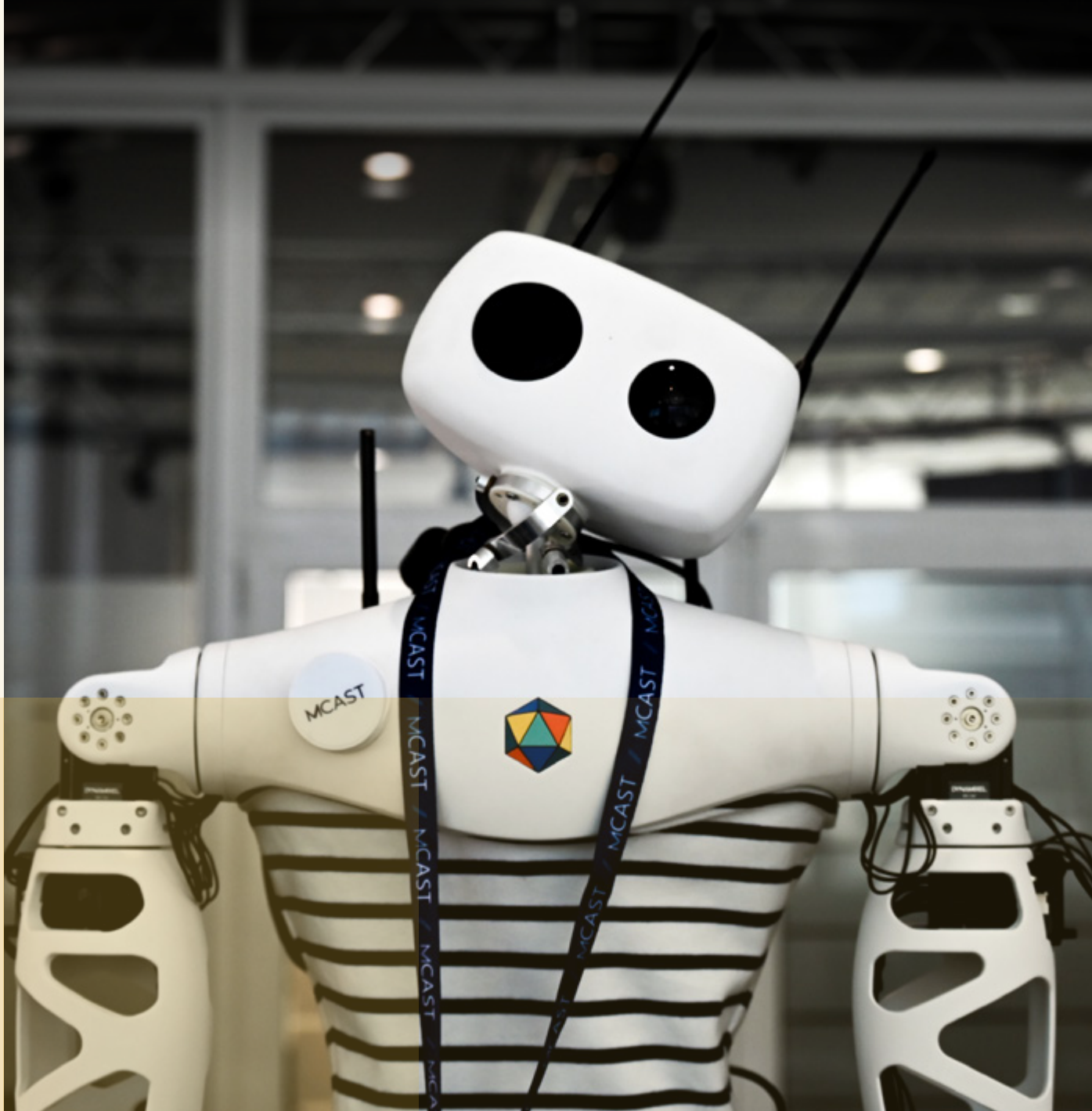




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MCAST

MCAST Artificial Intelligence Strategy

A Smarter College for Smarter Learning

2026–2030

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A Smarter College for Smarter Learning
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Preamble



Embracing AI for a Resilient and Innovative MCAST

At MCAST, we recognise that artificial intelligence is not merely a technological advancement but a transformative force reshaping every aspect of our society. In an era marked by rapid change and complexity, our commitment is to harness the potential of AI to enhance learning, streamline operations, and foster innovation across the entire College.

MCAST is dedicated to cultivating an environment where AI empowers both educators and administrators. By embedding AI within our curricula, we aim to equip students with the skills and mindset required for lifelong learning and adaptability. At the same time, integrating AI into our administrative and management processes will support greater efficiency, evidence-based decision-making, and a culture of continuous improvement.

This strategy reflects our holistic approach: leveraging AI not only to improve educational outcomes but also to enhance institutional performance. In doing so, we prepare both our students and our organisation to thrive in a dynamic, interconnected world.

Stephen Vella
MCAST Principal & CEO

Context

Defining Artificial Intelligence

Artificial intelligence (AI) is a term coined by McCarthy in 1956 (Cristianini, 2016), extrapolating the work of Turing (Turing 1937, 1950). It refers to revolutionary technology that has the potential to change many facets of modern life.

The definition of AI has changed over the years and has been adapted to reflect the more recent technological developments. One of the more recent definitions terms AI as the tangible real-world capability of non-human machines or artificial entities to perform, task solve, communicate, interact, and act logically as it occurs with biological humans (Gil de Zúñiga et al., 2024).

Since its inception in the 1950s (Russell & Norvig, 2016), AI has been the subject of persistent inquiry among scholars, who have endeavoured to identify software and utilities capable of enhancing and streamlining various domains inherent to societal routine. While initially conceived as primarily

serving technological and industrial sectors, the evolution of AI over time has underscored its capacity to significantly transform the landscape of education. AI has emerged as a multidisciplinary field, drawing upon various disciplines such as computer science, mathematics, neuroscience, and psychology. It encompasses subfields such as machine learning, natural language processing, computer vision, robotics, and expert systems, among others. AI systems can be classified into different categories based on their capabilities, ranging from narrow AI, which focuses on specific tasks, to general AI, which exhibits human-like intelligence across a wide range of domains (Goodfellow et al., 2016).

AI Today

Machine learning employs a variety of techniques, but they all share a fundamental methodology, in that they aim to create a “model” from real-world data that best captures its regularities and can then be used to generate accurate predictions in response to novel situations.

With the advent of the Internet, mobile devices, and sensing technology since the 1990s, and the equally impressive growth in computing power that enables massive amounts of data to be processed by these algorithms, machine learning has experienced exponential growth

in the data available in almost any application domain. Researchers have made significant advancements in deep learning approaches at the same time, understanding how to efficiently train increasingly complicated models using structured and unstructured (sensor, audio/video, voice, and text) data.

AI has witnessed remarkable advancements in more recent years. The integration of AI with other emerging technologies, such as robotics, Internet of Things (IoT), and autonomous vehicles, has opened up new avenues for innovation and automation (McLean et al., 2023).

Furthermore, there has been a significant boom in generative AI systems driven by advancements in machine learning and big data systems. This boom has been fuelled by research breakthroughs, increased computing power, and the availability of large-scale datasets. The rapid progress in generative AI has sparked interest and excitement in both the research community and industry, leading to the development of applications ranging from virtual reality and entertainment to healthcare and data augmentation.

Moreover, there have been notable advancements in AI ethics, fairness, and interpretability, addressing concerns related to biases, transparency, and accountability in AI systems (Jobin, Ienca, & Vayena, 2019). These recent developments underscore the need for our College to embrace AI as a core component of our academic programmes, research initiatives, and industry collaborations.



National AI Plan – Malta 2030

Malta's National AI plan was released by the Maltese government in October 2019 (Government of Malta, 2019). Malta's goal is to gain a strategic competitive edge in the AI sector of the global economy. The policy offers three pillars to serve as the cornerstones of Malta's AI strategy to fulfil this goal:

- the development of a strong ecosystem for AI centred on investments, support for start-ups, and innovation;
- support for expanded AI use in the public sector; and
- support for AI adoption initiatives in the corporate sector.

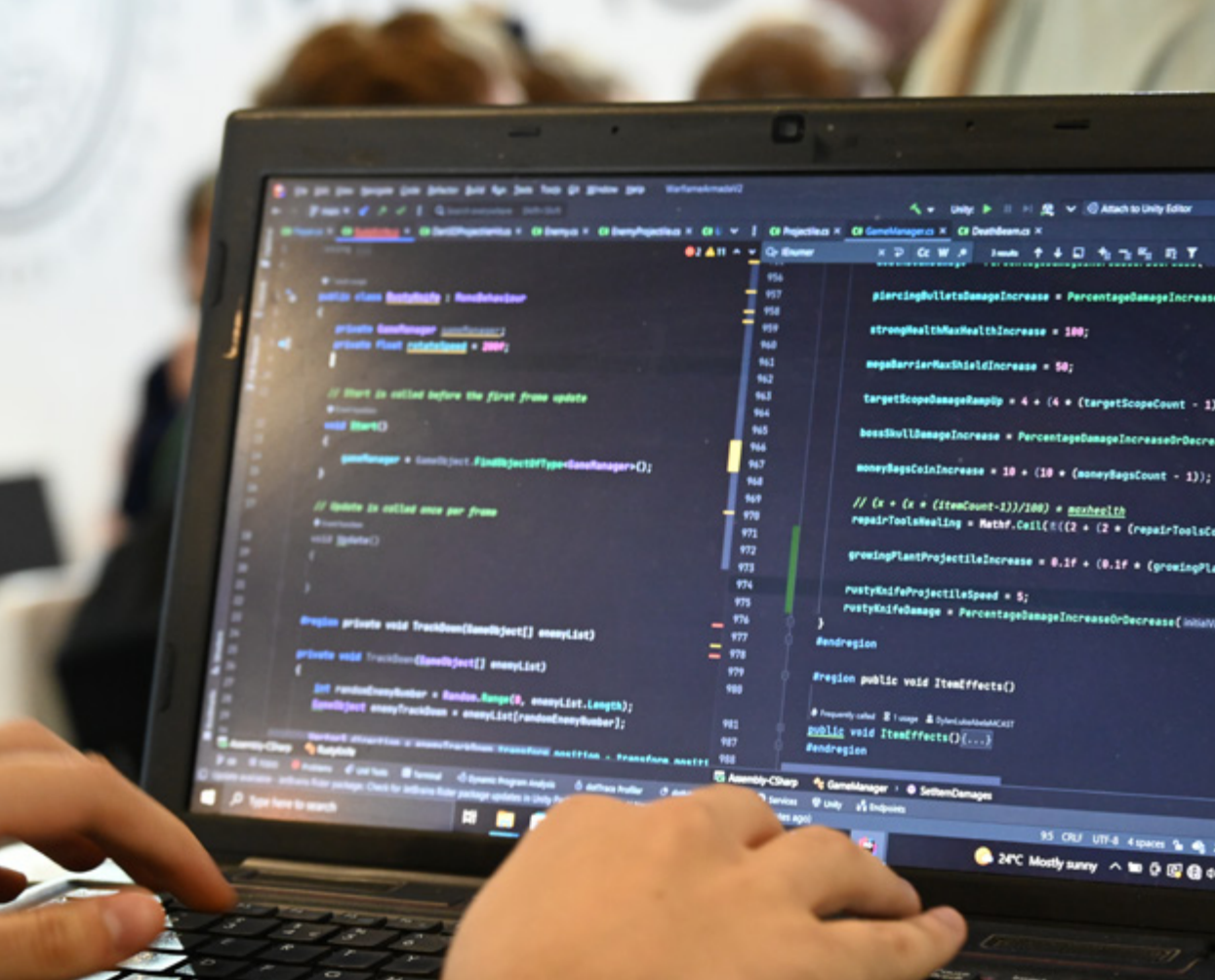
Three horizontal enablers—education and workforce, legal and ethical framework, and infrastructure—that span the three aforementioned sectors are necessary for the successful attainment of these goals.

The strategy foresees that Malta will make significant adjustments to the educational system in terms of human capital. In the beginning, educational courses and study programmes will include AI and will have connections to other fields like physics, marketing, sociology, and healthcare, among others. The strategy also suggests a number of initiatives for reforming the primary, secondary, and tertiary education sectors in addition to providing assistance to instructors to expand their AI course offerings.

AI in Education

AI has the ability to improve teaching and learning methods, tackle some of the major issues being faced by education today, and hasten development. Rapid technology advancements undoubtedly present a variety of hazards and difficulties, which have so far surpassed regulatory structures and policy discussions. Educational systems and organizations are working to fully utilize AI's promise while ensuring that its use in educational settings is constrained by the fundamental values of equity and inclusion.

AI-powered tools such as smart assistants are designed to enable teachers to use their time more efficiently. They can take on a range of administrative tasks, from tracking student attendance to lesson planning and organizing classroom activities. This provides teachers with more time and energy, giving them the opportunity to give more individual attention to students (Nemorin et al., 2023). The use of AI technologies in education and the number of published studies in the field have increased (Dell'Acqua, et al., 2023; Mollick & Mollick, 2023; Mollick, 2014; Willison, 2025a; Willison, 2025b). However, no large-scale analysis has been conducted to comprehensively investigate the various aspects of this field (Chen et al., 2022).



AI in Administration and Management

Artificial Intelligence (AI) is increasingly recognised as a transformative force within educational administration and management, offering the potential to enhance operational efficiency, strategic planning, and institutional responsiveness. By automating routine administrative tasks, such as scheduling, enrollment processing, and resource allocation, AI enables educational institutions to streamline workflows and reduce manual burdens on staff, thereby allowing them to focus on more strategic initiatives (Chen et al., 2020).

Beyond automation, AI-driven analytics can provide educational leaders with deep insights into institutional performance, student outcomes, and operational trends. These data-informed perspectives support evidence-based decision-making, facilitating timely interventions and strategic planning. For instance, predictive analytics can identify patterns in student enrolment and retention, enabling proactive measures to enhance student success and institutional effectiveness (Nguyen et al., 2022).

Moreover, AI technologies can support adaptive management practices by enabling real-time monitoring and responsiveness to emerging challenges. This agility is particularly valuable in dynamic educational environments where rapid decision-making is essential. However, the integration of AI into administrative processes also necessitates careful consideration of ethical implications, including data privacy, algorithmic bias, and the need for transparency in automated decision-making systems (Mao et al., 2024).

To harness the full potential of AI in administration and management, MCAST must invest in developing AI literacy among leaders and staff, establish robust governance frameworks, and ensure that AI applications align with the institution's mission and values. By doing so, AI can serve as a catalyst for innovation, efficiency, and enhanced educational outcomes.



Alignment to the MCAST strategic plan

The first MCAST Artificial Intelligence Strategy Roadmap 2025 was aligned to the MCAST Strategic Plan 2019 – 2021, in particular, in the following components:

- Upgrade IT infrastructure to enhance teaching and learning.

→ Provide students with a richer experience that enables all our students to reach their full potential.

→ Work with industry partners for quality placements.

→ Develop internal structures for data management, provision and dissemination.

→ Stimulate and develop applied research at college level leading to business development, transfer of knowledge and prototypes.
1. Develop our capabilities in data gathering, data analytics and decision analysis with a focus on impact (measure 1).

2. Further utilise the potential of EdTech for personalised learning for students with diverse needs, also by equipping learning spaces with the necessary technology (measure 2).

3. Structure, mainstream and publish an annual CPD programme for all MCAST staff, and further widen the subject matters including the use of VLEs and online pedagogies (measure 32).

4. Develop tools that facilitate learning, making it more engaging and hence more attractive for students (measure 33).

5. Include gamification, augmented reality and virtual reality, where appropriate, through a review of curricula in parallel with the development of technical skills whilst

The MCAST Strategic Plan 2022-2027 further builds on these developments. This updated MCAST AI Strategy 2025-2030 brings into line and adjusts the efforts towards the targets set by the College. In particular, this strategy draws on the following strategy measures¹:

1 The measures indicated are extracted from the MCAST Strategic Plan 2022-2027 and thus reflecting the numbering therein.

- taking into consideration different abilities (measure 57).
6. Develop training with industry focusing on digital skills, AR, AI, VR and new technologies that empower lecturers to teach in innovative learner-friendly ways (measure 58).
7. Enhance the overall learning experience of VET students through AI, virtual, and simulated work environments that complement real-life WBL (measure 89).
8. Establish a data governance programme, for continuous improvement in disaggregated data collection, analysis, and use (measure 138).
- Inclusive and accessible learning environments that respond to diverse learner needs.
- Innovation in vocational and professional education through applied research, emerging technologies, and industry collaboration.
- Data-informed decision-making, transparency, and performance monitoring.
- Sustainable and responsible use of technology that contributes positively to social, economic, and environmental goals.

The College is now progressing towards a new Strategic Plan, MCAST Towards 2030, which places strong emphasis on future-ready learning, inclusive and flexible education pathways, sustainability, collaboration, and accountable governance. This updated AI Strategy is also aligned with this new direction by supporting:

- The integration of digital and AI literacy across teaching, learning, research, and administration.

Through this alignment, the MCAST AI Strategy 2026–2030 supports continuity with previous strategic plans while actively contributing to the long-term vision of MCAST as outlined in MCAST Towards 2030, ensuring that artificial intelligence is used ethically, effectively, and in a way that enhances learning, innovation, and institutional resilience.

Strategy for artificial intelligence at MCAST

AI at the core of MCAST

According to this concept, AI will become a crucial aspect of what we do and will be deeply ingrained in our routines.

It takes into account several activities that will guarantee a smooth implementation of AI inside MCAST. It also emphasises skill development for the AI era, which is crucial for a VET provider. It also considers how advancements in the field of AI and associated subfields might lead to solutions that will support MCAST, industry, and society. This strategy will also support MCAST's focus on the 17 United Nations Sustainable Development Goals.

Beneficiaries

- Students
- Academics and Lecturing Staff
- Institution
- Industry

Guiding Principles

1. Education for the AI Era: Our strategy revolves around providing cutting-edge education that integrates AI across various vocational disciplines.
2. Ethical and Human-Centric Approach: Our strategy emphasises the responsible use of AI, prioritising data protection, reliability, honesty, respect, and accountability in alignment with relevant legislation, regulations, and policies.
3. Collaboration and Partnerships: We will actively seek partnerships with industry leaders, research institutions, and community organisations to foster knowledge exchange, facilitate internships, and create opportunities for applied AI projects.
4. Continuous Learning and Adaptability: In the dynamic AI landscape, lifelong and life-wide learning is paramount. Our strategy emphasises the cultivation of a learning culture that encourages continuous upskilling and reskilling.

5. Research and Innovation: To remain at the forefront of AI education, we will invest in AI-focused research activity, facilitate collaborations between faculty and industry experts, and encourage our students to pursue research projects in AI-related domains.

Goals

1. Students who are better prepared for a work sector that uses AI.
2. Students who are better assisted in their educational process.
3. An MCAST which operates with improved efficiency using AI-based tools and processes.
4. Greater understanding and application of AI in research, teaching, and learning.
5. A model for vocational learning and operations that makes effective use of AI to simplify preparatory and pedagogical approaches, such as lesson plans.

Strategic initiatives

Initiative 1 – Enhanced e-Learning Teaching and Learning Process

Through harnessing the capabilities of AI, MCAST aims to explore e-learning processes which furnish customised support to students, thereby enriching their educational accomplishments. These AI-enabled processes cater for individual students' academic needs, taking into account different learning styles and abilities. These provide a learning environment with tutoring and support that can be provided

outside of the classroom. Furthermore, AI will work to allocate student time to other more valuable topics not yet in students' skill set. By considering the students' own background, the material that has been researched and validated by the lecturer can be transformed and represented, as per the CAST guidelines, in various ways tailored for the students' specific and individual needs (CAST, 2024).

Initiative 2 – AI-based Personalised Career Support

The personalised career support system, including guidance for Work-Based Learning options, will provide students with comprehensive information about various academic programmes, courses, and career options available within and beyond the college. It will consider emerging industry trends, labour market demands, and technological advancements to suggest relevant areas of study or specific career paths that align with student-provided information.

Moreover, the personalised career support system will be accessible to students through a user-friendly online platform, enabling easy access

to information and recommendations at their convenience. Students will have the flexibility to explore different scenarios, compare options, and make informed decisions based on their unique aspirations and capabilities.

By implementing this AI-driven system, MCAST aims to empower students with the knowledge and guidance they need to navigate their educational and career paths successfully. Through personalised recommendations and comprehensive insights, we strive to enable our students to make informed decisions, unlocking their full potential and maximising their prospects.



Initiative 3 – Continuous Professional Development (CPD) in AI for Staff

MCAST intends to equip its staff with the necessary knowledge and skills to harness the potential of AI by offering a comprehensive range of CPD options to prepare its academics for AI in their teaching and delivery methods through the development of innovative CPD programmes that train staff to endorse and utilise the latest and emerging

AI technologies in their teaching and delivery settings. At MCAST, we recognise the ever-growing importance of AI in the field of education. By teaching based on concrete examples of how workplaces use AI, we can ensure that our staff engage appropriately with the technology and understand how such systems could work.

Initiative 4 – Rationalisation of the use of AI in Administration functions

MCAST aims to integrate AI within its core administrative functions to enhance its operation. A rationalisation of the communications channels that are in use by the administration of the College will enable the concrete communication between stakeholders in important administrative processes. Additionally, any AI bots that are trained to carry out tasks in support of these processes may be regarded as extensions of the administrative function, provided they have appropriate access to the necessary

information to ensure their outputs are contextually relevant and useful. Harmonised solutions can be integrated in various aspects of administration, including resource management and data analytics.

Initiative 5 – SMART Campus Buildings

In the College’s pursuit of technological advancement and operational excellence, we recognise the immense potential of utilising AI systems to optimise maintenance processes through the integration of data gathered from smart buildings. The MCAST Master Plan drives the College towards having smarter campus buildings with more automated controls, adapting to user preferences. Such features are dependent on data being generated through the buildings themselves. By harnessing the power of AI and leveraging data-driven insights, this strategy foresees the implementation of a predictive framework that enhances the reliability, efficiency, and sustainability of our facilities.

Through a network of sensors, IoT devices, and smart building technologies, MCAST aims to collect real-time data related to various parameters. This data can eventually form the foundation for developing AI-driven predictive models.

By applying machine-learning algorithms to this data, MCAST aims to identify patterns, correlations, and anomalies that may indicate potential equipment failures or needs, as well as to minimise the carbon footprint and energy use of the buildings that are part of our Campus to ensure maximal sustainability.

Initiative 6 – Alignment of Study Programmes’ Learning Outcomes to Job Profiles

MCAST aims to enhance the relevance of its programmes to industry by collaborating with external stakeholders. MCAST plans to identify current and future trends in the job market and propose appropriate knowledge, skills and competences to programme managers and programme content developers. Additionally, AI will be used to identify automation-resistant skills to ensure future-proof graduates.

MCAST recognises the vital role played by the National Skills Council in contributing to shaping the future of our nation’s workforce. As part of our commitment to academic excellence and staying at the forefront of innovation, we are dedicated to working closely with the National Skills Council to contribute to a national system for predicting trends in the changing skills needed by our labour force. Through a collaborative partnership, we aim to leverage the power of AI and data analytics to develop accurate and comprehensive models that forecast future skill demands across various industries and sectors.

Initiative 7 – AI knowledge enhancement for the community

Recognising the transformative potential of AI across the community, MCAST plans to develop policies to guide the use of AI tools in the teaching and learning process. In delivering AI familiarisation options MCAST ensures that our students, regardless of their field of study, acquire a fundamental understanding of AI concepts and their applications in their respective domains.

To foster AI knowledge within the community and meet the growing demand for AI professionals, MCAST aims to propose and promote a tertiary education programme to equip students with advanced AI expertise, fostering innovation, and research.

Initiative 8 – AI Research Collaborations

MCAST promotes, supports, and disseminates (also through open access) research on AI-related issues in different vocational sectors by students, staff, and other researchers. The centralisation of experts fosters a collaborative approach to improve the quality and throughput of research initiatives. Research on the use of AI in teaching and learning will also be encouraged.

Through applied research and innovation in the field of AI, MCAST has the potential to provide a range of services and solutions to industry and society. AI-based start-ups and AI solutions for SMEs can also be explored.

Through our collaboration with industry, we envision a dynamic exchange of knowledge, expertise, and resources. This partnership will enable us to gain insights into the pressing needs and trends within the industry, while also providing industry partners access to our research capabilities, top-tier faculty, and talented students. By working closely with industry, we can identify specific AI applications that align with market demands, ensuring that our research remains relevant and impactful.

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