

Appendix 1. Characteristics of the digital maturity model for telecommunications service providers

1. Strategy

This dimension represents vision, governance, planning, and management processes that will support the implementation of the digital strategy.

Level 1 - Initiating

The organization has decided to move toward a digital business and is taking initial steps in that direction.

- S1.1 The organization has defined an initial digital vision, albeit at this point it is mostly "siloes" and focused on incremental operational improvements.
- S1.2 Some proof-of-concept projects have been authorized at a departmental level to experiment with digital tools (e.g., self-service apps).

Level 2 - Enabling

The organization is implementing initiatives within the dimension that will form the foundation of its digital business.

- S2.1 A digital strategy that incorporates most elements of this digital maturity model is signed-off at CxO level.
- S2.2 Formal investments aligned to the digital strategy have been approved.
- S2.3 Digital leadership have been appointed to drive transformation
- S2.4 Budgets are incorporating digital targets.

Level 3 - Integrating

The organization's initiatives are being integrated across the organization to support end-to-end capabilities.

- S3.1 A common digital strategy is shared across the whole organization at all levels.
- S3.2 Investments have been authorised at CXO level for overall digital transformation.
- S3.3 Digital initiatives are being implemented across the organization, including cross-departmental projects.
- S3.4 Budgets, key performance indicators and performance metrics across the organization include a digital element, including common (inter-departmental) targets.
- S3.5 First set of digital services are in the roadmap/delivered, including partnerships with digital vendors (e.g., fleet management, IaaS).
- S3.6 Digital revenues are now being specifically recorded, although these might not yet be particularly large.

Level 4 - Optimizing

The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.

- S4.1 Digital strategy is well developed and drives the organization's direction and investments.
- S4.2 Digital is a core competence in the organization.
- S4.3 New business models are being implemented with pure digital elements.
- S4.4 Digital strategy is being shared and reviewed with all stakeholders, including external partners.
- S4.5 Digital strategy is no longer owned by a dedicated team but it is an inherent part of activities across the organization
- S4.6 New digital services are becoming a significant share of total revenues (~ 5%).

Level 5 - Pioneering

The organization is breaking new ground and advancing the state of the practice within the dimension.

- S5.1 The digital strategy has for some time been driving management and investment decisions.
- S5.2 The organization is now capitalizing on previous investments and transformation efforts to generate completely new revenue streams based on digital capabilities and digital business models.
- S5.3 Digital businesses provide sufficient revenue streams to enable continued investment in new digital initiatives.
- S5.4 Digital services account for a significant (>10%) share of total revenues.

2. Organization

This dimension focuses on changes in communications, culture, structure, training, and knowledge management within the organization that will enable it to become a digital player.

Level 1 - Initiating The organization has decided to move toward a digital business and is taking initial steps in that direction.
O1.1 The organization has articulated the need for digital transformation. O1.2 The need for digital competencies has been identified and a general development plan is being defined. O1.3 Initial investments are being made to develop digital competencies, including training programmes. O1.4 Recruitment of select "experts" to bring needed skills is ongoing, often in isolated teams.
Level 2 - Enabling The organization is implementing initiatives within the dimension that will form the foundation of its digital business.
O2.1 The organization has a vision for digital transformation, which begins to drive change towards a digitally-savvy workforce. O2.2 Digital units/teams are being created to explore digital opportunities. O2.3 Training and compensation schemes are being adapted to align with the digital strategy. O2.4 Digital services are supported by a specific sales team.
Level 3 - Integrating The organization's initiatives are being integrated across the organization to support end-to-end capabilities.
O3.1 Management is continuously communicating the digital strategy and advances in its implementation across the whole organization. O3.2 Digital strategy is driving corporate change, including organizational structure and key performance indicators. O3.3 Digital initiatives incorporate people from several functions and departments, as well as external partners. O3.4 Performance and compensation systems across the organization incorporate digital elements. O3.5 Global processes are set to promote the transfer of global/central digital knowledge towards the Operating Businesses (OpCos).
Level 4 - Optimizing The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.
O4.1 Digital is fully embedded in the corporate culture. O4.2 Digital capabilities are well developed and partnerships are continuously formed to access new ones. O4.3 A well-defined personnel development strategy is in place, including when to train, outsource, or acquire digital capabilities. O4.4 Key performance indicators for sales are now mainly driven by digital services.
Level 5 - Pioneering The organization is breaking new ground and advancing the state of the practice within the dimension.
O5.1 Collaboration with other ecosystem partners is well established, generating service innovation that is ahead of competition. O5.2 The organization is flexible and easily adapts to changes in the market in a more agile way than competitors. O5.3 The organization is focused on digital innovation.

3. Customer

This dimension focuses on customer participation and empowerment, as well as new benefits created in customer experience through digital transformation of customer touch points.

Level 1 - Initiating The organization has decided to move toward a digital business and is taking initial steps in that direction.
C1.1 Basic self-help tools (e.g., online portals, forums) are available to customers.
C1.2 Initial pilots of new digital tools such as self-service apps and social media support are being conducted.
C1.3 Initiatives and requirements to expand customer interaction beyond basic app-based self-support have been identified.
C1.4 Basic e-commerce capabilities are being implemented to drive calls to purchase online.
Level 2 - Enabling The organization is implementing initiatives within the dimension that will form the foundation of its digital business.
C2.1 An omni-channel vision has been fully articulated (although not necessarily completely executed).
C2.2 New digital customer engagement tools are being implemented supporting the customer lifecycle.
C2.3 Customer experience and usage data is actively collected and used to assist customer support and service improvements.
C2.4 New digital services (typically from third parties) are being made available to customers, albeit not yet as part of an integral "multi-product" service.
Level 3 - Integrating The organization's initiatives are being integrated across the organization to support end-to-end capabilities.
C3.1 An omni-channel vision is well under-way throughout customer-facing operations (e.g., from physical shops through to online to mobile and call centres).
C3.2 Customers can not only access support and information; service self-configuration tools are also available across channels.
C3.3 Customer experience and usage data is routinely collected across all channels and shared across organizational functions (e.g., marketing, product management, customer support, network operations).
C3.4 Customers can bundle new digital services with traditional services.
Level 4 - Optimizing The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.
C4.1 Customer experience management has moved from reactive to proactive including automated actions (e.g., next-best action, personalized promotions).
C4.2 Data analytics are being extensively used to improve customer value, including development of new services offerings, promotions, and branding.
C4.3 Digital tools and systems are enabling full customization of services at the individual customer level, including third-party products.
C4.4 Initial tests of data-driven dynamic are is ongoing.
Level 5 - Pioneering The organization is breaking new ground and advancing the state of the practice within the dimension.
C5.1 Dynamic pricing is being used to maximize customer value through full personalisation and flexibility.
C5.2 Machine learning and other advanced tools are being used to identify consumption trends and to develop new services and pricing strategies that are entirely new to the industry.
C5.3 New (including non-traditional telecommunication) digital services are being developed based on deep knowledge of customer (e.g., advanced analytics) and are, from inception, fully integrated across all touch points (e.g., one screen/app/bill for all services).

4. Ecosystem

This dimension focuses on partner ecosystem development and fostering as a key element for a digital business.

Level 1 - Initiating The organization has decided to move toward a digital business and is taking initial steps in that direction.
E1.1 The organization has developed a preliminary ecosystem strategy for digital services.
E1.2 Programs and key assets (e.g., people, technology platforms) have been identified that will form the basis for a digital ecosystem.
E1.3 Resources (e.g., people and funding) are being allocated to develop a digital ecosystem.
Level 2 - Enabling The organization is implementing initiatives within the dimension that will form the foundation of its digital business.
E2.1 An ecosystem strategy, as part of a wider digital product strategy, has been signed-off by senior management.
E2.2 An initial group of partners has been on-boarded, albeit with limited integration of products and capabilities (e.g., on a re-seller model).
E2.3 Tools and systems are being put in place to support a closer integration of partners, including service enablement platforms, APIs, and preferred pricing structures.
Level 3 - Integrating The organization's initiatives are being integrated across the organization to support end-to-end capabilities.
E3.1 The ecosystem strategy has evolved to focus on developing a two-sided model whereby value is created for both end customers and partners.
E3.2 Integration with partners goes beyond basic product bundling or re-selling, including some resource sharing (e.g., joint market channels).
E3.3 Investments in integration capabilities are being made to facilitate fast and efficient partner service development.
E3.4 The organization is integrating partner services and capabilities to enhance existing products.
Level 4 - Optimizing The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.
E4.1 The ecosystem strategy has moved towards a digital marketplace where users can integrate services from various ecosystem parties.
E4.2 Dedicated teams are in place to help develop partner capabilities (e.g., designating marketing resources to help partners to develop their promotions and go-to-market strategies).
E4.3 Investments in integration and development capabilities are being made to not only enable but accelerate and reduce costs of service creation by partners in ecosystem.
E4.4 Data flows across the ecosystem partners for product/service optimization.
Level 5 - Pioneering The organization is breaking new ground and advancing the state of the practice within the dimension.
E5.1 The ecosystem is mature and it starts producing innovations that cross organizational boundaries.
E5.2 Products and services developed and launched in partnership with ecosystem partners are leading the market and are based on data-driven customer knowledge shared across partner organizations.
E5.3 The organization is developing new revenue streams and business models that incorporate ecosystem partners from inception through to launch and operation.

5. Technology

This dimension is focused on the capabilities that enable an effective technology planning, deployment, integration, and use to support the digital business.

Level 1 - Initiating The organization has decided to move toward a digital business and is taking initial steps in that direction.
T1.1 A digital-specific, IT architecture is being developed. T1.2 Efforts to define required transformation of IT architecture have been started. T1.3 Some initial pilots are planned to test new digital tools and platforms.
Level 2 - Enabling The organization is implementing initiatives within the dimension that will form the foundation of its digital business.
T2.1 A digital-specific IT architecture has been defined and changes to enterprise IT are ongoing to align it to target architecture. Tactical IT investment plans are aligned to target architecture. T2.2 Platforms are being deployed to support digital services (e.g., an Internet of Things, or IoT, platform). T2.3 An integral API and security strategy for supporting third-party services has been defined. T2.4 Support systems are being implemented to support digital services (e.g., flexible charging and billing). T2.5 There is a process to evaluate IT investments based on their alignment to the digital strategy of the organization.
Level 3 - Integrating The organization's initiatives are being integrated across the organization to support end-to-end capabilities.
T3.1 Digital enterprise IT architecture has been largely implemented, including consolidation of stove-pipe systems into platforms for support of omni-channel and third-party services. T3.2 Third-party services are being integrated and supported by digital enterprise IT architecture and related tools. T3.3 Processes across the organization (e.g., customer support, partner onboarding) are aligned to digital IT architecture. T3.4 Analytics technologies are being implemented to facilitate data collection and sharing across functions.
Level 4 - Optimizing The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.
T4.1 End-to-end processes supporting digital services are being optimized by leveraging the digital enterprise IT architecture. T4.2 Integration tools are deployed to reduce time and costs of integration of third-party services. T4.3 Digital IT architecture supports business agility through flexible tools and supporting processes. T4.4 Analytics technologies are being used for optimization of services and processes. T4.5 Automation of processes using real-time data processing is being used for proactive decision making across the organization.
Level 5 - Pioneering The organization is breaking new ground and advancing the state of the practice within the dimension.
T5.1 Technologies such as advanced data analytics underpin innovation processes across the organization, from new service development through to service assurance to customer support. T5.2 Automation throughout the organization drives superior performance (e.g., speed, reliability, ARPU, NPS) compared to industry peers. T5.3 Tools using technology such as machine learning are implemented and used across the organization (and even to ecosystem partners) for predictive activities (e.g., service reliability, user consumption trends) that support digital business innovation.

6. Operations

This dimension focuses on the capabilities that support the service provision. Increased maturity within this dimension demonstrate a more digitized, automated, and flexible operation.

Level 1 - Initiating The organization has decided to move toward a digital business and is taking initial steps in that direction.
O1.1 Investments to automate key operations that support digital services (e.g., service provisioning, charging, and billing) are being evaluated.
O1.2 Improvements in network visibility and automation are being evaluated.
O1.3 Initiatives to update key business processes to support digital services have been identified.
Level 2 - Enabling The organization is implementing initiatives within the dimension that will form the foundation of its digital business.
O2.1 Systems to support and automate digital services are being implemented.
O2.2 Advanced analytics are being deployed for service assurance improvements.
O2.3 Systems and processes to collect and analyze customer usage data are being deployed.
O2.4 Processes and policies to better support digital services are being designed and implemented in some key areas of the organization (e.g., ordering, fulfilment, partner management).
Level 3 - Integrating The organization's initiatives are being integrated across the organization to support end-to-end capabilities.
O3.1 Automation of end-to-end processes is being implemented to support digital services..
O3.2 Network data is being actively collected, including user- and partner-contributed data, to improve network visibility and to assist expansion planning.
O3.3 Processes and systems are in place to support integration of third-party digital services.
O3.4 Network, customer, and other usage data is being collected and combined to provide visibility of end-to-end processes across the organization.
O3.5 Digital services are implemented and deployed jointly with traditional ones, and they share processes.
Level 4 - Optimizing The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.
O4.1 Automated processes are being optimized to improve efficiency and reduce costs of designing, provisioning, and supporting of digital services, including partner services.
O4.2 Real-time network, customer, and usage data is being combined and analyzed to optimize service reliability as well as key processes (e.g., customer support).
O4.3 Some real-time, automated decision making is being implemented in the service provision of digital services (e.g., if the event of service failure, send job order and customer-personalized message).
Level 5 - Pioneering The organization is breaking new ground and advancing the state of the practice within the dimension.
O5.1 Full observability of service and usage data is now driving innovation within the organization, including dynamic offerings to both customers and partners.
O5.2 Automated end-to-end processes ensure real-time data flows across functions for improved planning and decision making.
O5.3 Real-time, automated decision making is fully implemented in the service provision of digital services.

7. Innovation

This dimension focuses on the capabilities that enable more flexible and agile ways of working that will form the basis for an effective digital business.

Level 1 - Initiating The organization has decided to move toward a digital business and is taking initial steps in that direction.
I1.1 A need to develop a more agile and innovative organization has been identified.
I1.2 The organization is developing a strategy for digital innovation across functions.
I1.3 Some initial changes are being made to the way digital services are developed with a focus hitherto on incremental improvements.
Level 2 - Enabling The organization is implementing initiatives within the dimension that will form the foundation of its digital business.
I2.1 A digital innovation strategy has been developed with focus on agile development and open and data-driven innovation processes.
I2.2 Investments in digital technologies are aligned to innovation strategy and activities.
I2.3 New processes are being implemented to foster digital innovation.
I2.4 Investments in people development for digital innovation are underway.
Level 3 - Integrating The organization's initiatives are being integrated across the organization to support end-to-end capabilities.
I3.1 Open innovation with external parties including partners, users, and others has been implemented to support digital innovation.
I3.2 Data (including service, customer, and usage) is shared across the organization (and to partners) to support innovation.
I3.3 Metrics and key performance indicators specific to digital innovation and partner integration are being implemented.
Level 4 - Optimizing The organization's digital initiatives within the dimension are being fine-tuned and used to further increase overall performance.
I4.1 Innovation in new digital services is mature, with clearly defined targets, processes, and performance metrics.
I4.2 Time to market of new service propositions is being reduced through well-established innovation processes.
I4.3 Customer and partner co-creation of new services is used to advance innovation and reduce costs of development.
Level 5 - Pioneering The organization is breaking new ground and advancing the state of the practice within the dimension.
I5.1 The organization is breaking new ground in the way it innovates, establishing innovation processes that are new to the industry.
I5.2 The organization is recognized in the industry as leader in digital innovation.
I5.3 New digital services launched in the last 3 years account for a significant share of total digital revenues (e.g., >30%)