitment, training, and retention).

Mediating Variable: Development of Human Capital (advancement of skills, vocational training, and leadership training).

Moderating Variable: Digital Transformation (adoption of technologies, automation, and digitalisation of supply chains).

Dependent Variable: Operational Efficiency (including productivity, service quality, and performance outcomes). The model in Figure 1 shows that workforce localisation has a direct impact on operational efficiency, with human capital development as a mediating factor and digital transformation as an amplifying factor.

Leadership and strategic alignment serve as enabling factors influencing all dimensions.

3.4. Research Design

We will use a qualitative case study approach, along with descriptive and exploratory methods, for this study. Because this approach provides a better understanding of the phenomenon's complexities and realities within the organisation, this case study design is most appropriate. The phenomenon being studied is how different logistics companies understand and apply Omanisation policies, taking into consideration their operations.

3.5. Sampling and Participants

For logistics companies of different sizes, with varying ownership structures (local and multinational) and operational types (transportation, warehousing, freight forwarding, port services), a purposive sampling method was used. The participants were:

- HR/senior managers who are workforce planners and implementers of localisation policies.
- Operations managers who are responsible for the logistics functions daily.

- Omani nationals in the technical and administrative positions.

Data expected to be collected includes 10-12 companies and 25-30 participants to achieve a fair level of diversity and representation within the sector.

3.6. Data Collection Methods

Semi-structured interviews, document review/analysis, and observations were used to collect data.For the interview, key informants were interviewed to obtain their views on localisation, the challenges, and best practices. The questions were on recruitment, training, and how leadership uses technology to improve operational performance. For document review and analysis, Omanisation policies, company reports, and related materials were used. Workplace visits, where applicable, provided insights into the workflows and employee engagement. With the participants' consent, the interviews were audio-recorded, transcribed, and subjected to thematic coding.
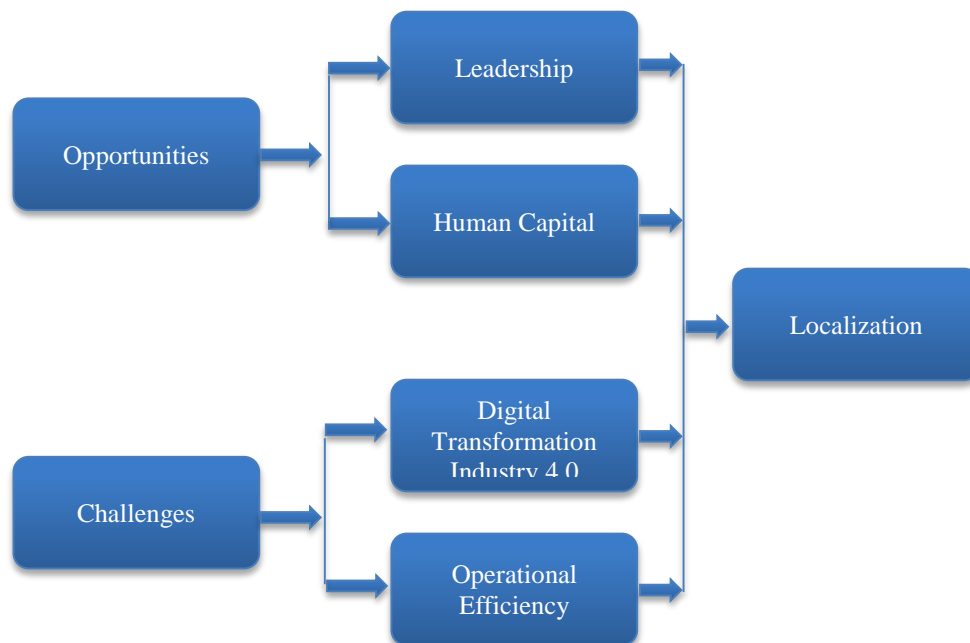

Fig. 1 Conceptual framework of workforce localisation and operational challenges in oman's logistics sector

3.7. Data Analysis

Using NVivo, Braun and Clarke's (2006) thematic analysis framework was applied to process the qualitative data and develop codes and patterns. The recognised patterns were categorised into themes, including: localisation strategies, operational challenges, gap analysis of competencies, leadership, and technology. Findings were strengthened and presented more credibly through data triangulation. When applicable, a quantitative method (survey-based perception analysis) was used to test the conceptual framework and validate the relationships among the interrelated variables.

Basic descriptive statistics and regression analysis were used to test directional hypotheses regarding localisation, operational effectiveness, and other variables.

3.8. Ethical Considerations

All participants were informed about the study's purpose, the voluntary nature of their participation, and the confidentiality of their responses. The study kept the data anonymised, and no organisational details were included in the study report. The study complied with the ethical guidelines of the relevant institutional review boards.

3.9. Expected Outcomes

This study aims to develop an alignment model that examines the intersection of workforce localisation policy, organisational operational experience, and digital transformation. More specifically, the study aims to assist policymakers and logistics managers with operational training, leadership, and technology to enhance Omanisation. The present study will address the intersection of nationalisation policy and supply chain performance models to close a theoretical gap and provide practical guidance to industry on sustaining a balanced focus on localisation and efficiency to close an application gap.

4. Data Collection and Analysis

The data were collected by four experts with a Master's in Supply Chain and Management. Among the four experts, the first Research Assistant collected data from 7 companies, the second from 13, the third from 8, and the fourth from 12. The company overview, expert feedback, and analysis are as follows: Since the company rules do not allow us to reveal their name explicitly, we used codes for the company name: OL, TO, JT, OA, GL, OT, and SA. The company details are given in Table 2.

4.1. Data Collection by the Research Assistant 1 and Its Analysis

4.1.1. Company Overview

Regarding the participants in this study, we have leading HR and Operations professionals from frontline companies in Oman, and our respondents span a range of years of experience and field specialisation. The respondents included the HR Manager at OL for over 7 years, Operations Head at TO having more than 10 years of industry experience, JV HR Officer, JT, having 5 years' experience, HR Director at OA having 20 years of experience, HSSE Advisor from GL having 8 years, Recruiter from OT for 6 years and a Planning Engineer from SA with 5 years of experience.

In these entities, the extent of skills localisation (Omanization) varies widely. With Omanization of about 60% in logistics operations, OL is around the median. However, the localisation of OL is even less of a concern for specialised management positions.

TO is constrained by subpar localisation, as the majority of the truck drivers are expatriates, and the office admin team is also expatriate. In JT (JV), there is around 70% localisation in the production and admin sections, with 30% localisation in the R&D technical positions. For OA, frontline positions demonstrate the greatest localisation (75%); technical positions have moderate localisation (40–60%); and managerial positions have strong localisation (70%). GL shows strong localisation in the admin and project support roles, whereas the technical roles are less localised (40%). OT supports further localisation across cross-functional and professional roles.

In contrast, in Specialised Engineering and Planning roles, SA has a gradual Omanization, but retention has been an issue in technical positions. Across the companies involved in the study, the key competences are grouped into four categories. The first one is technical or functional competencies, including supply chain management, regulatory and compliance knowledge, and an understanding of risk management, HSE compliance, and production efficiency. The second group is strategy and analytics, which includes planning and problem-solving, as well as, most importantly, data-driven decision-making. The third group of competences is leadership and relations, which provides for team management, collaboration, mentorship, and communication with other stakeholders.

Lastly, the behavioural and core competences, in addition to ethics and communication, adaptability, in the form of entrepreneurial and account-driven thinking, are to provide a holistic view of the competences needed to assist in the Omanization and the sustainable development of the workforce, which are further broken down into the turnover insights provided in Table 3.The retention strategies focus on potential talent and a multi-tier approach to skill localisation. The retention strategies were reported to focus on career development and structured development opportunities, including coaching, mentoring, high-visibility international assignments, extensive technical training, and upskilling through credentials, leadership, and other in-house academies. Recognition and retention strategies included stay interviews and engagement surveys, with tiered feedback for retention, to assess the benefits of a work-life-balanced, structured role. Purpose-driven engagement was reported to be related to employer branding.

The new action to address attrition is to implement a phased knowledge transfer to minimise the loss of key personnel. Other actions include executive sponsorship and mentorship, role-specific high-impact incentive systems, and attrition mitigation. These strategies are targeted and shaped by our global competition. Benchmarking is done against airports (Changi and Dubai), logistics companies (DHL, FedEx), and manufacturers (AkzoNobel, JT Global). Training in logistics is also offered by SkillsFuture (Singapore), IkTVA (Saudi Aramco), dual vocational training (Germany), GoTeach (DHL), and Maersk Training. The recruitment and talent strategies, complemented by employer branding and EVP focused on purpose and career progression, emphasise adaptability, digital skills, and problem-solving, as well as avoiding burnout. A digital application system, proactive touchpoints, and responsive communication improve candidate experience. Interstaff Omanization, along with a competitive salary and labour law-compliant offer, is intertwined.

Studies indicate that the combination of employee burnout, contract completion, stagnation in position, and

marketability contributes to attrition. In contrast, retention mirrors career progression, recognition, upskilling, and a deep sense of purpose.

It can be actively managed by conducting stay interviews, providing mentorship, running engagement and recognition programs, and offering flexible work arrangements. Employers have to contend with high employee turnover, skills and leadership gaps, costs, and workplace culture challenges, which can be alleviated by offering career opportunities, training and development, succession planning, and operational streamlining with engagement programs.

The robust presence of personnel availability for general operational roles is noted in the development of human capacity; however, specialisations, technical roles, and also for logistics, the availability is weaker; therefore, the adequate provision of services for the purpose of developing industry-specific graduate programs, mentoring, and training in cooperation with universities is essential. Managing risk in the provision of services for the structured transfer of knowledge, incremental operational transitions, envisioned career paths,

and sponsorship for leadership should be done. The organisational obstacles include challenges in readiness for change, organisational change, and structural rigidity, combined with evolving models of the organisation and the work environment; in such cases, change management and workforce upskilling, alongside inclusive policy frameworks and agile hierarchies, are required.

Some of the key observations include the relationship between skills localization and retention, the impact of leadership on turnover rate reduction, the importance of global benchmarking and its value to the enhancement of local HR practices, the benefits of career pathing and recognition, the impact of proactive HR practices on turnover reduction, and the need for agile training to fill the technical, digital, and logistics leadership gaps. Employer Concerns and Challenges are given in Table 4.

In Figure 2, the Consolidated chart shows Omanization and staff turnover for all the companies they provided: OL, TO, JT, OA, GL, OT, and SA. Sky Blue: Omanization (%); Light Green: Omani Staff Turnover (%); Salmon: Expat Staff Turnover (%).
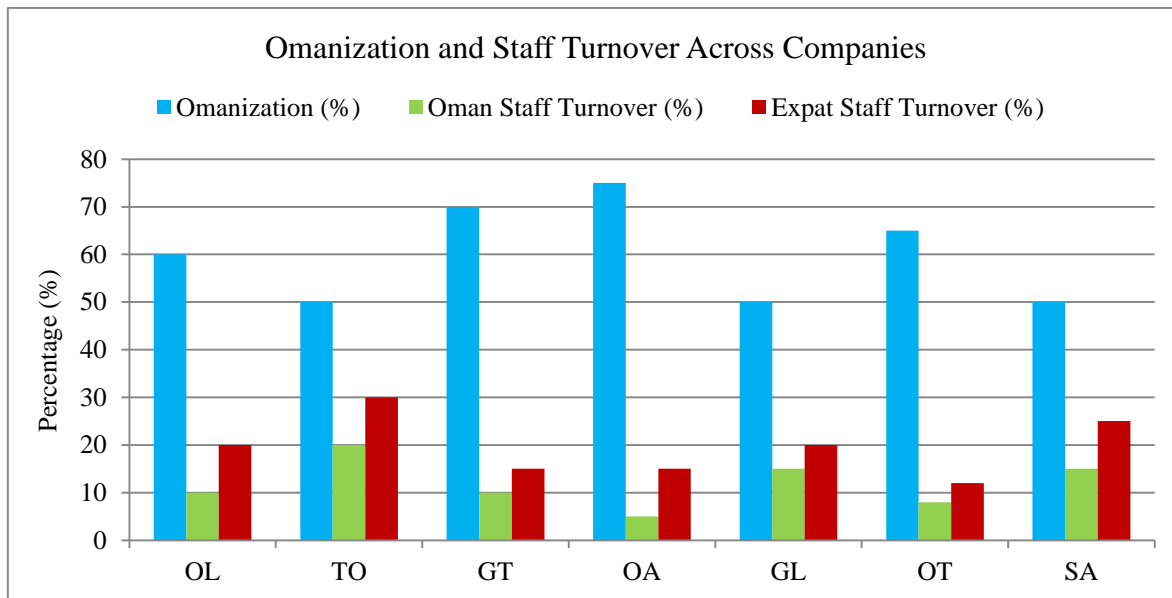

Fig. 2 Omanisation and Staff Turnover Across Companies

4.2. Data Collection by Research Assistant 2 and its Analysis

The next Research assistant collected the data from 13 companies, and the overview and Omanisation are given in Table 5.

4.2.1. Crisp Qualitative Analysis

There are significant differences in Omanisation and retention across sectors and in the organisation's maturity, size, and strategic orientation. High levels of Omanisation are evident in the large energy companies HH (97%), AA (95%),

and AA-2 (94%), which have well-established career pathways, leadership development, and participative national initiatives, and have local talent embedded at all levels of the organisation.

In port and logistics, BB (92%), II (90%), and LL (85%) also have strong localisation outcomes. This is also evident from training programs, competency frameworks, and structured mentorship programs, which improve both capability and commitment.

Table 2. The details of the companies collected by research assistant-1 -1

Company	Ownership	Staff	Nature of Business	Core Business	Market Segment	Trading Scope
OL	Private	Several hundred	Logistics & Freight	Supply chain, warehousing, transportation	Logistics	Local & Regional
TO	Private	Medium	Trucking & Transportation	Freight transport, supply chain services	Logistics	Local & Regional
JT	JV (Oman + International)	200+	Paint Manufacturing	Industrial & decorative paints	Manufacturing	Local & Regional
OA	Government (Oman Aviation Group)	1,350	Airport Management & Operations	Airside ops, terminal management	Aviation & Tourism	Local & Global
GL	Private	Several thousand	EPC contracting; energy & infrastructure	Oil & Gas, Industrial, Infrastructure	Oil & Gas & Infrastructure	Local & Regional
OT	Public-listed	2,500	Telecommunications & Technology	Telecom services	Technology & Telecom	Regional
SA	Private	Several hundred	EPC contracting	Oil & Gas, Energy, Industrial projects	Oil & Gas & Infrastructure	Primarily Local

Table 3. Turnover insights

Company	Omanization %	Omani Staff Turnover	Expat Staff Turnover	Retention Strategies
OL	~60%	Low	Moderate	Career growth, mentoring, incentives
TO	~50%	Moderate	Higher	Training, recognition, retention incentives
JT	~70%	Low	Moderate	Structured career path, training programs
OA	~75%	Very low (<5%)	Moderate	Mentorship, leadership development, engagement programs
GL	~40–60%	Low	Moderate	Knowledge transfer, project-based retention
OT	~65%	Low (~7%)	Varies	Tech upskilling, career development, engagement
SA	~50%	Low	Higher	Mentorship, leadership support, and project retention incentives

Table 4. Employer concerns and challenges

Concern	Solutions	Challenge	HR Action
High turnover	Career growth, mentorship, and improved work conditions	Organizational readiness	Change management programs, workforce upskilling
Skills gap	Training programs, university partnerships, certifications	Resistance to change	Early involvement, feedback loops, incentives
Leadership shortage	Leadership training, succession planning	Rigid structure	Promote flatter, agile hierarchies.
Cost pressures	Retention-focused strategies, operational optimisation	Business evolution	Align HR with new services/markets.
Workplace culture	Engagement programs, inclusive policies, and a safe environment	Work environment	Inclusive policies, safety, engagement

Table 5. Overview of the 13 companies – omanisation and localisation

Company Code	Ownership	Staff Strength	Core Business	Omanisation / Localisation (%)	Omani Staff (%)	Expat Staff (%)	Omani Turnover (%)	Expat Turnover (%)	Key Retention Strategies	Key Challenges	Remarks on Localisation
AA	Government	600+	Oil & Gas Production	95%	92	8	4	12	Career development, national pride, and competitive pay	Retaining specialised Omanis, skill gaps in technical areas	Strong Omanisation across operational and admin roles
AA-2	Government	400+	Oil & Gas	94%	90	10	3–5	10–15	Structured career paths, succession planning	Limited specialised skill availability	High localisation; low Omani turnover
HH	Joint Venture	615	Oil & Gas Production	97%	97	3	3–5	10–15	Career growth, leadership opportunities, Omanisation pride	Retaining expats during transition	Excellent Omanisation and retention practices
BB	Government / Semi-Govt	500+	Port Operations	92%	87	13	5	15	Incentives, training, mentoring	High market competition for talent	Omanisation improving; leadership roles mostly Omani
II	Government / Semi-Govt	Thousands	Multimodal logistics	90%	90	10	–	–	ICV-linked training, mentorship, competency frameworks	Talent shortage in specialist roles	–
CC	Sovereign / Investment	350	Investment & Logistics	88%	85	15	6	18	Training & development, mentoring	Retention of Omanis in finance/logistics roles	Focused on skill development and internal mobility
LL	Joint Venture	50	3PL / Port Services	85%	85	15	–	–	Financial incentives, flexible schedules, and team engagement	Competition from other companies for talent	–
DD	Private / JV	300	Logistics & Supply Chain	85%	83	17	5–7	12–20	Skills development, exposure to technology	Limited career growth in niche roles	Moderate Omanisation; challenges in niche skills

JJ	100% Omani	600+	Oilfield Services / Logistics	84%	84	16	–	–	Competency framework, skill-based pay, training bonds	Lack of certified logistics training institutes	–
FF	Private	200	Warehousing & Logistics	83%	78	22	7	18	Upskilling, clear career progression	Retention in specialised roles	Skills gaps in logistics tech roles; retention moderate
EE	Private	150	3PL & Freight	80%	75	25	8	20	Training, career pathways	Competition with regional players	Limited internal training; Omanisation is improving slowly
GG	Private	180	Customs & Freight	78%	80	20	6–8	15–18	Mentorship, on-the-job training	Digital logistics skill gaps	Structured training in progress; Omanisation moderate
KK	Private	120–150	Customs clearance / 3PL	70–75%	70–75	25–30	–	–	Career paths, mentorship, and digital training	Limited advanced logistics skill availability	–

Among companies with moderate levels of Omanisation, FF (83%), JJ (84%), and DD (85%) employ competent adaptive development and acknowledgement strategies to achieve and maintain employee retention. In contrast, smaller and nascent companies with lower Omanisation rates, E (80%), G (78%), and K (70-75%) have even more difficulties attracting and retaining specialised talent in highly advanced digital logistics and technologies. Most of the organisations to achieve employee retention, integrate retention measures such as employee vocational training, job training, supervisory training, monetary incentives, and retention bonded non-competition agreements, which do not include the specialised retention of employees, the digital and pressure in an equal market, and the training of a non-regionalised human capital system to employee retention increases to match system demands. The ratio and Turnover of Omanis and expatriates are indicated in Figures 3 and 4.
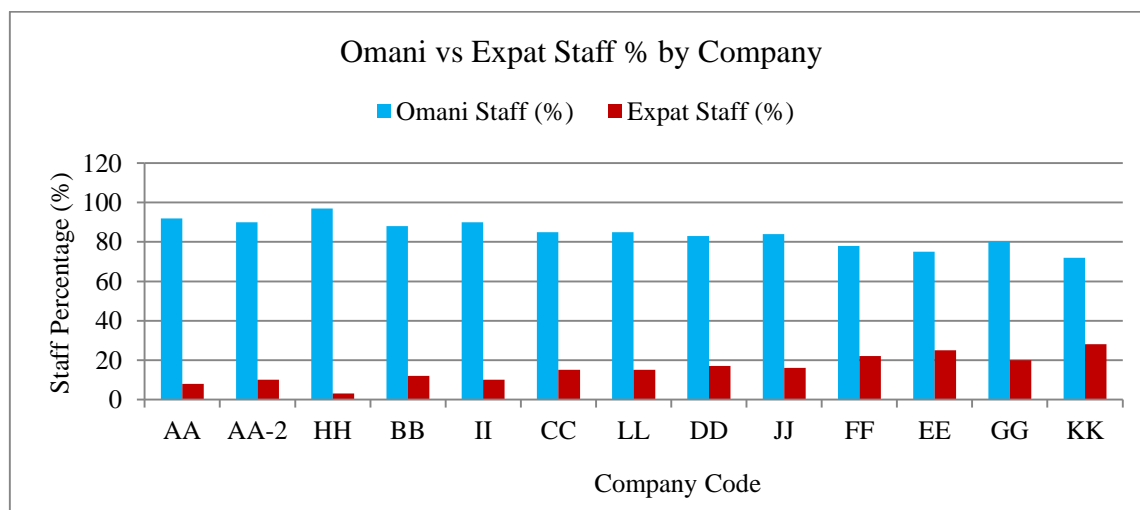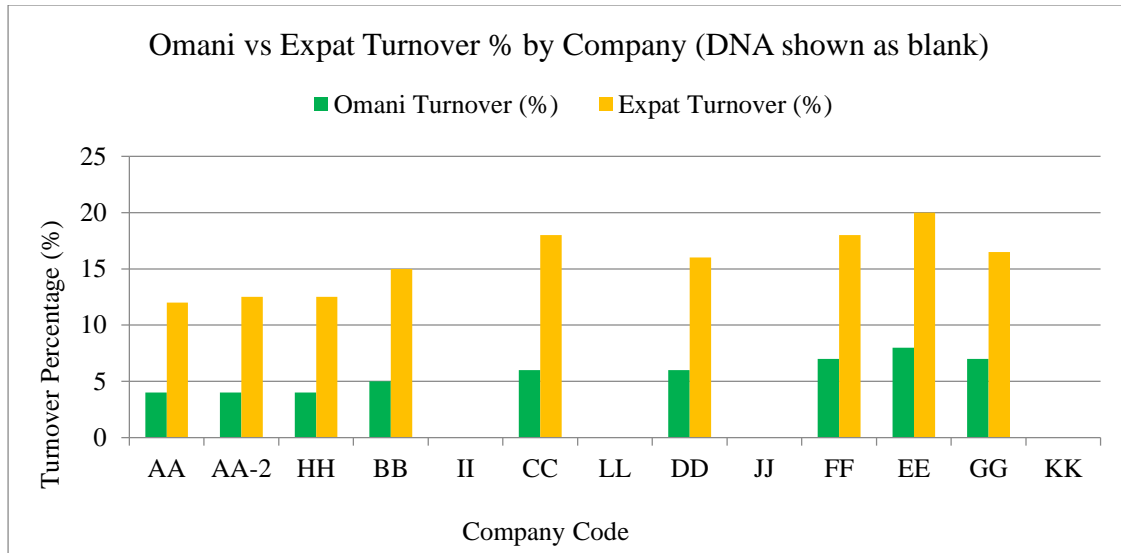

Fig. 3 Omani and expat staff % by the company

Fig. 4 Omnai and expat turnover % in the companies (some companies- not given data)

Observation: Companies in oil and gas (AA, AA-2, HH) have the most Omanisation by far, with logistics and ports coming in second (BB, II, LL), while the smaller private logistics companies (KK, GG) have the lowest Omanisation, indicating skill shortages and retention issues.

As far as Omanisation and localisation by sector is concerned, the differences are particularly pronounced by industry and by organisation size. In the oil and gas sector, large companies such as AA, AA-2, and HH, which have well-established Omanisation and retention initiatives, are the most successful, with Omanisation levels of 94-97%, as a result of well-structured employee career progression, succession planning, leadership capacity building, and initiatives that are geared towards fostering pride in the nation. Omanisation in these organisations is well-established, although retention remains a substantial issue, particularly for highly specialised technical skills.

In ports and logistics, BB, II, and LL also have high levels of Omanisation (85-92%) and are recognised as such, due to a supportive structure that includes competency frameworks, mentoring, and training programmes geared towards employee skills and engagement.

In contrast, smaller or emerging private logistics companies EE, FF, GG, and KK have MoE and lower Omanisation levels (70-83%), due to fewer opportunities to advance, niche skill shortages, and exceptionally high competition from large employers.

Retention tactics already adopted in many industries include educational programs, employee training, structured mentorship, leadership coaching, financial incentives, achievement awards, sponsored training, and other methods that keep employees engaged in the long term. Most

challenges involve the limited pool of technical Omani talent and the Omani workforce in digital logistics, fierce market competition, the shortage of highly trained local talent, and the retention of Omani workers in small companies with limited growth potential. Retention and workflow localisation, particularly for tiered Omanisation and defined career pathways in AA, AA-2, and HH, stand out. At the same time, the smaller logistics firms (GG, KK) lag in Omanisation and workforce retention, requiring greater investment in integrated training and mentoring frameworks, as well as more balanced career pathways. The successful localisation of the workforce across the rest of the economy is likely driven by a combination of national pride, acquired skills, and workforce incentives that support organisational stability and employee growth. As of October 2023, the quantitative data on Omanisation and employee retention demonstrate a clear relationship among firm size, industry, and localisation outcomes. As an illustration, leading firms, namely HH and AA, have nearly complete Omanisation and high retention of Omani nationals, suggesting these firms have retention strategies and career development positions that enable employees to grow into leadership roles. In contrast, the logistics and the emerging private firms, namely EE, FF, and GG, have lower Omanisation and higher turnover. Their situation results from the absence of career advancement frameworks, the unavailability of specific skill sets, and competition from larger firms. Overall, the data indicate that large, well-established companies in the oil, gas, and port industries continue to outpace smaller competitors in localisation and employee retention, demonstrating the significant impact of robust HR frameworks, structured Omanisation, and workforce investment. An examination of the qualitative data reports skills localisation and employee retention across industries and the geographical distribution of Oman. The variation across the domains of organisational size, industry, and particular strategic HR practices concerned

the oil and gas industry, with major companies AA, AA-2, and HH. They showcase a robust Omanisation rate of over 90%, due, among other reasons, to more developed Omanisation frameworks, including career laddering, succession planning, formalised and structured leadership courses, and initiatives that foster national pride and a sense of purpose. These practices lead to the inclusion of Omanis at all organisational levels, improved retention, even in highly specialised and technical positions, and high staff retention. BB, CC, and DD have been experiencing higher levels of Omanisation in the Ports and Logistics sector due to the presence of Omanisation Flexibility, Omanisation Mentoring, Omanisation Targeted/Omanisation Training, Omanisation Skills-Based Promotions, and Omanisation Employee Integration Theories. In contrast, smaller, more recent, and more private-sector logistics businesses EE, FF, GG, and KK have been experiencing Omanisation levels of 70-83%, attributed to structural and digital understaffing as well as discord within the organisation. In particular, these firms lack Logistics and Digital skills. Most sectors have structured retention as a function of Issued recognition procedures, Bonds for Training, Growth + Inspiration, Restructuring to alter mobility or position, skills accommodation, Power + Position, and Leadership + Formation to relay knowledge. Shortage of high-level Omani recruits in Advanced Logistics, Advanced Supply Chain, and Advanced Analytical positions; a tight local market and, consequently, a risk of high turnover; and a Lack of local operational and advanced technical training are some of the challenges.

Findings show that Omanisation and retention levels peak in organisations that take a comprehensive approach, combining systematic training and development plans, advancement-level integration, incentivisation and recognition systems, and contribution systems that engage employees in the country's development. On the other hand, small private companies need to make their investments in training, mentoring, internal mobility, and retention-oriented HR policies more strategic to bridge the skills gap and to improve employee engagement. In conclusion, the results indicate that the most sustainable localisation and retention of skills are achieved through active workforce planning, the development of retention systems, and a culture that encourages growth, recognition, and contribution to the country; these are the pillars of a stable entity.

4.3. Research Assistant 3's Data Collection Process and Its Analysis

In the same manner as RA 1 and RA 2, RA 3 obtained information from 8 companies and displayed it appropriately. Since our interest is in Local and Expat personnel and their turnover, the following information primarily relates to the main point. The distribution of personnel among the eight companies illustrates the proportions of local and foreign employees within the total workforce. Two columns for each company depict the proportions of local and foreign employees. The proportion of local employees indicates the degree of Omanisation, or the incorporation of local staff, in the company. In contrast, the proportion of foreign employees suggests the degree of reliance on them. This analysis sheds light on the proportion of employees in the company and the coverage of workforce localisation, depicting the trend in workforce localisation across various companies in different fields. The percentage of employees who leave an organisation over a specific period is called turnover. The eight companies being analysed show turnover rates and the percentage of employees leaving the organisation, studied from both local and expatriate staff perspectives. Each company has two bars that show the turnover of local and expatriate employees, reflecting the retention and turnover of both groups. It also indicates retention problems and challenges for regional and expatriate employees at each company, and identifies the particular workforce at each company with high turnover. The data for local Staff_s, expat Staff_s, and their turnover % in Table 6 and Figure 5 represent the staff composition by company. Figure 6 shows the turnover rates of Omani employees and expatriate employees.

Table 6. Data table for chart

Company	Local Staff %	Expat Staff %	Local Turnover %	Expat Turnover %
1	55	45	10	15
2	60	40	12	10
3	50	50	8	12
4	65	35	15	18
5	58	42	9	13
6	52	48	11	14
7	60	40	7	10
8	50	50	10	12

Table 7. Company overview collected by research assistant – 4

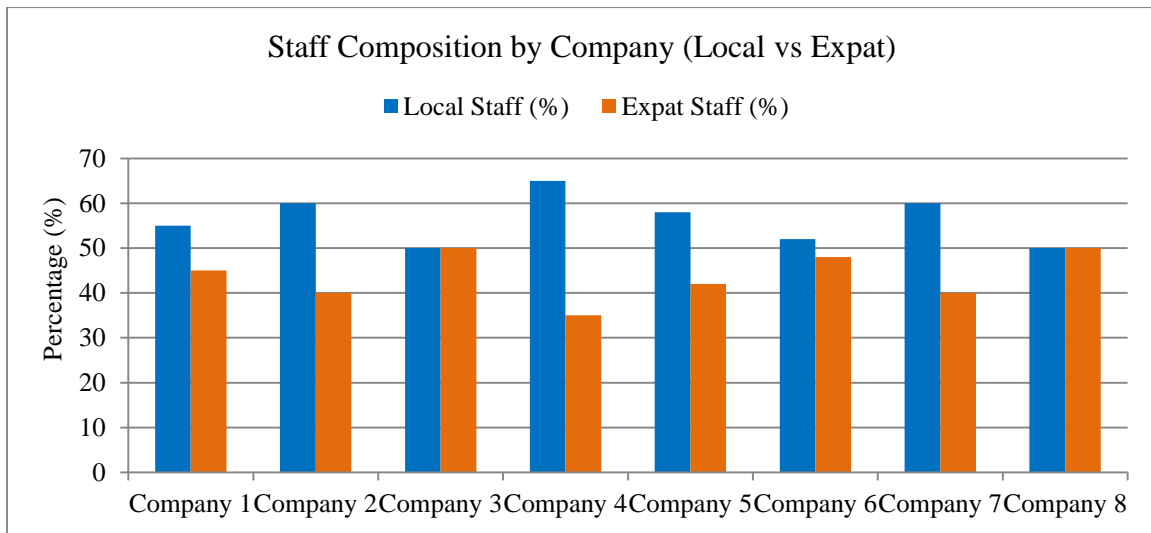| Company Code	Staff Size	Ownership	Core Business	Market Segment	Local/Regional/Global	Omani Staff Turnover %	Expat Staff Turnover %
MM	~[Insert]	Local/Private	Warehousing & 3PL	Local/Regional	Regional	Low (~1–3%)	Moderate
LL-1	400	Joint Venture	Port operations, cargo handling	Maritime, Oil & Gas	Regional/Global	Low	Higher (contract-based)
LL-2	400	Joint Venture	Port operations, cargo handling	Maritime, Oil & Gas	Regional/Global	Low	Higher
NN	[Insert]	Joint Venture	Warehousing & Export	Local/Regional	Local	Very Low (~1–3%)	Slightly Higher
OO-1	1,200	Subsidiary	Iron ore pelletizing & logistics	Mining, Manufacturing	Global	Moderate	Higher
OO-2	1,200	Subsidiary	Pelletizing plant, maintenance	Mining, Logistics	Global	Moderate	Higher

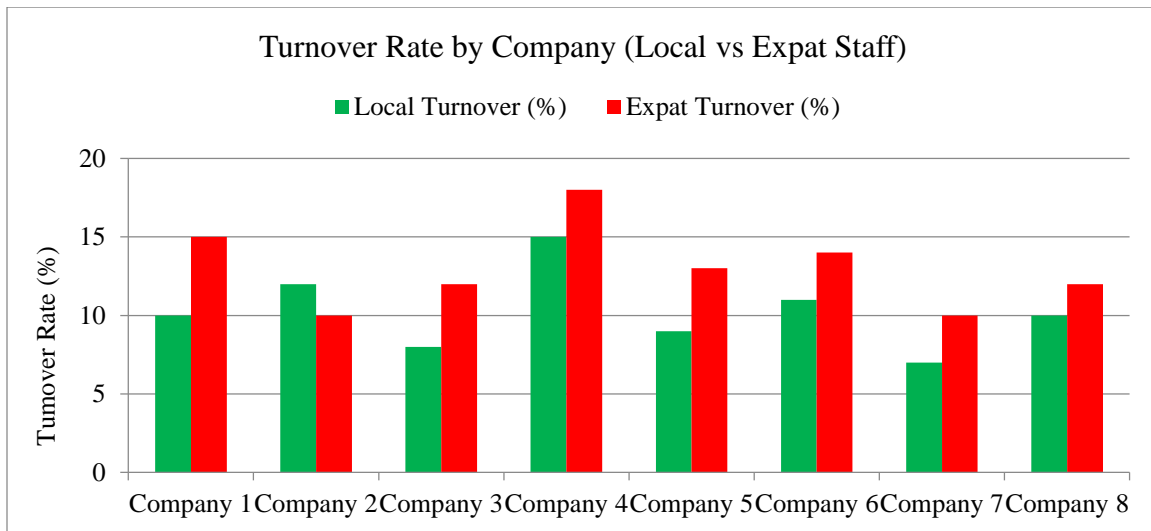**Fig. 5 represents the staff composition by company**

Fig. 6 Turnover rates of Omani employees and expatriate employees

4.4. Consolidated Analysis of Logistics Companies Selected by Research Assistant -4

The fourth research assistant collected the details from 6 companies; the detailed analysis is as follows. The company overview of the data collected by RA-4 is given in Table 7. In Oman, the levels of Omanisation and retention of local employees vary by company. A majority of the firms in the country possess high Omanisation with local employees equally positioned in the organisational hierarchy. Even so, Omanisation is not the same across all companies; for instance, NN has nearly 59% Omanisation, while OO-1, OO-2, and MM have full Omanisation in all the HR and administrative functions, which shows this is the average for the sector.

To enhance Omanisation, companies offer a variety of workforce training and development activities, including internship programs, training workshops, mentoring, and foreign placements, all aimed at improving employees' soft and hard skills. There are several dimensions to retention, including promotion pathways, recognition of employees through awards, such as Employee of the Month, flexible working and shift arrangements, medical and family coverage, and activities aimed at improving team cohesion and engagement. Retention of employees, especially of the local workforce, remains a challenge, especially when it comes to the high earning potential in the oil and gas and government positions, the difficulty of retaining young Omanis in remote locations such as Duqm, as compared to Muscat, and the ongoing lack of fit in the necessary competencies in technical and maintenance functions.

Table 8: Global Best Practices Adopted by the Companies. Optimising Omanization and retention in the companies reviewed in this study shows a positive correlation with the presence of Omanisation policies with multidisciplinary employee training and development opportunities, clearly defined career pathways, employee retention and career advancement incentives, and work-life balance initiatives, emphasising the role of HR as a facilitator of positive and balanced change for sustainable development in the companies. Best practices from companies are summarised in Table 8.

Table 8. Global best practices adopted by the companies

Practice	Companies Implementing
Employee recognition & awards	All
Mentorship programs	MM, OO-1, NN
Structured onboarding & career pathways	All
Family-inclusive benefits	MM, OO-2
Knowledge transfer & international secondments	OO-1, MM
Training & development partnerships with universities	00-2, NN

4.4.1. Quantitative Bar Chart

The following bar chart shows employee turnover compared to Omanization for each of the six companies. The companies are indicated at the bottom of the chart, and the percentages are shown above. Each company has three bars that represent turnover of Omani employees, turnover of expatriate employees, and overall Omanization. The chart's structure allows them to see retention of Omani and foreign employees at the company and, together with the Overall Omanisation bars, to reflect the scope of Omanisation.

Data analytics indicate that Omanization efforts are underway in the logistics industry, particularly in Oman HR, Oman Procurement, and Oman Tech Ops. Recognising employees, providing flexible schedules and career progression, and equipping workers with the tools and resources foster employees' loyalty. The concern around expatriates in technical roles is most prevalent, however, as employers try to close the gaps with training, mentoring, and appropriate sponsorship. There is a clear need for these specific retention strategies in Oman Duqm and Oman Sohar, as these remote areas face additional challenges in retaining youth. Overall, staff retention, engagement, and satisfaction have improved with local context adaptations of global best practices. The following table shows Omansisation within the company, and the following figure shows the turnover and Omansisation rates of the companies that Research Assistant 4 chose.

One of the findings of our staff turnover analysis is that, among the companies surveyed, Omani employee turnover is very low, ranging from 1% to 5%. This suggests that the companies have effective retention policies. On the other hand, turnover of expatriates is higher - from 3% to 10% - and is generally higher because of the temporary nature of employment contracts and mobility for specific projects. The Omanization rate is between 55% and 65%. This indicates that the integration of Omanis into the workforce of both the logistics and industrial sectors is progressing at a positive, steady rate. The strongest assertion is that companies that have proper and comprehensive HR policies, such as training and mentoring, clearly articulated career paths, and succession planning, have lower turnover rates. In addition, industrial companies (such as OO-1), unlike general logistics companies, have set higher targets for Omanization. Port activities, especially the Port of Duqm, face greater challenges than Sohar and Muscat in retaining their Omani employees. This suggests that there are additional retention challenges in remote and rural areas.
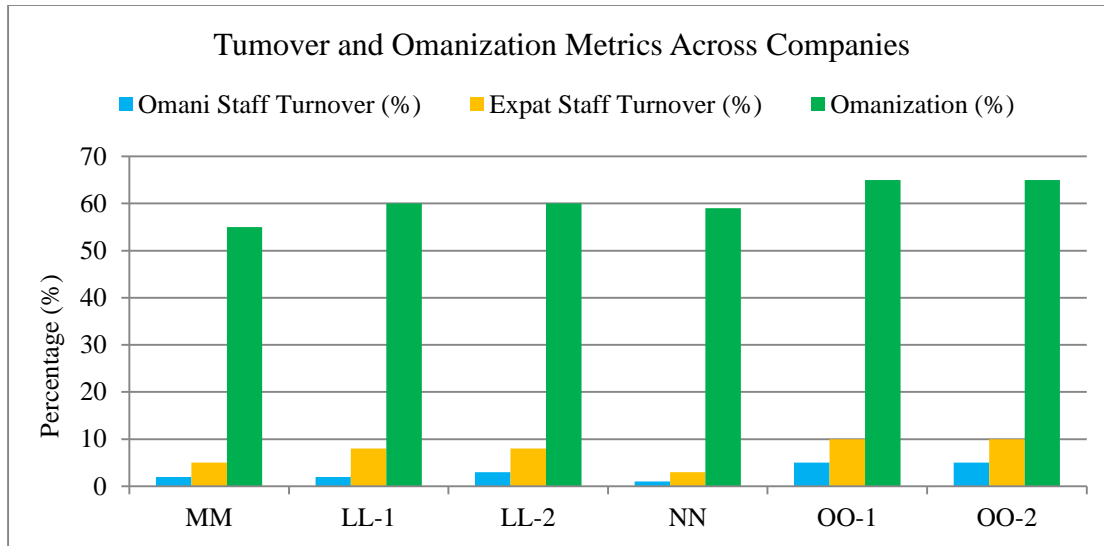
Fig. 7 Turnover and automation metrics across companies selected by the research assistant -4

Table 9. Omanisation in the selected company by the research assistant -4

Company	Location	Core Business	Staff	Omanization %
MM	Oman	Logistics/Warehousing	~150	55%
LL-1	Muscat	Port & Logistics	400	60%
LL-2	Muscat	Port & Logistics	400	60%
NN	Sohar	Warehousing & Export	~300	59%
OO-1	Sohar	Mining & Logistics	1,200	65%
OO-2	Sohar	Mining & Logistics	1,200	65%

5. Conclusion

Fundamental structural and operational issues particularly stymie Omanisation initiatives across various schemes in Oman's logistics and port sector. Perhaps the main problem is the mismatch between the skills available and those needed. Companies report that many graduates lack the technical skills required to perform freight operations, conduct supply chain analytics, handle equipment, and comply with safety regulations. While administrative skills are more prevalent, vocational and machine-related skills are less common, further perpetuating reliance on expatriates, especially in maintenance, warehouse management, and roles that operate specialised equipment. While nationalisation rates stand at an average of 69%, Omanisation in the logistics sector lags even behind the private sector, and the localisation of technical and mid-manager roles stagnates due to the absence of suitably trained Omanis. This is especially true for retention, as fewer than half of organisations have established clear career development, mentoring, and succession pathways, leading to a lack of growth systems. The outflow of potential employees compounds remote logistics hubs in Sohar, Duqm, and Salalah, as south Salalah and Duqm are the less developed zones compared to the Sohar hubs. Employees are often unwilling to relocate due to familial and social limitations, compounded by deficient housing and social infrastructure. The ambiguity of policies also stymies the initiatives to constrain workforce planning, as companies describe the absence of policies as unfettered and the enforcement of policies as overly prescriptive, especially in the context of the rapidly changing Omanisation policies. The expectation of a wage gap and the perception that Omani hires are less productive in the initial stages of employment leads many employers, especially for roles that require shift work or high levels of manual labour, to prefer hiring expatriates. Also, cybersecurity is a significant threat in the logistics sector. Ensuring software reliability and cybersecurity is more critical in implementing new software [24]. So, these professionals are in high demand in the logistics sector, where the country is increasingly reliant on expats. To continue developing Oman's logistics and supply chain sector, cybersecurity must develop alongside industry work on localisation. The industry and education system's divide leaves even fewer graduates familiar with new logistics systems and processes, and fewer facilitators with less-structured internships. Moreover, there is a glass ceiling surrounding middle management in ex-employee-dominated structures, as they seem unwilling to broaden their work scope, thereby streamlining the localising process from losing significant control to less meaningful control.

To conclude, economic pressures, regional competition, and post-COVID supply chain disruptions have constrained investment in training and further delayed Omanisation initiatives. The challenges of Omanisation's localisation point

to a plethora of issues stemming from the unsustainable nature of each. The lack of alignment between the industry and the education system causes skills gaps that continue to hinder the placement of indigenous recruits in logistics systems. Young Omani professionals, due to their age, are likely to resign from their positions, which is why so many managers rely on non-citizens to fill the gaps in the hierarchy. There is a lack of motivation and retention due to poor internal career planning and unclear progression. Social and family issues related to remote site work, such as Duqm and Sohar, restrict movement. Omanisation's regulatory environment is constantly evolving, creating uncertainty in HR planning. A wage–skill mismatch also contributes to the employment of expatriates. Graduates from academic programs lack the skills to meet industry needs because their programs provide limited practical exposure. Many smart sensors and machine learning techniques are being applied in both technical and management industries [24]. The skill development among young Omanis in the area of Industry 4.0 techniques such as IoT, Machine learning,

Deep learning, Blockchain technology, Digital twin, Artificial Intelligence, etc, is becoming mandatory in all fields [24]. There is also a lack of cultural trust to enable succession planning. Economic factors and a lack of training also limit Omanisation.

Consent for Publication

All authors have been informed and have consented to publication.

Acknowledgement

References

[1] Oman Vision 2040 Pillars, Government of Oman, Oman Vision 2040 Implementation Follow-Up Unit, 2019. [Online]. Available: https://www.oman2040.om/?lang=en

[2] Strategy of Oman Logistics Center 2040, Ministry of Transport, 2026. [Online]. Available: https://prod.mtcit.gov.om/ITAPortal/Pages/Page.aspx?NID=873111&PID=1342488#:~:text=The%20National%20Logistics%20Strategy%202040,handle%20and%20distribute%20goods%20effectively

[3] Mahmood Humaiyid Hamed Al-Wahaibi, "Logistics Hubs in Oman and Political Uncertainty in the Gulf," *Contemporary Review of the Middle East*, vol. 6, no. 2, pp. 109-153, 2019. [CrossRef] [Google Scholar] [Publisher Link]

[4] Ashraf Mishrif, Alessandro Antimiani, and Asharul Khan, "Examining the Contribution of Logistics and Supply Chain in Boosting Oman's Trade Network," *Economies*, vol. 12, no. 3, pp. 1-25, 2024. [CrossRef] [Google Scholar] [Publisher Link]

[5] Martin Christopher, *Logistics and Supply Chain Management*, 6th ed., Pearson Education, 2023. [Google Scholar] [Publisher Link]

[6] Thafseela Koya Poolakkachalil et al., "Comparative Analysis of Lossless Compression Techniques in Efficient DCT-based Image Compression System based on Laplacian Transparent Composite Model and an Innovative Lossless Compression Method for Discrete-Color Images," *2016 3rd MEC International Conference on Big Data and Smart City (ICBDSC)*, Muscat, Oman, pp. 1-6, 2016. [CrossRef] [Google Scholar] [Publisher Link]

[7] Jakob Lauring, Charlotte Jonasson, and Sebastian Stoermer, "Virtual Expatriate Assignments and Host Country National Support: The Role of Higher-Level Construals in Social Categorization Processes," *International Business Review*, vol. 33, no. 6, pp. 1-12, 2024. [CrossRef] [Google Scholar] [Publisher Link]

[8] Asma Mohammed Abdullah Al Jabri et al., "Logistic Companies in Oman: Role in Boosting Economy, Implementing Eco-Friendly, Technological Logistics for Sustainable Development," *European Journal of Business and Management Research*, vol. 6, no. 5, pp. 209-218, 2021. [CrossRef] [Google Scholar] [Publisher Link]

[9] K. Vijayalakshmi et al., *Secure and Private Federated Learning Through Encrypted Parameter Aggregation*, Handbook on Federated Learning, 1st ed., CRC Press, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[10] Ingo Forstenlechner et al., "Emiratisation: Determining the Factors that Influence the Recruitment Decisions of Employers in the UAE," *The International Journal of Human Resource Management*, vol. 23, no. 2, pp. 406-421, 2012. [CrossRef] [Google Scholar] [Publisher Link]

[11] Rafeef Ziadah, "Constructing a Logistics Space: Perspectives from the Gulf Cooperation Council," *Environment and Planning D: Society and Space*, vol. 36, no. 4, pp. 666-682, 2018. [CrossRef] [Google Scholar] [Publisher Link]

[12] Anita Poplavskaya, Tatiana Karabchuk, and Aizhan Shomotova, *Unemployment Challenge and Labor Market Participation of Arab Gulf Youth: A Case Study of the UAE*, Social Change in the Gulf Region, pp. 511-529, Springer, Singapore, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[13] Mohsina Kamarudeen, and K. Vijayalakshmi, "Machine Learning based Financial Management Mobile Application to Enhance College Students' Financial Literacy," *International Society for Technology, Education, and Science Science*, pp. 1237-1253, 2023. [Google Scholar] [Publisher Link]

[14] Sabiha Oltulular, "Human Capital Dynamics are the Key to Economic Growth: Source of Value of the Future," *Economies*, vol. 13, no. 8, pp. 1-26, 2025. [CrossRef] [Google Scholar] [Publisher Link]

[15] Abdullah Alsaif, David B. Grant, and Sarah Shaw, "Exploring Supply Chain Sustainability Practices in the Gulf Cooperation Council Petrochemical Sector," *International Journal of Logistics Research and Applications*, vol. 28, no. 10, pp. 1111-1140, 2025. [CrossRef] [Google Scholar] [Publisher Link]

[16] Khalid Al Badi, "Implementation of Marketing Concept and Organizational Culture in Smes in Al Buraimi - Oman," *Benchmarking: An International Journal*, vol. 26, no. 7, pp. 2401-2414, 2019. [CrossRef] [Google Scholar] [Publisher Link]

[17] Homaira Amzad, and K. Vijayalakshmi, "Tourism Recommendation System: A Systematic Review," *International Journal of Engineering Research and Technology (IJERT)*, vol. 10, no. 9, pp. 390-396, 2021. [Google Scholar] [Publisher Link]

[18] Fadi Abdelfattah et al., "The Future of Competitive Advantage in Oman: Integrating Green Product Innovation, AI, and Intellectual Capital in Business Strategies," *International Journal of Innovation Studies*, vol. 8, no. 2, pp. 154-171, 2024. [CrossRef] [Google Scholar] [Publisher Link]

[19] Mohammed Ali Alqassabi, "Insights on Sustainability of Small and Medium Enterprises in Oman: A Conceptual Framework," *International Journal of Economics and Financial Issues*, vol. 10, no. 1, pp. 209-218, 2020. [CrossRef] [Google Scholar] [Publisher Link]

[20] Mohammad Sharif Zami et al., "Challenges of Establishing Sustainable Logistics Urban Park in the Middle Eastern Countries," *Urban Science*, vol. 9, no. 12, pp. 1-29, 2025. [CrossRef] [Google Scholar] [Publisher Link]

[21] Yanxia Wang, Yisong Li, and Changxiang Lu, "Evaluating the Effects of Logistics Center Location: an Analytical Framework for Sustainable Urban Logistics," *Sustainability*, vol. 15, no. 4, pp. 1-22, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[22] José Ruiz-Meza et al., "Location of Urban Logistics Spaces (ULS) for Two-Echelon Distribution Systems," *Axioms*, vol. 10, no. 3, pp. 1-21, 2021. [CrossRef] [Google Scholar] [Publisher Link]

[23] K. Vijayalakshmi, "Reliability Improvement in Component-based Software Development Environment," *International Journal of Information Systems and Change Management*, vol. 5, no. 2, pp. 99-123, 2011. [CrossRef] [Google Scholar] [Publisher Link]

[24] Jagannathan Jayachandran et al., "Machine Learning-Enhanced MXene-Copper-Graphene THz Sensor for Accurate Salinity Sensing in Environmental Applications," *Plasmonics*, vol. 20, no. 12, pp. 11349-11359, 2025. [CrossRef] [Google Scholar] [Publisher Link]