

# Digital Landscape Assessment



Republic of Iraq



# Assessment Report

Digital Landscape Assessment of Iraq

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# Glossary

## Abbreviations

3G	Third generation of wireless mobile telecommunications technology
CERT	Computer Emergency Response Team
CIO	Chief Information Officer
CIRT	Cyber Incident Response Team
COMSEC	Council of Ministers Secretariat
COVID-19	Novel Coronavirus (2019-nCoV)
GDP	Gross domestic product
eGA	e-Governance Academy Foundation
ICTs	Information and Communication Technologies
ID	Identification
IT	Information Technology
L3 / L4	Level 3 / Level 4
NGO	Non-governmental organization
PPP	Public-Private Partnership
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme

## Terms

application	software that is dependent on the services of an operating system
Certification Authority	a trusted entity that manages and issues digital certificates and public keys that are used for secure communication in a public network
cybersecurity	(a) the security of cyber devices and (b) security against threats created through the operation of cyber devices. Security usually means a situation where risks are not materialized
data	reinterpretable representation of information in a formalized manner suitable for communication, interpretation, or processing
data exchange	Data exchange storing, accessing, transferring and archiving of data
digital identity	a set of data and software, protected with cryptographic means
digital signature	signature based upon cryptographic methods of originator authentication, computed by using a set of rules and a set of parameters such that the identity of the signer and the integrity of the data can be verified
e-governance	electronic governance, the application of information and communication technology (ICT) for delivering government services, exchange of information, communication transactions, integration of various stand-alone systems and services between government-to-customer (G2C), government-to-business (G2B), government-to-government (G2G) as well as back-office processes and interactions within the entire government framework

## Terms

e-government	using the tools and systems made possible by information and communication technologies (ICTs) to provide better public services to citizens and businesses
e-services	library services delivered via electronic means, whether from local servers or provided via networks
interoperability	ability of two or more systems or components to exchange information and to use the information that has been exchanged
open data	data that can be freely used, re-used and redistributed by anyone without restrictions from copyright, patents or other mechanisms of control
personal identity number	numeric code used to authenticate an identity
Public Key Infrastructure	a set of roles, policies, and procedures needed to create, manage, distribute, use, store, and revoke digital certificates and manage public-key encryption
trust service	an electronic service normally provided for remuneration which consists of: (a) the creation, verification, and validation of electronic signatures, electronic seals or electronic time stamps, electronic registered delivery services and certificates related to those services, or (b) the creation, verification and validation of certificates for website authentication; or (c) the preservation of electronic signatures, seals or certificates related to those services”.

## Executive Summary

UNDP Iraq Country office, building on its response to the COVID-19 pandemic, is seeking to extend its support to the Government to digital transformation services. While the government is working to tackle the social and economic impacts of the pandemic, it is looking at opportunities to promote a strong, sustainable, and inclusive recovery.

Digital transformation has become an imperative in the face of the crisis. Travel bans, physical closure of schools, workplaces, and businesses, the increased need for the provision of online services due to the lockdown restrictions imposed (e.g. healthcare services) have prompted countries to turn to digital solutions to be able to operate effectively. With the widespread lockdowns and uneven access to the internet, the digital divide has become more significant than ever.

The prospects of economies in the region for a strong, inclusive, and sustainable recovery, aligned to Agenda 2030 and its SDGs, will depend on how effectively governments leverage digital technologies and govern their interplay with major trends, including the changing nature of work, demographic transition, climate change, and urbanization. Governments also need to ensure access to reliable and affordable internet for all.

Firstly, UNDP and the Government of Estonia are collaborating on efforts that support digital transformation as a sustainable development pathway in the region. The cooperation will leverage both the longstanding digital evolution and expertise of Estonia alongside UNDP’s track records to support for, and sustained investments in sustainable development globally and in the region.

As a critical component of this cooperation, UNDP and Estonia’s e-Governance Academy (eGA) developed a Digital Landscape Assessment tool to support countries to assess their digital landscape within the framework of the SDGs and identify digital entry points for acceleration towards the SDGs. The overall aim of the tool is to support countries in the development of their digital transformation roadmaps, as well as inform their national development plans and sector strategies.

The Digital Landscape Assessment (DLA) includes three sub-components:

1. Rapid Integrated Assessment (RIA)
2. Digital Maturity Assessment (DMA)
3. Accelerator and Bottleneck Assessment (ABA)

The analysis drawn from the application of the DLA can inform the development of Iraq's national/sub-national development plan, a mid-term review of a plan, the development of sector strategies, and the development of a country's digital transformation roadmap.

UNDP conducted the Rapid Integrated Assessment (RIA) which assesses the alignment of digital targets with relevant SDG targets within the Republic of Iraq's planning documents. The objectives of the assessment were to identify gaps in alignment and opportunities for digital interventions, the landscape of entities responsible for implementation of the digital/ICT targets, and the balance of the identified digital targets across the five dimensions of sustainable development (people, planet, prosperity, peace, and partnership). The aim of the assessment is to inform the development of the next national development plan and sector strategies of the Republic of Iraq, as well as the development of its digital transformation roadmap.

The assessment analysed 16 planning documents (Vision 2030, COVID-19 Recovery Plan, Private Sector Development Plan, etc)<sup>1</sup>, finding that 37% of the ICT/digital relevant targets are covered within the documents, with 65 indicators out of 131 assessed (50%)<sup>2</sup>. Of these 65, only 49 have aligned on digital means to address the goals in question. Moreover, in terms of ICT/digital relevant targets' alignment with the five dimensions of sustainable development, the analysis found overall a mixed alignment with all five dimensions, with only People having over a 50% alignment rate (51%), Planet, Prosperity, and Peace having far less (43%, 32%, and 18% respectively), and Partnerships having no alignment.

However, despite these figures, there are opportunities identified by UNDP within the planning documents to further expand existing or proposed digital means to the uncovered targets. Therefore, to conclude, a set of recommendations have been provided in the RIA to integrate key digital targets into the Republic of Iraq's planning documents.

As a second step, experts from the e-Governance Academy carried out the Digital Maturity Assessment (DMA) of Iraq from December 2020 until August 2021.

<sup>1</sup> See Annex 1

<sup>2</sup> Digital goals were not assessed for Goals 1.1, 2.1, 2.4, 2.5, 2.5b, 2.5c, 3.3, 3.4, 3.6, 3.7, 3.9b, 4.1, 4.2, 4.4, 4.5, 4.6, 4.7, 4.7b, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.6a, 5.6b, 5.6c, 7.2, 7.3a, 7.3b, 8.1, 8.2, 8.3, 8.4, 8.5, 8.7, 8.8, 8.9, 8.10, 8.10a, 8.10b, 9.1, 9.3, 9.4, 9.5, 9.5a, 9.5b, 10.3, 10.4, 10.6, 10.7, 10.7a, 10.7b, 10.7c, 11.2, 11.3, 11.5, 11.6, 11.7a, 11.7c, 12.1, 12.2, 12.3, 12.4, 12.6, 12.8, 12.8a, 12.8b, 12.8c, 13.1, 13.3a, 13.3b, 14.3, 14.4, 14.5, 14.6, 14.7, 14.7a, 14.7b, 14.7c, 15.1, 15.2, 15.3, 15.4, 15.6, 15.7, 15.8, 15.9, 15.9b, 15.9c, 16.1, 16.3, 16.5, 16.6, 16.7, 16.8, 16.9, 16.10, 16.10a, 16.10b, 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8, 17.9, 17.10, 17.11, 17.12, 17.13, 17.14, 17.15, 17.16, 17.17, 17.18, 17.19

This second component of the DLA is the result of desk research, assessment of public documentation and written survey results. Dedicated interviews were conducted with the following stakeholders:

1. Council of Ministers Secretariat (COMSEC) (3 August 2021)
2. Ministry of Planning (4 August 2021)
3. Ministry of Justice Real Estate Dep (5 August 2021)
4. Ministry of Higher Education (9 August 2021)
5. Ministry of Justice IT Dep (9 August 2021)
6. Federal Public Service Council (10 August 2021)
7. Borders Port Authority (11 August 2021)
8. Committee on ICT Training & International Relations (16 August 2021)
9. Baghdad Municipality (19 August 2021)
10. Central Bank of Iraq (23 August 2021)

The DMA assesses the maturity of the Iraqi public sector in 14 e-government domains and proposes recommendations based on world-wide best practice, which would help Iraq to move towards more mature levels of e-government. It will also provide a basis for the definition of further roadmaps for digitalization.

The analysis focused on 14 areas of e-government:

1. Political will and support
2. Coordination
3. Financing model
4. Legal framework
5. Data, digital databases
6. Interoperability, secure data exchange
7. Secure digital identity and digital signature
8. Digital skills
9. Access to services, awareness-raising
10. E-participation, e-democracy
11. Information security
12. Telecommunications and digital infrastructure
13. Emerging technologies, innovation
14. International cooperation

The maturity of the Iraqi public sector was assessed as 'basic' in each of these focus areas, even if in several categories only some of the criteria of the 'basic' level were met.



To reach the next level in digital transformation, it is recommended to implement a series of recommendations. The recommendations are outlined under each sub-topic, but 9 of the most critical recommendations are presented below as key recommendations.

1. Long-term digital government strategy
2. Management and coordination of digital government
3. Systematic legal analysis
4. Consistency of public ICT funding
5. Digital data and interoperability
6. Cybersecurity
7. Access to basic ICT infrastructure
8. Identity & access to services
9. Digital skills

For each of these recommendations, a high-level agreement is needed on the ultimate objective, target group, activities to be undertaken, together with an implementation plan including measurable objectives, responsible actors, and a timeline.



# Key recommendations

## 1. Long-term digital government strategy

To address the absence of fundamental e-government policy and implementation mechanisms, the government should develop and adopt a long-term digital transformation strategy at the political level, which would ensure consistency in public ICT funding, and define the organizational setup for its implementation (e.g. CIOs in place at each ministry and larger public authority).

This should entail a high-level digital transformation strategy that would envisage key elements and structures of the digital governance system (incl. digital government coordination, enterprise architecture, interoperability framework, legal review, etc.), a detailed funding and implementation framework as well as a vision for guaranteeing the basic infrastructure for all counterparts. Additionally, ensuring a dedicated central planning institution and encouraging cooperation between government institutions would be essential for the upcoming years. Based on this high-level strategy, key institutions can draft their own strategy for digital transformation. Budget composition should not be the main coordination instrument. Shifting from ad hoc funding-based development to long-term strategic planning allows for cooperation and integration between the institutions and more cost-effective and innovative solutions. Planning should be arranged based on two tiers - strategic vision and implementation plans (including budget planning). Furthermore, the government should develop a strategic communication plan for digital governance and new e-services (with clear responsibilities and coordination).

## 2. Management & coordination

To have better visibility and coordination of digital transformation issues, a review of the roles and structure of the E-Government Committee (Committee 22 of 2020) should be undertaken to achieve improved integration of the representatives from ministries and other government institutions in the activities and specialized tasks of the committee.

The coordination framework should among other components entail regulation for establishing a sustainable (preferably non-political) institution for e-government coordination. A clear politically defined position of leadership in the governmental system allows for clear communication and a more streamlined coordination among other institutions. An effective collaboration scheme should encompass participation from the business, academic and civil society sector and be continuous in nature.

Furthermore, the management and coordination of digital transformation should be assessed at the level of ministries. To have a more strategic and coordinated approach to digital transformation in the public sector, the role of Chief Information Officers in

ministries and agencies should be defined and a framework for government CIO cooperation should be provided.

The cooperation framework should provide a strong official structure for government CIOs' cooperation, ranging from collaboration within each larger organization, horizontally between institutions, and also regionally with remote units and branches. Regular training of CIOs should be foreseen to further raise their awareness of digital transformation and the role of CIOs, but also to further their capacities to develop and implement projects, conduct procurements, etc.

Finally, the structure of all government institutions for their preparedness to adopt modern technology and procedures should be reviewed.

## 3. Systematic legal analysis

Considering that the adoption of many important legal acts is still pending and not all existing acts take the nuances of digital governance sufficiently into account, a systematic legal analysis on basic e-governance legal building blocks should be conducted and missing legal provisions should be adopted.

This analysis should be organized before undertaking the long-term strategy formulation process. The analysis would offer an understanding of basic legal acts and needed amendments in existing regulation that are necessary for moving forward with any e-governance plans. It would be valuable to include specialized IT law experts in the process. It is vital to adopt laws on personal data protection, right of access to information, telecommunications, and introduce necessary amendments to other legal acts, based on consultations with a wide range of stakeholders (other ministries, academia, civil society organizations, etc.). In addition, law implementation mechanisms need to be foreseen and adopted.

A legal review team should be established to conduct this review and work on developing legislation related to digital governance. There should be specific criteria set for the profiles of experts included in the legal review team. External consultants and international bodies can be involved in the process for expertise and mediation, as needed.

The opportunities for participation and e-participation are limited for the citizens, as there is a lack of effective mechanisms for citizens to express their views and hold the government responsible. A legal understanding of citizens' participation in governance and basic open government principles should be analysed and established.

Enhancing access to public information, participation, transparent procedures and public engagement in the administrative process is not exclusively based on digitalization and electronic instruments but should first be seen as a fundamental understanding of

public inclusion and providing meaningful feedback on governmental services. There are civil society organizations in Iraq whose mission is to promote human rights, citizen participation and support the fight against corruption. Such organizations should be more tightly involved in the legislation drafting progress and in cooperation mechanisms with the public sector. Furthermore, the government should find financial means to support these activities.

#### 4. Consistency of public ICT funding

Consistency of public ICT funding has to be ensured, as government authorities are currently struggling with having the necessary digital development costs approved and there is a lack of basic infrastructure in many institutions.

Sporadic funding and conflicting expectations of the institutions for financing their planned development projects significantly curb the digital transformation process and development progress. All funding decisions have to be based on long-term planning and implementation strategies. According to best practice, the digital transformation budget of an institution should amount to at least 1 per cent of the overall budget to offer minimal funds for sustainable development. Donor financing can complement the national budget but must be adequately coordinated.

To raise the level of public trust in government institutions, the ICT budgeting process and the budget structure in every institution has to be clear and transparent. A comprehensive review of software and hardware needs of public institutions would provide input to the sustainable planning of investments and maintenance costs.

Budget transparency includes, among others, procedural standardization, cooperation, and participation of relevant stakeholders, as well as implementing processes that are based on existent instrumental political and technical development plans. Public trust in the institutions is enhanced through transparent processes and accountability in the budgeting process, which in turn allows for sustainable development and service improvement. Additionally, the foreign donor funding component has to be clearly determined in the budget structure.

#### 5. Digital data and interoperability

Government organisations in Iraq are still largely operating in paper, there is no overview of available public data and no data collection principles in place. Data has to be collected and managed in digital form, which would allow for an interoperability framework to be developed.

Digitization of existent paper documents and data should be prioritized as this constitutes the basic requirement for data-driven development. Focus should be placed

on the digitization and inventory of mandatory basic data on the population (i.e. the civil registry), companies, and land and property.

To implement the technical interoperability framework, public administrations must be willing to share their data and service components with others by default. Re-use and sharing of information naturally lead to collaboration, i.e. working together towards mutually beneficial and agreed common goals but also to optimization of resources, time, and processes. An interoperability implementation and management regulation with a defined responsible governmental institution should be established.

Currently every authority has their own principles regarding data formats and use, hindering cross-institutional cooperation and data-driven decision-making. A universal data management regulation has to be established and a data collection audit conducted.

Data usage, access and ownership rules have to be determined as a basic requirement for the practical functioning of e-governance. Data in data centres have to be managed based on established and supervised principles, including rules on cybersecurity, data protection, and secure database management. The government should have a clear overview of what type and content of data is collected across all institutions. A meta-data component has to be associated with the collected data for providing basic possibilities for interoperability and defining characterization. This would open a fundamental opportunity for informed data usage and cross-institutional exchange.

#### 6. Cybersecurity

The lack of a coherent information security policy for the public sector hinders the provision of electronic services. A cybersecurity strategy should be developed and cybersecurity requirements should be established by legislation for all public sector authorities, together with designating a competent authority for supervision.

The government CERT should be reinstated and tasked with the management of and reporting on security incidents, together with improving visibility of their activities for general awareness-raising.

Critical infrastructure must be clearly defined, and minimum cybersecurity requirements should apply not only to public sector authorities, but to all providers of vital services. Digital service providers and operators of essential services should have an obligation to notify appointed government authorities of any cybersecurity incidents. As part of the analysis, specialized institutional responsibilities and any needs for legal amendments should be determined, including the need for centralized threat management and international cooperation strategies.

Digital service providers and operators of essential services should have an obligation to notify appointed government authorities (i.e. the CERT) of any cybersecurity incidents.

## 7. Access to basic ICT infrastructure

Missing or insufficient infrastructure components at government institutions is one of the main challenges faced when advancing and establishing electronic services and facilitating cross-institutional communications. All public institutions need to have access to basic infrastructure (including cybersecurity) components.

In particular, this includes access to stable and affordable basic services such as electricity, Internet access, or cellular network coverage, but also funding for internal hardware and software needs, including data management and information storage demands. In terms of basic cybersecurity needs, meaningful funding should be available for personnel, additional training programmes for all public officials, and crucial infrastructural components. To this end, ministries should provide the appropriate central institution (e.g. the e-Government Committee) with a complete inventory of the ICT infrastructure and equipment needs (for both the ministry and its institutions and branches) to effectively partake in digital governance. Possibilities for integrating international best practice for PPP in ICT infrastructure management should be explored.

A concept of the National Data Centre (and possible secondary data centres) and a national strategy for cloud services should be developed together with an analysis to identify the public sector's needs for hosting data.

## 8. Identity & access to services

A major drawback to the digital transformation and development of e-services in Iraq is the absence of a unified national identity register, which would give the government a clear understanding of the country's population and would allow identifying the customers using public services. Personal data management should be integrated with the National ID framework, and cooperation with the private sector promoted.

A unique identifier should ideally be assigned from birth and later linked to the National ID, allowing for life cycle usage. The National ID should become the primary identification structure in governmental services, providing the possibility for reliable authentication of persons. Only after a relative increase in the National ID uptake, further possibilities can be explored to offer services based on a digital identity token. The government should encourage cooperation with banks, telecommunications service providers, etc. for additional incentives for establishing remote identification and digital identity use cases.

## 9. Digital skills

There is a lack of digital skills especially among youth, because the curricula at different levels of education do not yet meet the requirements of a digital economy and a digital society. Strengthening of digital skills should be mainstreamed across curricula at all levels and public awareness campaigns should be held also outside the public sector.

The Ministry of Education should review and revise the curricula for primary, intermediate and secondary schools that would include topics on optimal use of ICT technology and the protection of personal data in an online setting. Assistance of international experts could be involved to this end.

The government should engage in public awareness campaigns and building digital skills also outside the public sector. Digital transformation is not possible without conscious and informed users of public e-services. Emphasis should be put on promoting digital hygiene, averting cyber risks, and popularizing remote communication means. Training courses should be organized for government officials, which contain components on complementing their ICT and digital skills and understanding of cyber hygiene. A boost in overall digital skills of civil servants helps enhancing the basic level of understanding necessary for implementing e-governance measures in the public sector.

Lastly, the third component of the DLA, the Accelerator and Bottleneck Assessment (ABA), was undertaken by the UNDP team. The main objective of the ABA was to map key digital interventions being implemented across the Republic of Iraq, identify bottlenecks to implementation, and recommend possible solutions to these bottlenecks. The assessment required a review of the above listed 18 national strategic documents.

Bottlenecks to implementation of key digital interventions were identified across five broad non-exhaustive categories (Policy and Planning, Budget and Financing, Service Delivery (supply), Service Delivery (demand), Cross-cutting), as well as relevant sub-categories. Some of the bottlenecks identified by UNDP include:

- Missing e-government policies and implementation mechanisms
- Lack of specific references to e-government and digital tools to support progress in education, healthcare, public services, etc.
- Lack of integrated connection between ministries' ICT budget proposals with government-level planning
- Fluctuating electricity supply
- Lack of digital skills
- Online registration being limited to one central location (Baghdad)
- Institutional non-compliance

Based on the bottlenecks identified, the report provides a set of solutions to help address these challenges and support the Republic of Iraq in advancing its digital transformation agenda.

# Digital Landscape Assessment

- Rapid Integrated Assessment

- Digital Maturity Assessment

- Accelerator and Bottleneck Assessment

UNDP has developed a tool to help countries assessing their level of preparedness for the implementation of the SDGs, the RIA analysis. The latter assesses the alignment of digital targets within the country's national development plan and sector strategies with the SDG targets.

This analysis constitutes the first step in building a national SDG roadmap or action plan, reviewing national development plans, as well as existing sectoral strategies, in order to:

- Assess the level of alignment of digital/ICT targets (at national and sub-national level as required) within the national development framework, including sector strategies, with the SDG targets, and identify the gaps thereof and opportunities for digital interventions.
- Identify relevant digital/ICT indicators as captured in development plans/sector strategies.
- Identify landscape of entities with responsibility on specific ICT/digital targets.
- Assess balance of digital targets addressed in a country's development planning framework across the five dimensions of sustainable development--people, planet, prosperity, peace, and partnership.
- Inform the development of the next Iraq's national development plan and sector strategies, as well as the development of its digital transformation roadmap.
- Identify instruments, data systems, data availability for a structured SDG monitoring progress.

In terms of key outputs, the RIA includes:

- An SDG/Digital Landscape profile card
- Recommendations based on the ICT/digital gaps identified

# 1.1. Methodology

Using the principle of Universality as the anchor to localize the 2030 Agenda, the RIA analysis was carried out to assess the level of alignment of national development planning documents with the ICT/digital relevant SDG targets; the 16 planning documents were reviewed based on how they incorporate the principles of (i) policy integration, and (ii) no one left behind. To proceed with the RIA exercise and review how many digitally relevant targets are covered by the national planning documents, there was a selection of relevant SDG targets for Iraq's digital strategy. SDG targets might be reflected under any of the following categories:

- ❏ **Not relevant/not applicable:** the SDG target is not relevant for Iraq's development of a digital strategy, or it relates to governance issues that have to be solved at the regional or global level.
- ❏ **Target covered:** presence of ICT/digital relevant target(s) in the national planning documents equivalent to the ICT/digital relevant SDG target. Covered targets can have a full or partial alignment with the SDGs:
  - Full alignment: the digital target found in the national planning document corresponds fully, in narrative, scope and ambition, to an ICT/digital relevant SDG target.
  - Partial alignment: the digital target found in the national planning document corresponds only partially to an ICT/digital relevant SDG target, meaning either in scope or in ambition.
- ❏ **Target not covered:** absence of a digital target in the national planning document which is equivalent to the ICT/digital relevant SDG target.

Each SDG contains two types of targets: "issue" targets, identified with numbers and "means of implementation" targets, identified with letters<sup>3</sup>.

For instance, to address the no-one left behind principle, the RIA looks at whether the word and concept of 'inclusion' is contained in those national digital targets which reflect the ICT/digital relevant SDGs. In this case, 'inclusion' is meant in its broad definition namely referring to vulnerable and marginalized populations, including in the latter also gender marginalization. Thus, the concept of inclusion goes beyond economic empowerment, in fact the analysis considers all targets requiring disaggregating information and data pertaining the age, citizenship status, gender, or any other relevant characteristic, to allow the understanding of whether inclusiveness is tackled.

A set of guiding question have been used to determine whether the targets do address the concept of 'inclusion':

- Does the plan include indicators disaggregated and/or target group-focused indicators by sex, ethnicity, age, disability, migratory status, or geographical area?
- Do goals covered in the national plans identify relevant risks or issues related to the exclusion derived from ethnicity, age, disability, migratory status, geographical area, gender, and discrimination against women?
- Does the plan address in its objectives, targets and indicators exclusions derived from ethnicity, age, disability, migratory status, or geographical area, gender inequalities and/or discrimination against women and girls, as well as other type of exclusions related to the specific sector?

3- Each SDG contains targets relating to means of implementation, including capacity building. "Issue targets" use numbers, whereas "means of implementation targets" use lower case letters. Out of 169 SDG targets, 126 are considered as issue targets, while 43 are considered as means of implementation targets. Although all targets in SDG 17 refer to means of implementation, in practice, and for the purpose of the RIA analysis, they are considered as issue targets.

# 1.2.RIA Results

Based on the review of sixteen (16) planning documents (see Annex 1) and, as presented in Table 1 and Figure 5, Iraq was found to be covering 37% (Total + Partial alignment) of the ICT/digital relevant SDG targets. Out of 169 SDG targets, 131 are found to be relevant targets for Iraq's digital strategy. Among these ICT/digital relevant targets, 93 are identified as "issue" targets, and 38 as means of implementation.

Table 1 also shows the percentage of covered ICT/digital SDG targets with indicators assigned, which translates the indicator alignment ratio to the goals and objectives identified in Iraq's national development plans. Looking closely, except for a few SDGs, this ratio is generally inferior to the coverage of ICT/digital relevant SDG targets. SDG coverage with indicators is superior to 70% for SDGs 1 (No Poverty), 4 (Quality Education), 5 (Gender Equality) and 6 (Clean Water and Sanitation). On the contrary, the remaining SDGs remained below this threshold.

When combining total and partial alignment, Iraq has achieved good coverage of three SDGs: 86% for SDG 1 (No Poverty), 93% for SDG 3 (Good Health and Well Being), 75% for SDG 6 (Clean Water and sanitation).

When analysing how the ICT/digital relevant SDGs and targets are covered in the national planning documents, two types of gap can be identified:

1. ICT/digital relevant SDG targets which do not have a corresponding goal or strategy within the national planning documents (ICT/digital relevant SDG targets not covered).
2. ICT/digital relevant SDG targets can be mapped, but the national targets scope and ambition are lower than the ones defined in the SDGs (ICT/digital relevant SDG targets covered, but with partial alignment).

Overall, the analysis found 82 gaps. Out of 93 ICT/digital relevant issue targets, 56 are not reflected in the planning documents. As for the means of implementation targets, out of 38 ICT/digital relevant ones the assessment found 26 gaps.

Finally, 41 targets were found to be only partially aligned. While it can be ascertained that the planning documents indicate interventions which are aligned and support the digital strategy, more can be done to operationalize the latter.

Table 1 - PERCENTAGE OF NATIONAL DEVELOPMENT PLANNING ALIGNMENT WITH ICT/DIGITAL RELEVANT SDG TARGET

	Total	%	Partial	%	none	%	Total+Partial	%	Covered	%	Uncovered	%
1 No Poverty	2	29%	4	57%	1	14%	6	86%	7	100%	0	0%
2 Zero Hunger	1	17%	2	33%	3	50%	3	50%	4	67%	2	33%
3 Good Health and Well-being	1	9%	7	64%	3	27%	8	73%	6	55%	5	45%
4 Quality Education	0	0%	3	38%	5	63%	3	38%	8	100%	0	0%
5 Gender Equality	0	0%	0	0%	7	100%	0	0%	1	100%	0	0%
6 Clean Water and Sanitation	1	13%	5	63%	2	25%	6	75%	6	75%	2	25%
7 Affordable and Clean Energy	0	0%	2	40%	3	60%	2	40%	1	20%	4	80%
8 Decent Work and Economic Development	0	0%	1	10%	9	90%	1	10%	6	60%	4	40%
9 Industry, Innovation, and Infrastructure	0	0%	2	29%	5	71%	2	29%	2	29%	5	71%
10 Reduced Inequalities	1	11%	3	33%	5	56%	4	44%	5	56%	4	44%
11 Sustainable Cities and Communities	1	11%	3	33%	5	56%	4	44%	2	22%	7	78%
12 Responsible Consumption and Production	0	0%	2	22%	7	78%	2	22%	1	11%	8	89%
13 Climate Action	0	0%	2	50%	2	50%	2	50%	2	50%	2	50%
14 Life below Water	1	25%	1	25%	2	50%	2	50%	1	25%	3	75%
15 Life on Land	0	0%	2	29%	5	71%	2	29%	4	57%	3	43%
16 Peace, Justice, and Strong Institutions	0	0%	2	18%	9	82%	2	18%	3	27%	8	73%
17 Partnerships for the Goals	0	0%	0	0%	9	100%	0	0%	6	67%	3	33%
	<b>8</b>	<b>6%</b>	<b>41</b>	<b>31%</b>	<b>82</b>	<b>63%</b>	<b>49</b>	<b>37%</b>	<b>65</b>	<b>52%</b>	<b>60</b>	<b>48%</b>

When analyzing the alignment of the ICT/digital relevant targets with the five dimensions of sustainable development with the five dimensions of sustainable development, the analysis revealed a generally fairly low alignment between the dimensions, with only People that stands out with a 51% alignment, followed closely by Planet with an alignment at 44%, as per Table 2 below.

Table 2 - ALIGNMENT PERCENTAGE OF NATIONAL DEVELOPMENT PLANNING DOCUMENTS WITH ICT/DIGITAL RELEVANT SDG TARGETS (GROUPED INTO COHERENT AREAS OR THEMES – 5Ps)

	Alignment					Indicators			
	Total	Partial	%	none	%	Total+Partial	Covered	Uncovered	%
People	4	16	41%	19	49%	20	26	7	21%
Planet	2	12	38%	18	56%	14	14	18	56%
Prosperity	2	11	28%	27	68%	13	16	24	60%
Peace	0	2	18%	9	82%	2	3	8	73%
Partnerships	0	0	0%	9	100%	0	6	3	33%
	<b>8</b>	<b>41</b>	<b>31%</b>	<b>82</b>	<b>63%</b>	<b>49</b>	<b>65</b>	<b>60</b>	<b>48%</b>

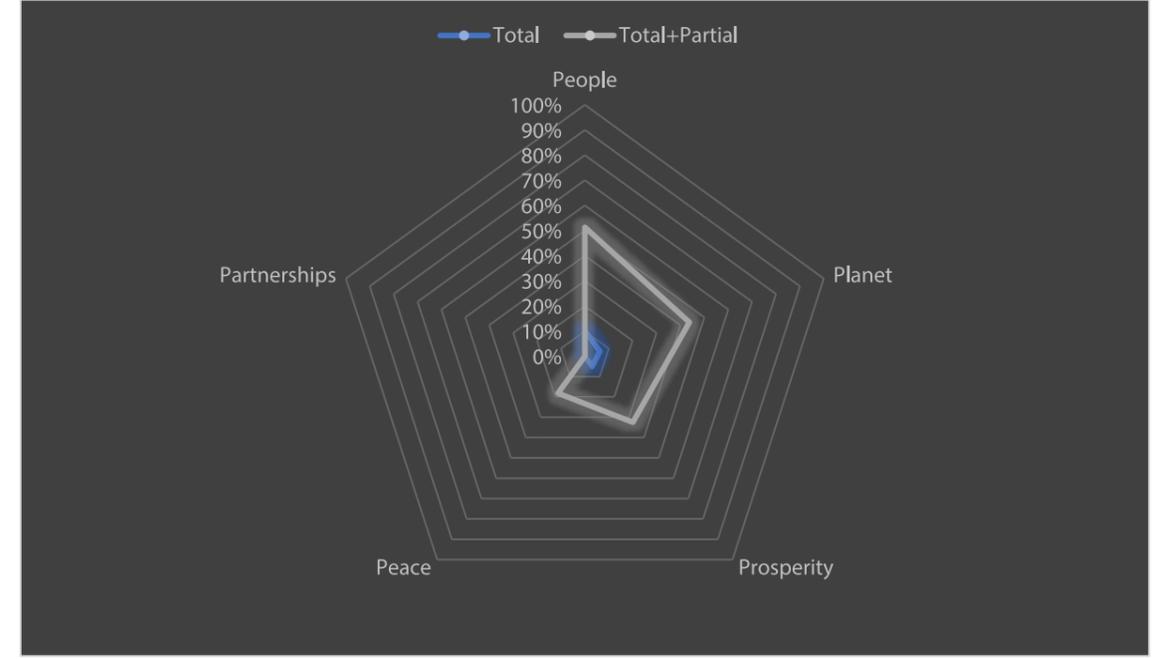


Figure 4 - DIGITAL PROFILE - PERCENTAGE ALIGNMENT WITH SD DIMENSIONS

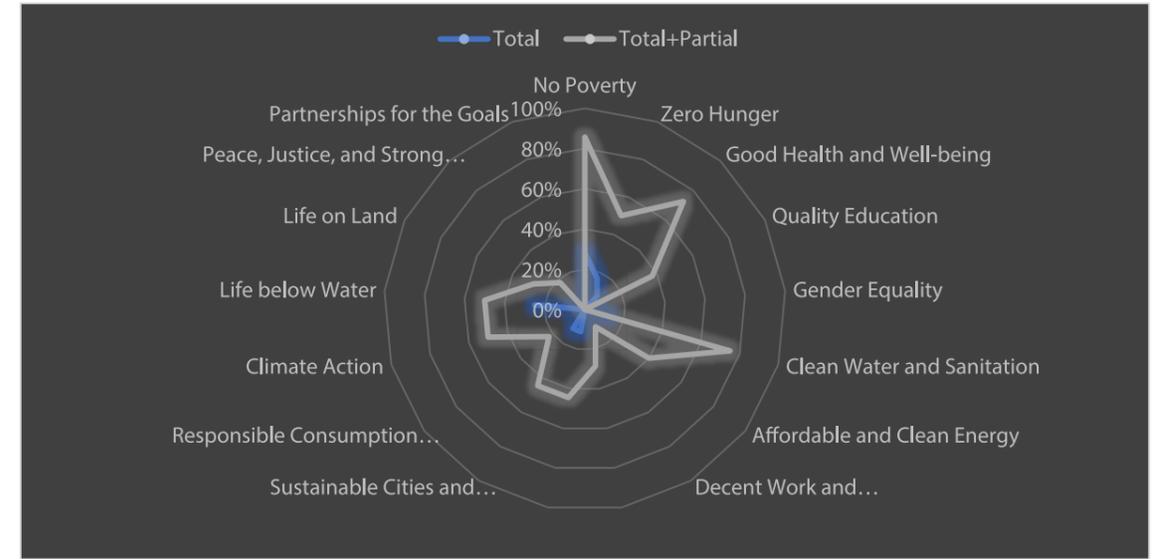


Figure 5 - DIGITAL PROFILE - PERCENTAGE OF ICT/DIGITAL RELEVANT SDG TARGETS COVERED

Following the analysis of the national development planning documents, the following is a list of ICT/digital relevant targets that apply to the Iraqi context but have not been addressed in the planning documents and are therefore identified as gaps.

- 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day.
- 1.3 Implement nationally appropriate social protection systems and measures (1) for all, including floors (2), and by 2030 achieve substantial coverage (3) of the poor and the vulnerable
- 1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources (1), as well as access to basic services (2), ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance (3)

Planning documents, including the one dedicated to poverty reduction, mention activities that could contribute to these targets. However, most of them do not specifically mention digital activities or the use of digital means to achieve these targets, even though digital technologies can indeed contribute to these goals and the government has already planned some for other targets.

- 2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe (1), nutritious (2) and sufficient (3) food all year round
- 2.2 By 2030, end all forms of malnutrition (1), including achieving, by 2025, the internationally agreed targets on stunting and wasting (2) in children under 5 years of age, and address the nutritional needs (3) of adolescent girls, pregnant and lactating women and older persons
- 2.4 By 2030, ensure sustainable food production systems (1) and implement resilient agricultural practices that increase productivity and production (2), that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality (3)

Although Vision 2030 and the Food security strategy mention some activities based on digital means, such as the use of modern technologies to modernize the agricultural sector and improve irrigation systems, more activities using digital means could be developed to effectively advance the above targets.

- 3.1 By 2030, reduce (1) the global maternal mortality ratio to less than 70 per 100,000 live births (2)
- 3.2 By 2030, end preventable deaths of newborns and children under 5 years of age (1), with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births (2) and under-5 mortality to at least as low as 25 per 1,000 live births (3)
- 3.3 By 2030, end the epidemics of AIDS (1), tuberculosis, malaria and neglected tropical diseases (2) and combat hepatitis, water-borne diseases and other communicable diseases (3)
- 3.4 By 2030, reduce (1) by one third (2) premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being (3)
- 3.5 Strengthen the prevention and treatment (1) of substance abuse, including narcotic drug abuse (2) and harmful use of alcohol (3)
- 3.9 By 2030, substantially reduce the number of deaths and illnesses (1) from hazardous chemicals and air (2), water and soil pollution and contamination (3)

Some planning documents mention the adoption of a health monitoring system, but it is not clear how this would contribute to the reduction of death and diseases for instance. And with the exception of awareness campaigns, planning documents do not articulate how the use of digital means could help ensure healthy lives and promote well-being for all at all ages.

- 4.1 By 2030, ensure that all girls and boys complete free, equitable and quality (1) primary (2) and secondary (3) education leading to relevant and effective learning outcomes
- 4.2 By 2030, ensure that all girls and boys have access to quality early childhood development (1), care (2) and pre-primary education (3) so that they are ready for primary education
- 4.3 By 2030, ensure equal access for all women and men to affordable and quality (1) technical, vocational (2) and tertiary education, including university (3)
- 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills (1), for employment, decent jobs (2) and entrepreneurship (3)

- 4.5 By 2030, eliminate gender disparities (1) in education and ensure equal access to all levels of education and vocational training (2) for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations
- 4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy (1) and numeracy (2)

The Iraqi development plans, particularly the vocational and technical education and the Reduction of Poverty strategies, have mentioned some solid actions to ensure educational opportunities are addressed for its population. However, these do not fully address the targets in a digital manner while the utilization of digital means and tools may further expand the concrete programs' reach.

- 5.1 End all forms of discrimination (1) against all women and girls everywhere (2)
- 5.2 Eliminate all forms of violence against all women and girls in the public (1) and private spheres (2), including trafficking and sexual and other types of exploitation (3)
- 5.3 Eliminate all harmful practices, such as child, early and forced marriage (1) and female genital mutilation (2)
- 5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision making in political (1), economic (2) and public life (3)

While the government's Vision 2030 addresses these targets, the planning documents do not propose any specific action through digital means to achieve progress towards them. In fact, SDG 5 is, along with SDG 17, the goal that is not covered, either fully or partially, by digital means.

- 6.1 By 2030, achieve universal and equitable access (1) to safe (2) and affordable (3) drinking water for all
- 6.2 By 2030, achieve access to adequate and equitable sanitation (1) and hygiene for all and end open defecation (2), paying special attention to the needs of women and girls and those in vulnerable situations
- 6.3 By 2030, improve water quality (1) by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials (2), halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally (3)

- 6.4 By 2030, substantially increase water-use efficiency across all sectors (1) and ensure sustainable withdrawals and supply of freshwater (2) to address water scarcity and substantially reduce the number of people suffering from water scarcity (3)
- 6.6 By 2020, protect (1) and restore (2) water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes (3)

The Iraqi development plans, particularly the Housing Plan and Economic Strategy, identify concrete actions for preserving water resources in Iraq. However, digital activities could be used to further supplement the government's efforts and policy targets.

- 7.1 By 2030, ensure universal access to affordable (1), reliable (2) and modern (3) energy services
- 7.2 By 2030, increase substantially (1) the share of renewable energy (2) in the global energy mix
- 7.3 By 2030, double (1) the global rate of improvement in energy efficiency (2)

While Iraq has sought to address energy concerns in its Reduction of Poverty Strategy, White Paper on Economic Strategy, and Vision 2030, the digital promotion of these activities has remained less concrete than on-ground activities. Digital support for these goals could develop these policies further.

- 8.1 Sustain per capita economic growth in accordance with national circumstances (1) and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries (2)
- 8.2 Achieve higher levels of economic productivity through diversification (1), technological upgrading (2) and innovation (3), including through a focus on high value added and labour-intensive sectors
- 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation (1), and encourage the formalization and growth of micro-, small- and medium-sized enterprises (2), including through access to financial services (3)
- 8.5 By 2030, achieve full and productive employment (1) and decent work (2) for all

- women and men, including for young people and persons with disabilities, and equal pay for work of equal value (3)
- 8.6 By 2020, substantially reduce (1) the proportion of youth not in employment, education or training (2)

The government has clearly stated its commitment to increasing the proportion of youth with job-relevant skills and decent jobs, and its goal of reducing unemployment. However, few activities using digital tools are mentioned, yet these tools can effectively contribute to achieving this goal.

- 8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery (1) and human trafficking (2) and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms (3)
- 8.8 Protect labour rights (1) and promote safe and secure working environments (2) for all workers, including migrant workers, in particular women migrants, and those in precarious employment (3)
- Many initiatives have been taken by the Iraqi government to protect the rights of workers, as well as children, but they do not take advantage of the benefits of digital tools.
- 8.9 By 2030, devise and implement policies to promote sustainable tourism (1) that creates jobs and promotes local culture and products (2)

The government's vision calls for supporting priority sectors for growth, including tourism, but the planning documents do not mention any activities that would use digital tools or means to achieve this goal.

- 8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking (1), insurance and financial services for all (2)

Initiatives have been put in place to widen access to banking and financial services, however the planning documents only mention this point broadly and do not specify how digital tools could contribute to progress towards this target.

- 9.1 Develop quality, reliable, sustainable and resilient infrastructure (1), including regional and transborder infrastructure (2), to support economic development and human well-being, with a focus on affordable and equitable access for all (3)

- 9.2 Promote inclusive and sustainable industrialization (1) and, by 2030, significantly raise industry's share of employment and gross domestic product (2), in line with national circumstances, and double its share in least developed countries (3)
- 9.3 Increase the access of small-scale industrial and other enterprises (1), in particular in developing countries, to financial services, including affordable credit (2), and their integration into value chains and markets (3)
- 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable (1), with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes (2), with all countries taking action in accordance with their respective capabilities

While the planning documents outline activities that would enhance progress towards this goal, most of these do not take advantage of the use of digital means.

- 10.1 By 2030, progressively achieve and sustain income growth (1) of the bottom 40 per cent of the population at a rate higher than the national average (2)
- 10.3 Ensure equal opportunity (1) and reduce inequalities of outcome (2), including by eliminating discriminatory laws, policies and practices (3) and promoting appropriate legislation, policies and action in this regard
- 10.4 Adopt policies, especially fiscal (1), wage (2) and social protection policies (3), and progressively achieve greater equality
- 10.5 Improve the regulation (1) and monitoring (2) of global financial markets and institutions and strengthen the implementation of such regulations
- 10.7 Facilitate orderly (1), safe, regular and responsible migration (2) and mobility (3) of people, including through the implementation of planned and well-managed migration policies

While the government is implementing different activities that ensure inclusion and contribute to reducing inequality, overall, planning documents could develop more activities using digital means to achieve this goal.

- 11.1 By 2030, ensure access for all to adequate, safe and affordable housing (1) and basic services (2) and upgrade slums (3)
- 11.2 By 2030, provide access to safe, affordable (1), accessible and sustainable transport systems for all, improving road safety (2), notably by expanding public transport (3), with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

- 11.3 By 2030, enhance inclusive and sustainable urbanization (1) and capacity for participatory, integrated and sustainable human settlement planning and management (2) in all countries
- 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality (1) and municipal and other waste management (2)
- While the housing policy mentions the government's commitment to using locally appropriate technologies and designs, additional mention of digital means or tools to make cities and human settlements inclusive, safe, resilient, and sustainable could help advance this goal.
- 11.7 By 2030, provide universal access to safe, inclusive and accessible, green (1) and public (2) spaces, in particular for women and children, older persons and persons with disabilities

The Iraqi government has expressed its commitment to developing and using environmentally friendly technologies and investing in green infrastructure. However, neither the development or accessibility to these public spaces nor the role of ICT in this field is addressed in the planning documents.

- 16.1 Significantly reduce all forms of violence (1) and related death rates (2) everywhere
- 16.2 End abuse, exploitation (1), trafficking (2) and all forms of violence (3) against and torture of children
- 16.3 Promote the rule of law (1) at the national and international levels and ensure equal access to justice (2) for all
- 16.4 By 2030, significantly reduce illicit financial (1) and arms (2) flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime (3)
- 16.5 Substantially reduce corruption (1) and bribery (2) in all their forms
- 16.6 Develop effective (1), accountable (2) and transparent (3) institutions at all levels
- 16.7 Ensure responsive, inclusive (1), participatory (2) and representative decision-making (3) at all levels
- 16.8 Broaden (1) and strengthen (2) the participation of developing countries in the institutions of global governance
- 16.10 Ensure public access to information (1) and protect fundamental freedoms (2), in accordance with national legislation and international agreements

Vision 2030 provides broad reaching goals to address concerns around rule of law and enforcing it within Iraq. These goals are admirable and acknowledge the importance of the issues to the country's development, but while they generally promote development of legal platforms to address these concerns, further application of digital tools and strategies could increase and improve Iraq's response to these issues.

- Finance 17.1 Strengthen domestic resource mobilization (1), including through international support to developing countries, to improve domestic capacity for tax and other revenue collection (2)
- Finance 17.3 Mobilize additional financial resources (1) for developing countries from multiple sources (2)
- Finance 17.5 Adopt and implement (1) investment promotion regimes (2) for least developed countries
- Technology 17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing (1) on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism (2)
- Technology 17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism (1) for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology (2)
- Trade 17.10 Promote a universal, rules-based, open (1), non-discriminatory and equitable (2) multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda
- Trade 17.11 Significantly increase the exports (1) of developing countries, in particular with a view to doubling (2) the least developed countries' share of global exports by 2020
- Multi-stakeholder partnership 17.17 Encourage and promote effective public (1), public-private (2) and civil society partnerships (3), building on the experience and resourcing strategies of partnerships
- Data, monitoring and accountability 17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product (1), and support statistical capacity-building in developing countries (2)

Iraq's development plans, including Vision 2030 and the White Paper on Economic Strategy, lay out several strategies to address these concerns broadly, but lack specific digital responses to manage them individually even though ICT solutions could play an important role in addressing them.

- 1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions
- 1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions

The share of government operating, and capital expenditures dedicated to support women, poor and vulnerable groups is not indicated in any public or governmental digital platforms, leaving the above-mentioned categories unaware of from the support they are entitled to as well as any projects or initiative that would support them.

- 2.a Increase investment, including through enhanced international cooperation in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries
- 2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

These targets were not addressed by relevant development plans, including Vision 2030, the White Paper on Economic Strategy, or the Implementing Strategy of Economic Reform. While Iraq is prioritizing other agricultural and food concerns which are more pressing, to assure longer term development, the government may wish to consider instituting these issues into their strategic plans.

- 3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate

Despite the government's willingness of combatting drug use through awareness campaigns, the use of ICT technologies and how they could contribute specially to enforce the WHO Framework Convention on Tobacco Control are not addressed.

- 3.b Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related

Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all

- 3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States
- 3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Despite the government's commitment to adopting a health monitoring system, the planning documents do not specify how the government plans to work toward these specific goals using digital tools.

- 4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all
- 4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States

The above-mentioned targets are partially covered by Iraq's planning documents, but further capitalizing on the use of digital means to achieve them could improve and accelerate progress toward these targets.

- 5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws
- 5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women
- 5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

Although the Iraqi government's plans call for supporting the development and growth of disadvantaged communities, the language used in the strategic plans does not address broader programs for women's economic growth, nor does it plan the use of digital tools that could effectively help achieve these targets.

- 6.a By 2030, expand international cooperation and capacity - building support to developing countries in water and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.
- 6.b Support and strengthen the participation of local communities in improving water and sanitation management

Goals to improve water and sanitation management in Iraq, particularly in the National Housing Policy, remain focused on top-down solutions. While the government is naturally a key stakeholder in these policies, community engagement has proven successful in other countries, and presents a useful model for Iraq to utilize in promote this objective.

- 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil fuel technology, and promote investment in energy infrastructure and clean energy technology
- 7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

Strategies around sustainable energy, particularly solar, were highlighted in the Reduction of Poverty Strategy. However, digital targets remained for these goals remained vague, and lacked a solid ICT element to further support them.

- 8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade related Technical Assistance to Least Developed Countries

MOI 8.a is left mostly unaddressed by the development strategies presented for the RIA. Further implementation of plans in this sector will require digital tools.

- 9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

- 9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

The Private Sector Development Plan and Vision 2030 highlighted the importance of education and development of higher-level resources for Iraq. However, the development plans lacked ICT or digital tools to further facilitate these plans.

- 10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements
- 10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes
- 10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent

Although the planning documents mentioned some activities that would work toward SDG 10, these points were not specifically targeted nor the use of digital means to achieve them.

- 11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
- 11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015J2030, holistic disaster risk management at all levels
- 11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

With the exception of 11.b, which is partially covered by awareness activities, the planning documents have not addressed these goals in a digital manner.

- 12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production

- 12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products
- 12.c Rationalize inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Despite the potential of ICT to monitor impacts, improve government capacity to undertake reforms and respond to changes in fuel markets, or build science and technology capacity, there is no clear reference in planning documents to advance these targets.

- 13.b Promote mechanisms for raising capacity for effective climate change related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
- 14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries
- 14.b Provide access for small scale artisanal fishers to marine resources and markets

The planning documents mentioned few digital activities that would work toward SDG 13 and 14, however these points were not specifically targeted nor the use of digital means to achieve them.

- 15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems

This target is partially covered by the adoption of a monitoring system, but there is no further mention of how this would contribute to progress towards this target.

- 15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation
- 15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

While Iraq's national strategic plans did address numerous concerns and noted the concerns around the Mesopotamian marshes in Vision 2030, resources for forest management and poaching were not specifically identified.

- 16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime
- 16.b Promote and enforce nondiscriminatory laws and policies for sustainable development

Policies around cooperation and development were discussed in Iraq's Private Sector Development Plan and Implementing Strategy on Economic Reform, however digital goals remain an area of continued focus for the Iraqi government.

# 1.3. Conclusion and recommendations

The review of Iraq's national planning documents highlights that the country has begun to assess the importance of digital/ICT goals in addressing the country's development. Vision 2030 serves as a broad, yet assertive, framework around which Iraq's future can be built. Digital targets are highlighted in many of the additional planning documents, either specifically or more broadly through general advocacy and communication campaigns. The framework similarly ensures general alignment with the goals laid out in the SDGs.

However, the broad lack of digital solutions in several areas, including around environmental development and the promotion of both gender equality and providing answers to bring Iraq further into the global economy, is notable. These areas may not currently be prioritized due to current domestic issues, but for long-term strategies, addressing these challenges will require further assessment about the need of digital tools for success.

The following recommendations are based on the above reported results and the gaps identified, as a consequence of their lack of mention in the planning document of digital solutions to achieve the SDGs.

## People .....

When looking at the total alignment, the ICT/digital SDG targets covered under the People category are at 10%, while partial alignment sits at 41%. This highlights the importance that the government hold for the goals that fall under this dimension, however, there are a few areas where the government could further cement its support for these goals.

**SDG 1-End poverty in all its forms everywhere:** Alignment for this goal stands at 86% (total + partial alignment), an impressive first step for the Iraqi government in its development goals. Accelerating progress to reach this goal and targets, for instance SDG 1.1 that has been identified as a gap, can utilize digital/ICT programs to further their success. These could include utilizing previously advocated training programs and advocacy campaigns to gather information on at-risk populations to ensure the meeting of 1.1.

**SDG 2-End hunger, achieve food security and improved nutrition and promote sustainable agriculture:** Alignment of SDG 2 sits at 50%, although total alignment sits at only 17%. While the Iraqi development programs have already highlighted the use of ration cards to promote food access, and promote the development of farmers' cooperatives, more steps could be taken using digital means. For instance, the government could utilize more explicit digital tools, such as surveying of farming conditions and highlighting crop packages to better suit Iraq's geographic situation and increase food yields.

**SDG 3-Ensure healthy lives and promote well-being for all at all ages:** SDG 3 is aligned at 73%, with Total alignment at 9%. Although total alignment scores low, the combined total and partial alignment showcases the clear importance that health issues hold in Iraq, particularly in the face of the COVID-19 pandemic. One potential area of growth in this sector that could further cement this ambitious goal and its targets is to expand the database and public awareness campaigns currently geared towards HIV and COVID-19 to communicable and waterborne diseases more broadly using digital tools. For instance, the government could develop an online platform or mobile application on which to deliver awareness, prevention, or support messages.

**SDG 4-Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all:** SDG 4 is only partially aligned at 38%. One the most notable areas to further ascertain the Iraqi government's goals is to accentuate plans to expand access to education through the promotion of online and remote education, digital resources and content, particularly tying this into existing Iraqi plans to support the empowerment of internally displaced populations.

**SDG 5-Achieve gender equality and empower all women and girls:** Gender equality is currently one of the two least covered of those SDGs under the People category, with no digital coverage at all. While Iraq has developed numerous programs to support at-risk populations, many of these are not specifically geared to support women and girls in achieving their educational and economic aspirations. The presence of these programs in other goals, such as SDG 1, SDG 3 and SDG 4, means that the steps to support outreach to women and girls, including tracking educational opportunities, particular distance and online learning, as well as promoting health issues such as access to reproductive health, can be geared appropriately to address SDG 5 as well.

## Prosperity .....

The Prosperity category currently stands at 33% coverage, with total coverage at 5%. While substantial efforts have been made to make Iraq a truly prosperous society, the lack of clarity around the SDGs falling under this dimension in Iraq's planning documents accentuates opportunities still remain to improve government programs.

**SDG 7 - Ensure access to affordable, reliable, sustainable and modern energy for all:** While not totally covered under digital goals at present, the Iraqi government's development plans are partially aligned with the goal at 40% and have already highlighted programs under other SDGs that could be utilized for promoting sustainable energy. This includes the use of public advocacy campaigns about utilizing renewable energy sources, such as solar, for further tying into plans to diversify the economy away from oil and gas, by developing accelerated digital tracks for investment in the renewables sector.

**SDG 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all:** SDG 8 is the least covered of all Prosperity goals by digital means with only 10% partial alignment. The Iraqi government could take advantage of digital tools to promote sustainable economic growth from using a digital platform or application to raise awareness to optimizing processes to reduce energy consumption through supply chain tracking for instance.

**SDG 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation:** SDG 9 has 29% partial coverage. Iraq is utilizing digital means to help push for development of infrastructure and diversifying industrialization and innovation methods, however, further utilization of digital construction tools to map out power grids, and promotion of online sources to promote and connect Iraqi-made products would enhance the efforts already made.

**SDG 10 - Reduce inequality within and among countries:** While Iraq's steps towards addressing SDG 10 are among the most developed out of all the Prosperity SDGs with a combined total and partial alignment of 44%, there is still room for further improvement. Expanding the monitoring and coverage of the welfare system, as well as working with the financial sector to develop and provide greater opportunities through digital tools for the middle and lower class to have easy access to banking for instance would help build these targets.

**SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable:** The 44% coverage, highlights the importance that Iraq views to build

a better urban environment for its citizenry. The government could further enhance its effort through taking advantage of digital technologies to develop databases that would strengthen national and regional planning for instance. It could also develop databases of all the public spaces accessible for persons with disabilities, promoting them on a platform or mobile application for example.

**SDG 12 - Ensure sustainable consumption and production patterns:** SDG 12 is covered partially at 22% in the Iraqi development plans. Addressing sustainable consumption could easily be paired with existing projects, including the mapping of settlements to ensure their sustainability, and efforts in the Industrial Strategy and Vision 2030 to diversify the economy from its oil and gas focus. Using ICT to promote sustainable consumption behaviours, for instance through digital awareness campaigns, would help achieve progress towards SDG 12.

## Planet .....

Planet is the second most covered dimension, with 56% total and partial coverage. However, its total coverage only sits at 6%, and two of the major SDGs are only partially covered (SDG 13 and 15).

**SDG 6-Ensure availability and sustainable management of water and sanitation for all:** This goal is the most covered one under the Planet dimension, with a score of 75%. The commitments made emphasize that Iraq acknowledges the need to improve access to water and sanitation. However, a greater emphasis on the explicit use of, for example, digital mapping and resources to form transnational border deals regarding water usage, could be supportive of Iraq's objectives. Similarly, the mapping plans for urban areas could be stated to all cover the management of sanitation issues for all individuals, in particular for women and girls.

**SDG 14-Conserve and sustainably use the oceans, seas and marine resources for sustainable development:** Neither of these issues is addressed in a concrete way in the development goals. However, digital tools can, much as the other SDGs, be applied to help Iraq address concerns on these fronts. For instance, using and presenting digital mapping to analyze areas of Iraq that will be most impacted by climate change can help Iraq prepare urban infrastructure and population, thus helping other goals. Similarly, Iraq may lack a long coastline or maritime area, its resources here can be mapped and reviewed, such as an online licensing system to ensure that fish stocks are adequately protected and not overtaxed.

SDG 13-Take urgent action to combat climate change and its impact and SDG 15-Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss: These goals are only partially covered by the national planning documents. For SDG 15, covering the documents remain focused on the Mesopotamian marshes, however other biomes and regions could benefit from similar monitoring efforts using digital tools. As for SDG 13, digital means could also play a major role to map and predict climate related risks for instance through satellite observation.

## Peace .....

The Peace dimension is partially covered at 18% coverage in the planning documents.

SDG 16-Promote peaceful and inclusive societies for sustainable development; provide access to justice for all and build effective, accountable and inclusive institutions at all levels: while efforts to highlight and build the social security system are still under way, further expansion of the use of ICT could be beneficial to ensure the development of a more peaceful and inclusive society. Efforts regarding this goal could also be enhanced by increasing the citizen’s access to information through online platforms, or promoting inclusion through digital awareness campaigns for instance.

## Partnerships

The “Partnerships” dimension is the least covered, with 0% coverage. Although some of the planning documents mention actions that could contribute to the progress towards the SDG, a strong network of relationships and cooperation between stakeholders could effectively contribute to the achievement of SDG 17 through the use of digital means.

SDG 17-Strengthen the means of implementation and revitalize the global partnership for sustainable development: Much of Iraq’s development progress has been focused more domestically. However, by utilizing digital platforms more thoroughly, and connecting them with regional and global groupings, the Iraqi government could not only build on SDG 17, but also further strengthen their goals elsewhere.

## ANNEX 1 : List of the (16) National planning documents provided by the UNDP Country Office in Iraq

1. Private sector development strategy
2. Poverty reduction strategy
3. NDP 2018-2022
4. Vision 2030
5. COVID-19 recovery response plan
6. 2019 VNR
7. Child protection policy in Iraq
8. White Paper Document - Economic Policy
9. Iraq’s National Housing Policy
10. Radioactive Waste Strategy
11. National Operating Policy
12. National policy to involve Iraqis abroad
13. National Strategy for The Prevention and Control of Non-Transitional Diseases 2018-2022 (final)
14. National Food Security Strategy
15. Iraqi Industrial Strategy
16. Training strategy and vocational and technical education in Iraq

# Digital Landscape Assessment

- Rapid Integrated Assessment

- Digital Maturity Assessment

- Accelerator and Bottleneck Assessment

## 2.1.Objectives

The aim of the assessment was to evaluate the current digital maturity of the public sector of Iraq, draw general findings and offer suggestions for further activities in 14 e-government focus areas:

1. Political will and support
2. Coordination
3. Financing model
4. Legal framework
5. Data, digital databases
6. Interoperability, secure data exchange
7. Secure digital identity and digital signature
8. Digital skills
9. Access to services, awareness-raising
10. E-participation, e-democracy
11. Information security
12. Telecommunications and digital infrastructure
13. Emerging technologies, innovation
14. International cooperation

The current Digital Maturity Assessment report provides Iraq with a good understanding of its current digital maturity and can be used as the foundation and inspiration for strategic national documents on digital transformation.

## 2.2. Methodology

The assessment was conducted in five steps:

1. **Preliminary research:** review of existing policy documents, strategies, government political agenda, public reports, statistical sources, etc.
2. **Digital Maturity Assessment questionnaire:** the public authority in charge of digital issues (Ministry of public administration, digital society and media) in the country filled in a questionnaire that mapped the existing digital governance situation in all 14 focus areas and stakeholders in Iraq to provide a first understanding of the digital landscape and set the stage for carrying out stakeholder interviews.
3. **Preparations for online data collection interviews:** the list of stakeholders to be interviewed and the interview agenda were developed. Online meetings with local digital governance officials and other key stakeholders were scheduled in cooperation with main partners in the country. The list of authorities to be interviewed was determined based on the questionnaire results and input from the main local partners.
4. **Online interviews with key stakeholders** were conducted to get a deeper understanding of their current state of digital development as well as their plans and challenges faced. In total, 10 online interviews were held with IT managers of relevant ministries and authorities as well as with representatives of the academia, business sector, and civil society organizations.
5. **Development of the Digital Maturity Assessment Report,** based on the input from the desk research, questionnaires, and interviews. The report assesses the country's current state of digital maturity in the specified focus areas and provides suggestions for next steps. The report places the country's public sector at a certain level of digital maturity – either basic, useful, or sustainable – for each of the 14 categories and makes recommendations on the next steps to be taken. The draft version was discussed with the main local partners and their feedback was integrated to the report.

## 2.3. Background of e-government development in Iraq

### Political context

Iraq (officially The Republic of Iraq) is a federal parliamentary constitutional republic. The country was founded after the First World War and put under protection of British rule. In 1932, Iraq was granted its independence. Some twenty years later, in 1958, the monarchy was overthrown and replaced with Republican system.

Iraq has been subject to three wars, the latest in 2003, which led to the installation of a more equal distribution of power among the government entities. The national assembly chooses the president and the prime minister.

The social and political climate in Iraq has been unstable throughout the years. Disregarding the multiple wars, great turmoil have been caused by the internal conflicts, the rise of ISIL/IS, and disputes over the sovereignty of the Kurdish regions.

Policy-makers are facing geopolitical risks, a weak fiscal position, legacy state-driven economy, a weak private sector which co-exist with endemic corruption, patronage, and poor service delivery, and has reduced the government's ability to respond to shocks and has resulted in intermittent unrest that continues to date<sup>4</sup>.

4. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#). July 12, 2021, page 1.

## Economic context

The Iraqi economy is largely dependent on natural resources, particularly oil. As of 2015, oil resources accounted for 90 per cent of the government's revenue, 99 per cent of exports and 58 per cent of GDP. Iraq experienced major developments in infrastructure in the 1970s, largely due to large governmental projects. This came to an abrupt halt in 1980 due to the Iraqi-Iranian War at that time, it resulted in the destruction of numerous infrastructures and an increase in the privatization of the economy. Consequently, the Iraqi economy became almost entirely dependent on oil. Additionally, the economic sanctions imposed on Iraq after 1991 further exacerbated the damage to the Iraqi economy.

Iraq also had a notably large agricultural and industrial sector. Both have had a serious decline, primarily due to climate change and the economic sanctions. Tax revenues make up for 35.7 per cent of the Iraqi GDP. After the War of 2003, the UN-mandated Coalition Provisional Authority set about a large economic reform focused on privatization of the economy and opening for foreign investment. Iraq's GDP growth has been remarkably positive post-2005, especially given the country's history<sup>5</sup>. In terms of budgeting, the country had a national budget deficit at -4.2 per cent of GDP in 2017<sup>6</sup>. Unemployment is high, resting at a level of about 13 per cent of the total labour force<sup>7</sup>.

According to the World Bank, the COVID-19 pandemic has put a heavy burden on the Iraqi economy. Given their dependency for oil exports, which has seen a drastic drop in demand due to downsizing in e.g. shipping and transport worldwide, the economy has taken a serious toll. The effects may be long lasting, and harmful to the Iraqi economy in the long run<sup>8</sup>. However, untapped potential is still seen, as the World Bank has stated that "Iraq's GDP per capita could be up to 60 per cent higher if it had similar levels of private sector participation, investment, human capital, and productivity as upper-middle-income countries in a comparable income bracket", noting that a GDP increase would happen if the right conditions are created for historically more diverse exports to return<sup>9</sup>.

5. World Bank (2020). [GDP \(Constant 2010 USD – Iraq\)](#).

6. CIA (2020). [The World Factbook – Iraq](#).

7. World Bank (2020). [Unemployment, total \(% of total labor force\) \(modeled ILO estimate\) – Iraq](#).

8. World Bank (2020). ["Overview – The World Bank in Iraq"](#).

9. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#), July 12, 2021, page 1.

## Business climate

The private sector in Iraq is extremely weak because of decades of state dominance over the economy. The ICT sector is small and creates only 3-5 per cent of employment, whereas only 20 per cent of the positions are occupied by youth (15-24 years)<sup>10</sup>. According to a market assessment of tech sector businesses in Iraq conducted in 2019<sup>11</sup>, telecommunications and mobile payments constitute the only competitive tech sectors in the country, while web designing is the most sought-after business area, and e-commerce, e-banking and digital payments reported as the most underdeveloped sectors.

The country has a Doing Business rank of 172 out of the 190 countries documented by the World Bank<sup>12</sup>. The Doing Business ranking is made up of ten different subindices, all showing the country ranking in specific areas of doing business. On "Getting Credit", Iraq scores 186 out of 190, i.e. the fourth lowest score in the ranking. The sub-index is, among other, operationalized by bankruptcy laws and legal rights for borrowers and lenders, and whether the country has sufficient credit registry coverage. Other key causes for the limited capacity of the private sector include poor coverage, elite capture, knowledge gap, labour shortages, and a difficult regulatory environment<sup>13</sup>.

Iraq also has a score of 154 on "Starting a Business", facing structural hinderance in various respects. One of them is that women require their husband's approval in order to leave the home. Nonetheless, the process of establishing a business has become easier in recent years<sup>14</sup>, and a prototype for setting up a business online is taking form<sup>15</sup>.

10. World Bank (2020). [Iraq Economic Monitor: Navigating the Perfect Storm Redux](#), page 28.

11. IOM Iraq (2019). [Technology and Innovation in Iraq: A Market Assessment of Tech Sector Businesses in Iraq](#).

12. World Bank Group (2020). [Doing Business: Economy Profile Iraq](#), page 4.

13. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#), July 12, 2021, page 11.

14. UNCTAD (2020). ["New system boosts ease of doing business in Iraq"](#).

15. Iraqi ministry of Trade (2021). ["Create Your Business Online"](#).

Iraq's highest subindex score within the Doing Business ranking, at 103 out of 190, is "Dealing with Construction Permits". The indicators making up the subindex consist of number of procedures needed to build a warehouse, time spent, and costs included<sup>16</sup>. Despite being the highest scoring subindex for Iraq, the indicator scores are well below the mean scores of Middle Eastern and North-African countries<sup>17</sup>.

Indicator	Iraq	Middle east & north africa	OECD high income
procedures (number)	11	15.7	12.7
Time (days)	167	123.6	152.3
Cost (% of warehouse value)	0.3	4.4	1.5
Building quality control index (0-15)	5.5	12.5	11.6

Figure 2: World Bank Group Doing Business indicators for "Dealing with Construction Permits"

Moreover, corruption is regarded as a major issue in Iraq. The country is ranked 160 out of 180 countries by Transparency International<sup>18</sup>. The Washington Institute<sup>19</sup> describes a situation where Iraqi officials and government has been combating corruption after 2003. Political blocs in the country are apparently leveraging interest groups as a struggle for votes, therefore leading to more rampant corruption. In August of 2020, the government established a group in order to fight corruption more efficiently<sup>20</sup>.

The effects of COVID-19 have been severe on the economy, considering its links to the public sector wage bill and the effects of the lockdown measures.

16. World Bank Group (2020). [Doing Business: Construction Permits](#).  
 17. Ibid.  
 18. Transparency International (2020). [Corruption Perceptions Index 2020](#).  
 19. The Washington Institute. 10th of November 2020. ["The Price of Corruption in Iraq: Kadhimi Faces the Challenge of Systemic Reform"](#).  
 20. Ibid.

## Socio-economic context

Iraq has a population of about 38 million people<sup>21</sup>. Around 75 per cent of them live in urban areas, leaving the remaining 25 per cent in rural areas. There has been an increase in urbanization in the last three decades. The population<sup>22</sup> of Baghdad makes up for about 7.2 million people, approximately 17.5 per cent of the total population. According to the CIA World Factbook for Iraq, 75-80 per cent of the population are Arab, while 15-20 per cent are Kurdish. The remainder part consists of smaller groups<sup>23</sup>. The GNI per capita (adjusted for PPP in USD) is at 11,310 USD<sup>24</sup>.



Unemployment and underemployment among youth and internally displaced people are expected to further rise with the COVID-19 crisis, to add a further 2.7-5.5 million people to the 6.9 million Iraqis already living in poverty<sup>25</sup>.

It is noteworthy that in the World Bank Human Capital Index 2020<sup>26</sup> Iraq scores just 0.41 points, which means that "a child born in Iraq today will be 41 per cent as productive when she grows up as she could be if she enjoyed complete education and full health". For instance, the child is only expected to complete 6.9 years of school, which amounts to a mere 4 learning-adjusted years of school, after factoring in what children actually learn<sup>27</sup>.

According to the Freedom House Index, Iraq is considered "Not Free" and is placed as the 31st lowest out of the 100 countries measured in the index. The two main reasons for the low score are high levels of corruption in society, as well as security threats. Iraq also has low indicator scores within areas such as freedom of assembly, due process in trials, as well as equal treatment under law and policy<sup>28</sup>.

21. World Bank (2020). [Population, total – Iraq](#).  
 22. Worldometer (2021). [Iraq Demographics](#).  
 23. CIA (2021). [The World Factbook – Iraq](#).  
 24. World Bank (2020). [GNI per capita, PPP \(current international \\$\) – Iraq](#).  
 25. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#). July 12, 2021, page 10.

26. World Bank (2020). [The Human Capital Index 2020 Update: Human Capital in the Time of COVID-19](#). World Bank, Washington, DC.  
 27. World Bank (2020). [Iraq, Human Capital Index 2020](#).  
 28. Freedom House (2020). [Freedom in the World 2020 – Iraq](#).

## Digital transformation context

The first major initiative to develop digital governance in Iraq was started in 2004 with the Memorandum of Understanding that was signed between the Italian Minister for Innovation and Technology and the Iraqi Minister of Science and Technology. This cooperation resulted in a new network to connect Iraqi ministries and establish basic infrastructure for digital service provision. This was followed by an USAID strategy to promote public digital services in Iraq with the aim of restoring basic services and improving public sector governance after the uncertain period when the Saddam Hussain regime was overthrown<sup>29</sup>.

The Iraqi government is a signatory party to the Arab ICT Organization (AICTO). The purpose of the organization is to develop “ICTs throughout the Arab region and providing necessary mechanism to support cooperation and complementary between AICTO members, promote and enrich common policies and strategies to develop vital technological domains”<sup>30</sup>.

In 2019, the Iraqi Ministry of Planning presented its Iraq Vision 2030<sup>31</sup>. The project mainly focuses on rebuilding a gutted economy and combating corruption. Nonetheless, it also emphasizes the need for modern technology in irrigation and digital infrastructure. The latter is presented with the following action point:



“ Develop the IT and communications infrastructure, increase access to these technologies, increase the speed of internet connections, develop the national structure of digital storing and link it efficiently to the internet. ”

A roadmap showing weaknesses, points of strength and ongoing initiatives within science, technology and innovation (STI) was presented by the UNESCO Iraq Office in 2011. The document states that the aim was to place “Iraq’s society and economy en route to becoming STI-based by the year 2020”<sup>32</sup>. The roadmap seems to be very inclusive, including aspects such as legislative frameworks, the enhancement of popular STI awareness and infrastructure development, to mention a few.

In October 2020, a joint effort to modernize and improve quality of learning in Iraq was started through an Education Management Information System Roadmap<sup>33</sup>. The parties are UNESCO, UNICEF and the Communications and Media Commission (CMC), the latter being a government entity established to monitor media and communications in Iraq. The goal is to provide “internet connectivity to over 3000 schools across 10 governorates” in Iraq.

29. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#). July 12, 2021, page 17 and Annex 9.

30. Ibid. [“At a glance – Organization Presentation”](#).

31. Iraqi Ministry of Planning (2019). [Iraq Vision 2030](#).

32. UNESCO/Iraq (2011). [“Revitalizing Science, Technology and Innovation in Iraq – A Roadmap”](#), p 6.

33. UNESCO (2020). [“With the generous support of the EU, UNESCO and UNICEF signed a roadmap with the Communications and Media Commission \(CMC\) for the provision of internet connectivity to over 3000 schools across 10 governorates”](#).

## Iraq in international e-government indices

Despite the fact that Iraq outperforms most countries when it comes to connectivity, its global e-government rankings remain rather modest. As illustrated in Figure 4, Iraq ranked 143<sup>rd</sup> out of 193 countries in the UN E-Government Development Index of 2020. Despite only a modest move upwards in the ranking, in terms of score value (0.436 out of 1) Iraq has clearly outperformed itself compared to all previous years.

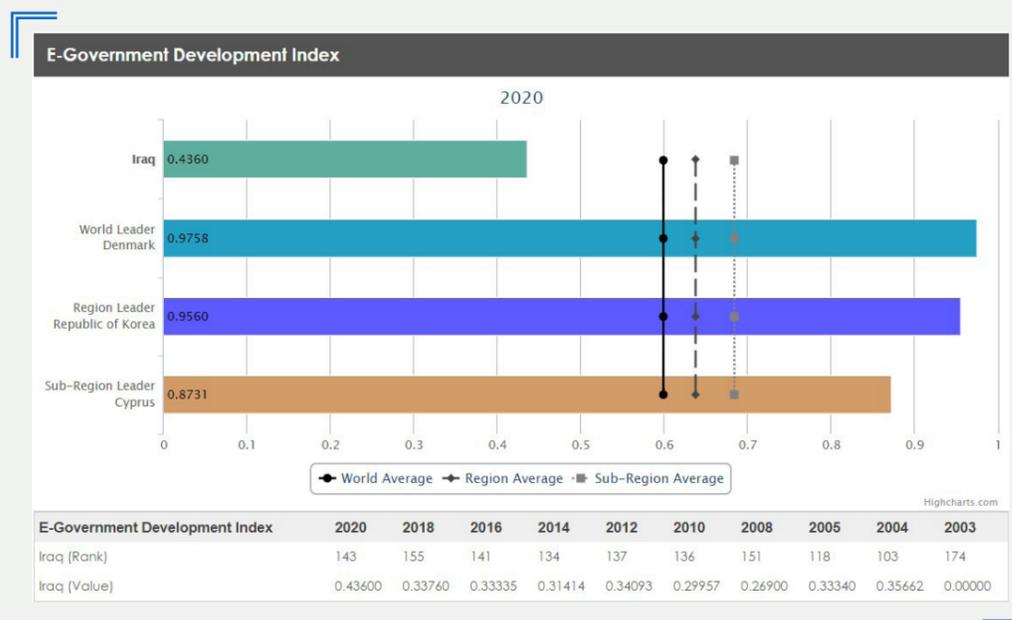


Figure 3: Iraq in the UN E-Government Development Index 2020

Looking at the sub-components of the UN E-Government Development index, Iraq scores the lowest in the Online Service Index sub-component (0.3353 out of 1), which is a score that has stagnated since 2016 and is significantly below the world average (0.562). Iraq almost reached the world average in the Telecommunication Infrastructure Index sub-component, with a significant leap in the score since the previous edition of the index in 2018 (a score of 0.184 in 2018 vs. 0.537 in 2020) but is significantly lagging behind in the Human Capital Index sub-component. It should be noted that the score for this sub-component has been decreasing throughout the years and is 0.252 points below the world average (0.4358 vs 0.688)<sup>34</sup>.

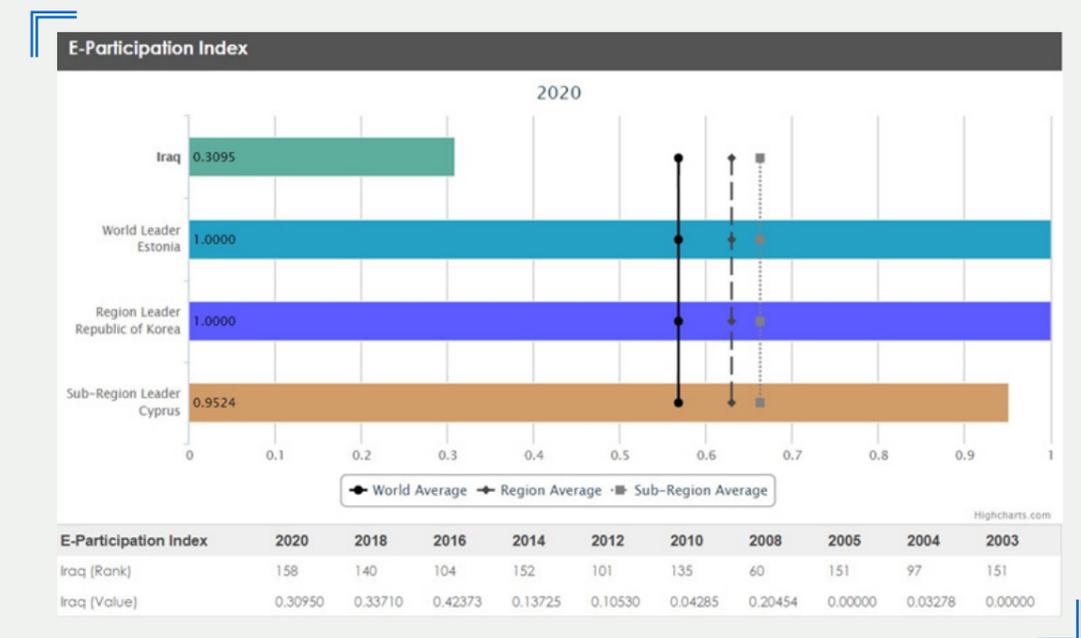


Figure 4: Iraq in the UN E-Participation Index 2020

34. UN (2020); Iraq EGD



## 2.4. Digital maturity of the central government

The UN E-Participation index measures the use of online services to facilitate provision of information by governments to citizens, interaction with stakeholders and engagement in decision-making processes. In the E-Participation Index 2020, Iraq was placed 158th in the world among 193 countries. It should be noted that in 2016 Iraq ranked 104th in the world in this index but has since then experienced a fall in the ranking, as seen in Figure 5 <sup>35</sup>.

This chapter provides an overview of the current e-government situation in Iraq, looking at 14 e-government domains. For each topic, the report places Iraq at a certain level of maturity – either basic, useful, or sustainable.

### Basic maturity

Organizations implement e-government activities based on the level of their internal capacities. There is no clear strategy or coordination in place. The activities are mostly sporadic, and processes are reactive in nature.

### Useful maturity

A strategic framework for e-government is in place and a division of roles exists. Conditions are created to be able benefit from standardization, coordination and the shared use of digital components and resources, but there are certain shortcomings when it comes to implementation.

### Sustainable maturity

E-government is a natural part of the operation of the public sector and the society as a whole. Public sector and the private sector jointly use digital components to reach the strategic objectives of the country. Processes are controlled and measured, with effective stakeholder involvement and a good balance between the top-down and bottom-up approaches.

In addition to indicating the maturity level, the report provides recommendations for further actions in each topic.

## 2.4.1. Political will and support

High-level political leadership paves the way to the adoption and implementation of relevant policies and agendas. The introduction of e-governance should be a political priority and an agreement between all political forces. Political will must be declared at the highest possible level, for example, by the President or the Parliament. For this to have proper effect, it is important to identify roles and determine responsibilities for coordination and implementation, also encouraging public-private partnership and cooperation with academic institutions. The agreement shall state the use of digital technologies to be successive as well as a main method of developing the society and addressing its challenges. Political will, if possible, should be affirmed with a political document, such as "Fundamentals of Information Policy", which would be a guarantee of such will.

Government and its leaders must understand that the digital agenda is not a separate topic but part of every policy, service and industry, as well as be able to change the mindset of officials at all levels, to reengineer existing public services and related operations, and guarantee the enforcement of the strategies and legislation by setting up relevant authorities. Political leaders need to stay engaged and commit time, budget, and even political capital to the cause of e-governance. In addition, ongoing open government and e-governance capacity building is necessary.



### Current situation in Iraq

In terms of political will, Iraq has made efforts to reach the basic level of maturity. According to survey results and interviews conducted with stakeholders, there is high-level political support for the general policy of introducing and developing different electronically enabled services and communication technologies both within the governmental institutions and in communication with citizens. However, because no fundamental political documents have been adopted at the government level, most developmental decisions are taken on a case-by-case basis. Agenda setting and planning is mostly done separately at the level of each institution.

The long-term strategic vision for the country, Iraq Vision 2030, outlines five key areas for development – “man building, good governance, diversified economy, safe society, and sustainable environment”. Although the specific goals include topics such as education, healthcare, provision of public services, public participation in decision-making, fighting corruption, reforming public financial administration, etc., there are no specific references made to the use of e-government and digital tools to support progress in these fields. The only reference to digital development can be found in the section on developing infrastructure, where the target-achieving tools include “develop the IT and communications infrastructure, increase access to these technologies, increase the speed of internet

connections, develop the national structure of digital storing and link it effectively to the internet”<sup>36</sup>.

The main public institution communicating on the broader topic of e-governance is the E-Government Steering Committee (also named Committee 22), founded in 2020 under the Council of Ministers Secretariat (COMSEC). This committee is composed of ministerial, public sector and specialist positions and includes several thematic teams (e.g. infrastructure team, information security team, data sharing team, electronic payment team, etc.). This institution has adopted certain more specialized development plans (e.g. the National Strategic Data Sharing Plan 2021-23) and it functions as a coordination hub for the government institutions at the ministerial level. In several interviews, stakeholders characterized the outcome and goals of the committee as inconclusive and unclear. However, they still hold the committee in high regard as an important part of the governmental structure on e-governance.

The interviewed stakeholders remarked that because of weak fundamental e-government policies and implementation mechanisms, priorities of which services and systems to develop have been set according to institutional needs. Nevertheless, some general priorities are understood to be prioritized across all topics. These encompass topics such as further integration and wider use of national ID services, providing safe and accessible data sharing and storing facilities, notably establishing a national data centre by the end of 2021. The data centre will be run by COMSEC in cooperation with national security agencies. The main objective of the data centre will be to host and manage sovereign data in a way that secures data sharing between government institutions, following national policies and guidelines for information security and data sharing. Additionally, priorities include allocating more resources to guaranteeing reliable infrastructure and ICT connections for governmental institutions.

As for the role of the political stakeholders, the role of the Prime Minister and the Cabinet has been designated as the most influential in matters of e-governance. As reported by the interviewees, the role of the Parliament and Members of Parliament is less active and their contribution in a fast legislative process in the field has been seen as modest.

A study carried out at the end of 2019 among 139 Iraqi public sector employees<sup>37</sup> observed that the vast majority of the surveyed public servants believed that there was no clear national policy being developed towards a proper shift to digital services. Most respondents thought that e-government projects should be implemented either by government agencies (41.73% of respondents) or in public-private partnership (30.94%) but found that digital development was not sufficiently financed by the government.

36. Ministry of Planning of Iraq (2019). [Iraq Vision 2030](#).

37. Shahoodh, G., Al-Salman, O., Mustafina, J. (2020). [Towards a Context-Aware Digital Government in Iraq: A Public Sector Employees' Perspective](#). 13th International Conference on Developments in eSystems Engineering (DeSE)

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•Agreement with political forces on e-governance is reached</li> <li>•An e-governance spokesperson is named</li> <li>•Sporadic awareness-raising campaigns are conducted</li> </ul>	<ul style="list-style-type: none"> <li>•Agreement at the highest possible political level is declared (political priority)</li> <li>•Political will is affirmed with a political document</li> <li>•Strategic e-governance implementation plan is adopted and published</li> <li>•Continuous awareness-raising</li> </ul>	<ul style="list-style-type: none"> <li>•Public-private partnership and cooperation with academic institutions takes place</li> <li>•Development assistance (financial and technical) is provided</li> <li>•Overarching national digital strategy exists, digital ambitions and goals are recognized by international stakeholders</li> <li>•The society supports achieving national digital ambitions</li> </ul>

Figure 5: Maturity levels for political will and support

## Recommendations

**Develop and adopt a fundamental political-level e-governance strategy for a longer period** The strategy should envisage key elements and structures of the digital governance system (incl. digital government coordination, enterprise architecture, interoperability framework, legal review, etc.) and ensure consistency in public ICT funding. It should entail a detailed funding and implementation framework as well as a vision for guaranteeing the basic infrastructure for all counterparts. Additionally, ensuring a dedicated central planning institution and encouraging cooperation between government institutions would be essential for the upcoming years. Best results would derive from a cross-sectoral approach by also promoting cooperation with stakeholders outside the governmental sector (i.e. academia, civil society organisations, private sector) in the scope of the strategy.

The e-governance strategy should be accompanied by a strategic communication plan for digital governance and new e-services (with clear responsibilities and coordination).

Furthermore, based on the high-level e-governance strategy, each ministry should draft their own strategy for digital transformation.

**Establish a cross-sectoral cooperation format.** An effective collaboration scheme should encompass participation from the business, academic and civil society sector as well as with local government authorities and be continuous in nature.

## 2.4.2. Coordination

The coordination component includes designating an institution that will have the mandate to take decisions on e-governance for the entire administration. It is possible to have regional (federal state) solutions, but in any event, coordination will be needed. This does not mean centralising but ensuring that relevant decisions are properly coordinated. The coordinating institution is responsible for the strategic planning necessary for a state building e-governance and, more generally, an information society. The higher in the hierarchy the appointed unit is, the better the chances of directing ministries and agencies. The power and competences of the coordinating institution should be determined by legislation.



### Current situation in Iraq

The role of coordination on e-governance matters is highly decentralized in the governmental system. All institutions (e.g. ministries, agencies, authorities, etc.) have been given relative independence in planning and proposing the priorities of ICT solutions development in their capacity. There are no legal provisions for establishing a system of e-governance coordination and because of the absence of fundamental cross-governmental strategic planning, the development of services and systems is mainly motivated by inherent everyday needs and heavily influenced by any available funding.

The special committee established by the Council of Ministers functions as a nexus between the authorities and the Council of Ministers and the Prime Minister's Office, disseminating relevant information and providing access to some auxiliary services (e.g. training performed by academia of the private sector), but is not responsible for primary e-governance coordination or strategic planning functions.

Most of the authorities have dedicated ICT personnel on the roster and also employ specialists responsible for planning and coordination of ICT projects. However, according to interviews, the main mode of cooperation is unofficial in nature (personal contacts, WhatsApp groups, etc.) and heavily dependent on personal networks. There is only intermittent cooperation in-between the authorities or horizontal collaboration on shared data and procedures.

Despite the decentralized nature of planning, according to the interlocutors, an important role in the de facto coordination and decision making has fallen to the Council of Ministers and the Prime Minister's Office as funding and budget planning have had the ultimate influence on the final commencement of the planned development projects.

## Maturity level for Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•A sustainable organization or a person responsible for e-governance development is designated</li> <li>•Power and competences of e-governance coordination are mandated by legislation</li> </ul>	<ul style="list-style-type: none"> <li>•Tools for coordination are applied (policies, legislation and regulations, budgeting, monitoring, common standards, nation-wide reuse of data, data exchange, re-use of software solutions, rapid development of online services, etc.</li> <li>•Continuous development of ICT skills of public officials</li> </ul>	<ul style="list-style-type: none"> <li>•The coordinating institution manages overall e-governance architecture and developments from a holistic point of view</li> <li>•Development of policies and standards is centralized, while implementation is decentralized</li> </ul>

Figure 6: Maturity levels for coordination

## Recommendations

**Organizational setup and legal provisions for e-governance coordination should be adopted.** The coordination framework should among other components entail regulation for establishing a sustainable (preferably non-political) institution for e-government coordination as well as applicable measures and instruments for effective intra-governmental communication. A redistribution of roles and analysis of the structure of the E-Government Committee (Committee 22 of 2020) should be undertaken, with the addition of representatives from ministries and government institutions to be comprehensive, taking into account specialization according to teams and tasks. Furthermore, a review of the structure of all government institutions should be carried out to see how digitalization efforts are managed and to optimise routines by adopting modern technology.

**ICT development should be devised based on long-term planning.** Budget composition should not be the main coordination instrument. Shifting from ad hoc funding-based development to long-term strategical planning allows for cooperation and integration between the institutions and more cost-effective and innovative solutions. Planning should be arranged based on two tiers - strategical vision and plans for implementation (including budget planning).

**Management and coordination of digital transformation** should be assessed and reinforced at the level of ministries. The structure of all government institutions should be reviewed for their preparedness to adopt modern technology and procedures. The role of Chief Information Officers at ministries and agencies should be clearly defined and a clear framework should be set for their cooperation. Government CIO cooperation should be facilitated. The cooperation framework should provide a strong official structure for government CIOs' cooperation, ranging from collaboration within each larger organization, horizontally between institutions, and also regionally with remote units and branches. Regular training of CIOs should be foreseen to further raise their awareness of digital transformation and the role of CIOs, but also to develop their capacities to develop and implement projects, conduct procurements, etc.

## 2.4.3. Financing model

General financing and financial models for e-services need to be developed in order to ensure sustainability. For every e-governance solution, the total cost of ownership of the solution must be planned. The introduction of e-governance will have a cost, even if it will soon lead to savings in other respects, so it is essential that there is adequate provision for the necessary funds in a sustainable manner. The provision can be made centrally but also at the level of specific institutions. In any case, sufficient financing should be provided on a medium- to long-term basis, preferably through multi-annual budgeting. Authorities must be able to manage the risks arising from cyclical planning of the state budget. For example, in the state financial forecast a separate budget line is allocated for the development of e-governance. To support that allocation, clear procedures for planning the e-governance budget and managing the use of budgetary resources must be established. The transparency and accountability of the financial model need to be ensured.

According to some institutions, their budget proposals for strategically important development projects are issued to the Council of Ministers level through Committee 22, which is responsible for additional evaluation and suggestions on the feasibility of the projects. However, other institutions indicated during interviews that they were not aware of a clear connection of their ICT budget proposals with government-level planning. It is important to note that the current ICT budgeting is not based on any adopted fundamental e-government strategy or development plan.

External ICT funding made available through international organizations is heavily dependent on specific topics and programmes (e.g. in the field of defence technology or border crossing).



### Current situation in Iraq

The issues with public sector financial management and budget planning are wider than what concerns the financing of e-government topics. Experts have pointed out that a lot of issues start with paper-based budget processes, starting from planning to execution and monitoring, instead of using an integrated financial management information system that would allow automating core budget execution functions and bringing transparency to the process <sup>38</sup>.

Each ministry or authority is responsible for planning and executing their own budget for annual ICT costs. The budgetary resources for ICT are divided into two large categories: everyday maintenance costs and strategic project implementation costs. According to interviews with government stakeholders, budgetary restrictions allow for a minimal level of continuous processes and maintenance of existing facilities (including day-to-day office equipment).

Most of the interviewees brought out that despite their budgetary proposals, strategic ICT development costs have not been approved at all or only in a small portion of the needed funding. This unpredictable situation has led to an effective halt in ICT development and lack of basic infrastructural requirements in many institutions.

### Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>• An impact analysis-based approach is used</li> <li>• A separate budget is designated for ICT at each ministry and government agency</li> </ul>	<ul style="list-style-type: none"> <li>• Tare developed and enforced by law</li> <li>• Instrument to ensure budget transparency and accountability are applied</li> <li>• Total costs and yearly resources for e-governance are planned at the national level</li> </ul>	<ul style="list-style-type: none"> <li>• Sources of sustainable financing are identified</li> <li>• Long-term e-governance strategy-based budgeting is applied</li> <li>• Risks arising from the cyclical planning of the state budget are considered</li> </ul>

Figure 7: Maturity levels for financing model

38. Atlantic Council (2021). "Gone with the Muhasasa: Iraq's static budget process, and the loss of financial control".

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## Recommendations

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**Consistency in public ICT funding has to be ensured.** Sporadic funding and conflicting expectations of the institutions for financing their planned development projects significantly curb the digital transformation process and development progress. All funding decisions have to be based on long-term planning and implementation strategies. According to best practice, the digital transformation budget of an institution should amount to at least 1 per cent of the overall budget to offer minimal funds for sustainable development. Donor financing can complement the national budget but must be adequately coordinated.

**The budgeting process (including ICT budgeting) of government institutions needs to be transparent.** Sustainable planning of investments and maintenance costs should be based on a comprehensive review of software and hardware needs of public institutions. Electronic means are recommended to be used for the budgeting process, which would allow for better oversight and implementation monitoring. Budget transparency includes, among others, procedural standardization, cooperation and participation of relevant stakeholders, as well as basing the process on existent instrumental political and technical development plans.

**The ICT budget structure in every institution has to be clear and transparent.** Public trust in the institutions is enhanced through transparent processes and accountability in the budgeting process, which in turn allows for sustainable development and service improvement. Additionally, the foreign donor funding component has to be clearly determined in the budget structure.

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## 2.4.4. Legal framework

There are no legal prerequisites for starting the process of introduction of e-governance. There are, however, several laws that need to be looked at and this legal overview should be made in the early stages of e-governance development. There should not be too much specialized legislation on e-governance, but the legal implications of the technologies used should be integrated in legislation across the whole spectrum of the affected laws. The more innovative the e-governance solution, the more it changes the existing workflows. Major changes in workflows may require new or amended legislation. The changes needed in the legal framework are country-specific, but often relate to electronic signature, data protection, accepting electronic information, etc.

The key legal issues to keep in mind in the context of introduction or further developing e-government can be summarized to include (but are not limited to) the following:

- There should be no obstacles to using electronic format for administrative acts,
- Electronic acts should have the same legal force as traditional acts,
- There should be a possibility for secure electronic identification and signature,
- Data protection provisions should be in place and implemented,
- There should be rules on the establishment of databases and interoperability of data,
- Data ownership and management provisions should be in place,
- Issues of responsibility for adoption of necessary rules and regulations should be clear.

Usually changes in the existing laws need to abandon requirements that focus on the 'paper world' and define public information as 'information which is recorded and documented in any manner and on any medium and which is obtained or created upon performance of public duties provided by law or legislation issued on the basis thereof'.

In addition to laws, different strategies and plans need to be developed and drafted, clearly indicating the connection between the legal component and the governance one.



## Current situation in Iraq

As identified during the interviews, the Iraqi parliament has not finished its legislative debates on the adoption of acts for a widespread acceptance and implementation of e-governance principles.

Nevertheless, there are certain regulations that allow for some elements of electronic administration. For instance, in 2012 the Iraqi Electronic Transactions Act was adopted to provide the foundation and legal framework for electronic transactions and electronic signature through modern means of communication, and to encourage the Internet industry. The Act also allows for electronic transfer of funds and regulates the admissibility and evidential weight of electronic records. However, the country still lacks the institutional framework (e.g. Certification Authority) and infrastructure to apply the possibilities foreseen in the Act.

The draft legislation for the telecommunications sector has been discussed for years, which has resulted in a Green Paper on Iraq Draft Telecommunications Law in 2018 <sup>39</sup>, but the legislation is yet to be adopted.

Similarly, the Cybercrimes Bill has been in preparation for more than a decade – a draft of the law first failed to pass in 2011 and was reintroduced to parliament in 2019. However, it was later tabled in 2020 due to pressure from civil society and human rights organizations, as the bill was feared to punish dissent in civil society and have a chilling effect on freedom of expression <sup>40</sup>.

There is no single law governing data protection issues in Iraq. Instead, different pieces of legislation are used, among those the Iraqi Penal Code No. 111 of 1969, the Iraqi Civil Code, and other sector specific laws (labour laws, banking laws etc.).

39. GSMA (2020). [Iraq Telecom Law – Workshop](#).

40. hrw.org (2021). [Iraq Parliament Suspends Draconian Cybercrimes Bill](#).

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>• Analysis of the legal system is conducted</li> <li>• Any legislation incompatible with e-governance is identified</li> </ul>	<ul style="list-style-type: none"> <li>• A minimum level of legislation relevant to e-governance is adopted</li> <li>• Specific regulations for data protection, electronic identity and signature, civil register and protection of national cyberspace are adopted</li> </ul>	<ul style="list-style-type: none"> <li>• All legal acts take the details of e-governance solutions into account</li> <li>• The legal environment at the pan-regional level is harmonized</li> </ul>

Figure 8: Maturity levels for legal framework

## Recommendations

**Formulation of a legal team to review and develop legislation dealing with information technology and digital transformation.** The composition and tasks of the current legal committee under Committee 22 should be reviewed, and specific criteria should be set for selecting the members of this panel. Cooperation with international consultants is encouraged to consult and adopt best practices from other countries.

**A systematic legal analysis on basic e-governance legal building blocks should be conducted.** This analysis should be organized before undertaking the long-term strategy composition process. The analysis would offer an understanding of basic legal acts and identify the needed amendments in existing regulations that are necessary for moving forward with any e-governance plans. It would be valuable to include specialized IT law experts in the process. The legal framework should also entail regulation on implementation strategies. Determining not only the ‘what?’ but also ‘who?’ already in the legal structure allows for effective and practical strategic planning of future e-service development projects.

**Work on adopting pending legal amendments should be pursued more actively and without further delays.** This includes adopting laws for personal data protection, right to access to information, telecommunications, and introducing necessary amendments to other legal acts, based on consultations with a wide range of stakeholders. External consultants and international bodies can be involved in the process for expertise and mediation, if needed. In addition, mechanisms need to be foreseen to guarantee the implementation of the laws.

## 2.4.5. Data, digital databases

Data constitutes a key element of digital transformation, as every interaction in a digital setting generates data and most depend on the availability of data in digital format. Developing a digital society requires governments to better understand what kind of data is available, both offline and digitally, how this data can be aligned and used for creating value in the public sector and in the society as a whole.



### Current situation in Iraq

Data management is still in a developing state. The governmental organizations do not have an overview of public data that is available and do not apply any data collection principles. Every authority has their own principles regarding data formats and use, making cross-institutional cooperation and data-driven decision-making difficult. Moreover, according to interlocutors, there are no discernible public open data principles or prepared outlets in place.

The bulk of data collected and held is on paper but intra-authority document management systems are increasingly established, which allow for electronic data formats to be processed. However, according to interviews, archived and previously used paper records are often not digitized, and only newly obtained data is collected and archived in machine-readable formats.

Databases (in institutions where electronic data is collected) are usually managed on internationally licenced or available solutions (e.g. Oracle or MySQL) but make in some cases use of legacy (e.g. MS Access) or simple (MS Excel) solutions.

Based on the information publicly available on the website of the Central Statistical Organization<sup>41</sup>, it seems that the information collected about technology and e-government is extremely limited and not up to date. Indeed, the latest technology survey dates back to the year 2011.

41. [Central Statistical Organization website](#).

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•Some digital databases are deployed and a governance organization is established</li> <li>•Ownership of data and access rights are clearly established</li> <li>•Basic capacities for data analysis and data management exist</li> </ul>	<ul style="list-style-type: none"> <li>•A significant number of registries, databases and services are digitized</li> <li>•There is an agreement on a common data format and the shared meaning of data</li> <li>•A catalogue of state databases and services exists, where a significant amount of registries, databases and services are described</li> </ul>	<ul style="list-style-type: none"> <li>•All data is described in the catalogue of state databases and services</li> <li>•Real-time data is used to inform public policy making</li> <li>•Open government data is made available for creating new services and providing input to public policy making</li> </ul>

Figure 9: Maturity levels for data and digital databases

## Recommendations

**Data has to be collected, processed, and stored in digital form.** Digitization of existing paper documents and data should be prioritized as high-quality digital data constitutes the basic requirement for data-driven development and data reuse within the public sector. Focus should be placed on the digitization and inventory of mandatory basic data on the population (i.e. the civil registry), companies, and land and property.

**A cross-governmental data management regulation must be established.** Data usage, access and ownership rules have to be determined as a basic requirement for the practical functioning of e-governance. The data management regulation should give priority to the digitization of existing documents and paper data as a prerequisite for data-based development. Data in data centres have to be managed based on these established and supervised principles, including rules on cybersecurity, data protection, secure database management.

**An inventory of information assets should be arranged.** The government should have a clear overview of what type and content of data is collected across all institutions. Conducting an inventory of records, inventorying documents to be digitized, and identifying existing information systems, databases, services and information assets is recommended. The meta-data component has to be associated with the collected data for providing basic possibilities for interoperability and defining characterization. This would open a fundamental opportunity for informed data usage and cross-institutional exchange.

## 2.4.6. Interoperability, secure data exchange

The digitization of public services means that ministries and government agencies capture and process data in a machine-readable form. Digital transformation requires digital databases and data exchange between those.

The modern e-governance model is a component-based service model, allowing the establishment of public services by reusing, as much as possible, existing service components. Public administrations should agree on a common scheme to interconnect loosely coupled components and put in place the necessary infrastructure.

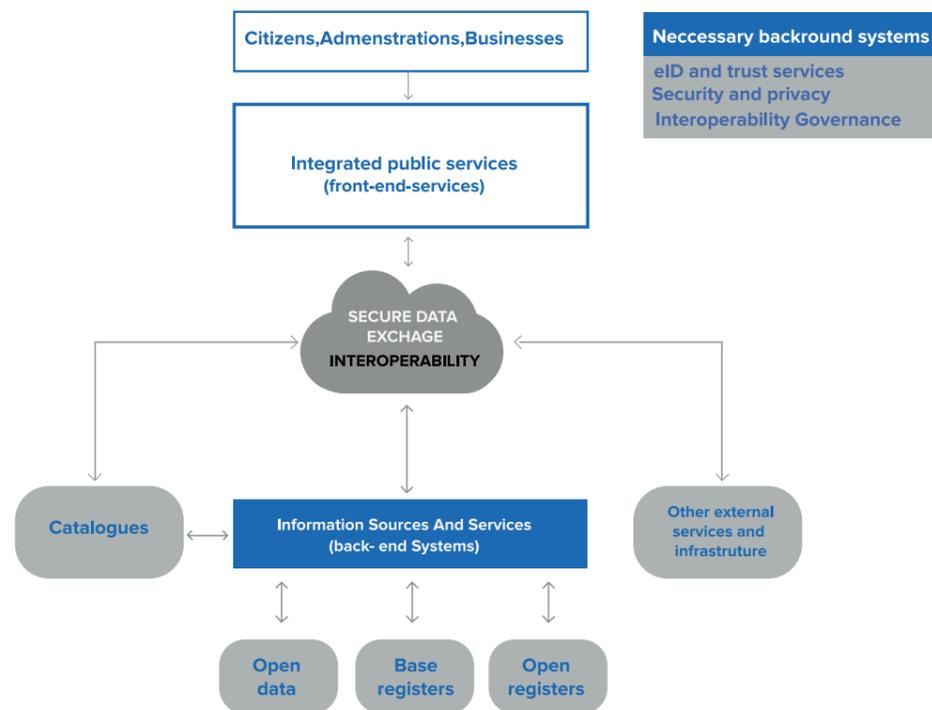


Figure 10: Conceptual model of integrated e-government (based on the European Interoperability Framework)

The model promotes reusability as a driver for interoperability, recognising that the public services should reuse information and services that already exist and may be available from various sources inside or beyond the organizational boundaries of public administrations. Information and services should be retrievable and be made available in interoperable formats.



## Current situation in Iraq

Currently the main mode of data transfer is manual transport of paper documents and printed data. In some institutions Compact Discs and USB Flash Drives are used for data transfer. There are no secure data exchange platforms in use.

There are plans to develop this aspect within the National Data Center. It is important to note that there is no clear policy or plans for implementing reciprocal use. However, a practical formulation of the "Iraqi National Strategic Data Sharing Plan 2021-2023" has been developed, providing an overview of the authorities that wish to share information among themselves.

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•A technical solution for secure exchange of data is deployed and a governance organization is established</li> <li>•An e-government architecture and interoperability framework is deployed</li> </ul>	<ul style="list-style-type: none"> <li>•A significant number of government registers and services exchange data over a secure data exchange layer</li> <li>•A designated organization or person for interoperability is assigned</li> </ul>	<ul style="list-style-type: none"> <li>•All digitized data is shared</li> <li>•Some private information systems are also connected to the secure data exchange solution</li> <li>•Cross-border interoperability exists</li> <li>•Organizational interoperability is agreed</li> </ul>

Figure 11: Maturity levels for data and digital databases

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## Recommendations

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An interoperability framework should be developed, together with basic electronic data collection and management principles. To implement the technical interoperability framework, public administrations must be willing to share their data and service components with others by default. Re-use and sharing of information naturally leads to collaboration, i.e. working together towards mutually beneficial and agreed common goals. An interoperability implementation and management regulation with a defined responsible governmental institution should be put into place. In addition to the technical support, this organization should be responsible for awareness-raising and motivating other public authorities to share their data. It is recommended to draw up an analysis of technical tasks, capabilities and prerequisites that must be implemented (procured) for implementing any interoperability solutions.

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## 2.4.7. Secure digital identity, digital signatures

For e-governance services to be useful for all types of governance tasks, it is essential that the users can identify themselves in a secure manner. This requires the development of a digital identity concept and tools. This can include digital ID or mobile ID together with a digital signature. Signatures must be secure enough to be recognized as evidence in court or similar situations.



### Current situation in Iraq

A major drawback to the digital transformation and development of e-services in Iraq is the absence of a unified national identity register, which would give the government a clear understanding of the country's population and would allow identifying all the customers using the public services. At the moment the most complete database of persons is with the Ministry of Trade, which is used to distinguish recipients for the purpose of monthly food rationing. However, this database is not person-based, but family-based, meaning that there are identification cards for heads of family and any family members are also listed on the same card. Only the family card has a unique number, but there is no unique number issued to the citizens.

A 12-digit unique persistent national identification number is issued to citizens on the Iraqi National Card, which have been in use since 2016. The card includes an RFID chip. The objective is to issue an ID card to every Iraqi citizen, but in reality, only around 16 million people out of a total of 40 million possess one, which counts for a 40 per cent rollout. According to interviews, there is active pushback from some adversarial groups in the society against the widespread rollout of the e-capable National Card because it would allow for verifiable identification and transparent transactions.

Yet, there is also some donor interest in supporting identity management, as recently the World Bank Group stated in its Country Partnership Framework for Iraq that it would provide support to the rollout of national identification <sup>42</sup>.

42 World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#). July 12, 2021, page 22.

Currently the main means of remote identification is a username/password combination and in some specialized areas (e.g. in financial transactions or military services) biometrics (dactyloscopy or eye iris scans) is used for verified identification. There is no straightforward technical solution for remote digital identity available, as the RFID chip could not be readily used for this purpose due to the costly nature of authentication.

The law on electronic signature and electronic transactions (No. 78) 2012 was adopted in Iraq in 2012<sup>43</sup>. However, according to a presentation held at the Inter-regional Standardization Forum for Bridging the Standardization GAP (BSG)<sup>44</sup>, due to the missing infrastructure in Iraq, successfully fulfilling the requirements and aims of the legislation has proved to be difficult.

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•An identity register is established</li> <li>•A unique personal identification mechanism is agreed</li> <li>•A technical solution for digital signature is deployed</li> </ul>	<ul style="list-style-type: none"> <li>•An ID card issuance system is established</li> <li>•A significant number of citizens have ID cards or other eID tokens</li> <li>•Digital identity and digital signature are used by citizens</li> <li>•Digital signature is recognized by law</li> <li>•Programmes to make digital identity and signature known and usable for the public are established</li> </ul>	<ul style="list-style-type: none"> <li>•Secure technology for digital identity and signature is introduced</li> <li>•Trust services exist</li> <li>•Digital identity is used when communicating with government agencies</li> <li>•Digital signature is used by citizens in their everyday life</li> </ul>

Figure 12: Maturity levels for secure digital identity and digital signatures

## Recommendations

National ID rollout should be encouraged to advance population data management. The National ID should become the primary identification structure in governmental services, providing the possibility for reliable authentication of persons. Only after a relative increase in the National ID uptake, further possibilities can be explored to offer services based on a digital identity token and deploy digital signatures.

National ID management should be integrated with general population data management. A unique identifier should ideally be assigned from birth and later linked to the National ID, allowing for life cycle usage.

Cooperation with the private sector should be extended, so that it would make the usage of the National ID more lucrative. The government should encourage cooperation with banks, telecommunications service providers, etc. for additional incentives for establishing remote identification and digital identity use cases.

43. UNCTAD (2021). [Cyberlaw Tracker: The case of Iraq – E-transactions Laws](#).

44. International Telecommunications Union (2017). [“E-Signature Law of Iraq no. \(78\) of 2012”](#) – presentation.

## 2.4.8. Digital skills

The rapid development of digital technologies requires both public officials and citizens to acquire skills needed to use the new tools and enjoy the possibilities of a digital society. In addition to equipping all citizens and public officials with basic skills, authorities need ICT specialists with advanced IT and project management skills to maintain ICT architecture and user support, manage ICT procurements, and implement the government's digital strategy.



### Current situation in Iraq

Although the education system delivers more than 11,000 graduates annually at all levels of technical and vocational education, there is said to be a skills gap, as the youth are not always properly equipped with jobs-relevant skills, including digital skills, as the curricula are seen as not able to meet the requirements of a digital economy and a digital society. This is also considered as a reason why formal qualifications do not seem to be highly valued by employers<sup>45</sup>.

Yet, in a study carried out in 2019 among 139 Iraqi public sector employees<sup>46</sup> via an anonymous survey, the majority (58%) of public servants rated their own ICT skills as appropriate to assist the digital transformation of government services, whereas only 17% noted shortcomings in digital skills.

According to interviews, the digital skills of government officials correspond to what is necessary to fulfil their duties. The Federal Public Service Council, in cooperation with more ad hoc operations by the e-Governance Committee, are responsible for the training of public service ICT officials. In case the officials have tasks involving basic ICT solutions, they have had access to appropriate training and their skills level is adequate. However, when it comes to more specific ICT capacities (e.g. network maintenance or cybersecurity management) there are certain shortcomings among the training or the availability of dedicated staff. As the availability of official training courses is uncertain, many institutions encourage their staff to engage in personal, mainly online, training and advancement in the needed topics. As stated in interviews, enthusiasm of ICT staff to engage in self-learning activities is high.

45. World Bank (2020). [Iraq Economic Monitor: Navigating the Perfect Storm Redux](#), page 28.

46. Shahoodh, G., Al-Salman, O., Mustafina, J. (2020). [Towards a Context-Aware Digital Government in Iraq: A Public Sector Employees' Perspective](#). 13th International Conference on Developments in eSystems Engineering (DeSE)

Based on the interviews, there are qualified ICT specialists available on the job-market but one of the main reasons for the shortage of highly trained staff in the fact that salaries in the public sector are not as competitive as in the private sector.

Public awareness campaigns or programs are rare, and the public sector has no clear policy or underlying data on the necessity of digital literacy campaigns for the general public.

### Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•Government understands the digital skills needed for effective operation</li> <li>•Limited awareness-raising campaigns on digital literacy and topics are conducted among public servants and the general public</li> </ul>	<ul style="list-style-type: none"> <li>•Continuous awareness-raising and training on digital literacy of the general public</li> <li>•Continuous development of ICT skills of public officials, including on-the-job learning</li> <li>•Ability to involve temporary ICT resources, when needed</li> <li>•ICT staff have access to continuous professional training</li> <li>•Top managers have sufficient digital skills to guide ICT developments based on business need and a long-term ICT strategy</li> </ul>	<ul style="list-style-type: none"> <li>•The government is able to attract and maintain specialists with a high level of expertise to develop and implement e-government</li> <li>•The government regularly involves private sector for additional competences, with partnering models in place</li> <li>•Top managers have advanced digital skills and have embedded ICT into the planning, management, and development of all areas of activity</li> <li>•A model of digital competences is implemented, which covers all roles in the organization and supports value delivery</li> </ul>

Figure 13: Maturity levels for digital skills

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## Recommendations

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**Increasing the level of digital skills of public sector officials.** An assessment of existing capacities of public officials and training needs should be carried out. Based on its results, a learning plan should be defined, and training courses should be organized for government officials, which contain components on complementing their ICT and digital skills and understanding of cyber hygiene. A boost in overall digital skills of civil servants helps enhancing the basic level of understanding necessary for implementing e-governance measures in the public sector. Special focus should be put on top management and middle-level managers to make sure they have a solid understanding of the basic elements and benefits of e-government.

The Ministry of Higher Education, and the continuing education centres at Iraqi universities should organize mandatory courses for public officials in the optimal use of ICT technology and the protection of personal information in an online setting. Course curricula could be prepared in cooperation with international consultants.

**Increasing the level of digital skills of the general public.** The Ministry of Education should review and revise the curricula for primary, intermediate and secondary schools that would include topics on optimal use of ICT technology and the protection of personal data in an online setting. Assistance of international experts could be involved to this end.

**Holding public awareness campaigns and raising of overall digital skill of the general public should be prioritized.** Digital transformation is not possible without conscious and informed users of public e-services. Emphasis should be put on promoting digital hygiene, averting cyber risks, and popularizing remote communication means. It is also important that digital skills and cyber hygiene courses be offered free of charge to avoid digital divide.

## 2.4.9. Access to services

To be able to benefit from the advantages a digital society brings, citizens and businesses should be able to access public services online. These should not simply be available, but also easy to access on different devices and platforms, inclusive and user-friendly.

To communicate with the public, the administration should establish a device and technology neutral digital information channel, such as a government portal, operating on different devices. This information channel is used to provide both information services and procedural services. A well-functioning digital information channel will transform government services into a single whole and improve the availability of public services.

A basic framework to assess the state of the e-services landscape can be applied to public services, resulting in the following stages of maturity:

- **Level 1:** Information exists electronically about the service.
- **Level 2:** One-way communication: Forms can be downloaded from the internet, to be filled in and submitted manually.
- **Level 3:** Two-way communication: Forms can be filled in and submitted online and the public service will be triggered for the authorized user.
- **Level 4:** Transaction: Services can be provided fully on-line by electronically submitting filled-in forms or data for processing. The output is also delivered electronically.
- **Level 5:** Personalized service: The entire service can be performed online, automatically and proactively



## Current situation in Iraq

Most Iraqi government ministries have an online presence. This mainly takes the form of websites, which usually include information about the structure of the organization, contact details, mission statements, news, procurements, and allow downloading documents. Some websites also have sections for citizens to submit or download forms for issuing complaints. Furthermore, most ministries have a social media presence, often on Facebook and Twitter, but some also share information via YouTube, Telegram, etc.

COVID-19 has accelerated the population's acceptance of the online economy, e.g. use of food delivery apps and online stores<sup>47</sup>, and to some extent also the online provision of public services by the government.

Most of the e-services currently provided by the government are services at levels 1–3 – i.e. sharing information via websites, offering forms to be downloaded, and in some cases also the possibility of filling in forms electronically via dedicated websites or pages. A notable example of an electronically driven service cross-institutionally is the possibility to issue complaints, appeals and suggestions to the public authority. According to interviews, this service has the strongest pressure from the public to be made more easily accessible and processable.

Notable online services launched by the Iraqi government in the past years include the "Tawtheef" recruitment portal<sup>48</sup> that supports graduates and qualified job-seekers to find employment in the public and private sectors. Other popular services include online application for ID cards and passports, consultation of examination results, enrolment in higher education, registering cars online, etc. The government has also issued electronic cards (Q-Card) to public sector employees to pay social assistance automatically through banking services<sup>49</sup>.

In addition, the Ministry of Trade has launched a platform for registering new businesses<sup>50</sup>. Even though according to the website this online opportunity seems to be currently available only in Baghdad, its aim is to make company registration digital in the whole country, enabling the entrepreneurs to see their current registrations, apply for licenses, update their data, and make declarations and payments<sup>51</sup>.

The e-government committee at COMSEC has conducted an exercise of identifying key services to be digitalized in the coming year. This includes 12 government-to-citizen services

(e.g. national ID card, birth and death registration, ration card system, vehicles registration system, e-marriage and e-divorce system, etc.). In addition, 6 government-to-business service integrations are foreseen (e.g. tax system, automated import and export licenses, border port automation system, etc.), together with 7 government-to-financial services integrations (e.g. integrated financial management system, government expenditures auditing system, national retirement system, etc.), and 5 government-to-government services integrations (e.g. national HR and payroll system, national document management system, government portal, etc.).

Digital initiatives currently being developed include automating the customs procedures and implementing the ASYCUDA system in cooperation with UNCTAD, with the aim to eliminate financial and administrative corruption and expel armed militias from border crossings<sup>52</sup>. The revenue related to automation is expected to be significant, as only 10-12 per cent of the expected customs revenue is said to reach the finance ministry<sup>53</sup>.

A development that will hopefully further facilitate the shift towards a more digital society is the launch of a mobile money app by the Trade Bank of Iraq<sup>54</sup>. Also, the Central Bank of Iraq has partnered with MasterCard to advance digital payments, starting with the education sector<sup>55</sup>. In fact, one of the key reforms foreseen in the 'White Paper' for economic reforms<sup>56</sup> published in October 2020 is namely the development of e-banking services. The challenge is that 80 per cent of the population are currently still unbanked, as Iraqis are claimed not to trust banks<sup>57</sup>. A National Payment System Strategy has been developed to help the country more towards a cashless system, which includes not only cooperation between a wide range of stakeholders (Central Bank of Iraq, government authorities, commercial banks, telecom companies, etc.) but also increasing the trustworthiness of banks and digital payments in the eyes of the end users. Furthermore, the World Bank Group's Country Partnership Framework for Iraq states that the enactment of laws to facilitate electronic payment systems will be supported<sup>58</sup>.

Recent data has now shown that the share of the adult population who have made at least one digital payment a year is constantly increasing, having quadrupled between 2014 and 2017 and reached 19 per cent in 2019. Also, recently the Central Bank of Iraq has facilitated the process for Iraqi citizens to open e-wallets online using their IDs<sup>59</sup>.

47. The National Interest (2021). "Can New Tech Save Iraq's Old Economy?"

48. [Tawtheef portal website](#).

49. A. P. D. S. Z. Mohammad, "Availability range requirements of the application of e-government in the Iraqi environment according to the indicators (EGDI) & (EPI) an analytical study", Tikrit Journal of Administration and Economics Sciences, vol. 15, no. 48 part 2, pp. 41-59, 2019.

50. [Create Your Business Online platform](#).

51. World Bank (2020). [Iraq Economic Monitor: Navigating the Perfect Storm Redux](#), page 26.

52. Al-Monitor (2021). "Iraq automates its customs service to reduce corruption at border crossings".

53. France24 (2021). "Worse than a jungle: the cartel controlling Iraqi borders".

54. The National Interest (2021). "Can New Tech Save Iraq's Old Economy?"

55. IBsintelligence (2021). "Mastercard partners with Central Bank of Iraq to advance digital payments".

56. Government of Iraq (2020). [White Paper for Economic Reform, October 2020](#).

57. The National Interest (2021). "Can New Tech Save Iraq's Old Economy?"

58. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026, July 12, 2021](#), page 22.

59. World Bank (2020). [Iraq Economic Monitor: Navigating the Perfect Storm Redux](#), page 24-25.

## Maturity level of Iraq: BASIC

	USEFUL LEVEL	SUSTAINABLE LEVEL
<b>BASIC LEVEL</b> Some e-governance services accessible to most citizens are available •Information on how to use these services is publicly available (transparency) •Some service usage campaigns are implemented •Government portal exists and is used to share information	•Many e-governance services are available •Services are easy to use •Many citizens use these services •Ongoing service usage campaigns are held •A government portal provides access to e-services •Citizens can see what data the government holds about them	•A wide range of e-governance services are available and used •People have good abilities to use government e-services •Well-established support for users is available (incl. technical support) •Civil society is involved in service provision and design •Information on the portal and e-services are securely accessible in various e-channels using any device

Figure 14: Maturity levels for access to services

## Recommendations

**Approve and implement the plan for developing top priority e-services.** The analysis that has already been carried out by the E-government Committee at COMSEC should be discussed with stakeholders to identify the services that are most frequently requested by citizens and businesses and calculate the cost of launching these as e-services. Some 15-20 services with the most reach and impact should be selected for further development, first making sure that any related databases have high quality data and that they are properly interconnected.

**Develop a national e-service portal where all services can be accessed.** The portal should provide general information about all public institutions and the services (including e-services) that they offer. This could be a web portal available on different platforms and devices, but it could also take the form of a mobile application.

**Public awareness should be built of existing and planned electronic services.** It is important to adequately convey the benefits of citizen-oriented electronic communication and potential services to the wider audience. The used channels and propagation methods should be designed based on the level of maturity of the services (see above) and the expected usage base. Planned and developed services should strive for enhanced digitalization and more complex communication channels to extend the provided level of service. Consideration should be given to offering unified collections of services (i.e. via a government service portal) for expedited access.

## 2.4.10. E-participation, e-democracy

E-democracy is an integral part of a nation's digital transformation. The smart use of digital tools enriches and transforms existing governance models and practices, increasing the transparency, responsiveness, and accountability of government. It also offers citizens an additional opportunity to take part in political processes, resulting in better political outcomes for the society as a whole. For successful e-governance it is beneficial to examine how it is possible to support civil society and encourage citizen engagement. This is a part of general computer literacy development.



### Current situation in Iraq

The overall opportunities for participation (not only e-participation) are viewed as limited by the citizens. According to a World Bank Group paper from 2021<sup>60</sup>, the 2019 mass protests in Iraq illustrated "the breakdown of the social contract over grievances on poor governance, lack of employment opportunities, and inadequate service delivery". The report notes that despite some progress, there is a "lack of effective mechanisms for citizens and civil society to express their views or hold the government accountable". This situation is reiterated in the interviews with the governmental stakeholders. The Right of Access to Information law has been in a draft status for more than a decade (and even if passed in its proposed form, would not be fully supported by the civil society)<sup>61</sup> and there are no current or future plans for additional participatory measures directed to the wider public.

Although policies and instruments related to e-participation are not widely used at the central government level, there are a few examples of citizen engagement at the local level. For instance, the United States Institute of Peace project in Nineveh province has looked at community participation and possibilities of introducing participatory budgeting to inform the annual budget of the province. Based on the surveys carried out within the project, the majority of respondents are supportive of decentralization and there is a need to involve citizens to solve smaller problems at the local level. This is why more platforms for community engagement should be developed and community-led participatory budget committees have already been established in Nineveh province<sup>62</sup>.

According to conducted interviews, no legal provisions on online-driven transparency mechanisms exist and the main understanding of citizen engagement is related to users providing feedback on public service quality or informing about shortfalls in public processes, however, usually through non-electronic means.

60 World Bank Group (2021). *Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026*. July 12, 2021, page 4.

61. Iraqi Civil Society Solidarity Initiative (2017). "Freedom of Expression and Access to Information: The Iraqi Women Journalists Forum Works to Promote Essential Rights" 26 July 2017.v

62. United States Institute of Peace (2021). "Iraq Faces Major Governance Challenges – Can Decentralization Help?"

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>• Legal acts are in place to coordinate citizen participation in decision-making and access to public information</li> <li>• Continuous efforts to raise the e-literacy level of citizens and public officials</li> <li>• A suitable institution responsible for e-participation/e-democracy is designated</li> </ul>	<ul style="list-style-type: none"> <li>• Strategies and action plans exist in the area of civic participation and transparency</li> <li>• Online tools are available that allow citizens to provide feedback to the government</li> <li>• Civil society actors play an active role in promoting (e-)participation and transparency</li> </ul>	<ul style="list-style-type: none"> <li>• Citizens and civil society actors take an active role in developing e-services, proposing policy options, and shaping the policy dialogue</li> </ul>

Figure 15: Maturity levels for e-participation and e-democracy

## Recommendations

**A legal understanding of citizens' participation in governance**, access to information, and basic open government principles should be analysed and established. Enhancing access to public information, participation, transparent procedures and public engagement in the administrative process is not exclusively based on digitalization and electronic instruments but should first be seen as a fundamental understanding of public inclusion and providing meaningful feedback on governmental services.

**Establish tools for e-participation and co-creation.** Digital solutions should be based on the established and agreed general principles to allow citizens to provide feedback to public services, file incident reports and bring issues to the attention of government and provide input to government decisions. This could take the form of surveys of public service users, mobile-based citizen feedback platforms, etc.

**NGOs should be encouraged and supported to work on issues related to citizen engagement and open governance.** There are civil society organizations in Iraq whose mission is to promote human rights, citizen participation and support the fight against corruption. Such organizations should be more tightly involved in the legislation drafting progress and in cooperation mechanisms with the public sector. Furthermore, the government should find financial means to support these activities.

## 2.4.11. Information security

The growing cyber threats in the world require public administrations to focus on e-governance security measures. It is important to be aware of the threats posed to e-governance. The coordinating institution is required to organize the development, monitoring and supervision of relevant information security rules and measures. A designated organization in the form of a CERT/CIRT should be established, proper audit processes established, and all ministries and authorities should be aware of and use adequate security measures. The cybersecurity framework and the system of security measures should be established by legislation.



### Current situation in Iraq

According to the stakeholder interviews, governmental organizations acknowledge the need for diligent cybersecurity policies and implement the relevant measures as far as their available resources allow. Nevertheless, in many instances the ICT funding does not allow for coordinated security procedures but preparing for and fighting cyber threats is left a personal responsibility of every ICT specialist or outsourced to private contractors also responsible for infrastructural components of the institution.

There seems to be a national Cyber Events Response Team in place in Iraq, under the supervision of the Iraqi National Security Advisory. However, this entity does not have an active public presence, as its website and social media channel have not been updated since March 2019. Considering also that the Iraqi CERT is not part of the main relevant international cooperation bodies (e.g. FIRST, OIC-CERT), it raises the question whether it is still operational.

Although some interviewees noted the existence of a dedicated governmental institution responsible for the facilitation of governmental cybersecurity measures or fighting malicious cyber incidents, most interviewees were not aware of such an organization. Moreover, the lack of a coherent information security policy has resulted in some organizations maintaining no outside online connections or providing otherwise possible e-enabled services in fear of not being able to cope with possible cyber incidents.

Iraq does not have specific legislation for dealing with cybercrime. A draft law has been submitted to the House of Representatives. The draft for cybercrimes legislation has come under scrutiny from human rights groups, specifically because the suggested law may impede free speech<sup>63</sup>. Meanwhile, the Penal Code No. 111 of 1969<sup>64</sup> and anti-terrorism legislation<sup>65</sup> is utilized for combating cybercrime:

63. MENA Rights Group (2020). "Iraq's new draft Law on Combating Cybercrimes still contains problematic provisions restricting fundamental freedoms".

64. International Labour Organization (2021). "Iraqi Penal Code (Law No. 111 out 1969)".

65. Iraqi government (2005). "Anti-Terrorism Law".

"Article 437 of the Penal Code states that any person who by reason of his office, profession, trade, or the field of nature of his work, is privy to confidential information and discloses such information in circumstances other than those specified by law or uses it to his advantage or to another's advantage, is punishable by a period of detention not exceeding two years and a fine for one of those penalties. However, there is no penalty if he has been authorized to make such a disclosure or if, by such disclosure, he intends to report a felony, misdemeanor, or prevent the commitment of such an offence"<sup>66</sup>.

In December 2010, the League of Arab States, including Iraq, entered into agreement on the Arab Convention on Combating Information Technology Offences<sup>67</sup>. The intent was to produce a common criminal policy regarding illegal cyberattacks and similar offenses across the Arab states.

### Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•Cybersecurity assessment is completed</li> <li>•Government institutions deal with cyber/ICT security at the system operations level</li> </ul>	<ul style="list-style-type: none"> <li>•National CERT/CIRT is created</li> <li>•A national-level cybersecurity strategy and implementation plan are adopted</li> <li>•Minimum security requirements for government institutions are established</li> </ul>	<ul style="list-style-type: none"> <li>•A ministerial-level policy development unit and an agency-level competent supervisory authority are established</li> <li>•There is a mandatory cyber/ICT security standard in place for public sector institutions</li> </ul>

Figure 16: Maturity levels for information security

66. DataGuidance (2020). "Iraq – Data Protection Overview".

67. DlgWatch (2010). "Arab Convention on Combating Technology Offences" - Parties to the agreement are included in the document.

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## Recommendations

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A unified cybersecurity policy and risk management strategy analysis and adoption process should be taken up for all public institutions. As part of the analysis, specialized institutional responsibilities should be determined, including the need for centralized threat management and international cooperation strategies.

The government CERT should be reinstated and tasked with the management of and reporting on security incidents, together with improving visibility of their activities for general awareness-raising. Minimum cybersecurity requirements should be in place for public sector authorities and vital service providers. Critical infrastructure must be clearly defined, and minimum cybersecurity requirements should apply not only for public sector authorities, but for all providers of vital services. Digital service providers and operators of essential services should have an obligation to notify appointed government authorities of any cybersecurity incidents.

Public institutions have to be provided with necessary resources for assuring their cybersecurity infrastructure. The resources should include meaningful funding for personnel, additional training programmes for all public officials and crucial infrastructural components to guarantee basic level of information security.

## 2.4.12. Telecommunications and digital infrastructure

Access to ICT is essential as a basic prerequisite for e-governance. A minimum level of ICT infrastructure capacity is needed to implement e-governance projects. Communications networks are built by commercial companies, while the state's task is to regulate the development of the networks and provide favourable conditions for residents to access the network. For example, electronic communications legislation should be developed and enforced. It is the responsibility of the state to connect all national and local government agencies, schools, libraries, hospitals, and other public authorities, using the existing network.



### Current situation in Iraq

According to stakeholders, missing or insufficient infrastructural components in governmental institutions is one of the main challenges in advancing and establishing e-enabled services and facilitation cross-institutional communications. This concerns both Internet and other telecommunications network availability (e.g. connecting the institution's headquarters with branch offices) and appropriate supplies (e.g. data servers or network hardware) in the institutions. In some facilities, fluctuating electricity supply accounts for unstable working conditions.

The regulatory environment for telecommunications is somewhat complex, with both the Ministry of Communications and the Communications and Media Commission having certain roles. This is caused by the fact that there is no telecommunications law in place, which would differentiate the role of the Ministry of Communications as the policy maker and the Communications and Media Commission as the regulator<sup>68</sup>.

Three main private operators (Zain Iraq, Asiacell, Korek Telecom) are currently providing broadband services (3G connectivity) in a competitive market. Additionally, the Ministry of Communications runs public companies that are responsible for fibre optic networks and managing .iq domains.

Although mobile penetration is rather high (95% in 2019)<sup>69</sup>, the market penetration of unique mobile internet subscribers stood at only 64% in 2019<sup>70</sup> and there were just 11.6

68. GSMA (2018). [Green paper on Iraq Draft Telecommunication Laws](#).

69. World Bank (2019). [Mobile cellular subscriptions \(per 100 people\) – Iraq](#).

70. World Bank (2020). [Iraq Economic Monitor: Navigating the Perfect Storm Redux](#), page 23.

fixed broadband connections per 100 people in 2019<sup>71</sup>. According to [Speedtest.net](https://www.speedtest.net), Iraq ranked 65th in the world for mobile speeds and 109th for fixed broadband speeds in June 2021<sup>72</sup>.

One of the five key reform pillars identified White Paper on economic reforms foresees the improvement of basic infrastructure, which includes developing Iraq's digital infrastructure (implementation of 4G technology and preparations for the introduction of 5G)<sup>73</sup>.

In-house data centres are established in only a limited number of institutions and use of private facilities for data storage is common. There is enthusiasm for the developing of the national data centre developed by the E-governance Committee, although the main aim of it, according to interviews, is data transfer between the institutions instead of data storage.

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•Some elements of data servers in government exist</li> <li>•Telecommunication network infrastructure is developed by dedicated companies</li> <li>•International connectivity is provided</li> </ul>	<ul style="list-style-type: none"> <li>•Government has a data centre that serves some public sector institutions</li> <li>•Regulation of ICT is enforced (including competition, regulation, regulatory powers)</li> <li>•Telecommunications market participants are interested in continuous innovation and coverage improvement</li> </ul>	<ul style="list-style-type: none"> <li>•Private and public cloud are in place and widely used for storing and disseminating government data services</li> <li>•Public-private partnership cooperation exists</li> </ul>

Figure 17: Maturity levels for telecommunications and digital infrastructure

## Recommendations

**Telecommunications law must be finally adopted.** In addition to a clear regulatory framework for licensing, quality assurance and market regulation in the field of telecommunications, which would lay the groundwork for increasing competition and private sector participation. A competent authority needs to be clearly assigned for its implementation.

**All public institutions need to have access to basic infrastructure components.** This includes access to stable and affordable basic services such as electricity, Internet access or cellular network coverage, but also funding for internal hardware and software needs, incl. data management and information storage demands. Ministries should provide the appropriate central institution (e.g. the e-Government Committee) with a complete inventory of the ICT infrastructure and equipment needs (for both the ministry and its institutions and branches) to effectively partake in digital governance.

A concept of the National Data Centre (and possible secondary data centres) and national cloud strategy should be developed together with an analysis to identify the public sector's needs for hosting data. Possibilities should be explored for integrating international best practice for PPP in ICT infrastructure management.

**Establish public Wi-Fi hotspots at government authorities and public spaces.** This would allow people with limited means to access the internet, including online public services.

71. World Bank (2019). Fixed broadband subscriptions (per 100 people) – Iraq.  
 72. Speedtest.net. [Iraq's Mobile and Fixed Broadband Internet Speeds](https://www.speedtest.net).  
 73. Government of Iraq (2020). [White Paper for Economic Reforms, October 2020](https://www.government.gov.iq).

## 2.4.13. Emerging technologies, innovation

Emerging technologies can improve citizens' lives in many ways, and technological advancements can help people complete tasks more efficiently. Examples of emerging technology can include big data, artificial intelligence, blockchain, etc.

As for innovation, it increases the chances to react and discover new opportunities and allows building better products and services.



### Current situation in Iraq

Considering the basic (or in some categories even sub-basic) level of digital maturity of Iraq, it is expected that the field of emerging technologies has not yet appeared as a focus area. Indeed, emerging technologies such as big data and artificial intelligence would need a certain level of digital data and information systems to exist upon which services can be built.

Currently the main initiator of innovative and emerging technologies in the country is the private sector, for example in the fields of financial transactions and business development (e.g. use of blockchain for identity management at the First Iraqi Bank)<sup>74</sup>.

The integration of any advanced technologies and products needs to be built on existent basic data capabilities, developed infrastructure, and established electronic services. According to stakeholders, emerging technologies have a place in their future aspirations, but no current plans or development ideas are in place.

74. Unlock (2021). "Iraq newly launched Blockchain enabled Digital Bank partners with ICS Financial systems" 16 March 2021.

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>•Strategic e-governance documents include elements of innovation</li> <li>•The use of emerging technologies is not yet among the country's strategic priorities due to the modest level of digital transformation in the</li> </ul>	<ul style="list-style-type: none"> <li>•Many innovative policy instruments have been successfully implemented</li> <li>•The use of emerging technologies is to some extent aligned with the generally good level of digital transformation in the country</li> </ul>	<ul style="list-style-type: none"> <li>•Digital transformation is a key driver for innovation in the country</li> <li>•The use of emerging technologies is fully aligned with the high level of digital transformation in the country</li> </ul>

Figure 18: Maturity levels for emerging technologies and innovation

## Recommendations

The government should cooperate with the private sector and academia to further develop understanding of emerging technologies as well as form joint enterprises and developmental projects. This includes access to public finance mechanisms, including further courses on emerging technologies in university curricula, partnership in advancing capacity development tools, incubators, business accelerators, training courses, etc. Further incentives could be given to envisage plans for localized technology innovation.

## 2.4.14. International cooperation

In order to benefit from the advantages that e-governance can provide for international relations (trade, free movement, research and education, etc.), it is important for states to take part in international cooperation (regional or other). Such cooperation helps states to learn from one another and develop joint projects.

### Current situation in Iraq

The value of international cooperation cannot be overstated both in terms of exchanging good practices and the financial resources it may entail, but to be able to receive the international assistance and fully benefit from it, internal capacities and readiness are needed.

International development and related projects are currently coordinated by a newly formed International Development Committee under COMSEC.

To date, the international cooperation examples have not been many and according to a stakeholder interviewed the cooperation has not been very productive, but some cases could be highlighted. For instance, in June 2021, the Government of Iraq signed a memorandum of understanding with Egypt in the field of ICT, with the aim to exchange expertise in a number of areas including telecommunication infrastructure, digital transformation, capacity building, innovation, cybersecurity, legislative and regulatory framework, etc. In addition, the two countries established a joint company to carry out digital transformation projects and develop electronic services<sup>75</sup>.

The World Bank Group has also set up a Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026<sup>76</sup>, which is organized under two pillars: 1) improved governance, public service delivery, and private sector participation, and 2) strengthened human capital. Citizen engagement and gender equality are seen as an overarching topic across both pillars.

Furthermore, a cooperation project with UNDP has been set up to import good practice from the Republic of South Korea. One of the objectives of this project is to create a National Information Agency and a National Data Centre. However, this has not yet been implemented.

75. Ministry of Communications and Information Technology of Iraq (2021). "ICT Minister, Iraqi Counterpart Discuss Enhancing Cooperation on ICT".

76. World Bank Group (2021). [Country Partnership Framework for the Republic of Iraq for the period FY2022-FY2026](#). July 12, 2021, page 1.

## Maturity level of Iraq: BASIC

BASIC LEVEL	USEFUL LEVEL	SUSTAINABLE LEVEL
<ul style="list-style-type: none"> <li>• Suitable body/persons responsible for cooperation are designated</li> <li>• Representatives of the country take part in international cooperation</li> </ul>	<ul style="list-style-type: none"> <li>• A cooperation strategy exists</li> <li>• Representatives of the country regularly take part in international cooperation</li> <li>• There are some international projects dedicated to digital transformation</li> </ul>	<ul style="list-style-type: none"> <li>• The country takes part in international projects linked to e-governance in an active and coordinated manner</li> <li>• Cooperation with international academic institutions is established</li> </ul>

Figure 19: Maturity levels for international cooperationTT

## Recommendations

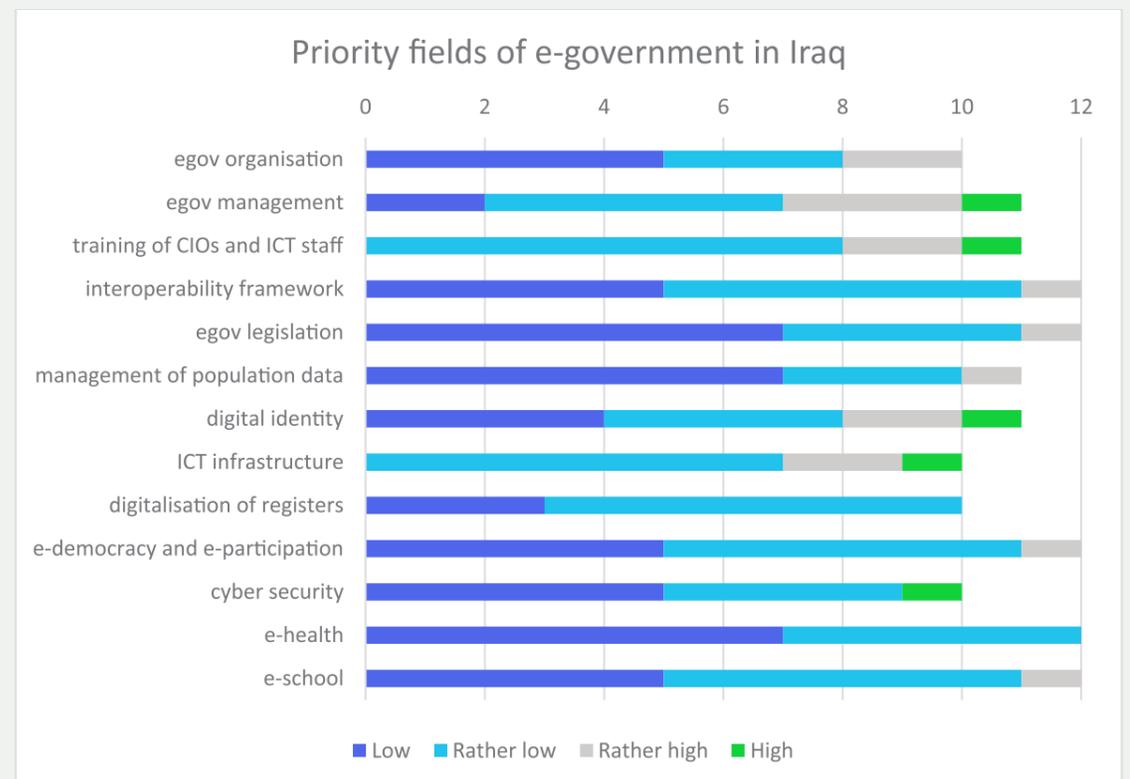
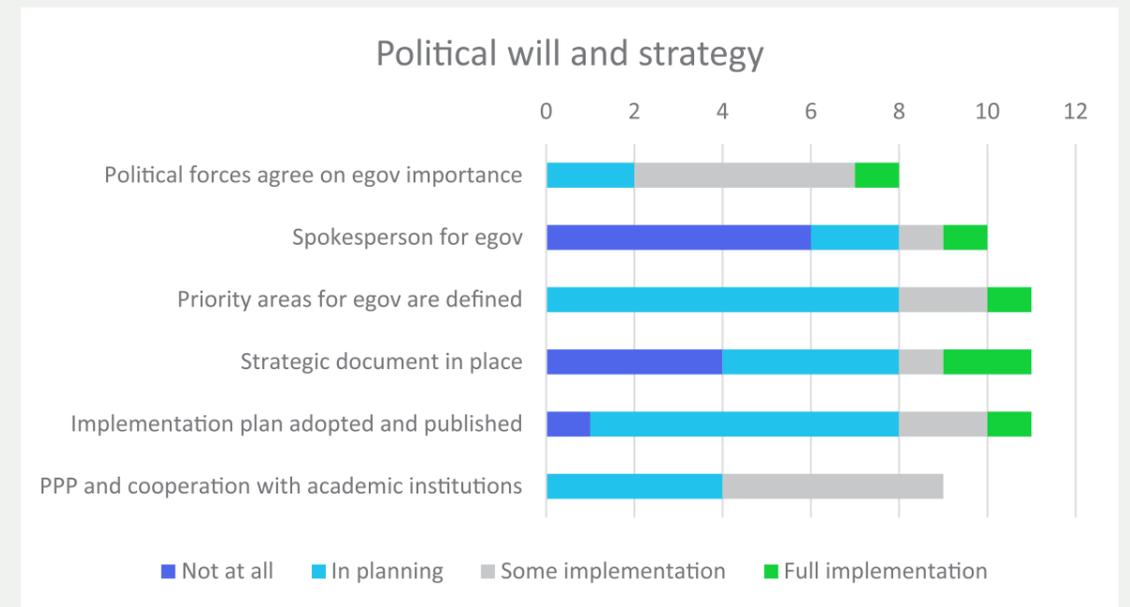
The government should devise an international ICT cooperation and partnership strategy. The plan should, among other aspects, formulate detailed needs for priority topics for international cooperation and work out a framework for a designated institutional nexus point of cooperation in the governmental system. The government must ensure that the presence of foreign policy and international relations is well represented in digital channels. Iraq's digital transformation interests need to be presented to other countries and international organisations as well as to technology companies. Memoranda of Understanding with specific action points on digital initiatives are recommended to be signed with governments with common digital objectives. Iraq should also actively seek digital cooperation opportunities with international organisations that deliver appropriate competences, reference models, and support on digital initiatives.

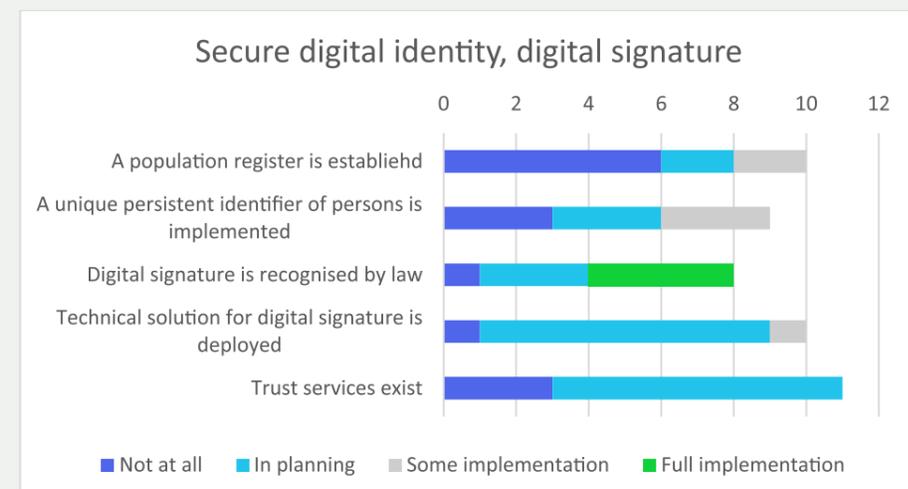
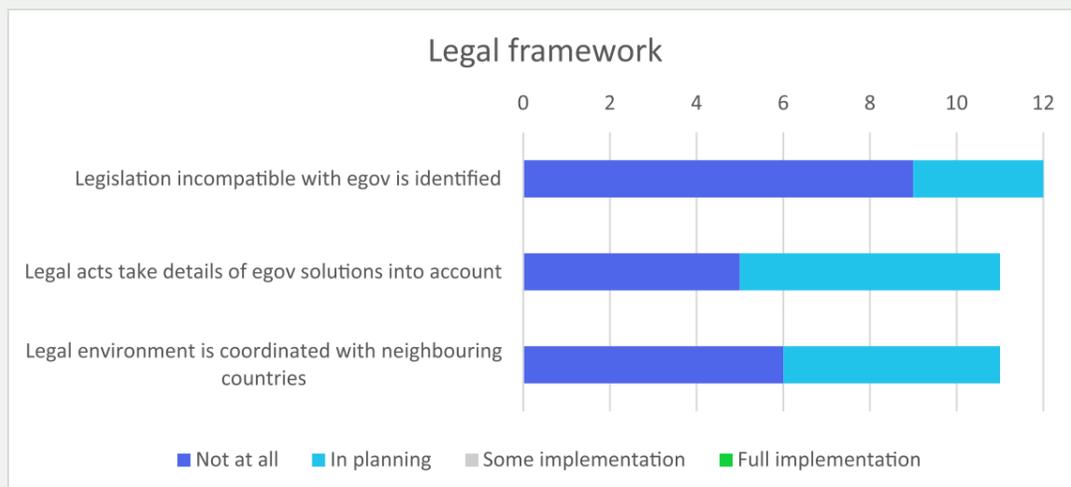
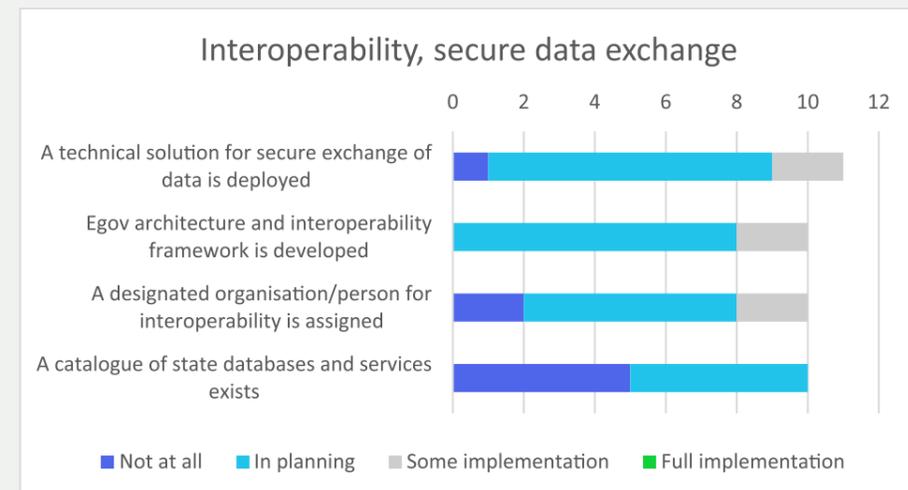
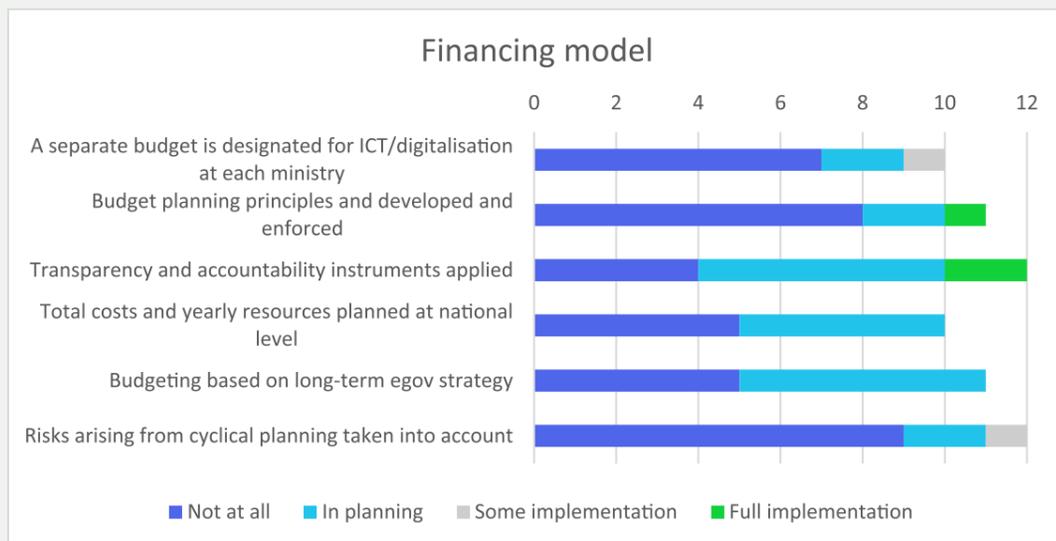
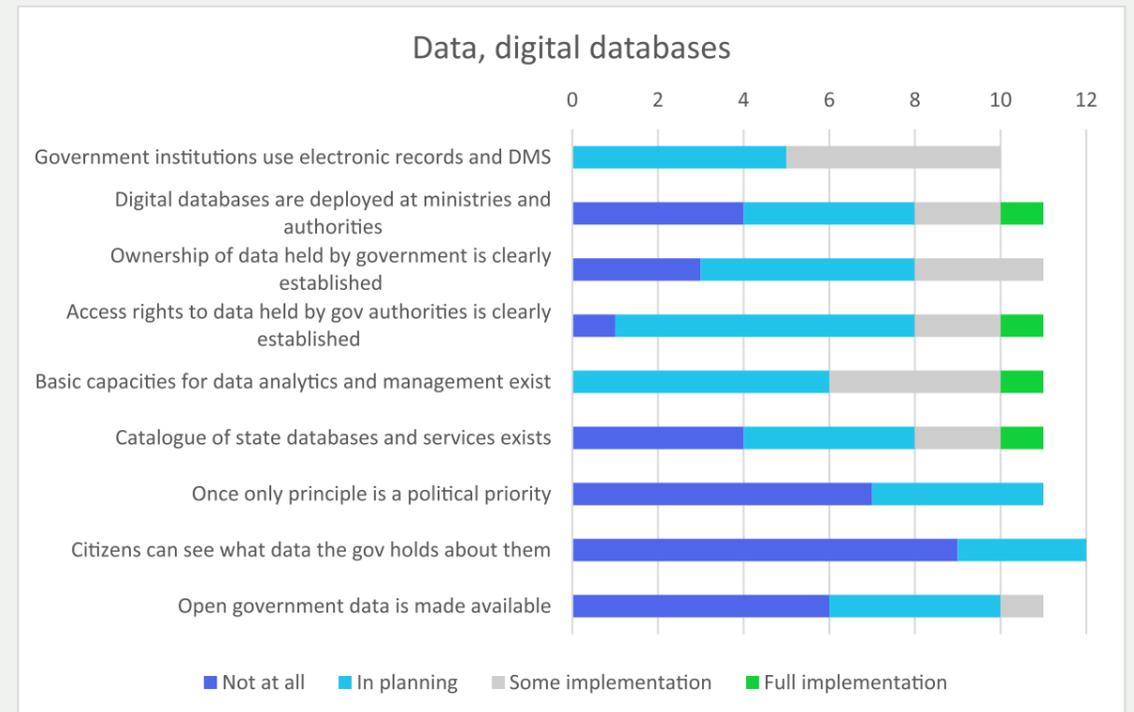
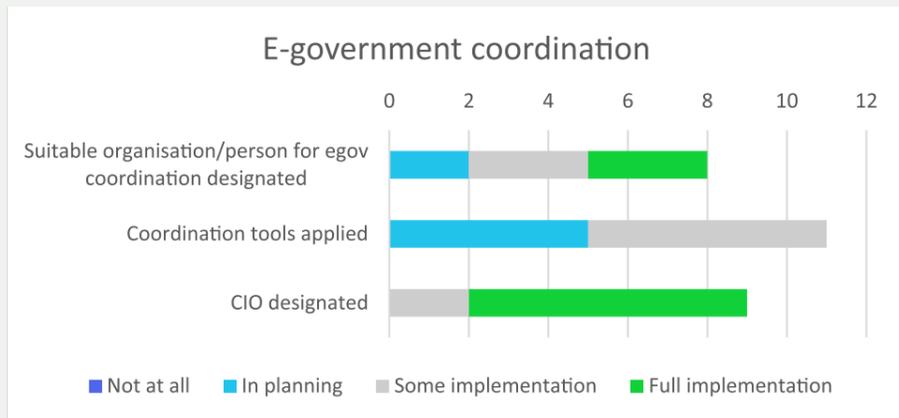
## Annex 2 : Overview of questionnaire responses

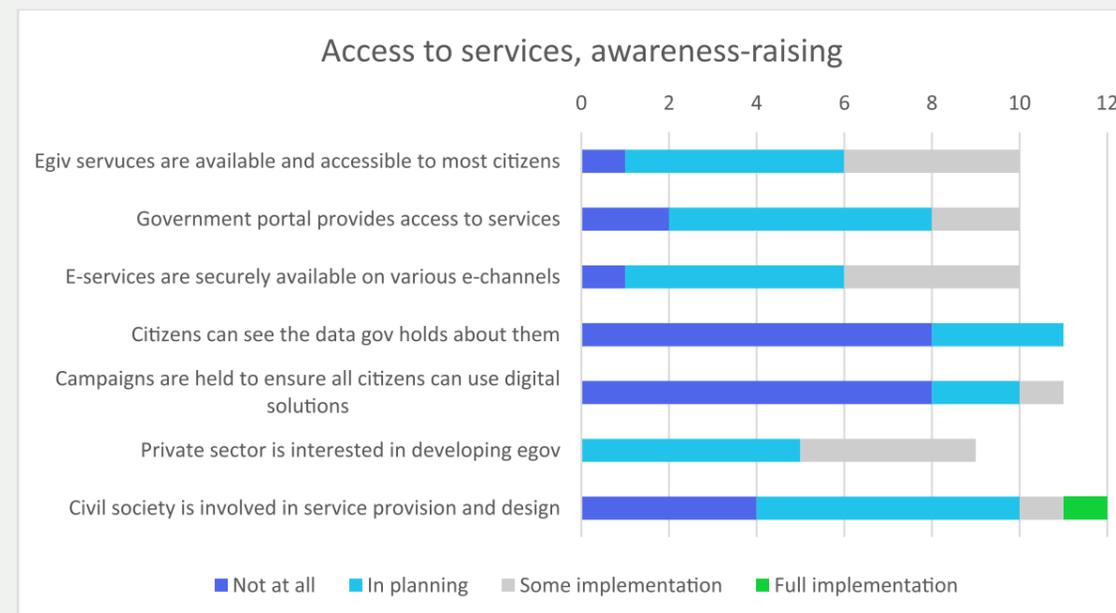
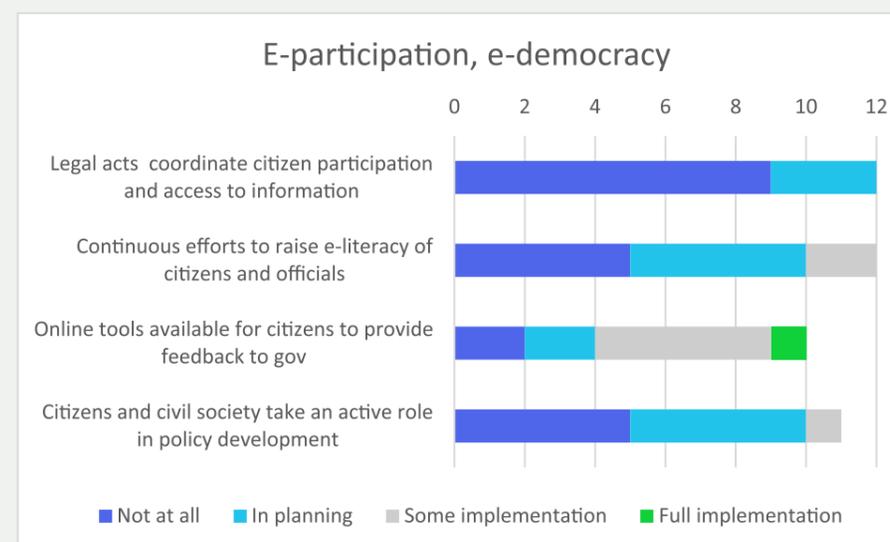
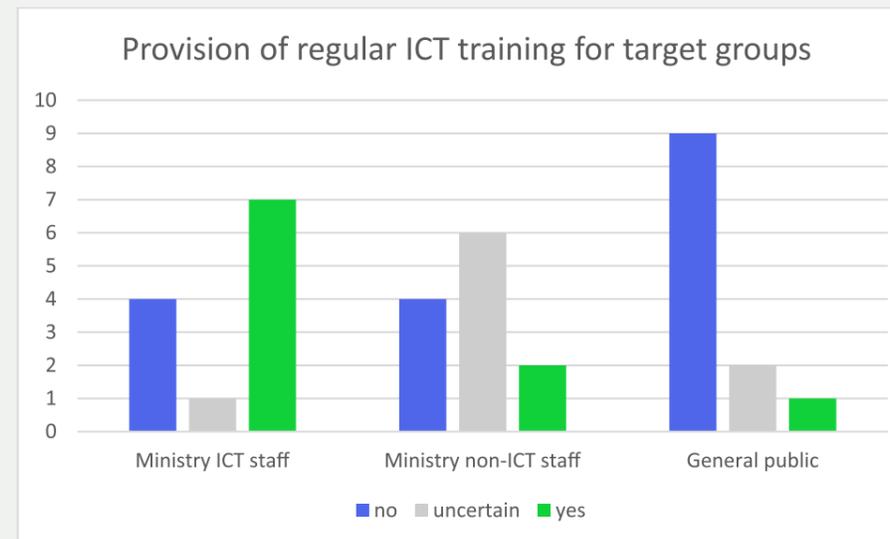
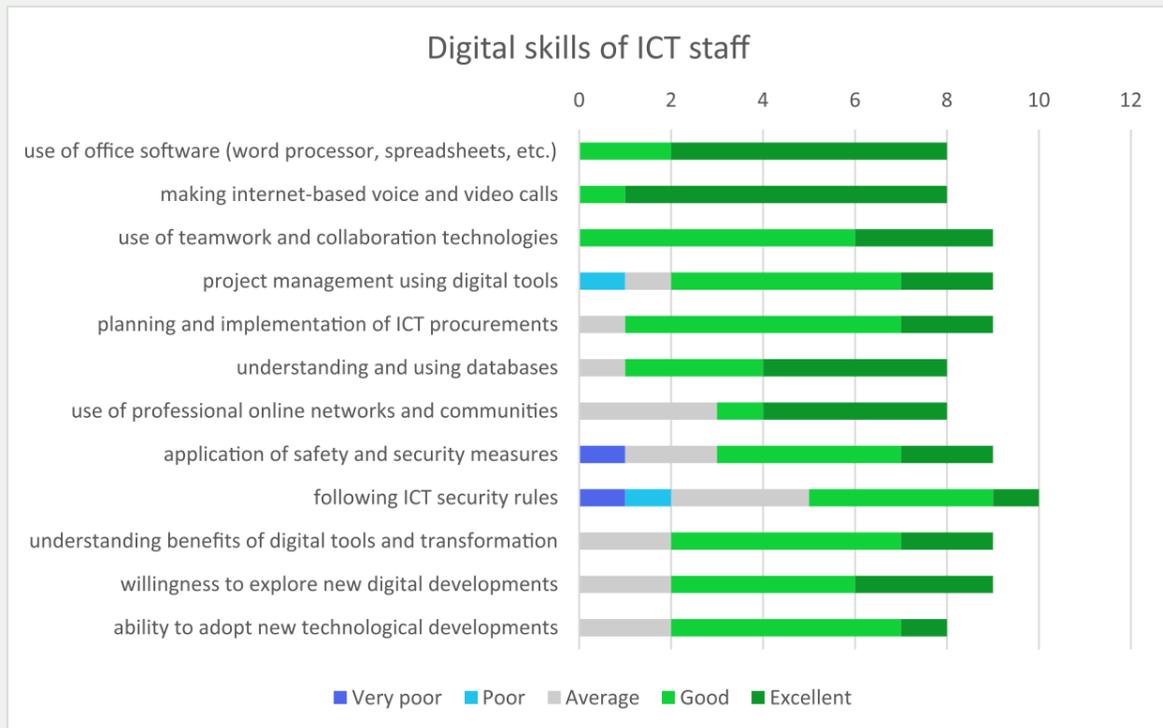
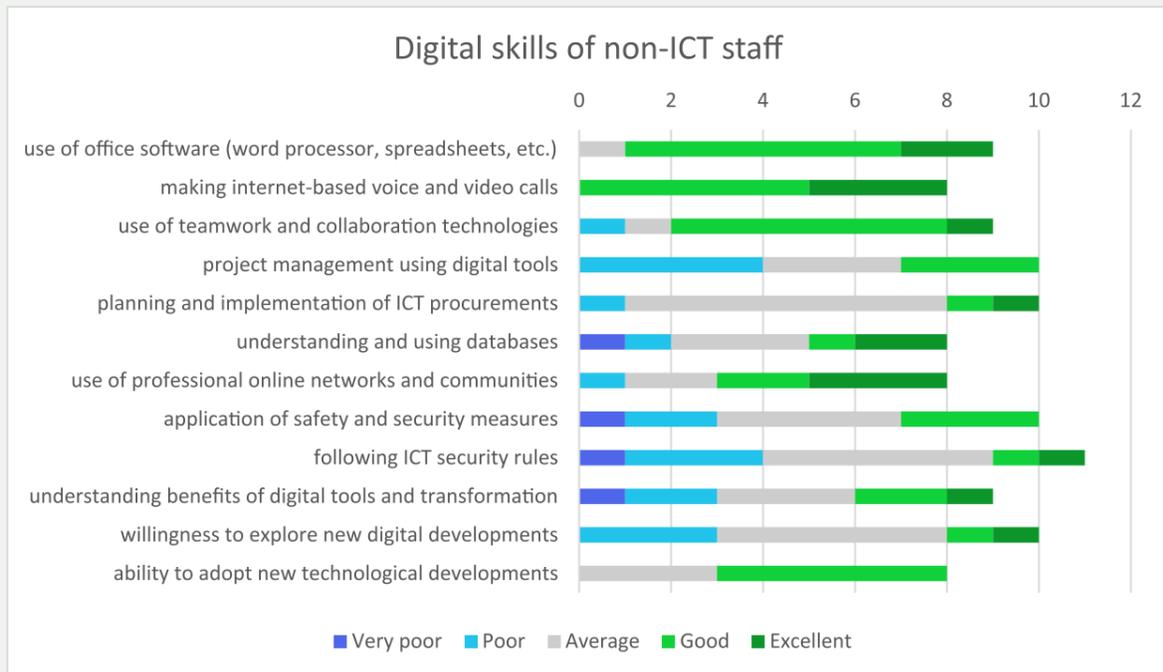
A Digital Maturity Assessment questionnaire was filled in by 12 respondents from 10 public bodies in Iraq:

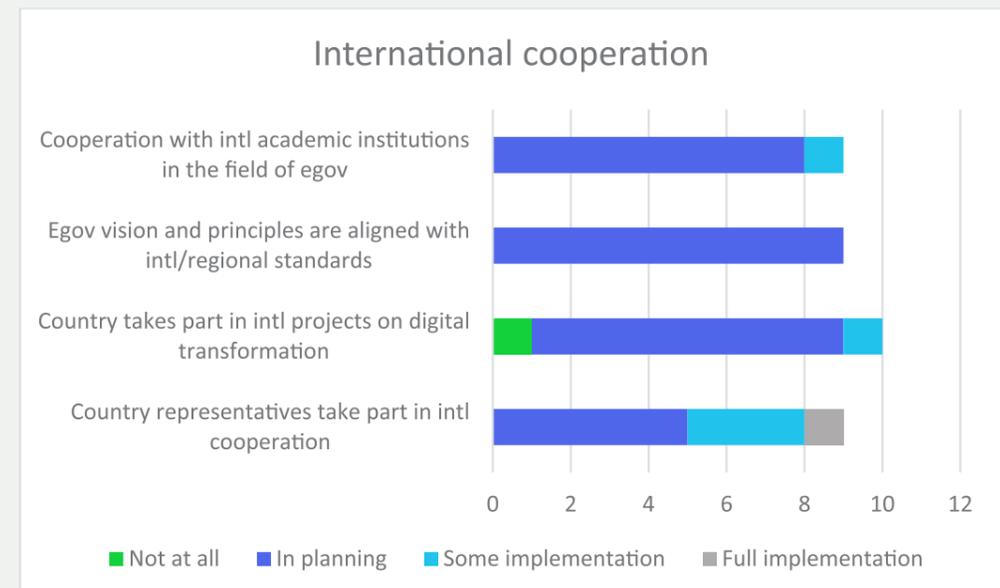
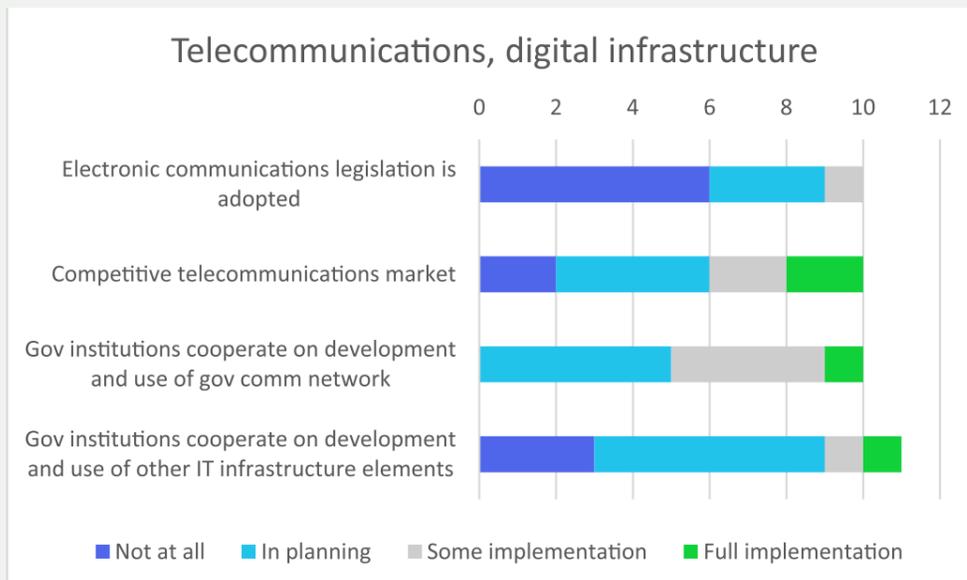
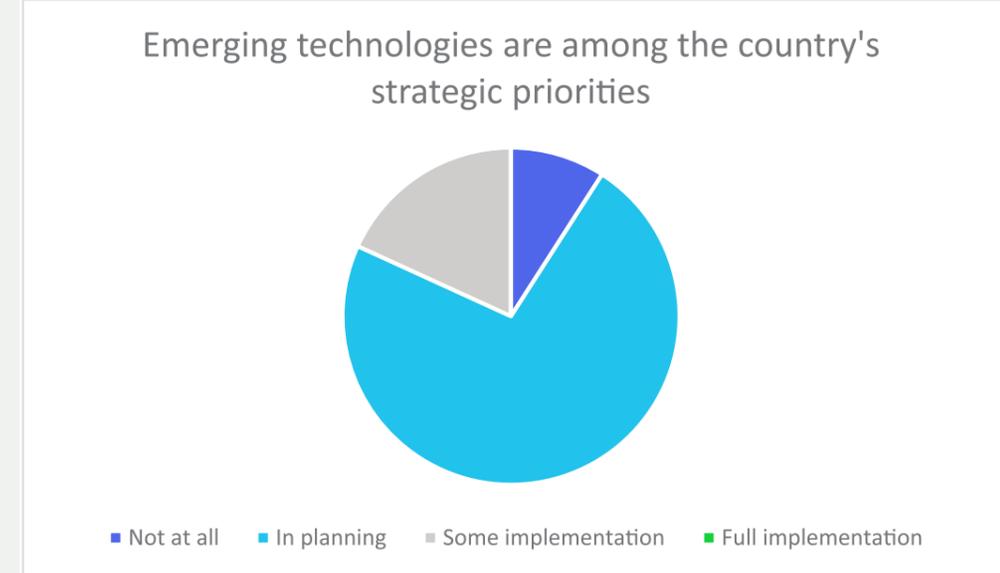
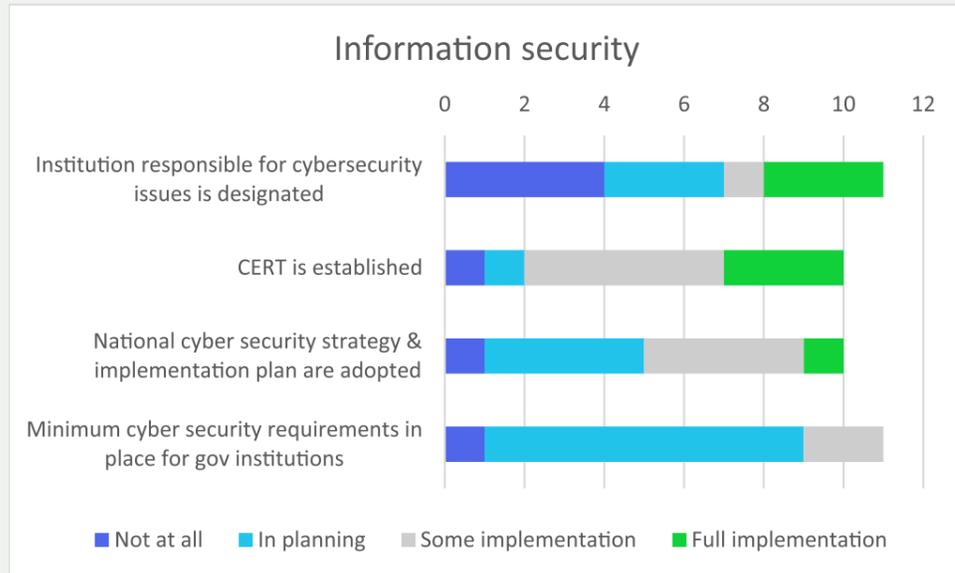
- COMSEC (2 responses)
- Ministry of Interior (2 responses)
- Ministry of Planning
- Ministry of Communication
- Ministry of Justice
- Ministry of Finance
- Border Ports Authority
- Media and Communications Commission
- Federal Public Service Council
- National Intelligence Service

The following graphs present the opinions of the respondents about the stage of development of different aspects of e-government in Iraq. It should be noted that not all respondents provided an answer to all questions, therefore less than 12 responses are indicated for many of the questions.









# Digital Landscape Assessment

- Rapid Integrated Assessment

- Digital Maturity Assessment

- Accelerator and Bottleneck Assessment



## 3.1 Priority Interventions

Institution	Digital Intervention
Government of Iraq	Further develop the fundamental political-level e-governance strategy over a longer period of time to include a broader set of priorities related to the development of the legal framework, data management, the digital economy, online services, digital skills, international cooperation, etc.
COMSEC in cooperation with national security agencies	Pursue the establishment of the national data center and completion of phase 1 focusing on deployment and staffing
Government of Iraq	Develop, integrate, and widespread use of digital ID services and digital signature.
Government of Iraq	Establish tools for e-participation and co-creation.
Private sector, Ministry of Communication, Media Commission.	Broadly provide and improve broadband and ICT services (connectivity) by private and public companies.
Government of Iraq	Provide e-recruiting services through "Tawtheef" recruitment portal.
Ministry of Trade	Launching e-platform to provide digital services for new businesses in all regions of Iraq (company registration, licenses, update data, declaration, and payments)
UNESCO, UNICEF and the Communications and Media Commission (CMC)	Improve quality of learning in Iraq through developing an Education Management Information System Roadmap to provide "internet connectivity to over 3000 schools across 10 governorates" in Iraq.
Government of Iraq	Develop e-banking services
Government of Iraq	The national e-service portal in terms of access to information and the range of services offered.
Government of Iraq	Develop cybersecurity strategy

## 3.2 Bottlenecks

Bottleneck Categories	Policy & Planning	Budget & Financing	Service Delivery (supply)	Service Utilization (demand)	Cross-cutting
Bottlenecks list	Weak fundamental e-government policies and implementation mechanisms.	ICT budgetary restrictions hinder the processes and maintenance of existing facilities.	Missing or insufficient telecommunication and digital infrastructure components.	Incomprehensive e-services process where no services can be totally performed online, automatically, and proactively.	There are no secure data exchange platforms in use. (Data exchange is restricted to paper documents, printed data, Compact Discs, USB Flash Drives)
	Lack of comprehensive implementation mechanism at the government level (case-by-case basis developmental decisions)	Restricted approvals on strategic ICT development budgets.	Limited and outdated information on technology and e-government provided on governmental institutions websites (the central Statistical Organization).	Online businesses registration opportunity is available only in Baghdad.	Lack of cross-institutional communication.
	Agenda setting and planning is mostly done separately at the level of each institution.	Lack of integrated connection between ministries ICT budget proposals with government-level planning.	Shortage in ICT capacities and highly trained staff due to digital skills gap and attracting qualified capacities by the private sector	Most of the e-services currently provided by the government are at the basic levels including guidance on services, forms download, filling in and submission through websites.	Non-compliance of institutions.

Bottleneck Categories	Policy & Planning	Budget & Financing	Service Delivery (supply)	Service Utilization (demand)	Cross-cutting
Bottlenecks list	<p>No specific references made to the use of e-government and digital tools to support progress in education, healthcare, public services, public participation in decision making, fighting corruption, reforming public financial administration, etc.</p>	<p>The current ICT budgeting is not based on any adopted fundamental e-government strategy or development plan.</p>	<p>Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</p>		<p>Failure to activate the electronic signature law.</p>
	<p>No legal provisions for establishing a system of e-governance coordination</p>	<p>External ICT funding made available through international organizations is concentrated on specific topics and programmes.</p>	<p>Lack of public employees' digital skills.</p>		<p>Weak rollout of national identification (only 40% of Iraqi population has digitized ID due to the active pushback from some adversarial groups in the society against the widespread rollout of the e-capable National Card because it would allow for verifiable identification and transparent transactions.)</p>
	<p>The absence of fundamental cross-governmental strategic planning where it is not within the responsibility of the e- Government Steering Committee (Committee 22).</p>	<p>Lack of integrated financial management information system.</p>	<p>Fluctuating electricity supply.</p>		<p>The main understanding of citizen engagement is related to users providing feedback on public service quality or informing about shortfalls in public processes, however, usually through non-electronic means.</p>

Bottleneck Categories	Policy & Planning	Budget & Financing	Service Delivery (supply)	Service Utilization (demand)	Cross-cutting
Bottlenecks list	E- Government Steering Committee (Committee 22) goals and outcomes are inconclusive and unclear.	Lack of funding of training programmes for public officials on digital services.	Weak general and digital educational infrastructure due to administrative, technical, and financial challenges.		80 per cent of the population are currently still unbanked, as Iraqis are claimed not to trust banks.
	Lack of integrated financial management information system	Lack of necessary customizations.	Most of the e-services currently provided by the government are at the basic levels including guidance on services, forms download, filling in and submission through websites.		E-banking and digital payments reported as the most underdeveloped sectors.
	Institutional-based prioritizing services and development.	There is no straightforward technical solution for remote digital identity available, as the RFID chip could not be readily used for this purpose due to the costly nature of authentication.			Lack of primary e-governance coordination or strategic planning functions.
	Inapplicable data collection principles within governmental organizations.	Digital development was not sufficiently financed by the government.			Lack of public awareness campaigns and programs.

Bottleneck Categories	Policy & Planning	Budget & Financing	Service Delivery (supply)	Service Utilization (demand)	Cross-cutting
Bottlenecks list	Paper-based methods are widely used as a data collection tool.	The ICT funding does not allow for coordinated security procedures but preparing for and fighting cyber threats is left a personal responsibility of every ICT specialist or outsourced to private contractors also responsible for infrastructural components of the institution.			Undefined status of the Cyber Events Response Team (CERT) and unfamiliarized by governmental institutions. Weakness of administrative procedures.
	Electronically collected data are sometimes collected using legacy or simple solutions such as MS Access and MS Excel.	Lack of funding for data management and information storage demands and cybersecurity.			The Cyber Events Response Team (CERT) does not have an active public presence.
	Lack of institutional framework (e.g. Certification Authority) and infrastructure to apply the possibilities foreseen in the Iraqi Electronic Transactions Act.				The main mode of cooperation from the ICT personnel is unofficial in nature, efficient, and inclusive.
	No single law governing data protection issues in Iraq. Instead, different pieces of legislation are used, among those the Iraqi Penal Code No. 111 of 1969, the Iraqi Civil Code, and other sector specific laws (labour laws, banking laws etc.).				
	Weak application of electronic means (electronic connectivity) between local and central governments.				

Bottleneck Categories	Policy & Planning	Budget & Financing	Service Delivery (supply)	Service Utilization (demand)	Cross-cutting
Bottlenecks list	Not activating the electronic contracting system in Iraq.				
	Failure to apply a single window to provide services in various government institutions, in addition to investment authorities.				
	Absence of a unified national identity register.				
	Database of ration cards is not linked to individuals' national ID.				
	Delay in reviewing the draft of The Right of Access to Information law.				
	Policies and instruments related to e-participation are not widely used at the central government.				
	Lack of provisions on online-driven transparency mechanisms exist				
	The regulatory environment for telecommunications is complex, with both the Ministry of Communications and the Communications and Media Commission having certain roles.				

Bottleneck Categories	Policy & Planning	Budget & Financing	Service Delivery (supply)	Service Utilization (demand)	Cross-cutting
Bottlenecks list	Lack of telecommunications laws to differentiate the role of the Ministry of Communications as the policy maker and the Communications and Media Commission as the regulator.				
	Difficult regulatory environment.				
	No specific references made to the use of e-government and digital tools to support progress in education, healthcare, public services, public participation in decision making, fighting corruption, reforming public financial administration, etc.				
	The public sector has no clear policy or underlying data on the necessity of digital literacy campaigns for the public.				
	Most developmental decisions are taken on a case-by-case basis.				
	Lack of a coherent information security policy.				
	No specific legislation for dealing with cybercrime.				

## 3.3 Accelerators

Prioritized Intervention	Bottleneck	Potential Solutions
<p>1. Further develop the fundamental political-level e-governance strategy over a longer period of time to include a broader set of priorities related to the development of the legal framework, data management, the digital economy, online services, digital skills, international cooperation, etc.</p>	<p>Policy &amp; Planning</p> <ul style="list-style-type: none"> <li>• Lack of fundamental e-government policies and implementation mechanisms.</li> <li>• Lack of comprehensive implementation mechanism at the government level (case-by-case basis developmental decisions)</li> <li>• Agenda setting and planning is mostly done separately at the level of each institution.</li> <li>• No specific references made to the use of e-government and digital tools to support progress in education, healthcare, public services, public participation in decision making, fighting corruption, reforming public financial administration, etc.</li> <li>• Lack of legal provisions for establishing a system of e-governance coordination.</li> <li>• Lack of fundamental cross-governmental strategic planning where it is not within the responsibility of the e- Government Steering Committee (Committee 22).</li> <li>• E- Government Steering Committee (Committee 22) goals and outcomes are inconclusive and unclear.</li> <li>• Lack of integrated financial management information system.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>• Enable e-services and communication technologies within the governmental institutions and in communication with citizens.</li> <li>• Actively adopt working on pending legal without further delays.</li> <li>• ICT development should be devised based on long-term planning.</li> <li>• Facilitate Government CIO cooperation.</li> <li>• Devise an international ICT cooperation and partnership strategy.</li> <li>• Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>• Establish incentives for private and public sector participation in the implementation of ICT infrastructure.</li> <li>• Establishing the cash system for information technology (smart village) (Industrial strategy 9.1)</li> <li>• Approve and implement the plan for developing top priority e-services.</li> <li>• Nominate a strong and visible spokesperson or dedicated institution for e-governance.</li> <li>• Establish a cross-sectoral cooperation format.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· ICT budgetary restrictions hinder the processes and maintenance of existing facilities.</li> <li>· Restricted approvals on strategic ICT development budgets.</li> <li>· Lack of integrated connection between ministries ICT budget proposals with government-level planning.</li> <li>· The current ICT budgeting is not based on any adopted fundamental e-government strategy or development plan.</li> <li>· External ICT funding made available through international organizations is concentrated on specific topics and programmes.</li> </ul>	<p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· Ensure consistency in public ICT financing.</li> <li>· Use digital budgeting processes including ICT budgeting.</li> <li>· Develop a transparent ICT budget structure within all institutions.</li> <li>· Apply integrated financial management information system that would allow automating core budget execution functions, bringing transparency to the process, and activate the movement and circulation of funds.</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Develop a national e-service portal where all services can be accessed.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>2. Pursue the establishment of the national data center and completion of phase 1 focusing on deployment and staffing</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Lack of fundamental e-government policies and implementation mechanisms.</li> <li>· Institutional-based prioritizing services and development.</li> <li>· Inapplicable data collection principles within governmental organizations.</li> <li>· Paper-based methods are widely used as a data collection tool.</li> <li>· Electronically collected data are sometimes collected using legacy or simple solutions such as MS Access and MS Excel.</li> </ul> <p>Budget and Financing</p> <ul style="list-style-type: none"> <li>· Lack of integrated financial management information system.</li> <li>· Lack of funding for data management and information storage demands and cybersecurity.</li> <li>· Lack of funding of training programmes for public officials on digital services.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Conduct analysis to identify the public sector's needs for hosting data.</li> <li>· An interoperability framework should be developed, together with basic electronic data collection and management principles.</li> <li>· Establish a universal data management regulation.</li> <li>· Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>· Facilitate Government CIO cooperation.</li> <li>· Devise ICT development based on a long-term planning.</li> </ul> <p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Allocate more digital infrastructure resources to guaranteeing reliable infrastructure and ICT connection for all governmental institutions.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Limited and outdated information on technology and e-government provided on governmental institutions websites (the central Statistical Organization).</li> </ul> <p>Cross cutting</p> <ul style="list-style-type: none"> <li>· There are no secure data exchange platforms in use. (Data exchange is restricted to paper documents, printed data, Compact Discs, USB Flash Drives)</li> <li>· Lack of cross-institutional communication.</li> </ul>	<p>Service Utilization (Demand)</p> <ul style="list-style-type: none"> <li>· Provide public institutions the access to basic infrastructure components.</li> </ul> <p>Budget and Financing</p> <ul style="list-style-type: none"> <li>· Apply integrated financial management information system that would allow automating core budget execution functions and bringing transparency to the process.</li> <li>· Introduce digital financial services and digital platforms to activate the movement and circulation of funds.</li> <li>· Ensure consistency in public ICT funding.</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· A meta-data component must be associated with the collected data for providing basic possibilities for interoperability and defining characterization.</li> <li>· An interoperability framework should be developed, together with basic electronic data collection and management principles.</li> <li>· An inventory of information assets should be arranged.</li> <li>· Establish a cross-sectoral cooperation format.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>3. Adopt the Iraqi Electronic Transactions Act for electronic transactions, electronic signature, and electronic transfer of funds.</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Lack of institutional framework (e.g. Certification Authority) and infrastructure to apply the possibilities foreseen in the Iraqi Electronic Transactions Act.</li> <li>· No single law governing data protection issues in Iraq. Instead, different pieces of legislation are used, among those the Iraqi Penal Code No. 111 of 1969, the Iraqi Civil Code, and other sector specific laws (labour laws, banking laws etc.).</li> <li>· Weak application of electronic means (electronic connectivity) between local and central governments.</li> <li>· Not activating the electronic contracting system in Iraq.</li> <li>· Failure to apply a single window to provide services in various government institutions, in addition to investment authorities.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· A systematic legal analysis on basic e-governance legal building blocks should be conducted.</li> <li>· Implement the government's digital strategy.</li> <li>· Adopt pending legal amendments actively and without further delays.</li> <li>· Work and coordinate with the Ministry of Communications and the related authorities in order to activate the law.</li> <li>· Facilitate Government CIO cooperation.</li> <li>· Devise ICT development based on a long-term planning.</li> <li>· Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>· Activating the law with the private sector, while coordinating and consulting with the private sector and ministries in this regard.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and infrastructure components.</li> <li>· Shortage in ICT capacities and highly trained staff due to digital skills gap and attracting qualified capacities by the private sector.</li> </ul> <p>Service Utilization (Demand)</p> <ul style="list-style-type: none"> <li>· Incomprehensive e-services process where no services can be totally performed online, automatically, and proactively.</li> </ul> <p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· Lack of necessary customizations.</li> <li>· Lack of funding of training programmes for public officials on digital services.</li> <li>· Lack of funding for data management and information storage demands and cybersecurity.</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· Non-compliance of institutions.</li> <li>· Failure to activate the electronic signature law.</li> <li>· Weakness of administrative procedures.</li> </ul>	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Equip all citizens and public officials with basic digital skills.</li> <li>· Attract ICT specialists in the public sector with advanced IT and project management skills to maintain ICT architecture and user support and manage ICT procurements.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>4. Develop, integrate, and widespread use of digital ID services and digital signature.</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Lack of a unified national identity register.</li> <li>· Lack of fundamental e-government policies and implementation mechanisms.</li> <li>· Institutional-based prioritizing services and development.</li> <li>· Database of ration cards is not linked to individuals' national ID.</li> </ul> <p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· There is no straightforward technical solution for remote digital identity available, as the RFID chip could not be readily used for this purpose due to the costly nature of authentication.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Integrate national ID management with general population data management.</li> <li>· Reform the ration card system to link it with the database of social protection beneficiaries and switch it to electronic cards.</li> <li>· Develop a national data centre aiming at providing safe and accessible data sharing and storing facilities.</li> <li>· Link data with various databases of ministries such as ministries of labour and trade to make available information needed for deciding eligibility of individuals.</li> <li>· Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>· Cooperation with the private sector should be extended, so that it would make the usage of the National ID more lucrative.</li> <li>· Facilitate Government CIO cooperation.</li> <li>· Devise ICT development based on a long-term planning.</li> <li>· Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>· Extend cooperation with the private sector so that it would make the usage of the National ID more lucrative.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Shortage in ICT capacities and highly trained staff due to digital skills gap and attracting qualified capacities by the private sector.</li> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· Weak rollout of national identification (only 40% of Iraqi population has digitized ID due to the active pushback from some adversarial groups in the society against the widespread rollout of the e-capable National Card because it would allow for verifiable identification and transparent transactions.)</li> </ul>	<p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Equip all citizens and public officials with basic digital skills.</li> <li>· Public authorities must attract ICT specialists with advanced IT and project management skills to maintain ICT architecture and user support and manage ICT procurements.</li> <li>· Public authorities need to implement the government's digital strategy.</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· Encourage national ID rollout to advance population data management.</li> <li>· Build cooperation between the government, private sector, and academia to further develop understanding of emerging technologies.</li> <li>· Create joint enterprises and developmental projects between public, private, and academia in emerging technologies.</li> </ul> <p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· Attract donors and allocate funding to support national identification documents management and rollout.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>5. Establish tools for E-participation and Co-creation.</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Delay in reviewing the draft of The Right of Access to Information law.</li> <li>· Policies and instruments related to e-participation are not widely used at the central government.</li> <li>· Lack of legal provisions on online-driven transparency mechanisms exist</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> <li>· Lack of public employees' digital skills.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· The main understanding of citizen engagement is related to users providing feedback on public service quality or informing about shortfalls in public processes, however, usually through non-electronic means.</li> </ul>	<p>Policy and Planning</p> <ul style="list-style-type: none"> <li>· Build legal understanding of citizens' participation in governance, access to information, and basic open government principles should be analysed and established.</li> <li>· Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>· Facilitate Government CIO cooperation.</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Equip all citizens and public officials with basic digital skills.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Encourage and support NGOs to work on issues related to citizen engagement and open governance.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>6. Broadly provide and improve broadband and ICT services (3G connectivity) by private and public companies.</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· The regulatory environment for telecommunications is complex, with both the Ministry of Communications and the Communications and Media Commission having certain roles.</li> <li>· Lack of telecommunications laws to differentiate the role of the Ministry of Communications as the policy maker and the Communications and Media Commission as the regulator.</li> </ul> <p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Limited capacity of the private sector includes poor coverage, elite capture, knowledge gap, labour shortages.</li> <li>· Shortage in ICT capacities and highly trained staff due to digital skills gap and attracting qualified capacities by the private sector.</li> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Adopt telecommunications law.</li> <li>· Develop ICT development based on long-term planning.</li> <li>· Establish the national data centre.</li> <li>· Facilitate Government CIO cooperation.</li> </ul> <p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Enhance digital infrastructure to include 4G and 5G in the future and improve connectivity speed.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<ul style="list-style-type: none"> <li>· Lack of funding of training programmes for public officials on digital services.</li> <li>· Fluctuating electricity supply.</li> </ul>	<p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Build cooperation between the government, private sector, and academia to further develop understanding of emerging technologies.</li> <li>· Create joint enterprises and developmental projects between public, private, and academia in emerging technologies.</li> <li>· Further assessment to the state of the infrastructure with the Ministry of telecommunications and the existing laws</li> </ul>
<p>7. Provide E-recruiting services through "Tawtheef" recruitment portal.</p>	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Fluctuating electricity supply.</li> </ul>	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Enhance digital infrastructure in Iraq.</li> <li>· Providing digital infrastructure, by introducing advanced technology (the fourth generation)</li> <li>· Enhance curricula and improve digital presence for all levels of education.</li> <li>· Build public awareness of existing and planned electronic services.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Build cooperation between the government, private sector, and academia to further develop understanding of emerging technologies.</li> <li>· Create joint enterprises and developmental projects between public, private, and academia in emerging technologies.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>8. Launching E-platform to provide digital services for new businesses in all regions of Iraq (company registration, licenses, update data, declaration, and payments)</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Difficult regulatory environment.</li> </ul> <p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> <li>· Fluctuating electricity supply.</li> </ul> <p>Service Utilization (Demand):</p> <ul style="list-style-type: none"> <li>· Online businesses registration opportunity is available only in Baghdad.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Facilitate Government CIO cooperation.</li> </ul> <p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Enhance digital infrastructure to include 4G and 5G in the future and improve connectivity speed.</li> </ul> <p>Service Utilization (Demand):</p> <ul style="list-style-type: none"> <li>· Allow this platform to be comprehensive and accessible to all Iraqi businesses to serve maximum number of people.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Build cooperation between the government, private sector, and academia to further develop understanding of emerging technologies.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>9. Improve quality of learning in Iraq through developing an Education Management Information System Roadmap to provide “internet connectivity to over 3000 schools across 10 governorates” in Iraq.</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>No specific references within the long-term strategic vision for the country, (Iraq Vision 2030) made to the use of e-government and digital tools to support progress in education.</li> </ul> <p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>Lack of integrated financial management information system</li> <li>ICT budgetary restrictions hinder the processes and maintenance of existing facilities.</li> <li>Restricted approvals on strategic ICT development budgets.</li> <li>Lack of integrated connection between ministries ICT budget proposals with government-level planning.</li> <li>The current ICT budgeting is not based on any adopted fundamental e-government strategy or development plan.</li> </ul>	<p>Policy and Planning</p> <ul style="list-style-type: none"> <li>Implement the roadmap for Education Management Information System Roadmap to provide internet connectivity to over 3000 schools across 10 governorates in Iraq.</li> <li>Build partnerships and collaborate with private sector.</li> <li>Apply it through short- and medium-term strategies and phasing.</li> <li>Devise an international ICT cooperation and partnership strategy.</li> <li>Adopt and implement a telecommunications law.</li> <li>Apply integrated financial management information system that would allow automating core budget execution functions, bringing transparency to the process, and activate the movement and circulation of funds.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Service Delivery (Supply):</p> <ul style="list-style-type: none"> <li>· Weak general and digital educational infrastructure due to administrative, technical, and financial challenges.</li> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Shortage in ICT capacities and highly trained staff due to digital skills gap and attracting qualified capacities by the private sector.</li> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> <li>· Fluctuating electricity supply.</li> </ul>	<p>Budget and Financing</p> <ul style="list-style-type: none"> <li>· Budget allocation within ministries of education and higher education budgetary plans.</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Strengthen digital skills through mainstreaming across curricula at all levels.</li> <li>· Enhance digital infrastructure to include 4G and 5G in the future.</li> <li>· Improve connectivity speed.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Build public awareness of the existing and planned electronic services.</li> <li>· Conduct comprehensive study prior to application</li> <li>· Build cooperation between the government, private sector, and academia to further develop understanding of emerging technologies.</li> <li>· Create joint enterprises and developmental projects between public, private, and academia in emerging technologies.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>10. Develop E-banking services</p>	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Lack of citizens' digital skills, especially among youth, due to poor curricula at different levels of education that do not meet the requirements of a digital economy and a digital society.</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· 80 per cent of the population are currently still unbanked, as Iraqis are claimed not to trust banks.</li> <li>· E-banking and digital payments reported as the most underdeveloped sectors.</li> </ul>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· Develop a National Payment System Strategy.</li> <li>· Develop and update a new banking system responding to the current and future requirements of the monetary and credit policy</li> <li>· Build a bank connection system to perform retail banking transactions (ATMs, mobile phone transfers, credit/debit cards)</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Equip all citizens and public officials with basic skills</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· Build public awareness of the existing and planned electronic services.</li> <li>· Build cooperation between the government, private sector, and academia to further develop understanding of emerging technologies.</li> <li>· Create joint enterprises and developmental projects between public, private, and academia in emerging technologies.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
<p>11. Improve the national e-service portal in terms of access to information and the range of services offered.</p>	<p>Policy and Planning:</p> <ul style="list-style-type: none"> <li>· The public sector has no clear policy or underlying data on the necessity of digital literacy campaigns for the public.</li> <li>· Lack of fundamental e-government political documents and implementation mechanism.</li> <li>· Most developmental decisions are taken on a case-by-case basis.</li> <li>· No specific references made to the use of e-government and digital tools to support progress in education, healthcare, public services, public participation in decision making, fighting corruption, reforming public financial administration, etc.</li> </ul> <p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· Digital development was not sufficiently financed by the government.</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and digital infrastructure components.</li> <li>· Most of the e-services currently provided by the government are at the basic levels including guidance on services, forms download, filling in and submission through websites.</li> </ul>	<p>Policy and Planning</p> <ul style="list-style-type: none"> <li>· Approve and implement the plan for developing top-priority government e-services including citizen services, business services, financial, government services integration)</li> <li>· Develop and apply integrated policies and strategies.</li> <li>· Facilitate Government CIO cooperation.</li> <li>· Devise ICT development based on a long-term planning.</li> <li>· Adopt organizational setup and legal provisions for e-governance coordination.</li> <li>· Establish a cross-sectoral cooperation format.</li> </ul> <p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Provide public institutions access to basic infrastructure components.</li> <li>· Enhance digital infrastructure to include 4G and 5G in the future and improve connectivity speed.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Service Utilization (Demand):</p> <ul style="list-style-type: none"> <li>· Most of the e-services currently provided by the government are at the basic levels including guidance on services, forms download, filling in and submission through websites.</li> <li>· Some services are only available in Baghdad.</li> </ul> <p>Cross-cutting:</p> <ul style="list-style-type: none"> <li>· Lack of primary e-governance coordination or strategic planning functions.</li> <li>· Lack of public awareness campaigns and programs.</li> <li>· 80 per cent of the population are currently still unbanked, as Iraqis are claimed not to trust banks.</li> </ul>	<p>Service Utilization (Demand):</p> <ul style="list-style-type: none"> <li>· Develop public Wi-Fi hotspots at government authorities and public spaces.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Build public awareness of existing and planned electronic services.</li> <li>· Enhance cooperation between ministries and public institutions.</li> </ul> <p>Budget and Financing:</p> <ul style="list-style-type: none"> <li>· Allocate budgets and funds for digital initiatives.</li> </ul>
12. Develop a Cybersecurity Strategy	<p>Policy and Planning</p> <ul style="list-style-type: none"> <li>· Lack of a coherent information security policy.</li> <li>· No specific legislation for dealing with cybercrime.</li> <li>· Lack of integrated financial management information system.</li> </ul>	<p>Policy and Planning</p> <ul style="list-style-type: none"> <li>· Create and adopt a unified cybersecurity policy and risk management strategy analysis for all public institutions.</li> <li>· Provide minimum cybersecurity requirements for public sector authorities and vital service providers.</li> <li>· Establish a universal data management regulation</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Budget and Financing</p> <ul style="list-style-type: none"> <li>· The ICT funding does not allow for coordinated security procedures but preparing for and fighting cyber threats is left a personal responsibility of every ICT specialist or outsourced to private contractors also responsible for infrastructural components of the institution.</li> <li>· ICT budgetary restrictions hinder the processes and maintenance of existing facilities.</li> <li>· Restricted approvals on strategic ICT development budgets.</li> <li>· Lack of integrated connection between ministries ICT budget proposals with government-level planning.</li> <li>· The current ICT budgeting is not based on any adopted fundamental e-government strategy or development plan.</li> <li>· External ICT funding through international organizations is concentrated on specific topics and programmes.</li> </ul>	<ul style="list-style-type: none"> <li>· Conduct a data collection audit.</li> <li>· Develop the national data centre.</li> <li>· Devise an international ICT cooperation and partnership strategy.</li> <li>· Apply integrated financial management information system that would allow automating core budget execution functions, bringing transparency to the process, and activate the movement and circulation of funds.</li> <li>· Designate a competent authority for supervision.</li> </ul> <p>Budget and Financing</p> <ul style="list-style-type: none"> <li>· Provide public institutions with necessary resources for assuring their cybersecurity infrastructure.</li> </ul>

Prioritized Intervention	Bottleneck	Potential Solutions
	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Missing or insufficient telecommunication and digital infrastructure components at government institutions.</li> <li>· Shortage in ICT capacities and highly trained staff due to digital skills gap and attracting qualified capacities by the private sector.</li> </ul> <p>Cross-cutting</p> <ul style="list-style-type: none"> <li>· Undefined status of the Cyber Events Response Team (CERT) and unfamiliarized by governmental institutions.</li> <li>· The Cyber Events Response Team (CERT) does not have an active public presence.</li> <li>· The main mode of cooperation from the ICT personnel is unofficial in nature, efficient, and inclusive.</li> </ul>	<p>Service Delivery (Supply)</p> <ul style="list-style-type: none"> <li>· Provide access of public institutions to basic infrastructure (including cybersecurity) components.</li> <li>· Provide additional training programmes on cybersecurity for all public officials.</li> </ul>

