SECTORAL DISCUSSION

IT & EMERGING AND ENABLING INNOVATION

Enabling Innovation using IT and Emerging Sector

1. Introduction:

The Mauritius Research and Innovation Council (mric.mu) operating under the aegis of the Ministry of Information Technology, Communication and Innovation piloted a major workshop in April 2022 called the 'Assises de la Recherche et de l'Innovation' which allowed the MRIC to set establish the baseline in the latest trends in IT and Emerging Technology in Mauritius and to propose a way forward in view of further enhancing the impact of this sector on the socioeconomic developments of Mauritius. This introduction summarises the main observations of the MRIC on this sector.

2. Les Assises de la Recherche et de l'Innovation (ARI 2022) – IT and Emerging and Enabling Innovation

2.1. Background

ARI 2022 subtheme IT and Emerging and enabling Innovation was a platform where relevant stakeholders (conversant with IT and Emerging Technologies) from the public sector, private sector, academia, and the society to engage a national dialogue while concurrently providing insights on emerging and frontier innovations.

The objectives of the IT subtheme were to:

- o Provide insights into emerging technologies and sectors in Mauritius,
- o Identify and introduce strategies to drive leadership in emerging technologies.
- o Reflect on barriers to innovation in Mauritius.
- o Propose strategies in the short, medium, and long term to address the barriers to innovation in Mauritius.

2.2. Current Trends

The Republic of Mauritius has been making significant strides in the Information Technology (IT) and emerging sectors. The government has been actively promoting a knowledge-based economy, recognizing the crucial role that technology and innovation play in driving economic growth and global competitiveness[1].

Mauritius has been investing in developing its IT infrastructure and fostering a conducive environment for IT businesses to thrive. The country has seen growth in software development, IT services, and outsourcing. The government has implemented initiatives to attract foreign

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[1] https://ncb.govmu.org/ncb/strategicplans/DigitalMauritius2030.pdf

investment in the IT sector, providing incentives and support for IT companies to set up operations in Mauritius[2].

The establishment of modern business centres, like the Cybercity in Ebene, has played a pivotal role in creating a hub for IT activities. These hubs not only provide state-of-the-art infrastructure but also facilitate collaboration among businesses, fostering innovation and knowledge exchange[3].

Beyond traditional IT, Mauritius has been actively exploring and investing in emerging sectors such as fintech, biotechnology, renewable energy, and smart cities. The government has recognized the potential of these sectors to diversify the economy and create high-value jobs. In the fintech space, Mauritius has seen the emergence of innovative startups and the adoption of digital payment solutions[4,5]. The regulatory environment has been adapted to accommodate and support fintech developments, making Mauritius an attractive destination for businesses in the financial technology sector[6]. Biotechnology and life sciences have also gained attention, with research institutions and companies focusing on areas like medical research, pharmaceuticals, and agricultural biotechnology. The aim is to position Mauritius as a regional hub for biotech innovation and research[7].

Mauritius is actively leveraging IT and exploring emerging sectors to position itself as a knowledge-based economy and a hub for innovation in the region. A recent research survey found that the innovative activity in the Mauritius ICT sector is focused in the following areas: BPO and management services, cloud, security, consulting, web development, and mobile connectivity[8].

The government's commitment to creating a conducive environment for businesses, coupled with strategic investments in infrastructure and education, bodes well for the continued growth of the IT and emerging sectors in Mauritius. Moreover, information and communication technology is amongst the most important sectors of the Mauritian economy together with

[2] https://honoris.ac.mu/the-latest-trends-and-developments-in-business-and-management-in-mauritius/
[3] https://www.afrasiabank.com/media/2611/afrasia-advertorial_yogesh_gokool.pdf
[4] https://www.mips.mu/
[5] https://www.thehindu.com/business/rupay-upi-payment-services-rolled-out-in-mauritius-sri-lanka/article67838467.ece#:~:text=Further%2C%20with%20the%20adoption%20of,as%20well%20as%20in%20India.
[6] https://www.avinashmeetoo.com/2023/07/14/interview-in-le-matinal-on-the-evolution-of-technology-in-mauritius-and-its-impact-on-our-future/
[7] https://edbmauritius.org/lifesciences
[8] https://link.springer.com/article/10.1007/s13132-023-01587-0

textiles, tourism, financial and business services, seafood processing, real estate development, energy, and education/training[9].

2.3. Future Trends

While predicting future trends is always challenging, several potential directions can be anticipated in the IT and emerging sectors in Mauritius. The government's commitment to fostering innovation and technology-driven growth, coupled with global trends, suggests several areas of potential development, including: Digital Transformation and Industry 4.0[10], Fintech Innovation; Cybersecurity[11]; HealthTech and Biotechnology; Renewable Energy Solutions; Smart Cities and Sustainable Urban Development; E-commerce and Digital Services; Skills Development and Education Technology; Remote Work and Telecommuting; and International Collaboration and Investment[12].

Although Mauritius has already embarked on the implementation process of several of the above future trends, it is to note that these trends are speculative, and the actual trajectory will depend on various factors, including global economic conditions, policy decisions, and technological advancements. The adaptability and responsiveness of Mauritius to emerging opportunities will be key in shaping the future landscape of its IT and emerging sectors.

2.3.1. Insights on future trends being implemented in Mauritius.

Digital Transformation and Industry 4.0: The adoption of digital technologies across industries will likely continue, with an increased focus on automation, artificial intelligence, and data analytics. Businesses in Mauritius may invest in Industry 4.0 technologies to enhance efficiency, reduce costs, and improve overall productivity[13].

Fintech Innovation: The fintech sector is expected to see continued growth, with an emphasis on innovative solutions for digital payments, blockchain, and financial inclusion. For instance the recently implemented Virtual Asset And Initial Token Offerings Services (VAITOS) Act and Sandbox regulatory license show government's supportive regulatory environment recently

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[9] https://www.trade.gov/country-commercial-guides/mauritius-market-overview#:~:text=The%20most%20important%20sectors%20of,energy%2C%20and%20education/training.

[10] https://www.zawya.com/en/press-release/mauritius-is-gearing-up-for-the-fourth-industrial-revolution-states-pm-hxhwdlpi

[11] https://www.linkedin.com/pulse/blockchain-enhancing-cyber-security-mauritius-suyash-sumaroo/

[12] https://www.iworkremote.co/post/why-you-want-to-work-remotely-in-mauritius

[13] https://tradeeconomics.com/projects/identifying-industry-4-0-opportunities-for-mauritius/

set in place to attract more fintech companies, making Mauritius a regional hub for financial technology[14].

Cybersecurity: As digitalization increases, the need for robust cybersecurity measures will become even more critical. Mauritius is likely to witness a growing focus on cybersecurity infrastructure and expertise to safeguard sensitive data and protect against cyber threats. In this connection the Ministry of Information Technology, Communication and Innovation has implemented the National Cybersecurity Strategy which is making its mark in the Country.[15]

HealthTech and Biotechnology: The healthcare and biotechnology sectors may experience advancements, with an emphasis on medical research, pharmaceuticals, and biotech innovation. Collaborations between research institutions, private enterprises, and government initiatives could drive breakthroughs in healthcare and life sciences[16].

Renewable Energy Solutions: Mauritius has been making strides in renewable energy, and this trend is expected to continue. Investments in solar, wind, and other sustainable energy sources may increase, aligning with global efforts to transition to cleaner energy alternatives[17].

Smart Cities and Sustainable Urban Development: The development of smart city initiatives is likely to progress, incorporating technologies for urban planning, intelligent transportation systems, and environmental sustainability. The aim is to create more efficient, liveable, and environmentally friendly cities[18].

E-commerce and Digital Services: With the increasing digitalization of services, the e-commerce sector is likely to expand. Transaction value in the Digital Commerce market is projected to reach US$0.66bn in 2024.Transaction value is expected to show an annual growth rate (CAGR 2024-2028) of 7.76% resulting in a projected total amount of US$0.89bn by 2028.

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[14] https://www.fscmauritius.org/en/fintech-and-innovation#:~:text=The%20Virtual%20Asset%20and%20Initial%20Token%20Offerings%20Services%20Act%20('VAITOS,Offerings%20in%20or%20from%20Mauritius.

[15] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.itu.int/en/ITU-D/Cybersecurity/Documents/National_Strategies_Repository/Mauritius_2014_National%20Cyber%20Security%20Strategy%20-%202014%20-%20EN.pdf

[16] https://www.marketlinks.org/resources/strategy-development-pharmaceutical-and-biotechnology-sector-mauritius

[17] https://sdgs.un.org/partnerships/mauritius-renewable-energy-roadmap-2030

[18] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://edbmauritius.org/wp-content/uploads/2022/10/smart-city-scheme.pdf

It is thus very likely that more businesses may embrace online platforms, and the logistics and digital payment infrastructure may further evolve to support this growth[19].

Skills Development and Education Technology: To support the evolving demands of the IT and emerging sectors, there may be an increased emphasis on upskilling the workforce. Education technology and online learning platforms may play a crucial role in developing a workforce with the necessary skills for the future job market[20].

3. Challenges

Mauritius has tackled many of common challenges (e.g. Infrastructure limitation, low connectivity, regulatory environment) that many regions face in adopting and advancing in IT and emerging technologies. For instance, in the last couple of years, Government and its private sector collaborators has invested massively in robust and reliable digital infrastructure, including high-speed internet, to support the growth of IT and emerging sectors. Mauritius is now widely recognized as one of the most highly advanced countries in Africa in terms of IT infrastructure and connectivity.

However, there are still many challenges that remain to be addressed. These include:

- _Shortage of skilled professionals in areas such as data science, artificial intelligence, and cybersecurity_ which seem to be limiting the effective implementation of emerging technologies and hence hindering Mauritius progress in the Sector.[21]

- _Scarce R&D and patent filing in the IT and emerging technologies sector_[22]. According to the observations of the MRIC, although there is considerable amount of research in the IT sector in Mauritius, there is still much room for improvement[23]. Furthermore, there is still scarce significant innovative activity according to traditional innovation measures: for example, data on patent filings suggest only shallow patenting activity with filings per year in the low two digits (WIPO, 2021). There seem to be a slow down in the innovation status in the IT and Emerging sector in Mauritius[24]

- _Scope for improvement of regulatory framework_. While the Government has implemented several laws and regulations, there still remain aspects of the framework that could be strengthened. For instance, an online consumer protection law is yet to be enacted, and there is no platform to promote regulatory cooperation between Mauritius and other jurisdictions on e-commerce. As such, Aid for Trade initiatives to

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[19] https://www.youtube.com/watch?v=0gzwE9uWInY

[20] https://honoris.ac.mu/embracing-e-learning-a-plus-for-mauritius-education-in-todays-era/

[21] https://defimedia.info/artificial-intelligence-silent-revolution

[22] https://link.springer.com/article/10.1007/s13132-023-01587-0

[23] https://defimedia.info/research-and-innovation-gliding-future

[24] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023/mu.pdf

foster e-commerce are yet to be implemented, while an e-commerce platform per se is yet to be established[25].

4. Key Enablers.

The following strategic initiatives can be considered to address the above-mentioned challenges in the IT and emerging sectors in Mauritius:

Key stakeholders need to come together to consider:

4.1. Investment in Education and Training:

- Strengthening education and training programs in information technology, computer science, and related fields.

- Intricate collaboration between the Private sector, public sector and the society with universities and technical institutions to develop specialized courses aligned with industry and the people of the republic of Mauritius needs.

- Promoting continuous learning and upskilling programs for professionals in the IT sector.

4.2. Support for Research and Development:

- Encouraging and funding research initiatives in emerging technologies, fostering collaboration between academia, research institutions, society, and the private sector.

- Establishing innovation hubs or research centres and FabLabs focused on areas such as artificial intelligence, blockchain, cybersecurity, and other cutting-edge technologies.

4.3. Entrepreneurship and Start-up Ecosystem:

- Consolidating the conducive environment and initiatives (such as the National SME Incubator Scheme) for entrepreneurship by providing financial incentives, grants, and incubation support for tech startups.

- Fostering collaboration between startups, established companies, and government agencies to stimulate innovation.

- Developing co-working spaces and innovation clusters to facilitate networking and collaboration among entrepreneurs.

4.4. Government Policies and Regulations:

- Developing supportive policies and regulations that promote innovation, including tax incentives for research and development activities.

- Streamlining bureaucratic processes to make it easier for businesses, particularly startups, to operate and thrive.

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[25] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.wto.org/english/res_e/booksp_e/07_adtera_chapter_03_e.pdf

- Building on the already existing regulatory framework such as the Sandbox license to establish a more robust and integrative regulatory framework for emerging technologies that ensures both innovation and responsible use.

4.5. Public-Private Partnerships:

- Encouraging collaboration between the government, private sector, and academic institutions to drive innovation.

- Fostering partnerships with international organizations, fostering knowledge exchange and exposure to global best practices.

4.6. Promotion of STEM Education:

- Promoting science, technology, engineering, and mathematics (STEM) education at all levels to cultivate a pool of talent with strong foundational skills. Support initiatives that encourage more students, especially women, to pursue STEM careers.

4.7. Cybersecurity Initiatives:

- Prioritizing cybersecurity initiatives to build trust in the digital ecosystem and protect against potential threats.

- Developing a skilled workforce in cybersecurity through training programs and education.

4.8. International Collaboration:

- Fostering collaboration with international organizations, businesses, and research institutions to bring global expertise and perspectives to the local ecosystem.

4.9. Marketing and Branding:

- Implementing marketing and branding strategies to position Mauritius as a hub for innovation in the IT and emerging sectors, attracting both talent and investment.

4.10.   Open Data Initiatives:

- Implementing open data policies to make non-sensitive government data available to the public, researchers, and businesses, fostering innovation and creating new opportunities.

4.11.   Innovation Grants and Competitions:

- Establish innovation grants and organize competitions to encourage individuals and organizations to develop and showcase innovative solutions in IT and emerging technologies.

4.12.   Digital Literacy Programs for All Ages:

- Expand digital literacy programs beyond formal education to include community-based initiatives, ensuring that individuals of all ages have the skills to navigate and leverage digital technologies.

4.13.   Industry-Academia Collaboration:

- Facilitate stronger collaboration between academia and industry by encouraging joint research projects, internships, and industry-driven curriculum development.

4.14.   Tech Transfer Offices:

- Establish technology transfer offices to facilitate the commercialization of research findings from academic institutions, promoting the integration of research into practical applications.

4.15.   Agile Regulatory Framework:

- Develop agile regulatory frameworks that can adapt quickly to technological advancements, ensuring that regulations do not stifle innovation while maintaining ethical and legal standards.

4.16.   Digital Innovation Zones:

- Create specific zones or districts designated for digital innovation, providing a physical space for startups, tech companies, and research institutions to collaborate and thrive.

4.17.   E-Government Services Enhancement:

- Continuously enhance e-government services, leveraging emerging technologies to improve efficiency, transparency, and accessibility for citizens and businesses.

4.18.   Venture Capital and Funding Ecosystem:

- Strengthen the venture capital ecosystem by attracting local and international investors interested in supporting innovative IT and tech startups.

4.19.   Cross-Industry Collaboration:

- Encourage collaboration between the IT sector and other industries (such as healthcare, agriculture, and tourism) to explore innovative solutions and create synergies.

4.20.   Sustainable Technology Practices:

- Promote the development and adoption of sustainable and environmentally friendly technologies, aligning innovation with global sustainability goals.

4.21.   Hackathons and Innovation Challenges:

- Organize regular hackathons, innovation challenges, and coding competitions to bring together creative minds, encourage problem-solving, and identify new talent.

4.22.   International Research Collaborations:

- Facilitate partnerships with international research institutions and universities to leverage global expertise, exchange knowledge, and participate in joint research projects.

4.23. *Smart City Initiatives:*

- Implement smart city initiatives that incorporate cutting-edge technologies to improve urban living, transportation, and public services.

4.24. *Diversity and Inclusion Programs:*

- Implement initiatives to promote diversity and inclusion in the IT and emerging sectors, recognizing the value of diverse perspectives in driving innovation.

Implementing a holistic approach that combines these recommendations can contribute to the upsurge of innovativeness in Mauritius in the IT and emerging sectors. Regular assessments and adjustments to these strategies based on evolving industry trends and global developments are crucial for long-term success.

5. Concluding Remarks

This position paper builds on the group reflection during the ARI 2022 to underscore the critical importance of fostering innovation in IT and emerging technologies for the sustainable growth and global competitiveness of the Republic of Mauritius. The transformative power of technology has the potential to drive economic diversification, enhance the quality of education, and improve the overall standard of living of our Nation. To fully realize these benefits, a comprehensive and collaborative approach is essential.

Leveraging on the tremendous advancements in connectivity and IT infrastructure, Mauritius stands at a pivotal juncture, poised to become a regional hub for innovation in the IT sector. By embracing a forward-thinking agenda that includes investments in education, research and development, entrepreneurship, and a supportive regulatory framework, the nation can position itself as a leader in emerging technologies in Africa.

The outlined enablers, ranging from educational reforms and digital infrastructure development to fostering cross-industry collaboration and promoting diversity, collectively pave the way for a vibrant and resilient IT ecosystem. Furthermore, the government's commitment to agile policies, open data, and sustainable technology practices can ensure that innovation not only thrives but also aligns with global standards of ethical and responsible technology use.

As Mauritius embarks on this transformative journey, it is imperative to emphasize the active participation of all stakeholders – government bodies, educational institutions, private enterprises, and the community at large. By fostering a culture of continuous learning, adaptability, and inclusivity, Mauritius can unlock its full potential in the digital era.

This paper advocates for a proactive, collaborative, and adaptive approach to leverage IT and emerging technologies for the benefit of Mauritius, ensuring a prosperous and sustainable future for generations to come.