World Customs Organization

SMART CUSTOMS PROJECT

Results of the WCO Smart Customs Survey

July 2024

wcoomd.org

Funded by

CHINA CUSTOMS

Smart Customs Project

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ABBREVIATIONS AND ACRONYMS

AI/ML	Artificial intelligence/machine learning
AMS	WCO Americas and Caribbean region
A/P	WCO Asia/Pacific region
DA	Data analytics
ESA	WCO East and Southern Africa region
EUR	WCO Europe region
IoT	Internet of Things
IT	Information technology
MENA	WCO North of Africa, Near and Middle East region
NCP	National Contact Point
VR	Virtual, augmented and mixed reality
WCA	WCO West and Central Africa region
WCO	World Customs Organization

Introduction: Aim of the Survey

The WCO Smart Customs Survey was launched on 17 April 2024, with an initial deadline set for 6 May 2024 and subsequently extended to 15 May 2024. In response to Members' requests, further submissions were recorded up until 24 June 2024.

The purpose of the Survey is as follows:

- Assess the global adoption status of technology;
- Assess Members' capacity-building needs with respect to the application of technologies;
- Define (up to three) technologies on which the Project should focus. The Project team will prepare detailed reports about the minimum technical specifications (for implementation/integration), costs and trends, as well as use cases, business processes, policy arrangements, and legal requirements for the adoption of the three technologies in focus in the Project;
- Establish the Smart Customs Community: nominate National Contact Points (NCPs) for the Smart Customs Project;
- Share knowledge on disruptive technologies applied to Customs;
- Identify Members interested in developing in-depth case studies on technological adoption. These will serve to update the Study Report on Disruptive Technologies or to feed into the Community Portal.

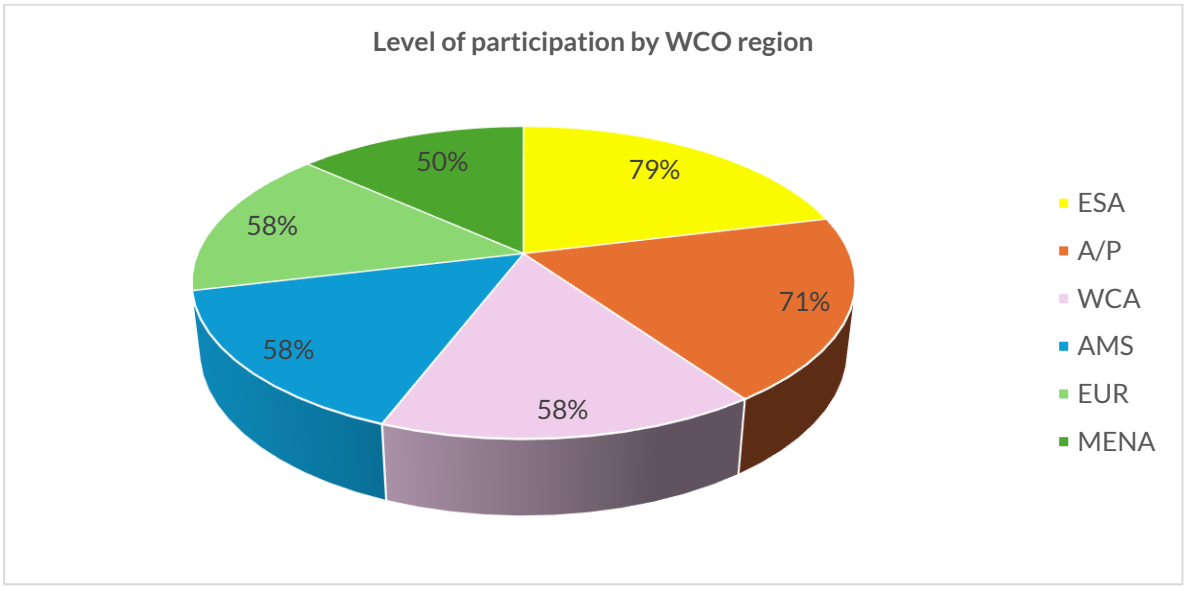
Taking into account that one of the main challenges in technology adoption relates to technology uptake by other stakeholders cooperating with Customs, a second Survey was launched in parallel to this one, inviting WCO Members to share a dedicated Survey link with any governmental agencies involved in the implementation and/or the use of the technologies that Members are adopting or considering.

I. Participation in the Survey

The participation in the Survey was high and balanced across all the WCO regions.

A total of **116 submissions** were received, representing **62% of the WCO membership**.

The top four participating regions in terms of their submissions rate were ESA and A/P, followed ex aequo by WCA, AMS and EUR.



WCO region	Submissions	WCO Members	Submission rate
ESA	19	24	**79%**
A/P	25	35	**71%**
WCA	14	24	**58%**
AMS	19	33	**58%**
EUR	30	52	**58%**
MENA	9	18	**50%**
TOTAL	**116**	**186**	**62%**

78% of respondents (90 Members) provided some details of the technologies adopted/under development/under consideration, while eight Members submitted separate files with case studies.

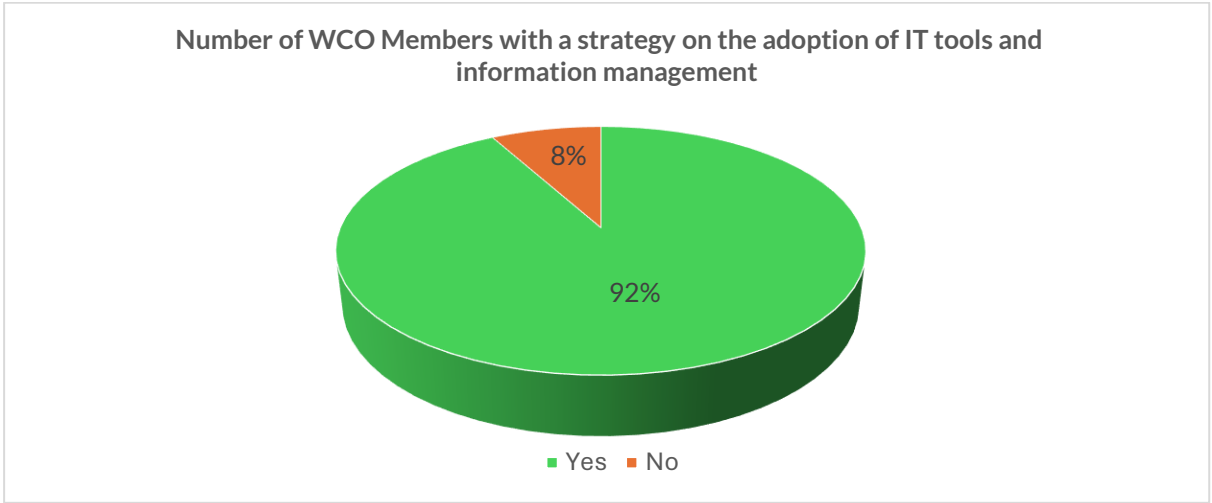
Additionally, 63% of respondents (73 Members) expressed a willingness to share further information and develop case studies on one or more technologies.

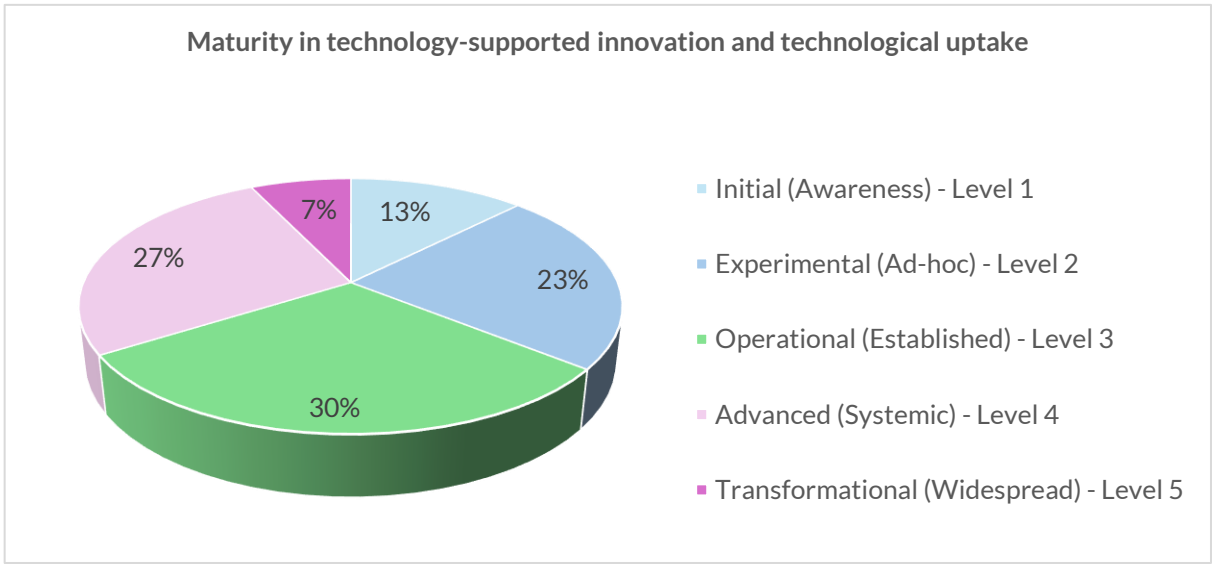
There were only six cases of partner agencies completing and submitting the dedicated Survey forwarded to them by Customs. The partner agencies were: Ministry of Finance; Trade Network Agency; Ministry of the Presidency; Telecommunication, Radiocommunication and Broadcasting Regulator; Ministry of Trade and Commerce (Department of Tourism); and Department of Information and Communication Technology. During the first meetings with NCPs held on 17 and 20 June 2024, Members expressed a degree interest in allowing further data collection from partner agencies to feed into the Survey, with an extended deadline.

II. IT strategy and maturity

An information technology (IT) strategy is in place in 92% of cases.

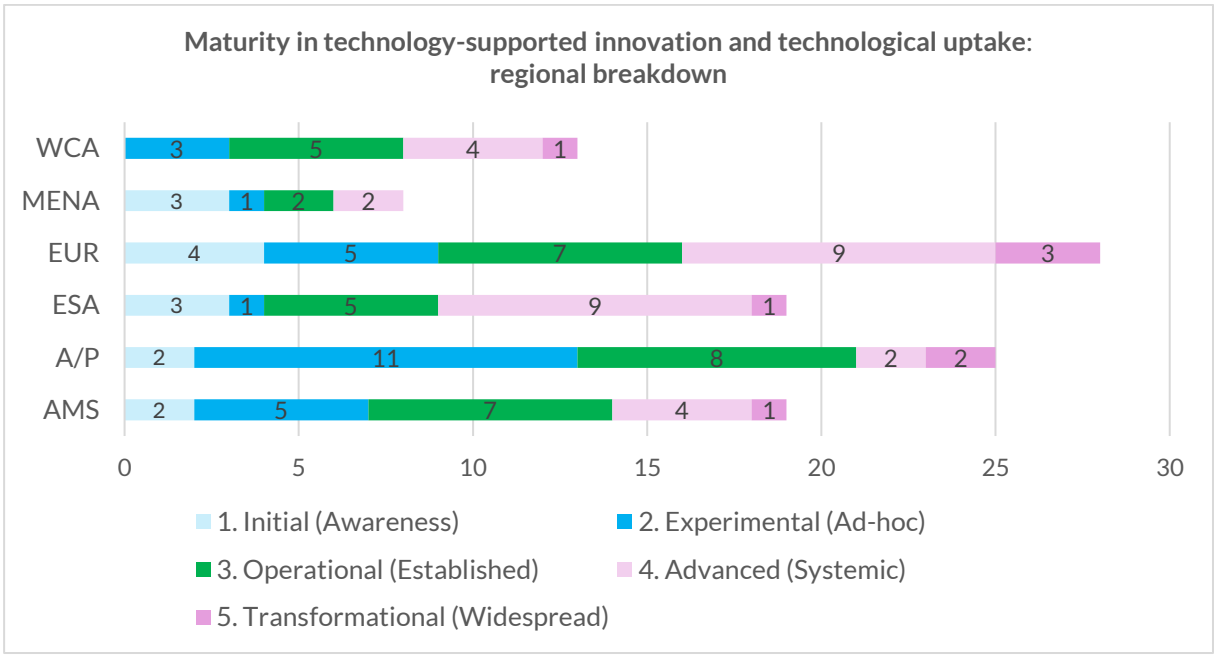
Concerning the **maturity level of technology-supported innovation and technological uptake**, the majority of the responses were concentrated at the operational (30%) and advanced (27%) levels of maturity. The transformational level (7%) scored the lowest, followed by the initial level (13%) and the experimental level (23%), highlighting room for improvement.





Level 1	**Initial (Awareness)**	At this stage, the administration is in the early phases of recognizing the importance of innovation but has not yet developed a structured innovation capability. Decision-making is ad-hoc, driven by individual initiatives, and tends to be reactive to business demands. Processes involve partial digitization, with manual data extracts. The in-house IT architecture is fragmented.
Level 2	**Experimental (Ad-hoc)**	In this phase, the administration actively seeks innovation opportunities, but the approach tends to be ad-hoc. Pilot projects are run, and technological expertise is primarily siloed. Coordination between teams is minimal, although some sharing of best practices occurs without a formal corporate process.
Level 3	**Operational (Established)**	At this stage, innovation teams are established, and the administration formalizes its approach, moving towards a sustainable innovation capability with scalable solutions. There are plans for deploying disruptive technologies aligned with strategic objectives. Executive support is present, and a clear multi-year transformation roadmap is in place.
Level 4	**Advanced (Systemic)**	Multiple innovations and solutions are deployed from a managed repository. A collaborative environment supports technological applications for diverse use cases. The administration has clear data architecture and IT governance. Strategic partnerships are utilized for technological innovation. Enterprise architecture guidelines ensure consistency, security and compliance across the organization.
Level 5	**Transformational (Widespread)**	Innovation is strategically planned, funded and championed at the enterprise level, becoming a critical business process. Disruptive technologies and innovative practices are fully integrated into business processes within a coherent IT infrastructure. Continuous improvement is emphasized, and planned obsolescence is managed. The administration develops a strong internal digital development capability and fosters a culture of innovation, moving beyond merely following best practices to becoming a trailblazer in the field.

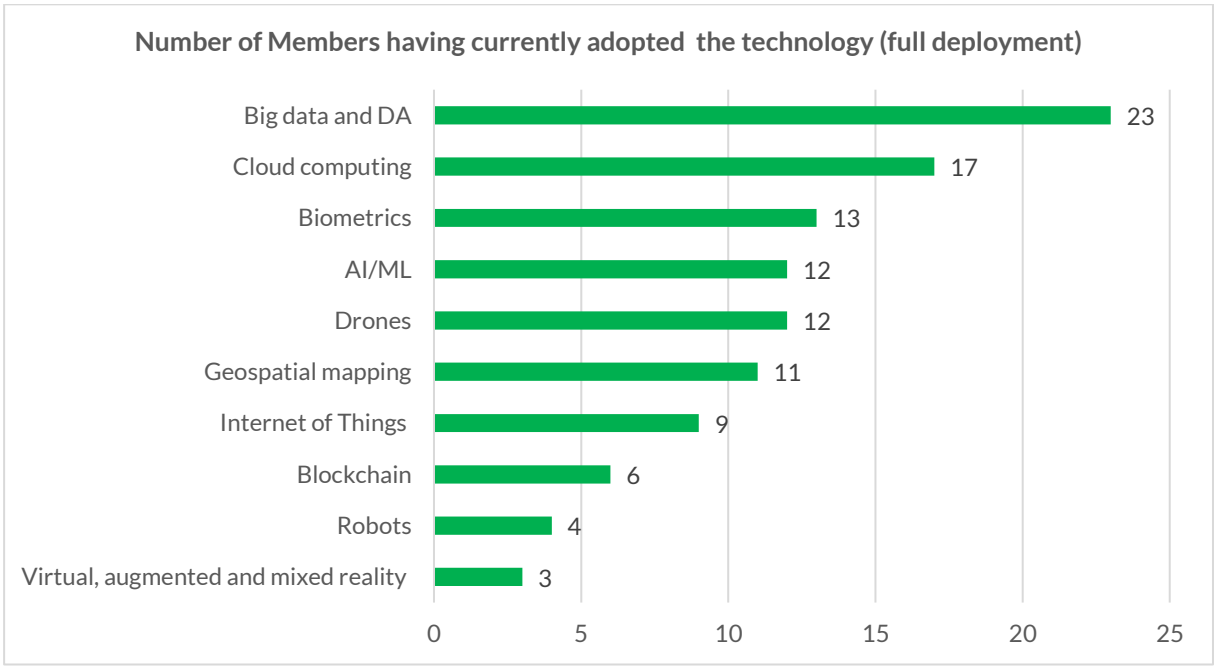
Details of the **maturity levels by WCO region** are provided in following graph.

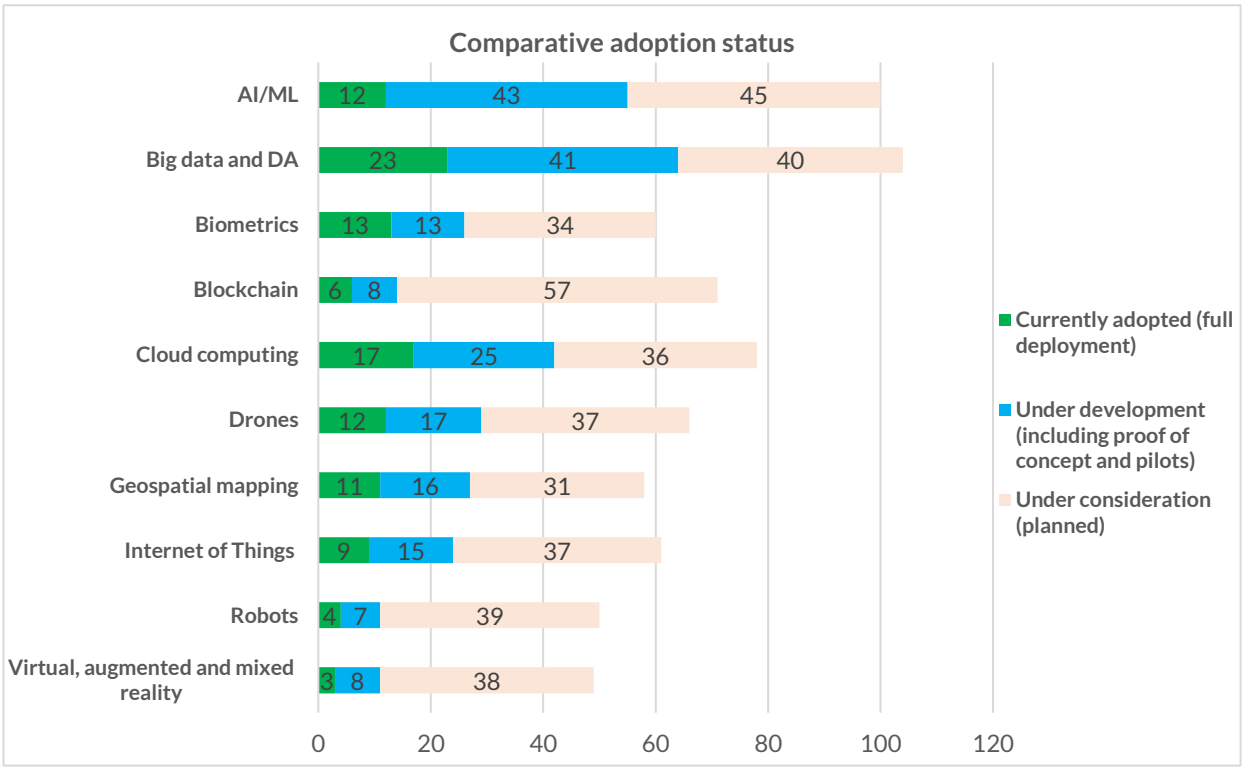


III. Adoption status of different technologies

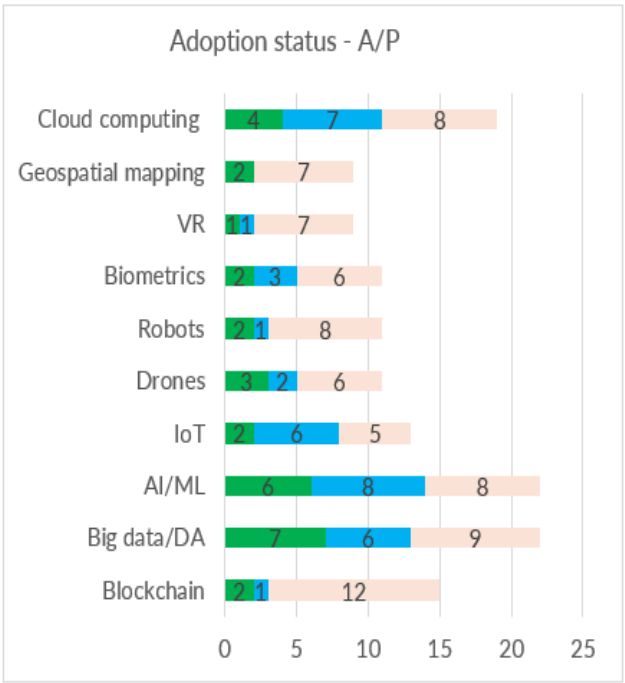
Big data and data analytics (DA) are the most frequently adopted solution (23 Members), followed by cloud computing (17), biometrics (13), artificial intelligence/machine learning (AI/ML) and drones (12); and geospatial mapping (11).

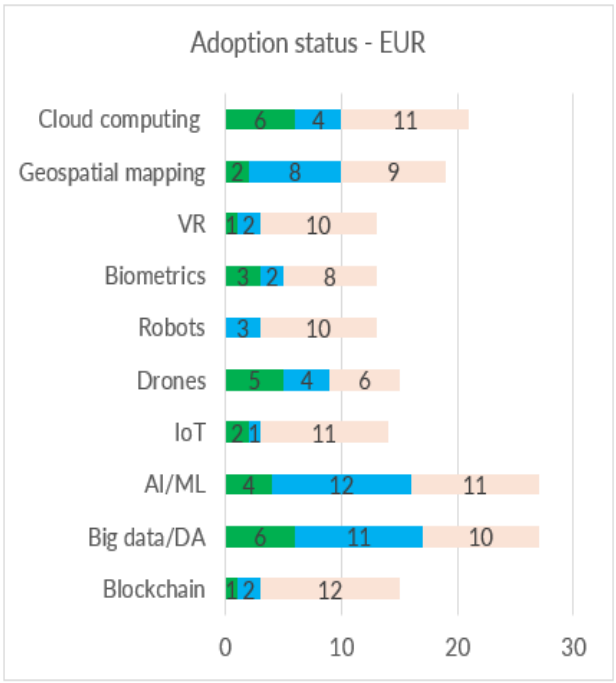
The comparative adoption status of the different technologies demonstrates the prevalence of development areas (pilots, proofs of concept and technologies under consideration for planning investment purposes) over full implementation.

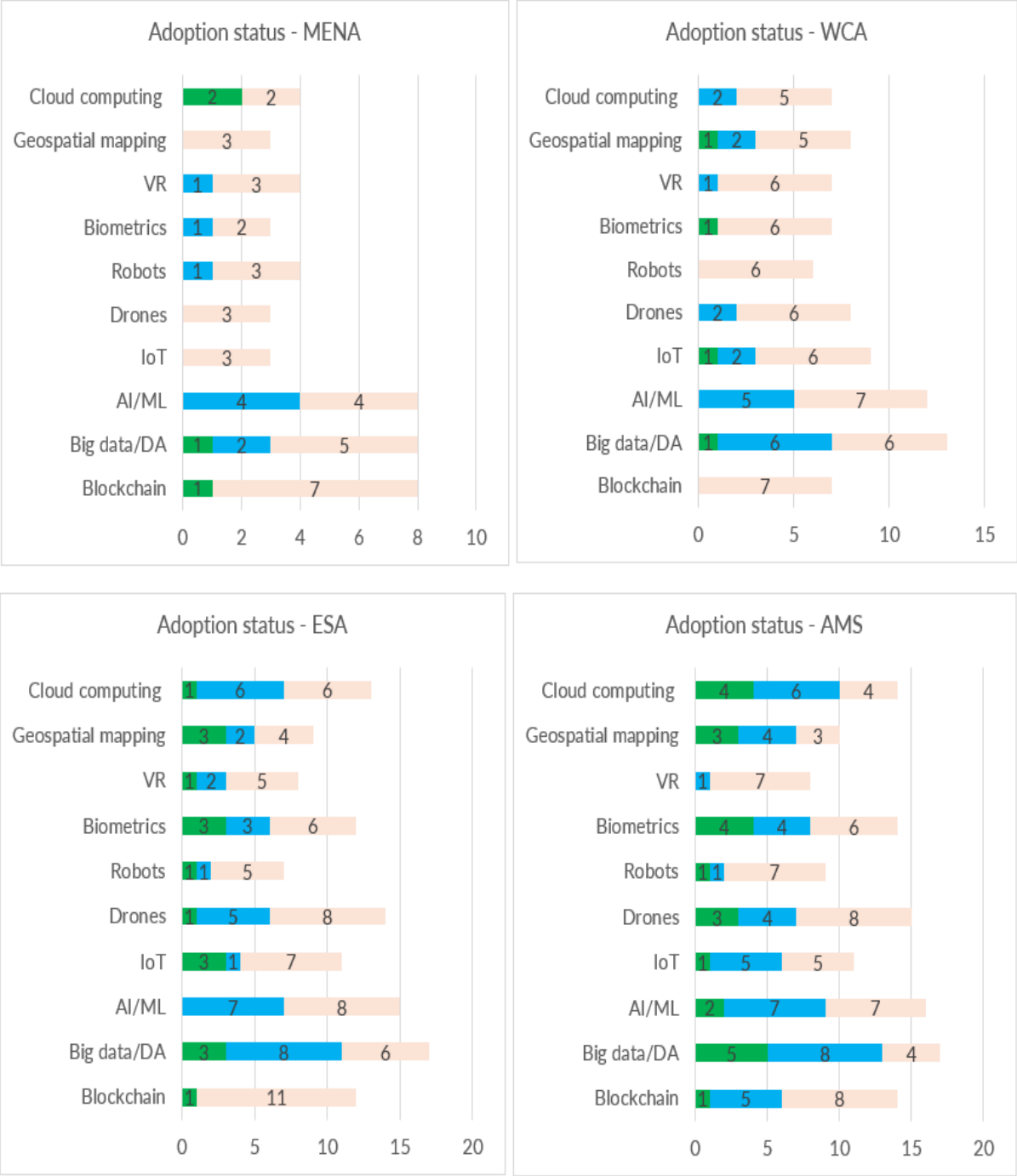




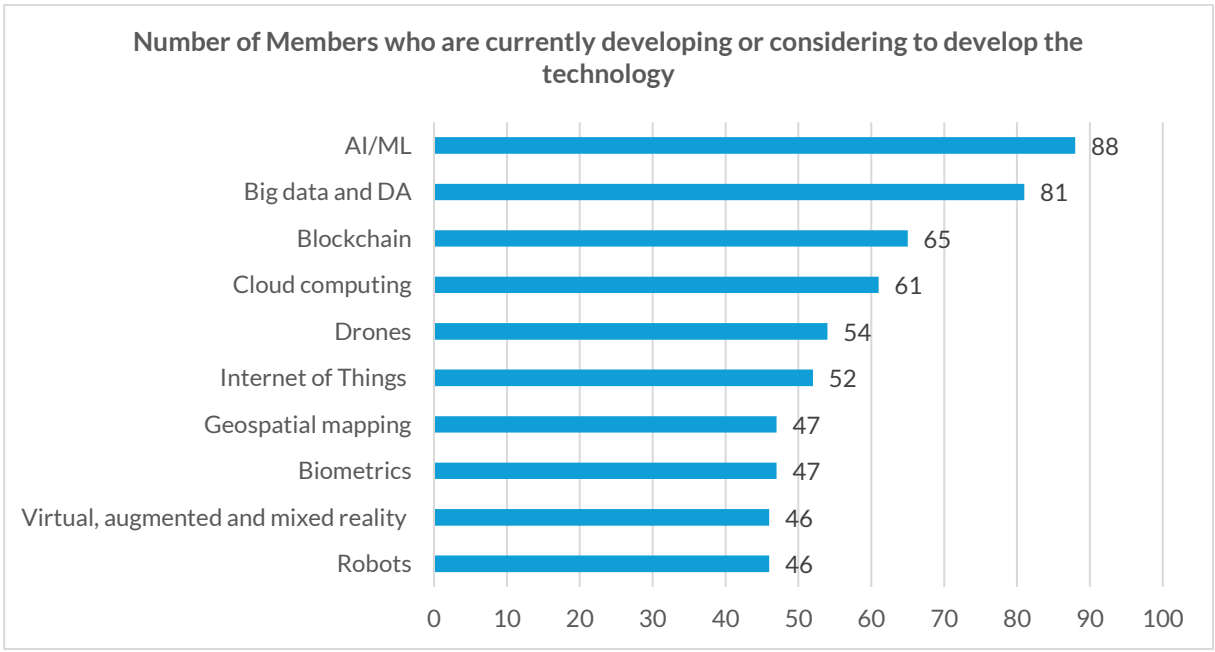
The regional context can significantly influence the general environment for technology adoption, including factors such as economic development, infrastructure and policies. Therefore, the regional breakdown of the adoption status of different technologies is presented to provide more granularity and enable more contextual evaluations, addressing the digital divide.







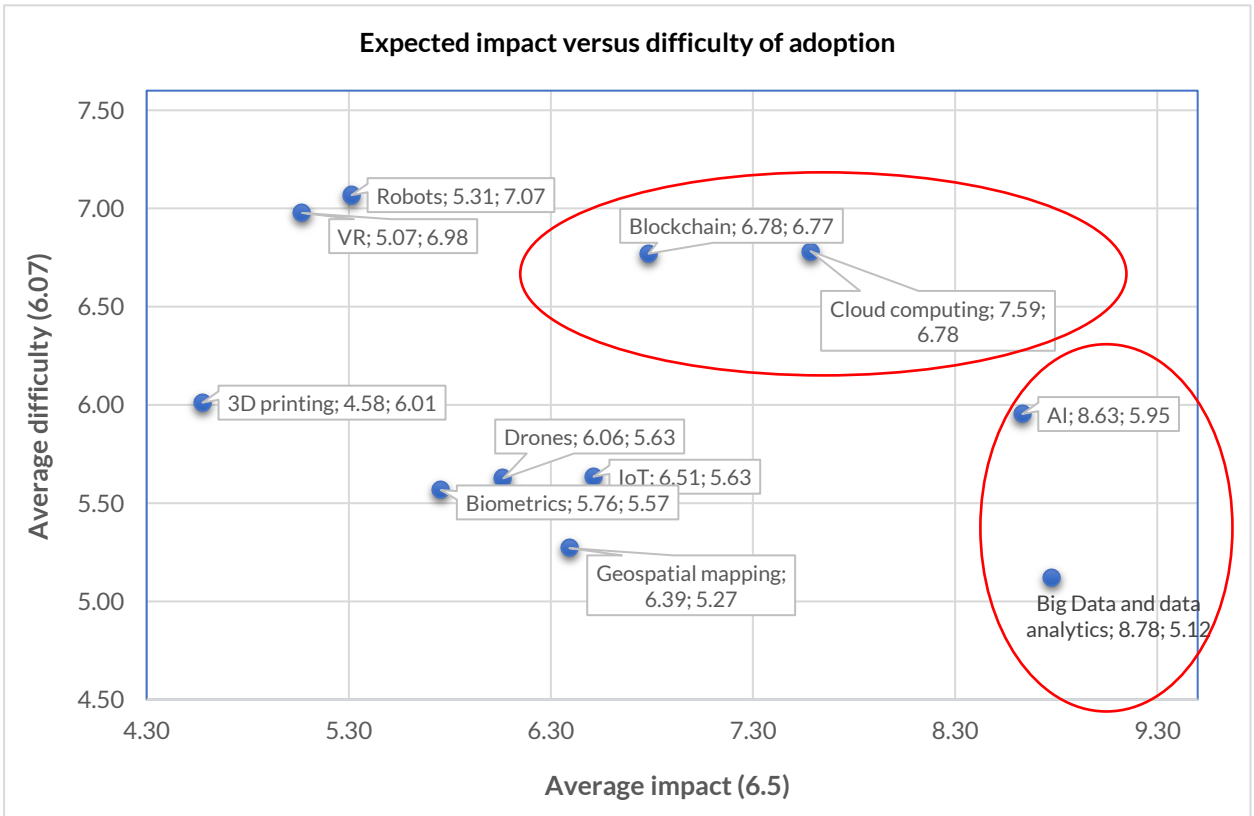
The technologies that seem to have the biggest **development potential** (under development or under consideration) are AI/ML, followed by big data and DA, blockchain and cloud computing.

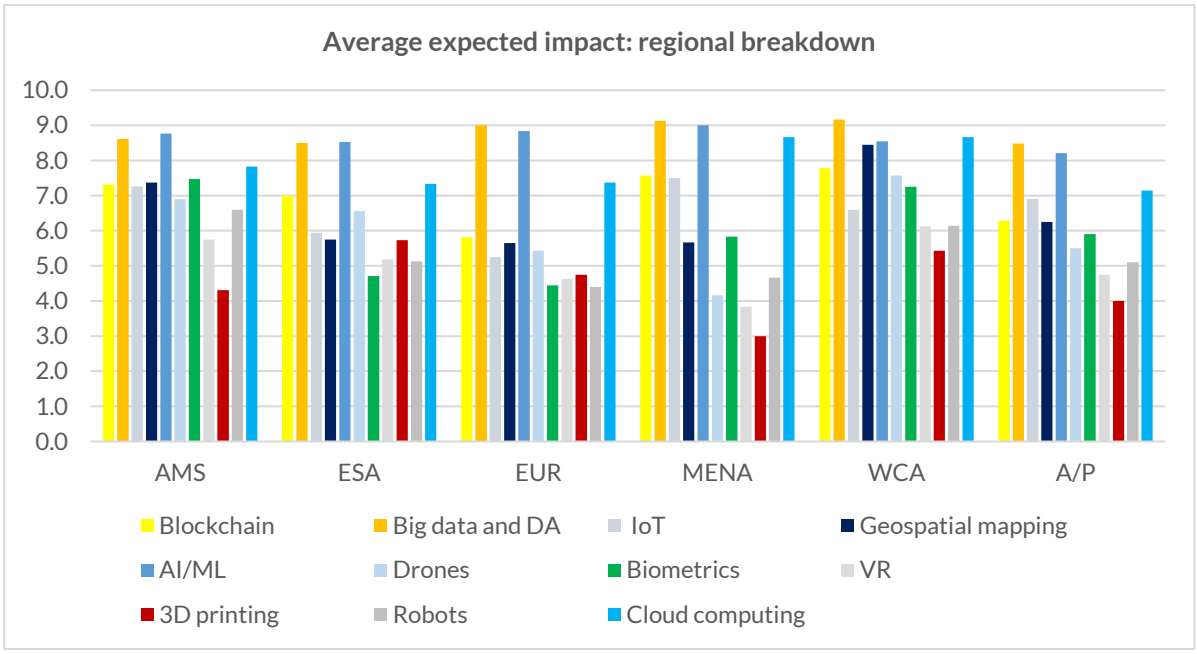


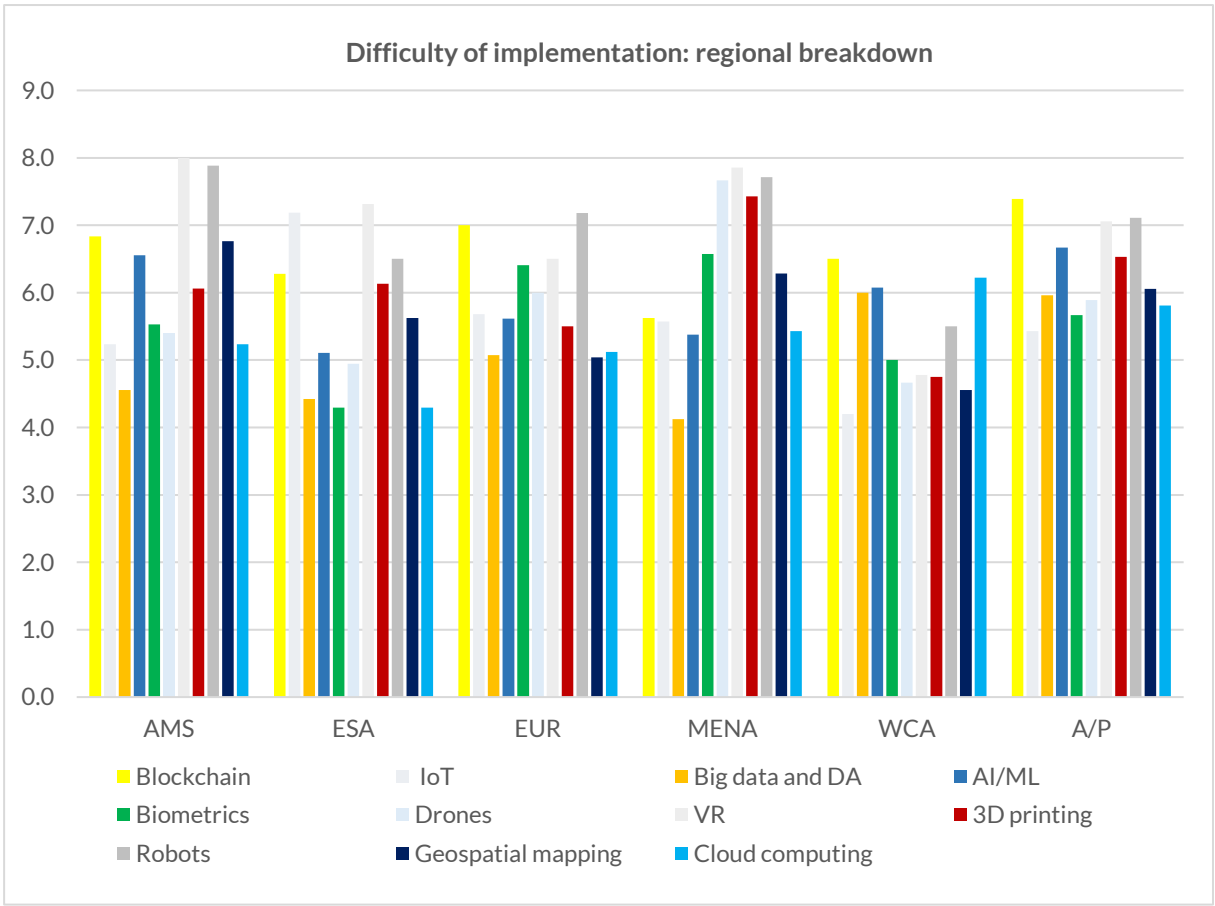
IV. Expected impact and difficulty of adoption

AI/ML and big data and DA appear to be the technologies with the highest expected impact and with relatively moderate difficulty scores.

Blockchain and cloud computing have been reported as having a higher level of difficulty of adoption, while still having a substantial estimated impact. Regional breakdowns are also presented below.




Average expected impact: regional breakdown
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
AMS
ESA
EUR
MENA
WCA
A/P
Blockchain
Big data and DA
IoT
Geospatial mapping
AI/ML
Drones
Biometrics
VR
3D printing
Robots
Cloud computing


Difficulty of implementation: regional breakdown
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
AMS
ESA
EUR
MENA
WCA
A/P
Blockchain
IoT
Big data and DA
AI/ML
Biometrics
Drones
VR
3D printing
Robots
Geospatial mapping
Cloud computing

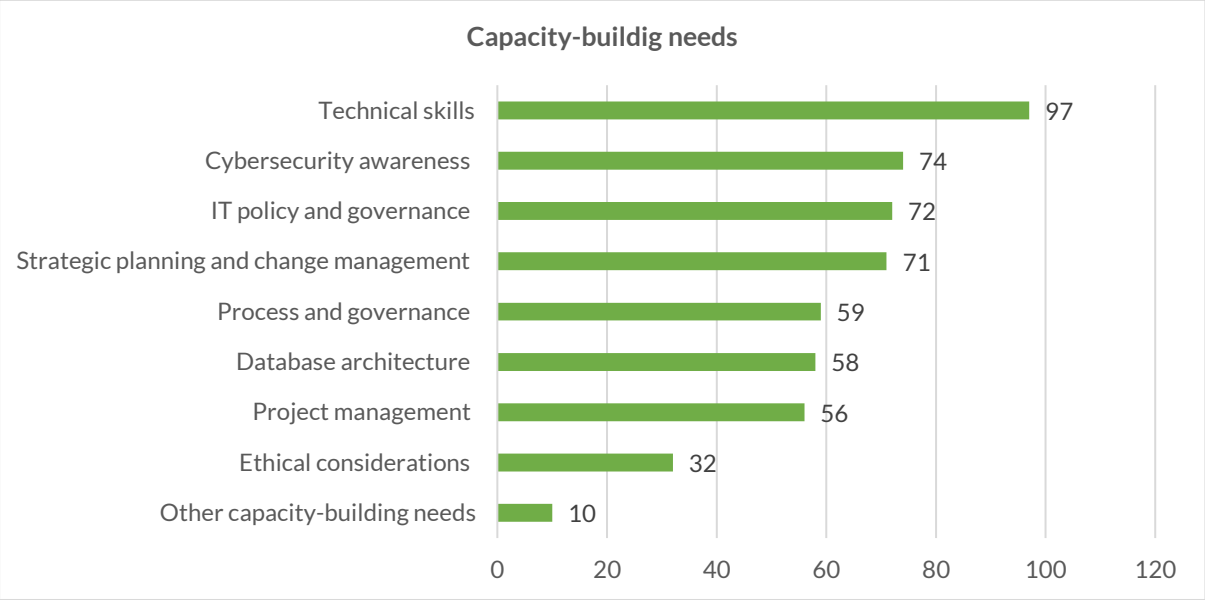
V. Adoption of technology to improve Customs performance

The uptake of technology is contributing or expected to contribute to advancing Customs performance, primarily in areas related to trade facilitation and economic competitiveness, as well as enforcement, security and protection of society, and less so in the areas of revenue collection and organizational development.[1]

[1] Reference is given to the WCO Performance Measurement Mechanism: https://www.wcoomd.org/en/topics/capacity-building/instrument-and-tools/pmm.aspx

VI. Capacity building

Technical skills; cybersecurity awareness; IT policy and governance; strategic planning and change management are the top four areas where Members reported capacity-building needs, followed by database architecture; process and governance; project management; and ethical considerations.

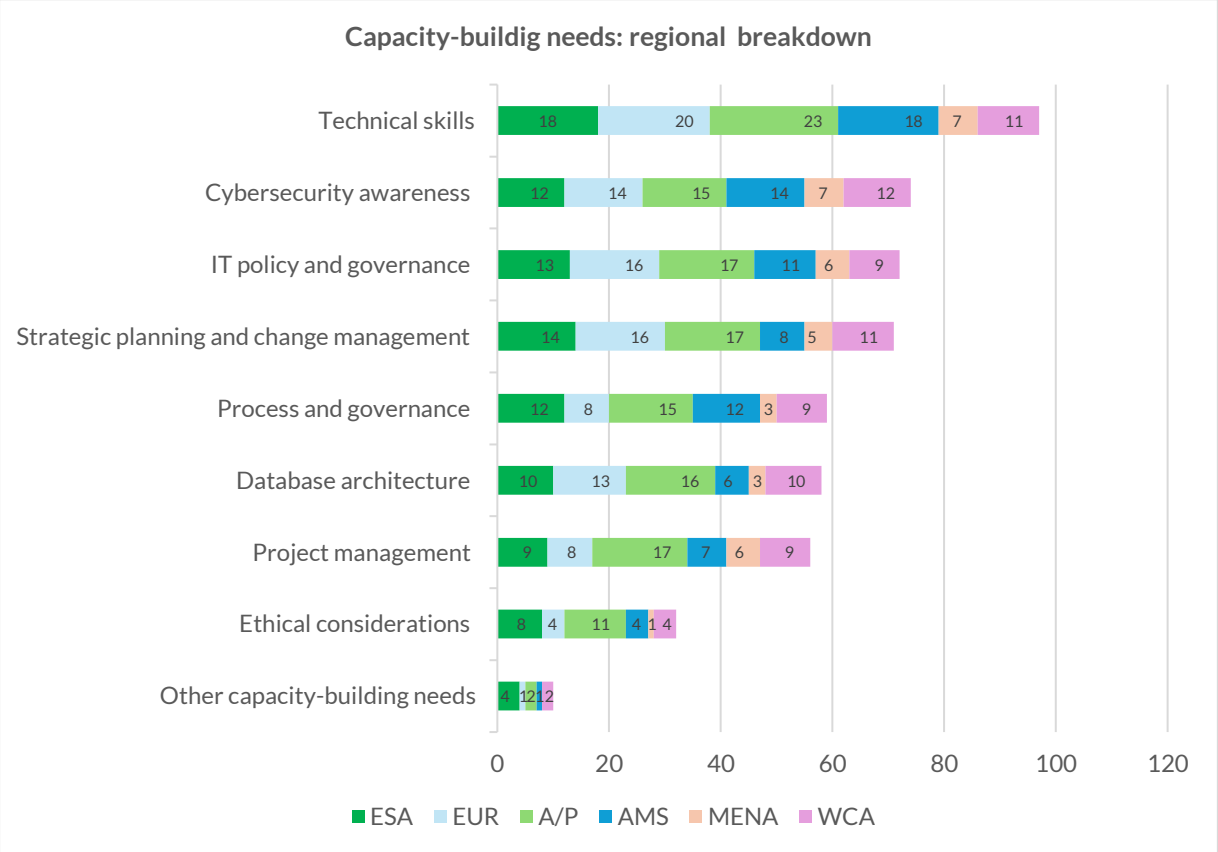


Technical skills	Developing specific competencies required to implement, maintain and optimize new technology solutions effectively.
Cybersecurity awareness	Understanding and mitigating threats and vulnerabilities associated with new technologies to protect data and systems from cyberattacks.
IT policy and governance	Creating and enforcing policies and frameworks to govern technology use in support of the administration's strategic goals, ensuring compliance and security within the administration. These policies ensure accountability in technology implementation, guide the allocation of resources to critical technology projects, and support innovation.
Strategic planning and change management	Aligning technology adoption with organizational goals and managing the transition process to ensure stakeholder engagement and support.
Database architecture	Designing and managing databases to optimize data storage, retrieval and management for new technology solutions.
Process and governance	Establishing procedures and policies to systematically and transparently manage decision-making on technology adoption, performance monitoring and compliance. Streamlined processes facilitate technical adoption and support change management. Well-defined processes help in identifying potential risks early, allowing for the development of mitigation strategies to prevent technology adoption failures. Governance structures enable the establishment of performance metrics and key performance indicators (KPIs), facilitating the monitoring and evaluation of technology adoption success.
Project management	Planning, executing and overseeing technology projects to ensure timely, within-scope and budget-compliant completion.

Ethical Considerations	Understanding and addressing the moral implications and societal impacts of adopting new technologies.

Other reported capacity-building needs are: digital signatures; enterprise architecture; administration of networks and systems; multiprotocol label switching (MPLS) networks; storage systems; Oracle databases; MicroStrategy; backup and recovery; data modelling; IT management; funding for research and development; document forensic analysis; funding organizational priorities; business understanding combined with a vision and technical understanding (mediator); management support and willingness to take risks; change management; legal bases; creating understanding or presenting complexity in a simple and understandable manner; simple acquisition for pilot tests; and applications of AI and big data in a tax administration.

The regional breakdown below provides further details about the relevance of the different capacity-building needs in different contexts.



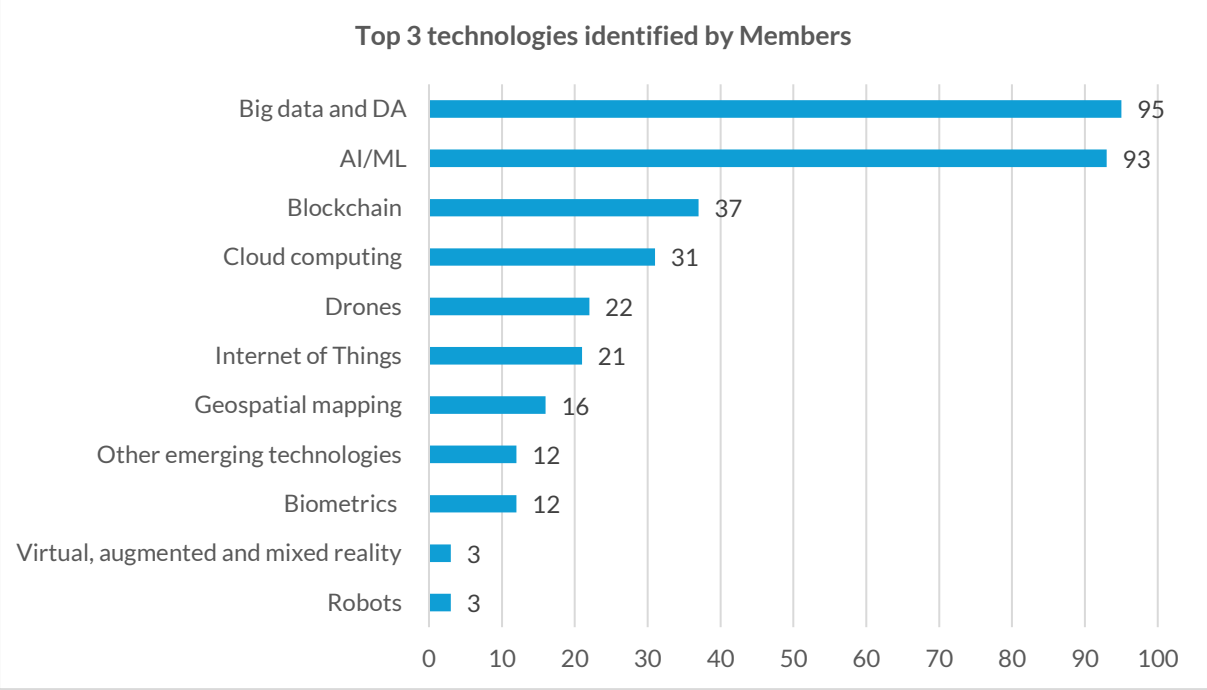
VII. Selection of the technologies in focus

One of the aims of the WCO Smart Customs Survey was to define up to three technologies as the focus of the Project, and on which the Project team would prepare detailed reports about the minimum technical specifications (for implementation/integration), costs and trends, as well as use cases, business processes, policy arrangements, and legal requirements.

To this end, Members were asked to identify the top three key technologies/application of different technologies that might be adopted by their administration in the near future, and which they would like to see as the focus of the Smart Customs Project.
The top three technologies identified by Members were:

- Big data and DA
- AI/ML
- Blockchain

The selection reflects the technologies with the highest 'development potential', bringing together technologies that Members are planning to develop or are considering for development.



The choice of the three technologies to be looked at in focus is also **borne out by other evidence from the Survey**, relating to the estimated impact of the technologies and their difficulty of adoption: AI/ML and big data and DA appear to be the technologies with the highest expected impact and with relatively moderate difficulty scores. Blockchain and cloud computing have been reported as having a higher level of difficulty of implementation, while still having a substantial estimated impact.

In addition, for reasons of efficiency, when selecting the three technologies *in focus* one should bear in mind that the **Project scope should not duplicate other existing WCO tools or concurrent WCO activities and programmes**.

As a result of the above-mentioned considerations, **the technologies in focus will align with Members' preferences regarding the top three technologies which also have the greatest development potential and for which there is no overlapping of efforts with other WCO activities and programmes. These technologies are:**

- **Artificial intelligence/machine learning, including relevant components of big data and data analytics**
- **Blockchain**
- **Cloud computing**

All the other technologies that will not be in focus will be addressed by the Project team through updates of the Study Report, as well as through discussions via the Community Portal and regional workshops.

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