THE BRITISH OMANI SOCIETY
الجمعية البريطانية العمانية

The British Omani Society
New Generation Group Delegation
London, UK

AI on the move:

Shaping the future of transport

14th-16th September 2023

Sponsored by bp

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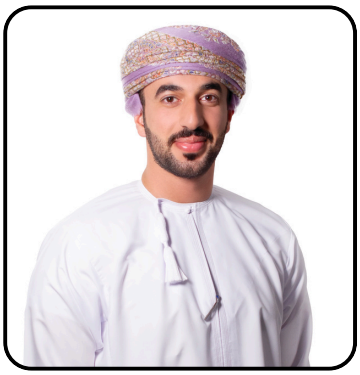
❖ Contents

❖ Event programme

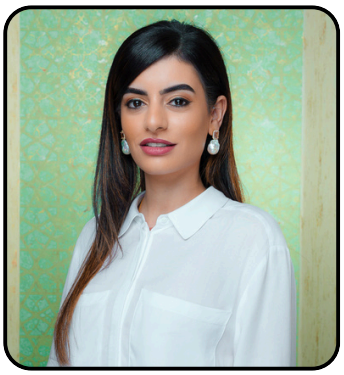
DAY	DATE	TIME	EVENT DETAILS	SUB DETAILS
DAY 1	13/09/2023	**Delegates Arrival to London**		Oman & UK Delegates Hotel Check-in: Victory Services Club London - W2 2HF | Contact Shuaib (07472226999) or Neil (07553263890) for any help
DAY 2	14/09/2023	DAY BEGINS	**Sessions Day 1**	
		08:45-09:00	**Arrival to BOS Building**	**34 Sackville Street W1S 3ED**
		09:00-09:30	**Sheikh Ma'an Hamed Al Rawahi: NGG Chairman**	Welcoming Note: Background on The British Omani Society
		09:30-10:00	**Faris Jamal Khodr: Head of Political & Economical Section, Embassy of Sultanate of Oman in the UK**	Address to Delegates: Oman-UK Relations
		10:00-11:30	**Francis Heritage: Senior Manager (Defence), Faculty AI**	Faculty AI: Introducing AI and its applications in Transport
		11:45-13:00	**Akram Dweiakat: Engineering Manager - Network Economics, Deliveroo**	Artificial Intelligence (AI) 101, What is the Buzz About?
		13:00-14:00	**LUNCH BREAK**	
		14:00-15:30	**Dr Natalia Konstantinova: Staff Data Scientist, BP**	Route Optimisation and Fuel Consumption: AI Perspective
		15:30-16:30	**Patrick Burrows: Associate, Travers Smith LLP**	Artificial Intelligence: Regulation for the Future
		18:00	**DINNER**	**At Hotel - Victory Services Club London**
			DAY ENDS	
DAY 3	15/09/2023	DAY BEGINS	**Sessions Day 2**	
		08:45-09:00	**Arrival to BOS Building**	**34 Sackville Street W1S 3ED**
		09:00-09:30	**NGG Remarks: Lessons Learnt**	
		9:30-11:00	**Dr Melanie Garson Tony Blair Institute, Cyber Policy, Acting Director Geopolitics**	Machine, Minerals and Models: Geopolitics and Diplomacy in the Age of AI
		11:30-12:30	**Dr Mivy James - BAE Digital Transformation Director**	Considerations for Artificial Intelligence
		12:30-13:30	**LUNCH BREAK**	
		14:00-15:00	**Rikesh Shah: Open Innovation and Open Data Expert, PA Consulting | Ex-Head of Open Innovation, Transport for London**	The impact of Generative AI on transport
		15:00-16:00	**Panel Discussion: Rikesh Shah | Andrew Roughan: CEO, Plexal | Panel Chair: Russell Gundry: Director, Innovation, Plexal**	Planning a Resilient Transport Infrastructure Leveraging AI
		16:00-17:00	**Ammar Al Taie: phd Student, Multimodal Interaction Group, School of Computer Science, Glasgow University**	Sharing the Road: Cyclists, Autonomous Vehicles and Automated, Sustainable Transport in Oman
		19:00	**CLOSING DINNER**	**At Hotel - Victory Services Club London**
			DAY ENDS	
DAY 4	16/09/2023	DAY BEGINS	**CULTURAL DAY BEGINS**	
		09:00-09:30	**NGG Closing Remarks**	At Hotel - Victory Services Club London | UK Delegates Check-out
		10:30-16:00	**Cultural Day in London**	
			DAY ENDS	
DAY 5	17/09/2023	**Omani Delegates Travel Back**		Oman Delegates Check-out

❖ Oman delegates:



Shuaib Al Rawahi
Senior Projects Engineer, The Royal Estates, Royal Court Affairs

Shuaib is a highly skilled Senior Projects Engineer and Technical Coordinator at the Head of Royal Estates Office, with a background in Civil and Environmental Engineering from Cardiff University and a Master's degree in Project Management, Finance, and Risk from City University of London. In his current role, he excels in project supervision, stakeholder coordination, and technical reporting related to various Royal Projects. Beyond his professional life, Shuaib is an active sports enthusiast, enjoying CrossFit and skiing, and has a passion for poetry. Recently, Shuaib completed Oman's National Program for Spatial Planners, where he got passionate on how to utilise AI in designing Oman's future Smart Cities. He is known for his commitment to continuous learning and growth, exemplified by his leadership role as the Team Leader of the British-Omani Society New Generation Group in Oman.



Samah Al Rawahi
External Communications & Brand Lead, Petroleum Development Oman

Samah serves as the External Communications and Brand Lead at Oman's National Oil Company, Petroleum Development Oman (PDO). In this role, she leads a team responsible for executing external communications strategies to enhance and protect the company's brand and reputation through digital channels and campaigns. Samah has also been involved in a significant project focused on developing the gig economy within Oman's Content Creation Market. Additionally, she held the position of Vice President on PDO's Young Professionals Network Steering Committee, overseeing activities and capacity-building programs aimed at integrating young professionals into PDO. Samah is a frequent public speaker on digital media and has participated in the World Economic Forum of the Middle East and North Africa. Furthermore, she co-founded Roshan Jewels, a Muscat-based jewellery brand that encourages women to embrace their individuality and supports global women's and girls education initiatives.

AlZubair Al Mahri
Senior Business Performance Analyst, Finance & Strategy, OQ

AlZubair has now completed over 3 years at OQ as a Senior Business Performance Analyst in the Finance & Strategy Stream. His experiences includes working for PwC's Middle East unit as a consultant, Raysut Cement Company, Salalah Methanol, North America Muslim Student Organization (Arizona VP), Founding Arizona's first Omani Student Association , founding Oman's first youth-led Think Tank Unit (Tadhafur) and getting selected as an executive committee member of the Oman Youth Center under the supervision of H.E Sayyid Theyyazan Al Said the minister of Culture, Sports & Youth.

❖ Oman delegates:

Sara Al Raisi

Executive Assistant to SVP Oman & Country Chairman, Shell Development Oman

Sara Al Raisi a business administration professional with 8 years' experience in the oil and gas industry, working for diverse functions and supporting multinational teams with global and local activities in Oman. Admin focal point dedicated to delivering operational and project value to the business. Partnered with colleagues in all parts of the organisation delivering strategies and required services. Sara, passionate about personal growth through new tasks, effective knowledge transfer, goal and action oriented. She is committed to organisational excellence and working in a team environment. Outside work, Sara is a very family-oriented person, enjoys gathering and fitness.

Mohammed Al Hinai

CEO, Scylla Artificial Intelligence Oman

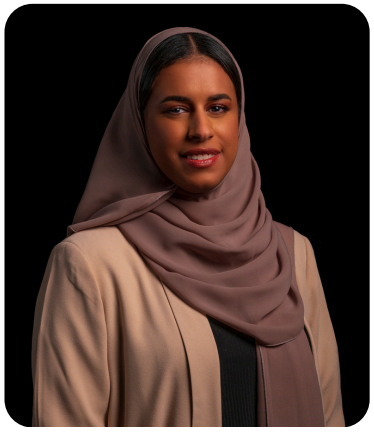
Mohammed is a highly accomplished individual who has achieved significant milestones in both academic and professional domains. Mohammed Graduated with honours from the University of Buckingham, where he earned a degree in Accounting & Finance. Driven by a passion for innovation and technology, Mohammed recently founded "Scylla Oman" specialising in artificial intelligence (AI) for security threat detection. With his expertise in finance combined with his keen interest in emerging technologies, he recognized the potential of AI in revolutionising the field of security and dedicated himself to creating effective solutions in the Mena Market. Through Scylla , himself and his team strive to develop cutting-edge AI algorithms and systems that can accurately detect and prevent security threats. By harnessing the power of machine learning and data analysis, they aim to provide reliable and efficient security solutions to organisations and individuals alike.

Aisha Al Amri

Functional Specialist in Well bp

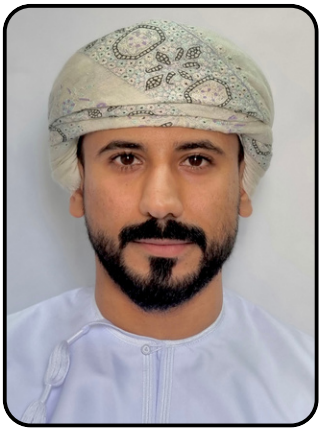
Aisha Al Amri is a highly accomplished procurement and supply chain management professional with over 13 years of experience. She graduated from Sultan Qaboos University, College of Commerce and Economics, with a degree in finance. Aisha is currently working with BP as part of the Global Sourcing and Contracting team, where she plays a crucial role in ensuring efficient procurement processes and optimising supply chain operations. Her expertise in strategic sourcing, contract negotiation, and supplier relationship management has contributed to the success of numerous projects. Aisha's dedication to her field and her commitment to delivering exceptional results make her a valuable asset to any organisation. In her free time, she enjoys exploring new cultures, travelling, and staying active through various outdoor activities with her family.

❖ Oman delegates:



Marwa Al Busaidi
Managing Director (Oman Office), eMushrif

Marwa currently works at eMushrif as the Managing Director of the Oman office. Graduating with a bachelor's degree in chemical engineering from Monash University in Melbourne, Australia, she embarked on a journey with eMushrif back in 2018, where she immersed herself in the intricate workings of operations. One of the most notable projects of Marwa›s journey was leading the Sahala Project during the unprecedented challenges posed by the COVID19- pandemic. This experience, transitioning from Operations Lead to Project Manager, not only sharpened her adaptability but also deepened her understanding of crisis management and strategic planning.



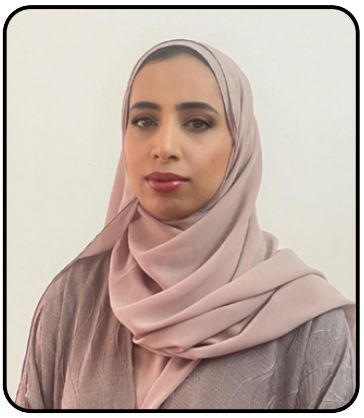
Sulaiman Al Wahaibi
Assistant Operation Manager, Mwasalat Oman

Sulaiman embarked on his career journey with a Bachelor's degree in Civil Engineering but swiftly transitioned into the digital realm. As the Assistant Operation Manager at Mwasalat Oman, he passionately utilises data and AI to optimise transportation services, focusing on route optimization and operational efficiency. Sulaiman›s commitment to staying on the forefront of Big Data and AI advancements underscores his belief in their transformative potential for the transportation industry. Beyond his role, he is dedicated to making tangible improvements in Oman's transportation, all while keeping a watchful eye on the latest technology trends to ensure Mwasalat Oman remains at the forefront of innovation.

Sumaiya Al Abri
Head of Transport Modeling Operating Section, Ministry of Transport, Communications & IT

Sumaiya is an accomplished transport planner with a background in civil engineering and over a decade of experience in strategic planning, transport planning, and project management, currently serves as the lead Transport Planner for the Ministry of Transport, Communications & IT in the Muscat Metro Team. She leads the pre feasibility study of the ambitious Muscat Metro Project, aimed at enhancing public transportation through a Light Rail Transit system. Sumaiya is passionate about leveraging her leadership skills in planning and is drawn to challenge-driven projects. She is committed to networking with industry professionals, staying updated with industry trends, and continuously enhancing her knowledge and skills to contribute to sustainable and efficient transport solutions for the communities she serves.

❖ Oman delegates:



Buthaina Al Nadabi

Civil Road Engineer, Ministry of Transport, Communications & IT

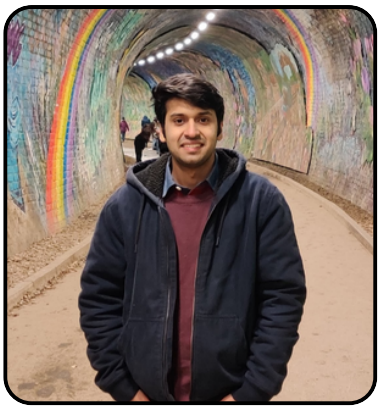
Buthaina is a graduate from Technical College Oman, holding a degree in architectural engineering. She boasts over 7 years of experience in the construction industry, with a diverse background encompassing roles as a contractor, consultant, and client representative. Buthaina currently serves as a project Civil Engineer in the Ministry of Transport, Communications, and Information Technology, where she oversees projects exceeding 10 million Omani Rials in cost. Her unwavering commitment lies in her aspiration to acquire additional experience and advance her career in the field.

Abdullah Al Reasi

Communication Officer, Embassy of Oman in the UK, Ministry of Foreign Affairs

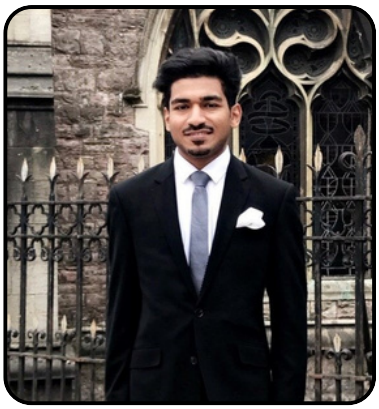
Abdullah dedicated his career to making a meaningful impact on local and global scales. He proudly represented Oman in international forums, including the UN Climate Change Summit COP27 and the World Youth Forum as an official youth delegation. In the literary world, he is the author of three books, each delving into different aspects of life. His work reflects his passion for knowledge sharing, exploring opinions, and listening. In the realm of journalism, he held influential roles in various Omani newspapers, connecting with diverse audiences and sharing stories of significance. One of his core passions is youth empowerment, which he has pursued through active participation in numerous youth laboratories within Oman.

❖ UK delegates:



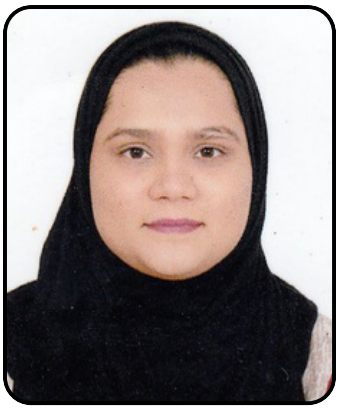
Sarthak Ahuja
Data Scientist,
bp

Sarthak is a data scientist, helping bp improve its green energy output and contributing to get bp to #NetZero. Sarthak pursued his master's in Artificial Intelligence at University of Glasgow after completing his bachelor's in computer science. Previously, he worked at Mercedes Benz Research and Development as a Software Engineer (Machine Learning) for two and half years. He has also done multiple machine learning internships, one working on an autonomous car student project. His hobbies include running, playing sports, reading, and making music! He likes to learn more about his interests in deep learning, LLMs, Big Data, Casual AI; and their applications. He is always open to a chat over a wide range of topics from AI, sustainability, mental health, equity, career progression and many more!



Omar Al Shukaili
Assistant Project Manager, Mace Group UK

Omar is an Assistant Project Manager working as part of Mace Consult Business in the UK. He has around 5 years of experience in Construction. Omar started his career as an Architectural Engineer with Omran before he joined the Mace team in Muscat as a Project Engineer. He was then transferred to the UK Business to support one of the Public Sector Programmes› Multi-Disciplinary Team. Omar has a Bachelor Degree in Architectural Engineering from Cardiff University, UK and he is an Associate Member with the Association for Project Management. He is currently working towards his Chartership Accreditation.



Numaya Mustafa
Pay & Benefits Officer, Leicester City Council

Numaya Mustafa is a graduate from Waljat College of Applied Science, Oman, earning a Bachelor›s degree in Business Administration from Birla Institute of Technology in 2013. She currently works as a Pay and Benefits Assistant at Leicester City Council. With over 7 years of professional experience, she has worked in various fields, including Accounting, Payroll, Marketing, Insurance, and Administration. Numaya is highly passionate about her work, demonstrating a strong drive for continuous expansion of her knowledge and skills across different domains. Her goal is to grow personally and contribute to society in various ways. She has a deep love for reading, enjoys adventurous activities, loves to travel, bake, sing, and explore new things from time to time, always seeking opportunities to acquire new skills.

❖ UK delegates:

Munia Zaki
Advisor,
Citizen Advice

Munia holds a Masters in Law from BPP, where she delved into the ramifications of AI regulation within the legal realm. Her research focused on AI's challenges and prospects in the legal sector, particularly amid rising competition. Her academic foundation lies in Religion, Philosophy, and Ethics, which she pursued at King's College London. Prior to her postgraduate studies, she gained invaluable experience within the British government, serving in the offices of the House of Lords and the House of Parliament. This exposure provided her an in-depth understanding of the legislative process, from inception to implementation.

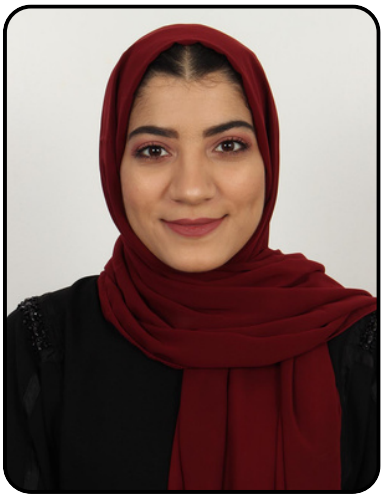
Deena Shahrabani
Data Product Manager,
Trainline

Deena Shahrabani is Data Product Manager at Trainline, Europe›s leading train and bus app. Prior to her transition to the transport industry, Deena supported the launch of the Arabic language for Amazon's smart speaker Alexa which launched in the Gulf last year, and also supported the launch of Oman's first energy-focused accelerator with Phaze Ventures.

Bikram Khastgir
Lecturer,
University of Bristol

Bikram Khastgir is an engineer and entrepreneur with over 7 years of experience in the field of AI. He holds a master›s degree in Biomedical Engineering from the University of Bristol and pursued Executive Management studies from the Indian Institute of Management, Bangalore. Bikram is committed to advocating for open science, technology adoption and equitable educational access. Throughout his career, he has led complex projects and developed innovative solutions in Healthcare, Finance and IT industries. He has spearheaded various initiatives, in multiple capacities ranging from technical course development to policy making. Recently, Bikram stepped down as the CTO of Neuromatch to focus on his startup. Though he continues with his teaching assignments at the University of Bristol and SGS Filton, he is actively working on developing interfaces leveraging the power of AI. He is involved in mentoring young engineers and entrepreneurs on the challenges of being a founder, developing product visions and design thinking.

❖ UK delegates:



Najla Al Futaisi
CEO, High East Minster & CTO, Ketnode

Najla is the founder and CEO of High East Minster, HEM, an AI company dedicated to pushing the boundaries of innovation. With a deep understanding of AI and a PhD in Deep Learning, Najla founded HEM in Oman while completing her doctoral studies at Imperial College London. Her devotion to groundbreaking and value-driven AI solutions has propelled the formation of HEM. Najla also holds the position of CTO at Ketnode, Oman's premier AI venture studio. Her academic work revolved around AI for infant atypical speech and language environment analysis, as well as generative AI. Najla possesses a diverse educational background, holding a Bachelor›s degree in Information Management for Business from University College London and a Master›s degree in Advanced Computer Science from the University of St Andrews.

Rakan Armoush
Software Engineer, Balfour Beatty

Rakan is a software engineer at Balfour Beatty, the UK's largest company for construction and highway management. He holds a Master›s degree in Software Engineering from the University of West London and is currently pursuing a PhD in drones and AI at the same university. The University of West London is ranked 23rd in the Guardian›s 2023 rankings.

❖ Speakers:

Francis Heritage
Senior Manager (Defence),
Faculty AI

Francis Heritage is a Business Development executive for the Defence arm of Faculty, Europe›s largest, independent Applied AI company. He previously worked as an Engagement Manager on Faculty's transport, civil nuclear and defence projects, overseeing AI project delivery. He joined as the first member of the Faculty's Defence team in 2021, having previously completed a 13 year career as a Royal Navy Warfare Officer; this included officer training alongside Royal Navy of Oman colleagues and career appointments in the Gulf and Indian Ocean regions. He remains a member of the Royal Naval Reserve, serving as an Equerry to the Royal Household and as a coder in the Royal Navy's data engineering team. He holds an Exec MBA from Quantic and read History at the University of Cambridge.

Akram Dweiakat
Engineering Manager
Network Economics, Deliveroo

Akram Dweikat is a computer engineer and entrepreneur, specialising in machine learning & AI. He has been recognized by the UK government as an Exceptional Talent in computer engineering, innovation, and entrepreneurship. Akram is currently the Engineering Manager for Deliveroo›s Network Economics (ML) team and ZbyHP Global Data Science Ambassador. He served as an AI Expert at the World Economic Forum Global Future Council on Artificial Intelligence for Humanity. In his spare time, Akram helps build agricultural gardens for income and food security in his native Palestine. Earlier in his career, Akram helped establish the entrepreneurial community in Nablus and was one of eight youths selected to meet US President Barack Obama on his official visit to Palestine.

Dr Natalia Konstantinova
Staff Data Scientist,
BP

Natalia Konstantinova is a great enthusiast with over 15 years experience in the application of Natural Language Processing, Artificial Intelligence, IT and machine learning technologies to real world problems. She is currently a Staff Data Scientist at BP and her role is to develop standards and best practices to accelerate the adoption and implementation of AI enabled solutions, and doing so with the right level of compliance and standards within BP. Natalia got her PhD from the University of Wolverhampton and worked in various fields such as machine translation, ontologies, information extraction, dialogue systems and chat bots. Natalia is a strong believer that modern technology can transform businesses and our everyday life.

❖ Speakers:

Patrick Burrows
Associate,
Travers Smith LLP

Patrick joined the British Omani society in July 2022. Patrick studied Arabic at Durham University (UK) and is an investment funds lawyer based in London. Patrick has a keen interest in the Middle East, having lived in Jordan as a student and Abu Dhabi professionally. He has travelled widely across the region, but Oman is the country to which Patrick keeps returning, to discover more and more of the amazing country that Oman is.

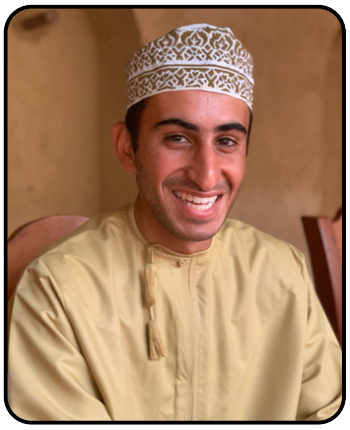
Dr Melanie Garson
Cyber Policy, Acting Director Geopolitics, Tony Blair Institute for Global Change

Dr Melanie Garson is the Cyber Policy and Tech Geopolitics Lead at the Tony Blair Institute for Global Change. Her work focuses on cyber policy, the geopolitics of AI, the internet, the rise of tech companies as geopolitical actors, data governance as well as the intersection of emerging tech, foreign policy and diplomacy. She is also an Associate Professor in International Conflict Resolution & International Security in the Department of Political Science at University College London where she teaches about cyberwarfare and the future of conflict in the digital age, as well as International Negotiation. Melanie is an accredited mediator and has worked as a solicitor in the International Disputes department of Freshfields Bruckhaus Deringer. She received her PhD from University College London, and holds a Masters in Law and Diplomacy from the Fletcher School of Law and Diplomacy (Medford, MA).

Dr Mivy James
Digital Transformation Director, BAE Systems Digital Intelligence

Mivy James has been an IT professional for almost 30 years. In her role as Digital Transformation Director for BAE Systems Digital Intelligence, Mivy helps UK government departments with their digital transformation journeys, focussing on enterprise architecture and technology strategy, and has a particular focus on high trust sectors of government. Mivy started her career as an analyst/programmer after completing a degree in Computer Science and Maths, and soon moved into technical leadership and system design. Mivy has worked for a range of clients across the UK government on everything from cutting edge technology research to the strategic design of multi-billion-pound programmes. Mivy is enthusiastic about technology and particularly keen to encourage women to follow careers in the IT profession, she is the founder and chair of Digital Intelligence›s gender balance network.

❖ Speakers:



Ammar Al Taie
phd Student, Multimodal Interaction Group, School of Computer Science, Glasgow University

Ammar›s area of research centres on Autonomous Vehicle-Cyclist interaction. He frequently employs unconventional technologies, including new displays on the car›s exterior, in his research. Ammar is known as a «hands-on» researcher, with the majority of his work conducted in real-world settings, utilising innovative technologies like eye-tracking. During his leisure time, he takes pleasure in activities such as running, cycling, reading graphic novels, and playing Mario Kart.

Andrew Roughan
CEO,
Plexal

Andrew, the CEO of Plexal, is an accomplished leader with extensive experience in technology, telecoms, and innovation. Plexal, the innovation centre at Here East, plays a vital role in catalysing a globally notable innovation campus on the Queen Elizabeth Olympic Park, aligning with the UK Government's Olympic Legacy plan. Under Andrew's guidance, Plexal focuses on building collaborative innovation ecosystems, addressing key areas such as national security, emerging technology, and prosperity gain. These ecosystems, whether physical or virtual, emphasise collaboration between diverse entities, fostering progress through technology for the benefit of citizens, industry, and government. Andrew's mission-oriented leadership is dedicated to advancing innovation and technology transformative power.

Russell Gundry
Director, Innovation,
Plexal

Russell is an innovation leader with 15 years of experience in delivering innovative and creative projects and programmes. At Plexal, he holds the position of Director of Innovation Strategy, where he takes the lead in designing and executing new programmes that aim to foster economic growth, social prosperity, and environmental impact. Those who collaborate with Russell often describe him as intellectually rigorous, dedicated to advancing social progress, and unwaveringly focused on maintaining high-quality standards. Throughout his career, Russell has collaborated with some of the world›s largest and most prestigious companies, driving purpose-led projects with ambition and integrity. He has also played a vital role in assisting charities and social enterprises in shaping sustainable community services with a similar sense of ambition and integrity.

❖ Speakers:

Rikesh Shah

Open Innovation and Open Data Expert, PA Consulting

Ex- Head of Open Innovation, Transport for London

Rikesh is a recognized thought leader in public innovation, currently serving as an open data, open innovation, and future of mobility expert at PA Consulting, a global consultancy firm specialising in end-to-end innovation. His extensive background includes leading Transport for London's award-winning innovation team, where he collaborated with startups, corporates, academia, accelerators, and venture capitalists to create new value through technological advancements. Rikesh played a pivotal role in establishing TfL's first Innovation Hub, which addressed key challenges and promoted problem-solving with innovators worldwide. He was also responsible for overseeing TfL›s world-leading open data program, which benefits thousands of users and contributes significantly to London's economy. Rikesh's contributions extend to his roles on various boards, including the London Transport Museum Board, where he serves as a Non-Executive Director, and his involvement with influential organisations and academic institutions, where he shares his expertise in emerging technologies, open innovation, and transportation.

❖ Context:

The British Omani Society (BOS) is a registered charity and non-profit organization committed to fostering cultural, economic, and social ties between the United Kingdom and the Sultanate of Oman. BOS organizes events and initiatives to promote mutual understanding and collaboration between these two nations. The BOS hosted a New Generation Group (NGG) delegation on “AI on the Move: The Future of Transport,"; featuring an array of distinguished speakers who shared their expertise on various aspects of AI in transportation. It included the participation of twenty promising youth from Oman and the UK, facilitating discussions on the significant role of AI in shaping the future of transportation.

The event underlined the importance of Oman-UK relations in the context of AI and transport, aligning with Oman Vision 2040, and highlighted the power of international collaboration in harnessing AI's potential for a sustainable, efficient, and interconnected transportation future. The NGG delegates reached several conclusions that they hope will be of interest and value to those in the Government of the Sultanate of Oman working towards this vision.

❖ Introduction:

Artificial Intelligence (AI) is rapidly shaping the future of transportation globally, offering unprecedented advancements in safety, efficiency, and sustainability. As we delve into this comprehensive report, we explore how AI technologies, including autonomous vehicles, predictive maintenance, public transportation optimization, and traffic surveillance, are revolutionizing the transport sector. A key focus of our discussion is the concept of digital twins and their role in transforming transportation systems, particularly within the context of Oman's transport infrastructure. This report aims to provide insightful analysis and recommendations, contributing to the evolution of transportation in Oman and beyond.

❖ Key applications of AI in the Transport sector:

1. Autonomous Vehicles

• **Self-Driving Cars:**

AI enables AVs to perceive their environment using sensors.

• **Advanced Driver Assistance Systems (ADAS):**

AI is used in ADAS to provide features like lane-keeping assistance, adaptive cruise control, and collision avoidance systems.

2. Traffic Management and Optimisation:

• **Traffic Prediction:** AI can analyse historical traffic data, weather conditions and unique events to predict traffic congestion & suggest alternative routes to drivers in real-time.

• **Smart Traffic Lights:** AI-powered traffic lights can adapt their timing based on real time traffic flow, reducing congestion, and improving traffic efficiency.

• **Dynamic Toll Pricing:** AI can optimize toll pricing based on traffic conditions, encouraging off-peak travel, and reducing congestion during peak hours.

• **Traffic Flow Analysis:** AI can analyse traffic patterns and provide insights to city planners for optimizing road layouts and infrastructure.

3. Infrastructure Maintenance:

• **Predictive Maintenance:**
AI helps predict when infrastructure elements, like bridges and roads, need maintenance by analysing data from sensors and historical maintenance records.

• **Condition Monitoring:**
Sensors equipped with AI can continuously monitor the health and condition of infrastructure, detecting structural issues or wear and tear in real-time.

4. Public Transportation:

• **Route Optimization:** AI algorithms optimize public transportation routes to ensure efficient and timely service, benefiting both passengers and transit agencies.

• **Demand Forecasting:** AI helps predict ridership patterns, enabling public transportation providers to adjust schedules and routes as needed.

• **Fare Collection and Ticketing:** AI-based ticketing systems simplify the process for passengers and help transportation agencies track usage more effectively.

5. Traffic Surveillance and Security:

• **Video Analytics:**

AI is used for video surveillance, automatically detecting incidents, such as accidents or suspicious activities, and notifying authorities in real-time.

• **Facial Recognition:**

AI can be used for security purposes at transportation hubs, helping to identify individuals and enhance safety.

➢ The Role of Data in AI/Machine Learning for Transportation:

Data is a fundamental component of AI/machine learning, and it plays a crucial role in training and improving machine learning models. Data is fed into machine learning in three main ways:
1. **Data Collection:** Gathering relevant data
2. **Data Preprocessing:** Preparing and cleaning data for analysis
3. **Data Splitting:** Training data, validation data and test data

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❖ AI and Digital Twins in Transportation:

Digital twins represent a significant leap in transportation management and planning. They are virtual models that mirror physical objects, processes, or systems, enabling real-time monitoring, simulation, and analysis. This technology is instrumental in various facets of transportation, such as:

1. **Building New Systems:** Digital twins assist in designing and testing new transportation systems in a virtual environment before actual implementation. This process saves costs and time, enabling the optimization of system design and functionality.

2. **Scheduling & Route Optimisation:** They are pivotal in scheduling and route optimization. By simulating different scenarios, digital twins help in finding the most efficient routes and schedules, considering several factors like traffic patterns, vehicle availability, and passenger demand.

❖ Route Optimization Challenges:

• **Changes on the Road:** Digital twins account for dynamic road conditions, including construction, traffic incidents, and weather changes.
• **Cost, Distance, Time, and Fuel Consumption**: They help in optimizing routes based on these critical factors, ensuring cost-effective and efficient transportation.
• **Driver Preferences:** Personalization of routes based on driver preferences can be integrated, enhancing user satisfaction.
• **Event-Based Prediction:** Considering public holidays, cultural events like Eid, and other significant occasions, digital twins can predict and prepare for changes in transportation demand and patterns.
• **Data Management:** Understanding the amount of data required for effective operation and decision-making is crucial. Digital twins aid in identifying the essential data, thereby avoiding unnecessary strain on budgets due to data over-collection or underutilization.

❖ Legislation of AI:

The legislation of AI is a rapidly evolving and complex area of law, as governments around the world are grappling with the need to regulate and govern artificial intelligence. The aim of AI legislation is to ensure the ethical and responsible development, deployment, and use of AI technologies. It is essential to note that specific laws and regulations vary by country and region.

1. **Ethical Use and Accountability:** AI in transportation must adhere to ethical principles, ensuring that its deployment does not harm users or the environment. This includes responsible data usage and respecting user privacy.

2. **Data Privacy:** With the vast amount of data collected by AI systems in transportation, stringent data privacy regulations are crucial. This includes securing user data and adhering to global data protection standards.

3. **Safety and Security:** AI systems must be designed to prioritize safety, minimizing risks of accidents or security breaches. This encompasses both physical safety in autonomous vehicles and cybersecurity in data handling.

4. **Bias and Fairness:** AI algorithms should be free from biases that could lead to unfair treatment of certain user groups. Ensuring diversity in data and testing procedures can help achieve this.

5. **Transparency:** The workings of AI systems, especially in decision-making processes, should be transparent to users and regulators. This fosters trust and makes it easier to assess the systems' compliance with regulations.

6. **Intellectual Property:** AI technologies often involve novel inventions and methodologies, necessitating robust intellectual property laws to protect innovations while encouraging sharing of knowledge.

7. **Liability:** Clear guidelines on liability in cases of malfunction or accidents involving AI systems are essential. This includes determining responsibility between AI developers, users, and manufacturers.

8. **Accountability:** Organizations using AI in transportation must be accountable for their systems' performance and impact, including adherence to ethical standards and regulatory compliance.

9. **Governmental Oversight:** Regular monitoring and evaluation by government bodies ensure compliance with AI regulations and adapt to technological advancements.

10. **Export Controls:** Regulations on the international transfer of AI technologies ensure that they are not misused and comply with global standards.

11. **Education and Training:** Building expertise in AI within the transportation sector through education and training is vital for effective implementation and regulation.

❖ Future of diplomacy in the age of AI:

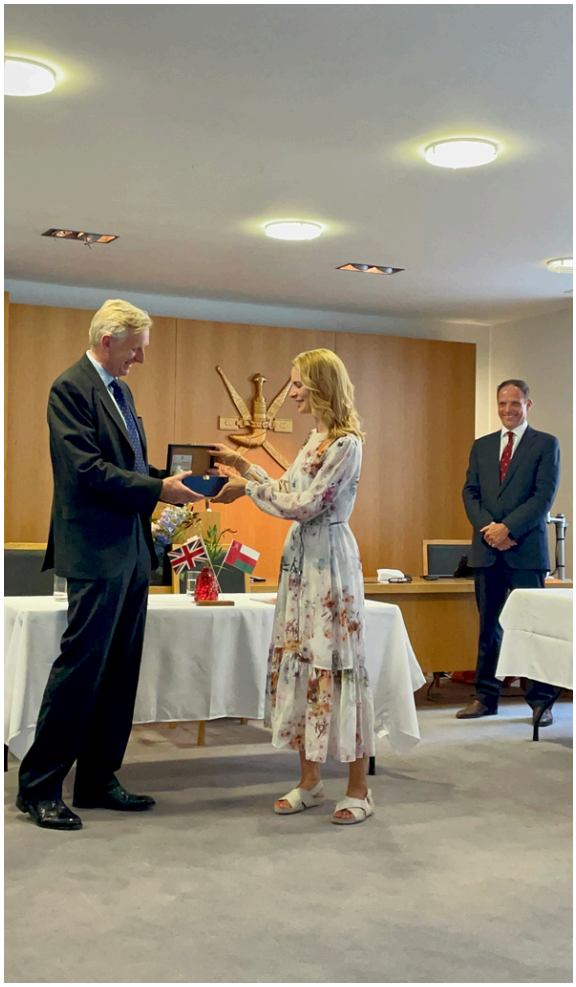
The future of diplomacy in the age of AI is expected to be significantly impacted by advancements in artificial intelligence and related technologies. Diplomacy, which involves the management of international relations and negotiations, will undergo transformations in numerous ways due to AI.

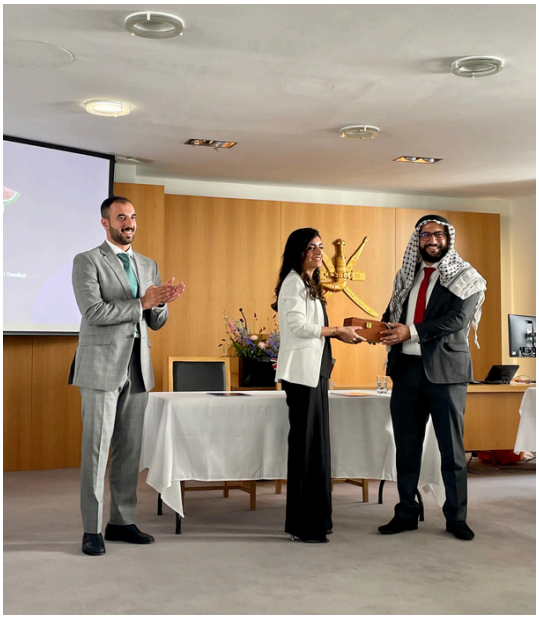
1. **Data-Driven Decision-Making:** AI can provide diplomats with comprehensive data analysis, aiding in more informed decision-making in international relations.

2. **Predictive Analytics:** AI tools can forecast global trends and potential crises, enabling proactive diplomatic strategies.

3. **Translation and Communication:** Advanced AI translation tools can bridge language barriers, facilitating smoother international communications and negotiations.

4. **Security and Cybersecurity:** AI can enhance the security of diplomatic communications and provide advanced cybersecurity, essential in the digital age.





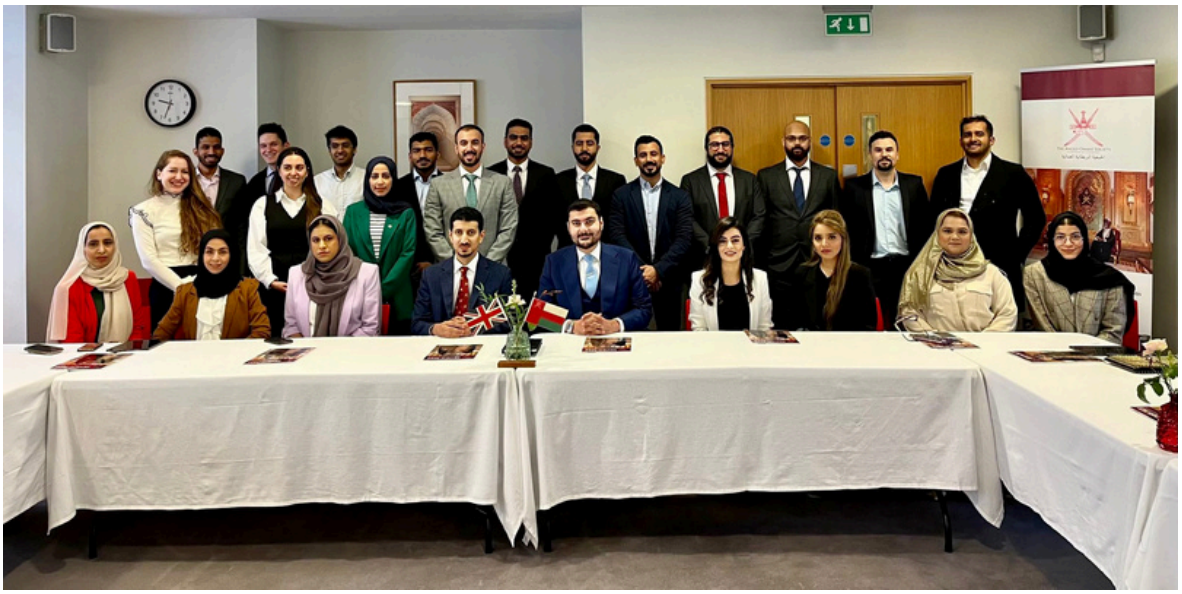
❖ AI Regulation and Legislation: Comparing the UK and Oman

United Kingdom:

1. **Principles-Based Approach:** The UK's cross-sectoral, principles-based framework for regulating AI is expected to be applied by existing transport regulators, such as the Civil Aviation Authority (CAA) and the Office of Rail and Road (ORR), within their respective domains. These regulators will interpret and implement the five core AI principles (safety, transparency, fairness, accountability, and contestability) in the context of the transport industry.

2. **Regulatory Sandboxes:** The UK's AI Authority is required to collaborate with transport regulators to construct regulatory sandboxes specifically for AI applications in the transport sector. These sandboxes will allow transport companies and startups to test innovative AI solutions, such as autonomous vehicles or predictive maintenance systems, in a controlled environment with appropriate safeguards.

3. **Public Engagement:** The UK's AI Authority is mandated to implement a program for public engagement on the opportunities and risks presented by AI in the transport sector. This includes consulting with transport industry stakeholders, consumer groups, and the public to ensure transparency and address concerns related to AI adoption in transportation.

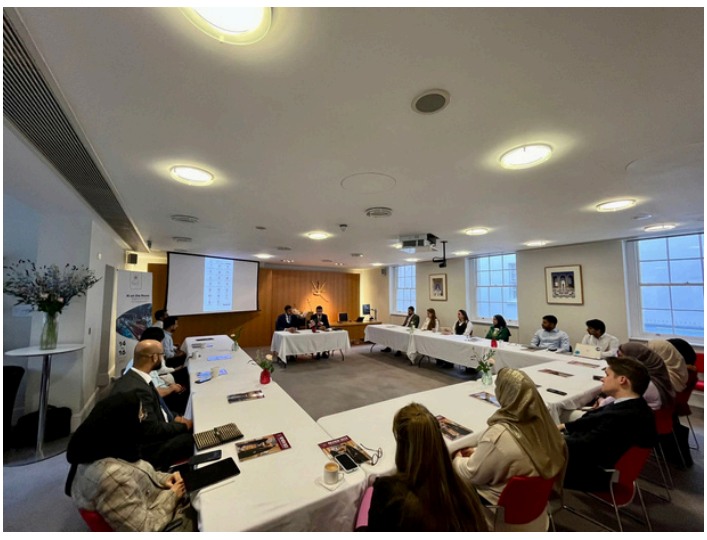


Oman:

1. **National AI Strategy:** Oman's National AI Strategy prioritizes the deployment of AI in driving the development of key economic sectors, including logistics and transportation. This strategy aims to provide a clear plan for the development and application of AI solutions in the transport industry.

2. **Policy Guidelines for Government Transport Entities:** The Ministry of Transport, Communications, and Information Technology's policy guidelines on AI use by government entities are applicable to transport-related ministries and state-owned companies, such as the Oman National Transport Company (MWASALAT). These guidelines encourage the adoption of AI in developing innovative transport solutions while emphasizing principles like transparency, security, and accountability.

3. **Sector-Specific AI Integration for Transport:** Oman aims to develop specific and tailored AI strategies for the logistics and transportation sectors, prioritizing areas where AI can have the most significant impact, such as road safety (for cyclists and pedestrians), traffic management, predictive maintenance, and autonomous vehicles. The UK's approach is focused on a principles-based framework and regulatory sandboxes, with an emphasis on public engagement. Oman, on the other hand, has a National AI Strategy that prioritizes the transport sector, along with policy guidelines for government transport entities, and a focus on sector-specific AI integration.



❖ bp in Oman and impact on transport sector:

bp's role in Oman extends beyond just extraction and production; it plays a critical part in shaping the energy landscape, supporting the growth of cleaner energy alternatives, and fostering sustainable practices within the transport sector. Through its significant contributions to gas production and environmental management, bp aids in the broader transition of Oman's transport industry towards more sustainable energy usage.

1. **Boosting Natural Gas Supply:** bp's Khazzan and Ghazeer fields significantly increase Oman's natural gas production, contributing 1.5 billion cubic feet of gas per day. The gas from Block 61 feeds Oman's LNG industry and meets domestic energy needs along with increasing export capabilities. This indirectly benefits transport sector through energy security and potential use of LNG as a cleaner fuel for shipping and heavy transport.

2. **Cleaner Transportation Alternatives:** Natural gas is a cleaner-burning fuel compared to traditional petroleum-based fuels. Expanded natural gas availability supports a transition to cleaner natural gas vehicles (NGVs) in Oman, aligning with global efforts to reduce transport emissions.

3. **Renewable Energy and Green Hydrogen:** bp's partnership with Oman on renewable energy and green hydrogen has implications for transport. Renewables can power EV charging, while green hydrogen is a promising fuel for buses, trucks, shipping, and aviation. This could accelerate Oman's low-carbon transport solutions, aided by a stable energy supply for power generation.

4. **Economic Diversification and Sustainability:** bp contributes to Oman's economic diversification and industrial growth, potentially spurring transport-related manufacturing, services, and infrastructure development in vehicle assembly, maintenance, logistics services, etc. Additionally, bp's emission reduction initiatives, like 'green completions' reducing 465,000 tonnes of CO_2 since 2019, promote sustainable practices. [reference report – others provided on request]

❖ Challenges:

The adoption of Artificial Intelligence (AI) in Oman's transport industry faces several challenges, including:

1. **Data Quality and Availability:** Oman's transportation sector lacks standardized data collection and management practices, making it difficult to gather and utilize relevant data for AI applications.

2. **Cybersecurity Concerns:** The increasing reliance on AI and connected technologies in the transport sector raises significant cybersecurity concerns, which must be addressed to ensure the integrity of AI-powered systems.

3. **Human Factors and Adoption:** The successful adoption of AI in the transport sector relies heavily on human factors, including the willingness of operators and passengers to adapt to new technologies. Cultural and educational barriers to the adoption of AI-powered solutions must be addressed.

4. **Infrastructure and Regulatory Framework:** The transport infrastructure in Oman, including roads, ports, and airports, must be adapted to support the integration of AI technologies. Regulatory frameworks must be developed to ensure data privacy and security, which are crucial in the AI ecosystem. The transport sector is heavily regulated, and AI-powered systems must meet strict safety and regulatory standards.

5. **Cost and Funding:** The implementation of AI in the transport sector can be costly, particularly for small and medium-sized enterprises (SMEs) or those with limited resources. Public-private partnerships and government initiatives can help address these funding challenges.

6. **Lack of Awareness and Education:** There is a need for educating students, spreading awareness, and training employees to improve the use of AI in the logistics sector in Oman.

7. **Challenges in Implementing AI in Public Transport:** The government-owned public transportation company in Oman, Oman National Transport Company S.A.O.C (MWASALAT), is launching an intelligent transportation system (ITS) for the public transport network. However, implementing AI in public transport faces challenges such as ensuring data privacy and security, and addressing the need for substantial investment, cross-sectoral coordination, and upholding high-quality data standards.

❖ Policy Recommendations:

To address the challenges and opportunities in Oman's transport industry, I recommend the following policy recommendations to the Oman transport ministers:

1. **Enhance Public-Private Collaboration:** Strengthen partnerships between the government, academia, and the private sector to facilitate the development and implementation of AI solutions in the transport sector. This collaboration can provide the necessary resources, training, and support to address the current limitations in AI adoption.

2. **Foster Sector-Specific AI Integration:** Develop specific and tailored AI strategies for the key economic sectors, such as logistics and mining, ensuring alignment with Oman's Vision 2040 goals. This approach can help prioritize sectors where AI can have the most significant impact and drive innovation and diversification.

3. **Address Data Quality and Availability:** Develop policies and guidelines to ensure the availability and quality of data for AI applications in the transport sector. This includes standardizing data collection and management practices, ensuring data privacy and security, and promoting data sharing and collaboration between stakeholders.

4. **Invest in Education and Training:** Invest in education and training programs to educate students, spread awareness, and train employees on AI technologies and their applications in the transport sector. This can help address the lack of awareness of AI potentials and the need for new skills.

5. **Promote Regulatory Frameworks:** Develop regulatory frameworks that support the adoption of AI in the transport sector, ensuring data privacy and security, and promoting best practices and responsible AI development.

6. **Encourage International Collaboration:** Encourage international collaboration and partnerships to leverage best practices and expertise in AI adoption, particularly in highly regulated industries like aviation and finance.

7. **Monitor and Evaluate AI Adoption:** Establish a monitoring and evaluation framework to track the progress of AI adoption in the transport sector, identifying challenges and opportunities, and providing insights for policy adjustments and investments.

8. **Address Cybersecurity Concerns:** Develop policies and guidelines to address cybersecurity concerns related to AI adoption in the transport sector, ensuring the integrity of AI-powered systems and protecting against cyber threats.

9. **Support Startups and Research:** Support startups and research initiatives focused on AI applications in the transport sector, providing funding, resources, and mentorship to stimulate innovation and entrepreneurship. By implementing these policy recommendations, Oman can accelerate the adoption of AI in its transport industry, enhancing safety, efficiency, and sustainability, and contributing to the country's economic growth and diversification.

❖ Conclusion:

In conclusion, the integration of AI and digital twins in transportation heralds a new era of efficiency and intelligence in the sector. These technologies offer remarkable opportunities for enhancing the Omani transportation system, making it more responsive, sustainable, and aligned with global advancements. The insights and technologies explored in this report hold significant relevance for Oman's transport sector. By adopting AI, Oman can enhance its transportation infrastructure, making it more resilient, efficient, and adaptive to the needs of its citizens and the economy. This advancement is not only a step towards modernization but also a stride towards establishing Oman as a forward-thinking nation in the realm of transportation technology.

❖ Acknowledgements:

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