



AI MATURITY MODEL & ASSESSMENT



Abstract

The challenges posed by OTTs / Technology companies (GAFAM), who are eating into major revenue share, has forced traditional Telecom companies or Communication Service Providers to transform into Digital services organizations. This inorganic shift has led to random acquisitions of content, platforms and products, making the operations even more complex. Artificial Intelligence being a buzzword, many CSPs are scrambling towards AI solutions to bring in some sanity and cohesion in their operations. No wonder, the global artificial intelligence in telecommunication market size was valued at USD 679.0 million in 2019 and is expected to grow at a compound annual growth rate (CAGR) of 38.4% from 2020 to 2027¹.

CSPs are in possession of vast amounts of data collected over the years, this data is culled from devices, networks, mobile applications, geolocation, customer profiles and usage data. A new forecast from International Data Corporation (IDC) estimates that there will be 41.6 billion connected IoT devices, or "things," generating 79.4 zettabytes (ZB) of data in 2025.; it is going to overwhelm CSPs with a lot of data².

We spoke to our key 5 clients and observed that everybody is at different phase of their AI life, some are just thinking of it, few have already progressed ahead and trying to get the benefits of AI. And this is where we, at Infosys Communications Consulting Practice, felt we need a benchmarking framework that will help CSPs to gauge their AI preparedness. The benchmarking framework is packaged as an AI Maturity Model and a Survey based on this model.

In this paper, the author discusses the various facets of AI Maturity, benchmark with their peers and how it will help CSPs to assess their AI Maturity and strategize their future journey to become Digital Service Provider to propel them in a next growth orbit to stay ahead in the competition.

Why AI Maturity Model?³

Artificial Intelligence has potential to reshape the Way of working for Communications Service Providers (CSPs). AI not just helps improve the operational parameters / profitability but has potential to bring transformations in their business models, bring in innovations in their offerings and provide enhanced experience to their end customers and users.

While dealing with a complex AI landscape, it can overwhelm the CSPs with its critical parts – organization, technologies, capabilities, processes, people – and how they are assembled in different parts of businesses to address different channels across multiple domains. So, while there

is an enthusiasm to leverage AI to bring in transformation, the way forward will ultimately be decided by CSPs preparedness in AI space.

A maturity model is useful for any enterprise considering or in the process of implementing an AI project. First, it builds a framework around AI program, helps identifying CSP their goal and vision for AI program. A maturity model will provide a defined framework, which has pillars and attributes, to measure and track the current state, what is next tangible target for them, how they can target low hanging fruits and the steps they need to take to move to the next stage of maturity.

We have designed the AI Maturity Model for CSPs by listening out to their needs to

understand how their analytics deployments compare to those of their peers and to provide best-in-class insight and support.

We have developed an assessment tool based on our AI Maturity Model which will help CSPs understand their preparedness in AI journey, what they have achieved and what is yet to be achieved. Our intention was to build a maturity model and assessment that does not ends just by asking CSP a few questions to assess maturity but help them to progress in AI journey without partnership.

At the end of the benchmark survey, you will be able to objectively quantify the maturity of your AI Program, understand your progress and identify what it will take to get to the next level of maturity.

AI Maturity Model – Core Pillars and its Dimensions

At Infosys Communications Consulting Practice, we have developed an AI Philosophy for our partners based on our experience and our engagement with CSPs. The philosophy has three key legs in AI journey, **Engage, Evaluate and Enable**. The focus of this paper will be on Evaluate part of this journey where we will assess the existing phase of a CSP in AI journey which will help us to enable them for their future.

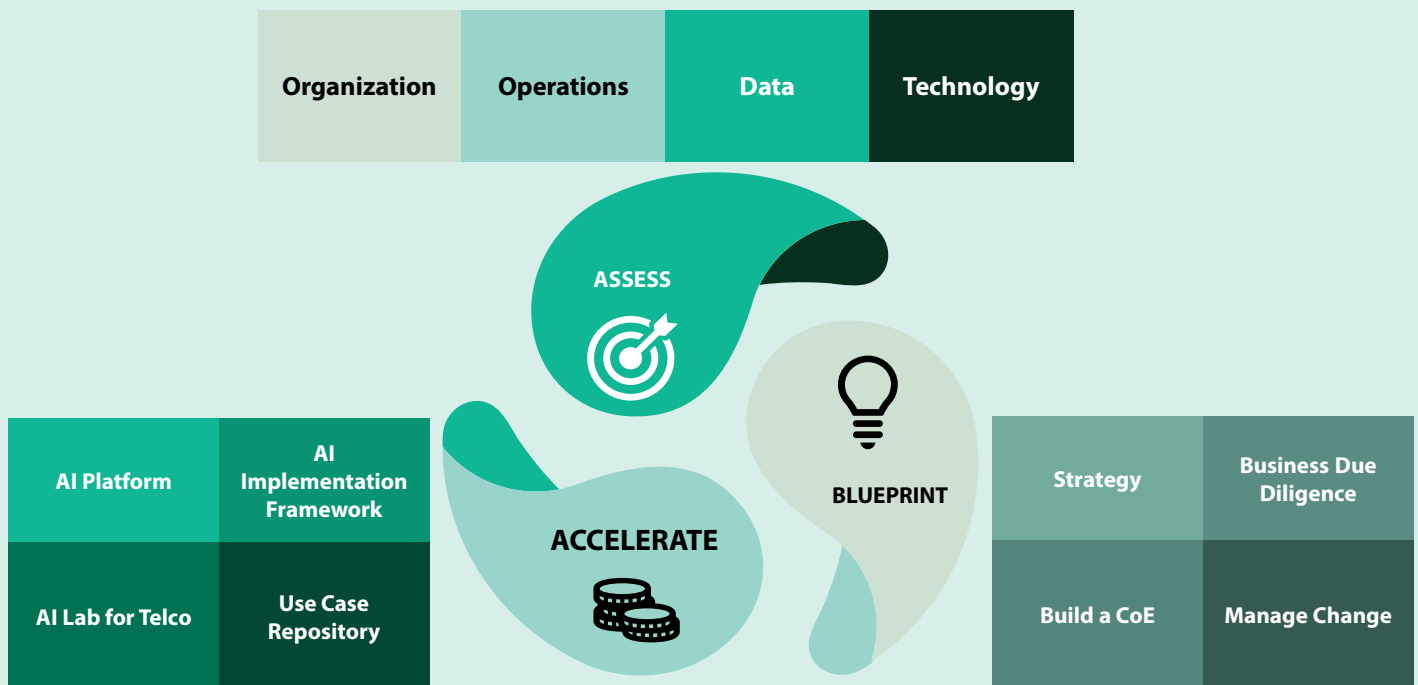


Figure 1

The AI Maturity Model is aptly supported by four core pillars of a CSP organization, as depicted in figure 2 below. These core pillars outline the key capability foundations required for a CSP to be AI ready. Our methodology defines five

phases of AI journey – **Skeptics, Watchers, Explorers, Rising Stars** and **Visionaries** and is supported by four core pillars of a CSP – **Organization, Operations, Data** and **Technology**. The assessment measures organization’s maturity of their AI program

objectively across four core pillars that are key to deriving value from AI.

Below figure depicts the core dimensions of our AI maturity model for a CSP.

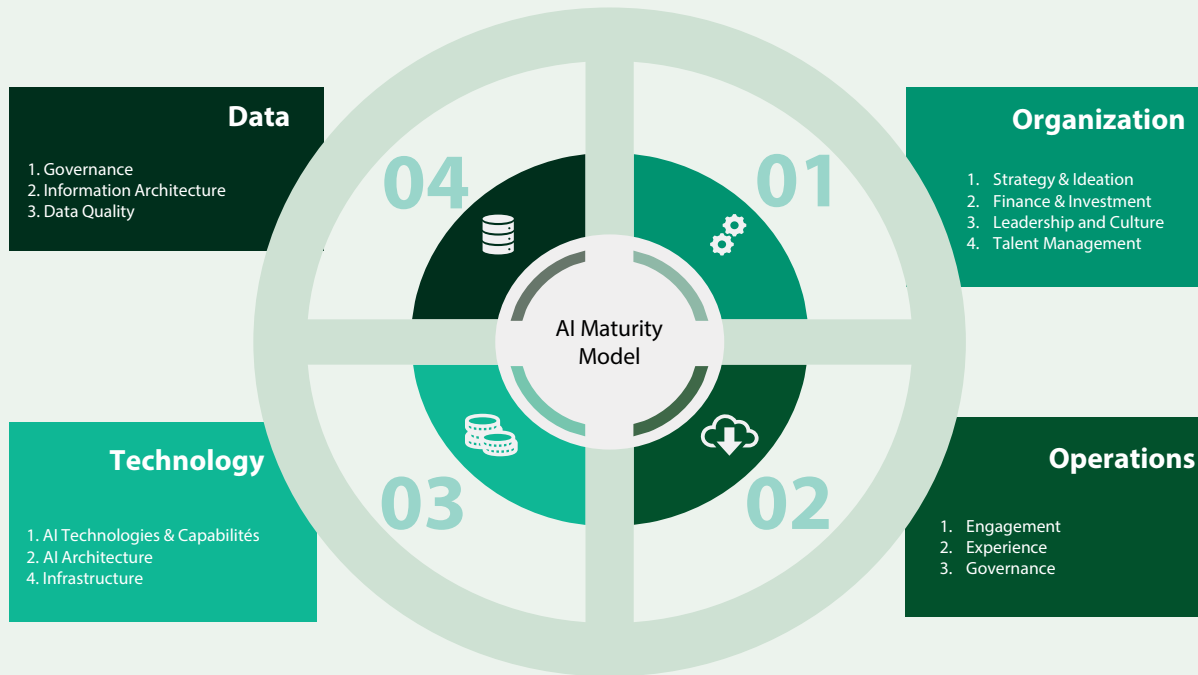


Figure 2

We will discuss each dimension briefly below.

Organization

The organizational support is critical for the success of any AI initiative. AI strategy of an CSP, its cultural adoptability, leadership acceptance and funding support decides the journey of a CSP in AI space. The aim of this dimension is to define and develop an organizational culture. Ensure a governance framework is in place that is well supported by a clearly defined talent processes /policy. This will help to progress in adopting and implementing AI not just for CSP employees but for their partners and end customers, to achieve the organization’s growth and innovation objectives.

We will measure CSPs preparedness from Organization perspective across below areas –

Strategy and Ideation	<ul style="list-style-type: none"> Helps to examine the state and nature of a CSPs roadmap to support AI Examine metrics/KPIs to measure the success AI innovation in products, processes and business outcome to revolutionize end user experience
Finance and Investment	<ul style="list-style-type: none"> Define AI budget, its considerations and decisions Optimize investments for AI that helps the organization achieve maximum value for their investments
Leadership and Culture	<ul style="list-style-type: none"> Accelerate organizational change management through accountability to establish AI strategy for organizational evolution Defines and establishes organizational culture to drive innovation focus, behaviors, beliefs, values to realize the AI strategy
Talent Management	<ul style="list-style-type: none"> Defines and establishes the organizational foundation, talent management processes and capabilities to support the AI strategy It also establishes the competencies, knowledge, skills and tools to empower the workforce, employees and third-party service providers, implement the AI strategy

Operations

The pillar is in charge the E2E responsibility for designing, planning, automating and governing the routine activities and processes related to AI services. The pillar deals with large-scale deployments of AI components across core enterprise processes. It tries to answer the behavior of AI components to their users and stakeholders, while ensuring adoption and deployment AI-based solution to support OSS / BSS and enterprise processes. This dimension measures the customer / user experience across all its touchpoints. It as well help defining comprehensive operational and security governance models overarching internal and external / third party stakeholders.

Engagement	<ul style="list-style-type: none"> • Helps to examine the state and nature of a CSPs roadmap to support AI • Examine metrics/KPIs to measure the success • AI innovation in products, processes and business outcome to revolutionize end user experience
Experience	<ul style="list-style-type: none"> • Define AI budget, its considerations and decisions • Optimize investments for AI that helps the organization achieve maximum value for their investments
Governance	<ul style="list-style-type: none"> • Defines and establishes leadership, governance, accountability to facilitate leading and managing the AI strategy and initiatives • Defines and establishes organizational behaviors, beliefs, values, innovation focus, etc. (i.e. culture) to realize the AI strategy and initiatives

Data

Data has a business value – the entire Analytics / AI is based on this foundation. This pillar of our framework focusses on CSPs ability to make data available for AI use cases, put a governance model in place, manage data, process data and analyze data in a secure way. The pillar takes in to account key data attributes like velocity, volume and variety and builds strong Data management foundation.

The foundation of any successful analytics initiative is unified, consistent, regularly updated and relevant data from trusted sources. Data is a key enabler for any AI implementation, the various controls / governance put in place ensures the security and privacy aspects around data are very well taken care off, mitigating the fear that end user would have in their minds. Aspects of data quality, integration and access

issues while enabling use cases across CSPs architecture also needs to be focused. But as they say, Garbage In – Garbage Out is very much relevant for Analytics projects and hence it is imperative that data quality is ensured to avoid overhead of data processing.

The capability to actively learn, gather inference and provide decision support underscores the essence of an optimized data-use environment.

Governance	<ul style="list-style-type: none"> • Assess definitions, role matrix / ownership, policies, standards and procedures for data management • Examine the security compliance and ease of access of data for AI implementations
Information Architecture	<ul style="list-style-type: none"> • Assess current information architecture, its definitions, involved data model, standards and variety of data • Assess capability to manage the lifecycle of data assets to generate, process and store the data with its key attributes volume and velocity
Data Quality	<ul style="list-style-type: none"> • Examine the current state of data quality, investments to improve data quality, any quality framework in place to improve data quality at source. • Assess CSPs data preparedness, the efforts (cost and time) to process data and willingness of an AI implementation despite these efforts

Technology

This pillar explores and assesses the different AI technologies and capabilities being leveraged by the CSP, and how the CSP has planned or already have initiated implementation of AI solutions using technology stack. We plan to assess existing IT Architecture of CSP, its proposed / existing integration with AI tools/ technologies, investment plans to

modernize existing architecture and intent to adopt delivery mechanism like DevOps, AGILE and AIOps. This will help measure the extent of using AI technologies and methods to enable business and operations in order to drive autonomous actions.

Technology spans the integration of remote devices, computing and storage

devices, various business support applications and network resources. They could be hosted on Cloud (private, public or hybrid) or on-prem environments, needs to be integrated into systems that autonomously learn, infer and act to assist or augment interactions with the real world, across environments without compromising performance, security.

AI Technologies and capabilities	<ul style="list-style-type: none"> • Assess AI tools and technologies that CSP is currently using • CSPs preparedness to invest in AI tools and technologies to be examined
AI Architecture	<ul style="list-style-type: none"> • What is the state of existing Enterprise Architecture? Assess if it is monolithic, SOA based or microservices based or hybrid? • Is current Enterprise Architecture able to adopt / integrate with AI tools and technologies?
Infrastructure	<ul style="list-style-type: none"> • To what extent Infrastructure can support existing architecture and is there any plan to modernize • Assess if it is on-premise or cloud based or hybrid with some applications hosted on cloud. Verify willingness to adopt cloud hosting or SaaS based tools

Phases in AI Maturity

AI maturity is seen as an evolution of an organization to integrate, manage and leverage all relevant internal and external data sources to drive insights and helping business with data backed decisions.

It can take years to create and instill an analytics culture in an organization. But for all, who are at various levels in their journey, they need to understand their preparedness, their relative strength and weaknesses to benefit from AI implementations.

AI maturity can be aligned with the four core developmental phases shown in Figure 1.

Today there is great variation in where CSPs are situated on their journey to AI maturity. Some have already committed to AI, with a defined strategy and solutions of some kind in place. Others are still experimenting with new capabilities as their confidence grows. Many more are at an earlier stage altogether, formulating a plan of action or even wondering how to take the first step. But to move forward and benefit from all AI has to offer, CSPs need to understand their development needs and their readiness for AI in relation to their strengths and weaknesses.

The first phase is the AI Novice, and as the term suggests, a CSP in this position is still in assessment mode and has not started its AI journey. An AI Ready CSP is

in a position where it can move forward and implement AI, but still has issues that need to be addressed if it is to make further progress. The AI Proficient CSP has made solid progress in its AI journey and has a reasonable degree of practical experience with AI and an understanding of how to leverage it – but there are still some gaps and limitations to be addressed. The AI Advanced CSP is at the most mature developmental phase: it possesses a good level of AI expertise and can demonstrate a proven track record across a range of use cases. However, determining exactly where an individual CSP sits in relation to these phases is complex. To address this challenge and help CSPs on their AI journey, we have developed an AI maturity assessment model.



Figure 3

We will talk about each phase in detail below.⁴

Skeptics

This is the most immature phase where CSPs have not taken any proactive steps on the AI journey, they can be still classified in to "assessment mode". They seek to understand the definition of AI, and its applicability across a broad category of scenarios and capabilities. They are not in position to take advantages of the opportunities offered by AI capabilities. There is no data management strategy in place causing data quality and consistency issues.

The CSPs in this phase are found to be lacking the cohesive organizational strategy and alignment, availability of data and mindset to take risk to be disruptive in their areas of business.

Pillar	Core Attributes
Organization	AI is not on agenda for leadership Yet to formulate an AI strategy No budget allocated for AI
Operations	No focus on Automation, most manual processes Process mapping is not done No work on identifying AI use cases has begun
Data	Fragmented data sources with data quality issues Inflexible data management approach Traditional reporting mechanism that drive no insights from data
Technology	Legacy platforms mostly built with monolithic applications No plan to upgrade No thought around configurable, core or custom AI technologies

Watchers

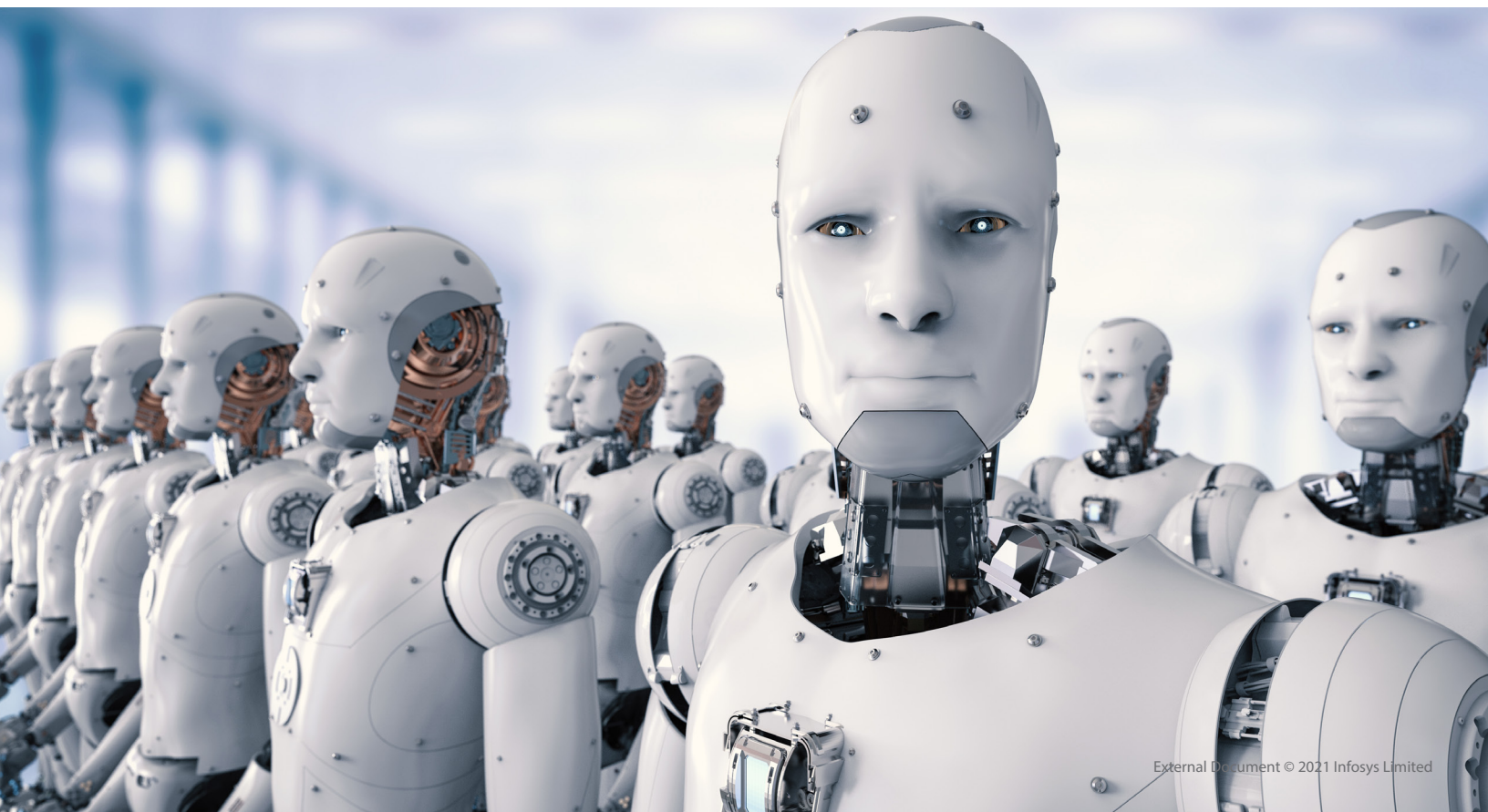
Organizations at this stage are interested to embark on AI journey and are starting to their homework. They are keen to understand how other CSPs are utilizing AI for their businesses and strive to acquire systems and processes to make data-driven decisions. But these organizations often rely on the talent, instincts, and experience of leaders to make decisions. This is often due to lack of systems that help them with insights from their data.

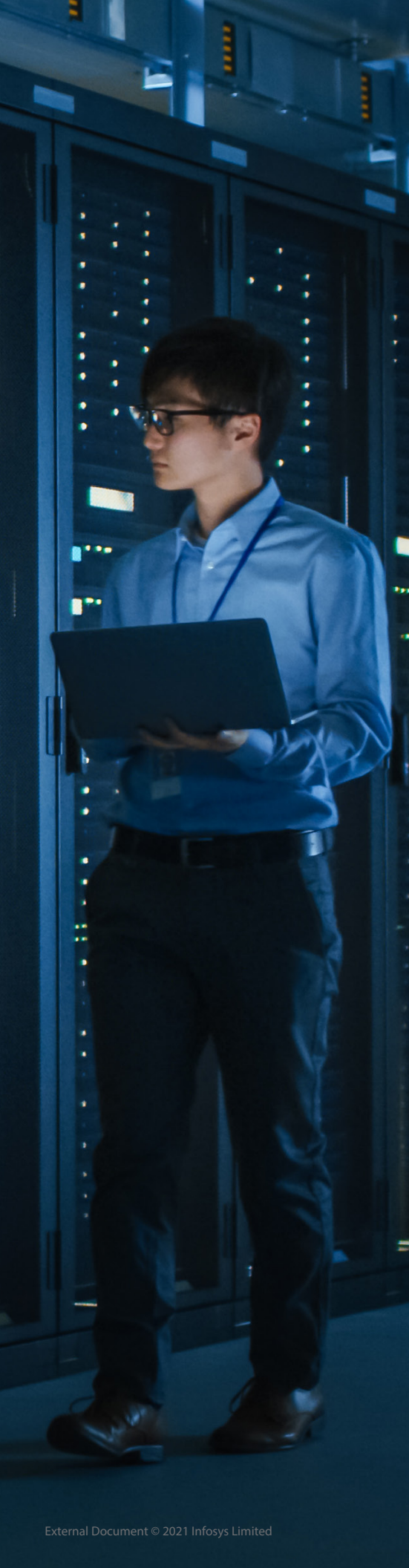
These organizations will try to rely on experience of external organizations to help them embark on AI journey due to lack of inhouse dedicated team. But they will have work begun on Strategy, have some budget allocated for AI and building talent & process map of their existing processes. They would start envisioning about the potential value of combining multiple sources of data and understand the need of Data

Management. They would want to map their AS-IS processes and build a process library which will help them identify potential use cases for AI implementation.

Such CSPs must take the next step by making tactical investments to enable the relevant skills, technology, and data to start realizing these plans. Configurable AI is their best bet to begin their journey.

Pillar	Core Attributes
Organization	<p>AI is now topic of discussion across board</p> <p>The work on AI strategy has begun, an external partner is onboarded to help</p> <p>Budgets are now allocated</p> <p>Do we need a CoE or take a decentralized approach is the question now!</p>
Operations	<p>Process repositories are built to map AS-IS processes</p> <p>Potential use cases are being identified</p> <p>Policies for AI are being formulated</p>
Data	<p>IT and Business are talking about need for a Single source of truth</p> <p>Data sources are identified for consolidation and to drive analytics requirements</p>
Technology	<p>Platform modernization map is being worked out</p> <p>A discussion happening now on configuration, core or custom approach</p> <p>Exploring different tools and technologies in market for adoption</p>





Explorers

These CSPs understand that AI will be instrumental in helping them compete and transform. They have already embarked on their journey for digitization of assets and the infusion of AI to automate processes. We will call CSPs as Explorers when they are sufficiently prepared in terms of strategy, organizational set-up, and data availability.

They continue to implement cultural changes so the leaders are on board for AI driven transformation as well the change will help empower employees and data-driven decisions is made an habit. These organizations are focused on adopting a data culture and continuing to identify strategic initiatives to disrupt in

Telecom landscape by using AI to create new business models and streamline operational processes.

The CSP would build an internal team well supported by external partner. This teams would drive the PoC's of identified use cases ahead. They would be participating in external industry forums to gain more knowledge and share experiences.

They would not have a dedicated analytics platform as yet, but they may be thinking about a unified architecture that can enable users to access multiple data sources and different types of data, including unstructured content.

Pillar	Core Attributes
Organization	<ul style="list-style-type: none"> AI strategy is now formulated AI is now here to stay with regular funding A centralized team is now set up, although focusing only on governance and strategic goals. Organization is hiring internal talent now Employees are now engaged in reskilling to adopt new technologies
Operations	<ul style="list-style-type: none"> A Use case repository across core OSS / BSS functions is now ready Few use cases are now deployed and are being evaluated for adoption and Rol Operational matrices are defined Employees are empowered to identify potential Automation opportunities
Data	<ul style="list-style-type: none"> Data governance strategy is defined with a focus on ethical use of data Data security practices are defined to protect sensitive data and restrict unauthorized access Organization would have their own data lake in place, but still data needs preprocessing for job Identified data sources are now mapped to use cases
Technology	<ul style="list-style-type: none"> Disparate tools and technologies are being used to drive insights from data A core technologies option is more preferred in this phase for CSPs where developers building quick PoCs using native Python / R applications Architecture team has now finalized a centralized tool (custom tool) for organization but still not operational.

Rising Stars

The CSPs in this phase try to move from AI adoption in isolation to Corporate adoption. This will help them to extend the value of AI to their internal users and to their end customers. This phase is probably the lengthiest phase of all where the transition to corporate adoption would meet with many hurdles.

Operationally, a CoE would be fully functional by now and these organizations will invest more in understanding how

to implement, monitor, and improve AI over time. The focus will be on rapid and iterative experiments. Strategic initiatives are now established as part of a fully embraced data culture that will help translate insights into actions. These organizations continue to nurture talent, in a hybrid internal – outsourcing mode and work is progressing on multiple AI initiative simultaneously using the talent pool.

A centralized AI platform would be operational by now and users across different functions would start building

their use cases on a single platform, helping reuse across organization. Most of these applications would be on-premise but some would be on cloud on experimental basis. CSPs at this level of maturity should maintain operational vigilance when it comes to monitoring, retraining, and implementing AI-based systems.

Maintaining AI talent, prioritizing new strategic initiatives, and continuing agile experimentation are required areas of focus for these organizations.

Pillar	Core Attributes
Organization	<p>AI CoE is now fully functional and is driving the AI implementations centrally</p> <p>AI CoE will have hybrid way of working, few roles are internal and few outsourced.</p> <p>Org wide governance will be driven through AI CoE</p> <p>Leadership and board level engagement is now established</p>
Operations	<p>Use cases across Fulfillment, Assurance and Billing areas are now implemented and their success is tracked against established matrix</p> <p>Operational matrix is undergoing evolution and improvement based on experience</p> <p>Employees are empowered with inhouse training / certification to learn and implement AI in their day to day work</p>
Data	<p>Data governance strategy is now practiced for each implementation</p> <p>Data security practices are helping identify and protect sensitive data and restrict unauthorized access</p> <p>A dedicated data lake is set up acting as a single source of truth for all data requirements</p> <p>Identified data sources are now mapped to use cases</p>
Technology	<p>Disparate tools and technologies are being used to drive insights from data</p> <p>A core technologies option is more preferred in this phase for CSPs where developers building quick PoCs using native Python / R applications</p> <p>Architecture team has now finalized a centralized tool (custom tool) for organization but still not operational.</p>



Visionaries

In today's scenario, very few CSPs can be considered as Visionary in AI space. CSPs at this stage enable the end user to draw insights from AI use cases and transforms the way they do business. At this stage, a CSP would have a handful projects successfully implemented and adopted and the users start seeing it as a competitive differentiator. The organizations have shifted their culture to include lifelong learning and a growth mind-set. Rapid, iterative experiments come naturally. Strategic initiatives are established as part of a fully embraced data culture and help translate insights into

actions. These organizations continue to successfully curate AI creation talent and understand how to apply these resources to several AI initiatives simultaneously.

CSPs at this stage, would be executing analytics programs smoothly using a highly tuned infrastructure with well-established program and data governance strategies. CSPs at this maturity level are focused on shifting culture to empower employees to increases collaboration, generates ideas for optimization and build new business models. These organizations can compare between Configuration AI,

Core AI and Custom AI and can implement a combination of this with a thoughtful decision. A fully functional centralized AI CoE will enable this implementation.

The governance mechanism would be fully established, functional and continually improving. While building AI solutions, these organizations infuse ethical perspectives into their experience creation process.

The CSPs who have achieved this phase cannot be complacent and they will have to keep improving continually to always stay ahead of game and keep achieving benefits of AI.

Pillar	Core Attributes
Organization	<p>Senior leadership is now completely on-boarded to drive the AI transformation in their respective areas.</p> <p>The habit of data driven decisions is now inculcated and business is already seeing the benefit of it</p> <p>AI CoE is now a full-fledged internal team driving AI implementations with the help of internal / external partners.</p> <p>AI governance is ensuring each use case is business centric, value is realized and is adopted.</p>
Operations	<p>A good range of AI use cases are now developed to support internal processes, external B2C use cases and certain B2B scenarios.</p> <p>Use cases are now business centric and are being developed as a continual improvement program</p> <p>Use cases are optimized to drive cross-domain value and ensure alignment across business processes (Fulfillment, Assurance, Billing)</p> <p>Employees are suitably rewarded for their newly acquired AI skills</p>
Data	<p>Data is now recognized as an asset and is now being monetized</p> <p>Data governance strategy is well formulated with a focus on quality, format and ownership of data types</p> <p>Data is now available in near real time basis and a centralized platform now able to support volume, variability and velocity of data</p> <p>AI solution are are now developed as privacy at their core from beginning, rather it being an afterthought.</p>
Technology	<p>AI tools and technologies are now fully integrated with core enterprise architecture of CSP, this will help exploiting AI tool capability across all key applications</p> <p>A centralized platform, supported by AI CoE, is now governing new AI deployments</p> <p>An established AI platform allows may allow exploring open source tools or systems with pre-integrated AI capabilities, often termed as Custom technologies</p>

Evaluation criteria

The survey has questions across four core pillars, these four pillars and dimensions are foundation of our AI Maturity Model. These dimensions are used to explore inter-relationships across CSPs core functions to identify their preparedness for AI. We appreciate the fact that a CSP will be at a different maturity phase across each of these dimensions and a detailed survey output will help CSP to understand it. But the overall survey outcome will be considered to map a CSP into definite stage as the holistic approach will help them to better their performance in AI.

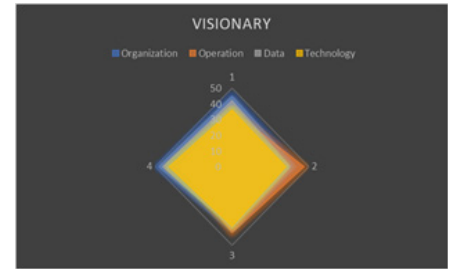
Each pillar has multiple dimensions and the questions are made granular to probe at each dimension level. Questions may be weighted differently depending on their relative importance and their format. As we have acknowledged the fact that a

CSP can be at different levels of maturity in the five dimensions, we score each section separately so CSP can draw insights from them, but we as well provide an overall score for a holistic view.

Below images are for illustrative purposes only and can give an idea on how an output is presented to participant.

There are some questions, which are not scored but using which we are trying to understand the focus areas for CSP. The focus areas will help us in bringing customized recommendation to CSP when we progress our engagement with them.

The output of the assessment is a score in each dimension and the total score, as well as a gap recommendation that provides advice and best practices for getting to the next stage of maturity.



The outcome will also suggest CSP their next logical step and few achievements across dimensions which they need to achieve to reach that phase. We have published few generic recommendations for a CSP so that their AI journey can begin

What is next for CSPs?

To harness the benefits of Artificial Intelligence, an enterprise would require a strategic approach that spans across human, technology and processes. At the same time, due diligence needs to be applied to aspects of it being a human-centric, ethical, sustainable and law abiding.

CSPs are faced with fierce competition by OTTs / Technology companies as well as disruptive forces such as pandemic etc (COVID19). To stay relevant and robust, CSPs will need to adapt, adopt and embrace Artificial Intelligence.

The paper discusses a scientific approach that provides holistic, domain-aware view

to assess the AI maturity of the CSPs. It will certainly help CSPs to navigate to the coveted goal of being a digital value player, assessing their current status in AI journey and plan their future steps in accordance with the assessment.

At the end of the survey, we are making some generic recommendations based on our experience. Those covers broader spectrum of AI. Some are below for reference –

Few key strategic objectives:

- Expand Revenue: Use conversational bots and RPA
- Improve Operations: IoT and predictive analytics to reduce downtime and costs of maintaining key equipment

- Improve demand forecasting: Optimize inventory and reduce stock outs
- Improve customer experience: Predict churn and make recommendations

But get your data ready before you embark on journey:

- Modernize your data platforms
- Ensure apps and data are globally distributed
- Migrate your data to the cloud
- Build cloud scale analytics to visualize insights and you may need to begin to build the governance and AI maintenance processes that will guide your organization through its transformation.

About the Authors



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Anupam is a highly versatile, influential, and results-oriented business leader with around 24 years of CME(Communications, Media, and Entertainment) industry experience. He has 360-degree experience in key business functions like Sales/account management, consulting, and delivery, Through multiple engagements, he has helped telecom companies to devise and roll-out strategy in areas like Analytics, product management, business architecture, and sales operations. He is currently focused on AI and Analytics engagements for Infosys's Telecommunications clients.

Anupam believes in continual education and is a strong advocate of the concept, quite evident from his profile. He holds a Bachelor's Degree in Electrical Engineering from the National Institute of Technology, Surat. He can be reached at anupam_agarwal@infosys.com



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Chetan has over 18 years of experience in Consulting and Solution Architecture and has delivered solutions for multiple B2B / B2C Telecommunications engagements across multiple geographies. The expertise is demonstrated through multiple engagements for global CSPs, which helped them in achieving the goals of Digital transformations, Analytics, and Automation across key customer journeys. He is currently involved in building AI and Analytics capabilities for the Telecom vertical.

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