وزارة الاتصالات وتقنية المعلومات
MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY

OpenRAN public consultation

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Contents

1 Introduction:

The Ministry of Communications and Information Technology (MCIT) seeks to gather comprehensive information and recommendations pertaining to the Open RAN (ORAN) initiative. This includes insights into projects, pilots, research and development (R&D) initiatives, as well as examination centres and labs. The objective is to thoroughly study and understand ORAN technology, economic, financial, strategic, and technical implications. Recognized as a future network technology trend, ORAN holds the potential to reduce costs while enhancing innovation in the Radio domain. MCIT aims to develop a strong foundation for ORAN technology rollout and local ORAN ecosystem development.

2 Executive summary:

Recognizing the critical role of ORAN in the telecommunications sector, MCIT is strategically positioning Saudi Arabia to lead in future technology. This entails a comprehensive approach, encompassing R&D, technological advancements, strategic partnerships, localization initiatives, and significant investments. This commitment aligns seamlessly with our Vision 2030 objectives, as we strive to establish Saudi Arabia as a frontrunner in shaping the future landscape of technology around the globe.

As an integral component of the ORAN market development strategy, the MCIT is set to spearhead a series of initiatives. These include the implementation of an ORAN pilots program across diverse sectors and the establishment of Research and Development labs, in collaboration with relevant stakeholders. Emphasizing key pillars such as the technology landscape, research and development, strategic partnerships and investments, as well as localization efforts, the program strategically prioritizes avenues critical to the success and growth of the ORAN initiative.

Through this document, the Ministry of Communications and Information Technology (MCIT) aims to gain a thorough understanding of ORAN technology, encompassing potential barriers, challenges, risks, and opportunities. The primary objective is to discern the optimal approach for the successful adoption of ORAN within the Kingdom of Saudi Arabia.

3 Description of the pillars:

ORAN Program outlines four pivotal pillars essential for advancing and fully realizing the potential of ORAN technology. These pillars form the foundation of our strategy to foster innovation, development, and widespread adoption of ORAN within the telecommunications sector.

MCIT has selected four main pillars as follows:

1. Technology development
2. Research and development “ R&D “
3. Human capital and localization
4. Regulations / Standards

3.1 Technology development

This pillar focuses on the advancement and evolution of ORAN technologies. It aims to explore innovative solutions and improvments in network functionality, efficiency, and flexibility. Emphasis is on developing technologies that enhance the performance and scalability of ORAN networks, ensuring they meet the future demnds of telecommunication.

All inquiries and considerations are meticulously organized under five principal sections for ease of navigation and comprehensive understanding.

1. Overall assessment of the current state and future direction of ORAN

1. What is your overall assessment of the current state of ORAN development and deployment?
2. What are the key challenges and opportunities you see for ORAN adoption in your network?
3. How do you intend to foster the growth of a Local Open System Integrator?
4. In your opinion, can the Neutral Host business model expedite the adoption of the O-RAN ecosystem?
5. What measures are in place for implementing a Cloud-RAN approach?
6. What opportunities exist for deploying ORAN -compliant small cells?
7. Do you think that Open RAN has a better chance penetrating telecom markets through emerging deployment and business scenarios like Private Mobile Networks (PMNs) than the chance it has in replacing traditional RAN in public mobile networks?
8. How can the evolving standardization of ORAN be driven to support Mobile-Edge ?
9. Where would you initiate the pilot, and how would you coordinate with legacy systems?
10. How does RIC solution address security concerns, including authentication, authorization, and data encryption for communication with RAN elements?
11. What security measures are in place to safeguard the integrity of virtualized network functions and the underlying infrastructure?

2. Perception of the legacy vendors and their impact on ORAN

12. How do you perceive the legacy vendors initiatives and project on ORAN adoption?
13. Do you believe the engagement of legacy vendor will change the perception of ORAN as a viable alternative to traditional radio access networks (RAN)?
14. Do you believe that cross-vendor interoperability can be achieved in acceptable terms, that will prevent a single vendor scenario?
15. to what extent will RIC solution seamlessly integrate with the existing non-ORAN RAN equipment? Are there any specific limitations or dependencies to consider?

3. Strategy for ORAN adoption

16. What is your current strategy for ORAN adoption?
17. Do you have plans to deploy ORAN in your network in the near future?
18. What criteria will you use to select ORAN vendors?
19. How will you manage the integration of ORAN components into your existing network?
20. Are you more inclined to work with a single system integrator for a turnkey ORAN solution, or are you open to managing multiple vendors directly?
21. What is your long-term vision for ORAN and its role in your network strategy, if it is incorporated?

22. What is the well-defined strategy for integrating ORAN with evolving technologies like 5G/6G?
23. In case the test and integration center is a necessity, what do you think is the best practice to establish that center?
24. What would be the best approach to establish the center such that its neutrality is guaranteed? In other words, which entity (or group of entities) within the Kingdom is (are) better suited to shoulder the perdon of such center?

4. Impact of ORAN on network performance and cost

25. Will the overall performance of network be enhanced by adopting ORAN?
26. Do you expect ORAN to reduce the overall cost of your network?
27. How do you expect ORAN to impact your operational and maintenance costs?
28. What are the challenges associated in integration with older systems?
29. How will you manage the security risks associated with ORAN?
30. Compared to traditional RAN solutions, how do you currently view the cost competitiveness of ORAN deployments? Do you foresee cost advantages in the future?
31. How overall Total Cost of Ownership (TCO) reduction achieved using ORAN?
32. What methodologies followed for daily Operations of multi-vendor ORAN network?
33. How do you think effective interference management can be achieved, given the increased flexibility and complexity of Open RAN architectures?
34. How can automation be utilized within ORAN to streamline network operations and maintenance, and what impact does it have on overall operational cost and efficiency?
35. How does SDN integration enhance the flexibility, manageability, and security of ORAN networks, particularly concerning network slicing and traffic management?
36. What role does NFV play in ORAN solution, and how does it contribute to network agility, cost-efficiency, and interoperability within a multi-vendor ecosystem?

5. Regulatory and policy considerations for ORAN

37. What are the key regulatory and policy considerations for ORAN adoption?
38. How do you expect ORAN to impact the regulatory landscape for telecommunications?
39. Do you think that attracting ORAN vendors and system integrators to the Kingdom (establishing offices in the country) could help the ORAN adoption journey? Why?
40. What could be the best approach, in your opinion, to attract ORAN vendors and integrators to the Kingdom?
41. What role can governments play in promoting ORAN adoption?
42. Does the ORAN solution support all standard 3GPP & O-RAN Alliance Open interfaces?
43. In your opinion, how could the government go about developing a local ORAN vendor/integrator industry (incuding Saudi ORAN hardware, software, and system integration start-ups and companies)?
44. Does the solution certify with NESAS and SCAS security certification?
45. In regards to digital sustainability, do you belive there will be positive environmental impact realized from switching to Open ran?

6. Potential Integration of Artificial Intelligence in Open RAN

46. Can AI-driven algorithms help in managing and optimizing the network's resources? If so, how?
47. What are the potential benefits and challenges of using AI in ORAN, specifically regarding real-time data analytics and decision-making?
48. How can AI be leveraged to enhance the security and resilience of ORAN networks, and avoid exposing a security threat?

3.2 Research and Development (R&D)

The R&D pillar is dedicated to fostering innovation and exploration in the ORAN space. This involves conducting in-depth studies, experiments, and trials to uncover new possibilities, overcome existing challenges, and leverage cutting-edge advancements. The goal is to cultivate a robust knowledge base and technical expertise that propels ORAN technology forward.

49. Have your organization conducted any research related to ORAN? If yes, what are the main themes your organization is focused on? (please elaborate on each theme if possible)
50. What are the outcomes of such research? (Research outcomes such as papers, patents, spin-outs … This question tries to gauge the value of the research related to ORAN.)
51. Does your organisation have facilities to test and integrate ORAN solutions?
52. If yes, do such facilities comply with O-RAN Alliance guidelines? (If no, please elaborate on why?)
53. What types of tests do such facilities carry out? (answer this question if you have testing facilities)
54. Have you deployed/developed any ORAN solutions?
55. If yes, please elaborate on such deployments?
56. Does your organization utilize private 5G networks? (the purpose of this question is to see whether having private 5G networks is conducive for R&D in ORAN related fields)
57. Which applications/domains do you believe will benefit from deploying ORAN solutions? (Here, we're looking into examples of the innovative side of ORAN in applications/scenarios that might require more that what's on offer in monolithic and closed infrastructure)
58. What challenges have you identified when doing R&D in ORAN related projects?
59. Do you believe the current ecosystem is sufficient for conducting R&D in ORAN related fields? (if no, please elaborate on why? What's missing?)
60. Are telecom regulators engaged in supporting R&D efforts in your organisation ?
61. What economic ripple effects can be anticipated from investing in R&D within the realm of Open RAN and its associated technologies?
62. What R&D prospects exist in Open RAN, including opportunities for chairing Working Groups within Saudi R&D Centers?
63. How would the development of shareable small cells be structured in Saudi Arabia?
64. What advantages does the implementation of National Open Test & Integration Centers "OTICs" bring to Open RAN components testing and badging, and what overarching framework is commonly adopted for its implementation?
65. What benefits accrue from participating in Open Source projects such as OAI and srsRAN for local labs experts?
66. What is the standard procedure for providing funding to local companies to enable their participation in the O-RAN alliance as contributors to technical working groups in Open RAN research and development?

3.3 Human capital and Localaization

This pillar emphasizes the development of local talent and expertise in the ORAN sector. It focuses on building a skilled workforce through education, training, and hands-on experience. By localizing human capital, the initiative aims to create a sustainable ecosystem that supports the long-term growth and competitiveness of ORAN technology within the region.

- **3.3.1 Skillsets and competencies:**

67. What is the definition of “Modern communications technologies” and what technologies fall under this category.
68. What specific skills and competencies are required for different roles within the ORAN eco-system (e.g., network planners, software developers, security specialists)?
69. How much overlap is there between existing telecom skills and those needed for ORAN?
70. What are the gaps in existing talent pools, and how can they be addressed (e.g., reskilling, upskilling, attracting new talent)?

- **3.3.2 Education and training:**

71. Provide an international benchmark (include Minimum 5 countries) of ORAN adoption and current training initiatives
72. Are there existing educational programs or certifications specifically focused on ORAN technologies?
73. What kind of training initiatives are needed to prepare the workforce for ORAN adoption?
74. The relationship of ORAN, 6G, and 5G technologies in term of human capital with the following technologies:

    - Cloud Computing
    - Data Science
    - Software Engineering
    - Computer Science

75. How can universities and vocational institutions align their programs with the industry’s ORAN skill needs?
76. Can you list down the major institutes for teaching and training the O-RAN eco-system in accordance with Technologies like 5G and 6G ?
77. What is significance for learning standards of 3GPP , Small Cell Forum and Open RAN in real O-RAN deployments ?
78. Do you suggest the learning the 5G Communication protocols like CFR , DPD , DUC and DDC is 5G O-RAN systems designs?
79. Can you provide a plan human Capital development for new graduates and experienced Engineers?

- **3.3.3 Geographical considerations:**

80. How will the demand for ORAN skills vary across different regions and countries?
81. What are the challenges and opportunities for localizing ORAN talent pools in specific markets?
82. How can governments and industry stakeholders collaborate to develop regional ORAN skills ecosystems?

- **3.3.4 Demand for ORAN Technologies:**

  - **3.3.4.1 Market drivers and adoption trends:**

83. What is the global and local demand of ORAN, 6G and 5G technologies and future forecasts?
84. What is the expected scale and focus of human capital development of ORAN, 6G and 5G in the upcoming years?
85. What are the key factors driving the demand for ORAN technologies (e.g., cost reduction, flexibility, innovation)?
86. What are the different stages of ORAN adoption across different market segments (e.g., mobile operators, enterprises, rural areas)?
87. What are the projected timelines for widespread ORAN deployment in different regions? with further focus on KSA?

  - **3.3.4.2 Impact on workforce needs:**

88. How will the adoption of ORAN technologies impact the size and composition of the telecommunications workforce?
89. What new job opportunities will emerge with ORAN, and what will happen to existing roles? And how much will it be compared with other technological occupancies?
90. How can workforce transitions be managed effectively to mitigate job losses and support reskilling?

  - **3.3.4.3 Specific requirements of different ORAN components:**

91. What are the unique human capital needs for different aspects of the ORAN architecture (e.g., RAN Intelligent Controllers, AI specialist, software development)? And what are the weights of these aspects?
92. w will the demand for skills vary depending on the chosen ORAN deployment model (e.g., centralized, distributed)?

3.4 Regulations / Standards

This section addresses the crucial role of regulations and standards in the adoption of Open RAN (ORAN) technology. It explores the regulatory framework governing spectrum allocation, network security, and data privacy, as well as compliance requirements. Additionally, it outlines the contributions of standards bodies and consortia such as the Telecom Infra Project (TIP) and the O-RAN Alliance. By understanding and adhering to these regulations and standards, stakeholders can navigate the ORAN ecosystem effectively, ensure compliance, and drive innovation.

93. Do you think that telecom regulations (as of Feb. 8th, 2024) consititute a barrier to Open RAN adption and/or development? Why?
94. Is there a policy or regulatory intervention that you think is necessary to help the adoption of Open RAN? If yes, what is that? If no, please explain why?
95. How do you characterize the Open RAN standardization process so far? In other words, what is your assessment of the standardization progress of O-RAN Alliance and Telecom Infra Project?
96. How aligned are the standardization efforts of the O-RAN Alliance or Telecom Infra Project (TIP) with:
- 3GPP's ongoing efforts to improve 5G standards (release 18 and 19), and
- ITU's efforts to set the stage for the next-generation of mobile network technology, commonly referred to as 6G?

4 Response structure

- This Public Consultation is available on the MCIT website: (وزارة الاتصالات وتقنية المعلومات mcit.gov.sa)
  - Entities wishing to particiepent in this document must submit the feedback to MCIT no later than 24-Aug-2024

- Comments filed in relation to this Public Consultation must be submitted to one or more of the following addresses:
  - a) By email to OpenRAN@mcit.gov.sa
  - b) By hand delivery (a softcopy and a hardcopy) or by post to the following address:

    Ministry of Communications and Information Technology (MCIT) Digital City, Prince Turki Bin Abdul Aziz I and Imam Saud Bin Abdul Aziz Intersection
    PJQQ+MR5, An Nakheel, Riyadh 12382 Kingdom of Saudi Arabia

Submissions: Respondents should send their RFI responses in PDF or Word format or PPT. Early submissions are encouraged, the responses should be tailored to your specific area of expertise and experience. It is not required to address every question.

Contact Information: For any questions or further clarification regarding the submission process, review criteria, or privacy practices, please contact us at OpenRAN@mcit.gov.sa

Our team is available to assist and ensure a smooth and transparent process.

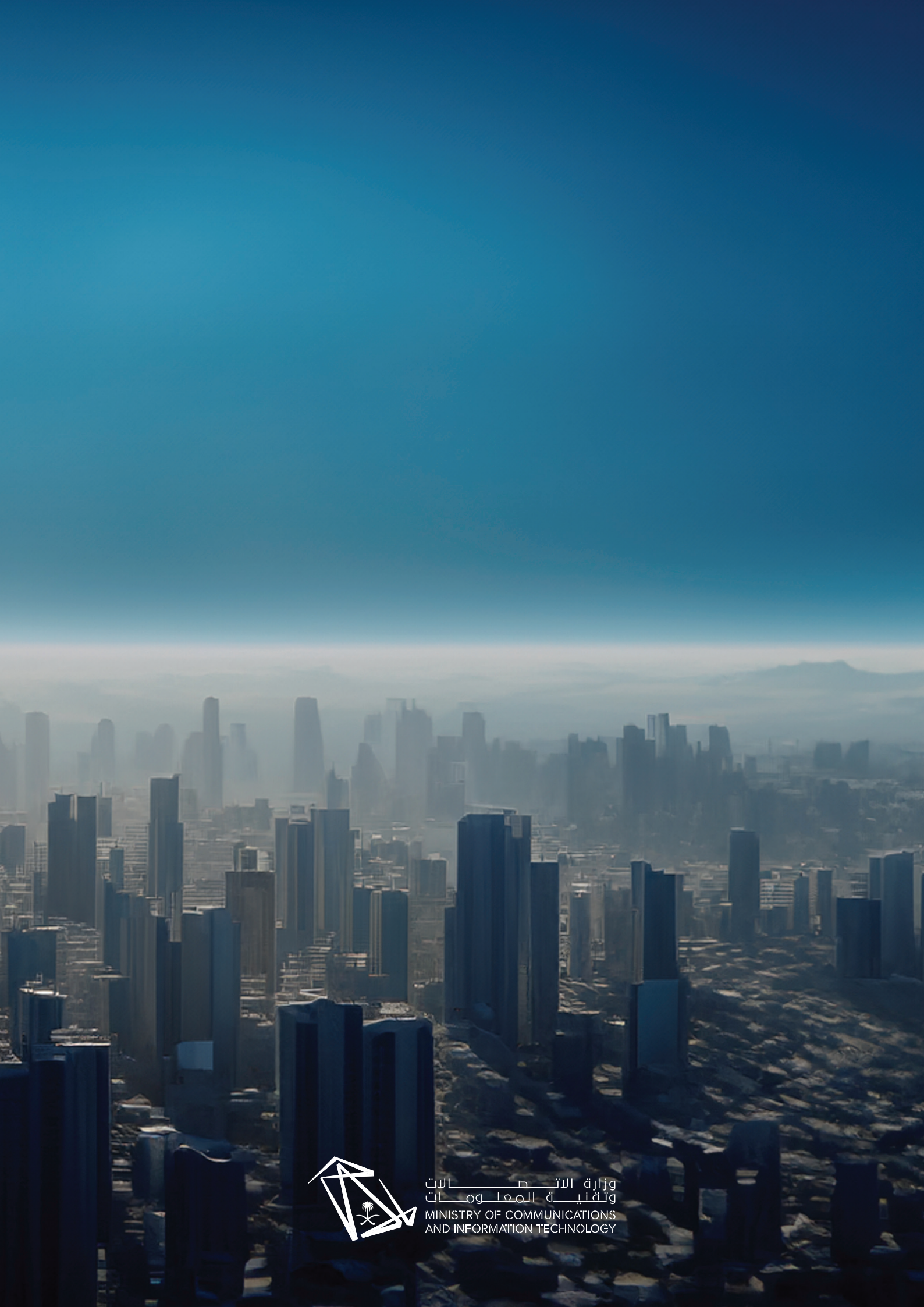
5 Process and Privacy

Privacy:

The MCIT is committed to maintaining the confidentiality and privacy of all submissions. Information received will be handled with the utmost care, stored securely, and only accessed by authorized personnel involved in the process. Respondents should clearly mark any sensitive or proprietary information within their submissions.

Use of Information:

Information provided in response to this document will be used exclusively for the purposes of evaluation and strategic planning within the context of the ORAN initiative. Personal data will not be used for any unrelated purposes without obtaining explicit consent from the data subject.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