

Intelligent Document Processing (IDP) Playbook

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Objective

The aim of the IDP Playbook is to empower enterprises at various stages of their digital journeys with insights on the role and impact of IDP in digital journeys and to help develop strategies to improve outcomes from their IDP investments.

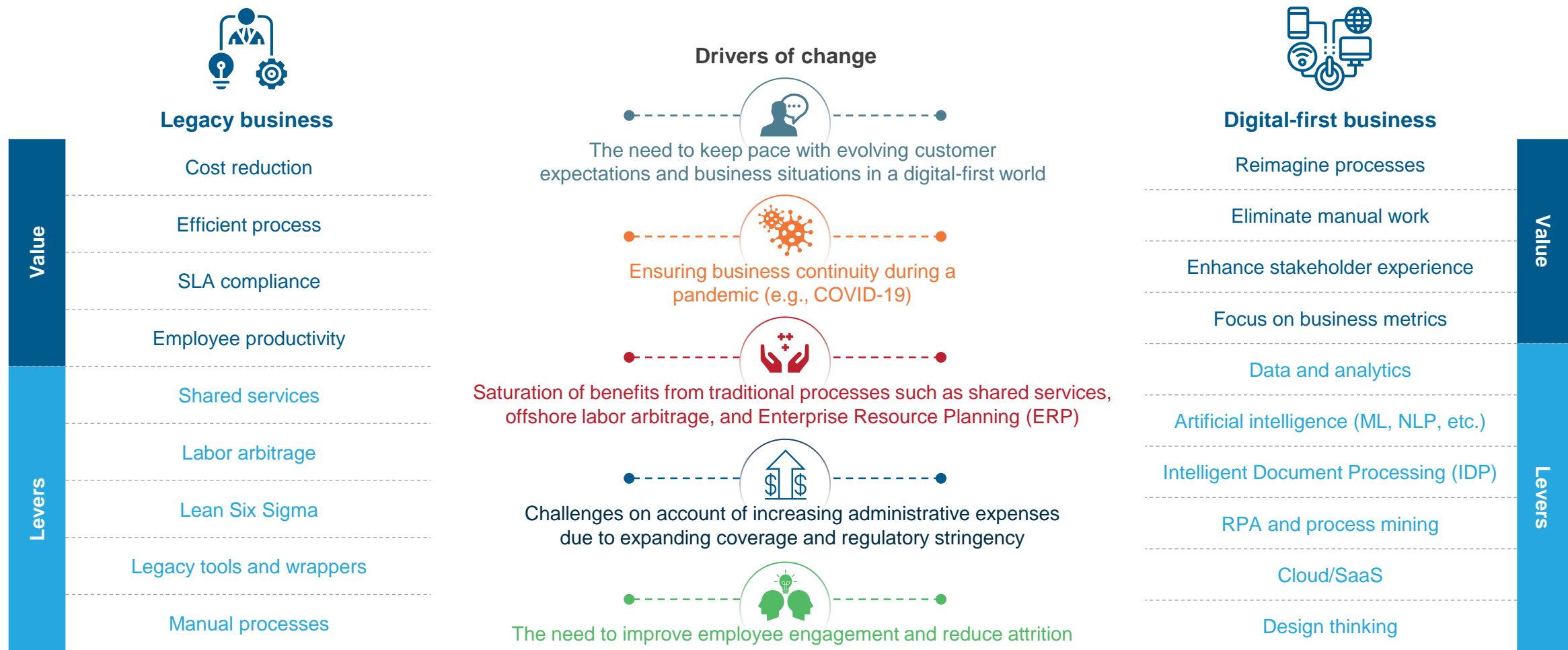


01

Introduction to automation

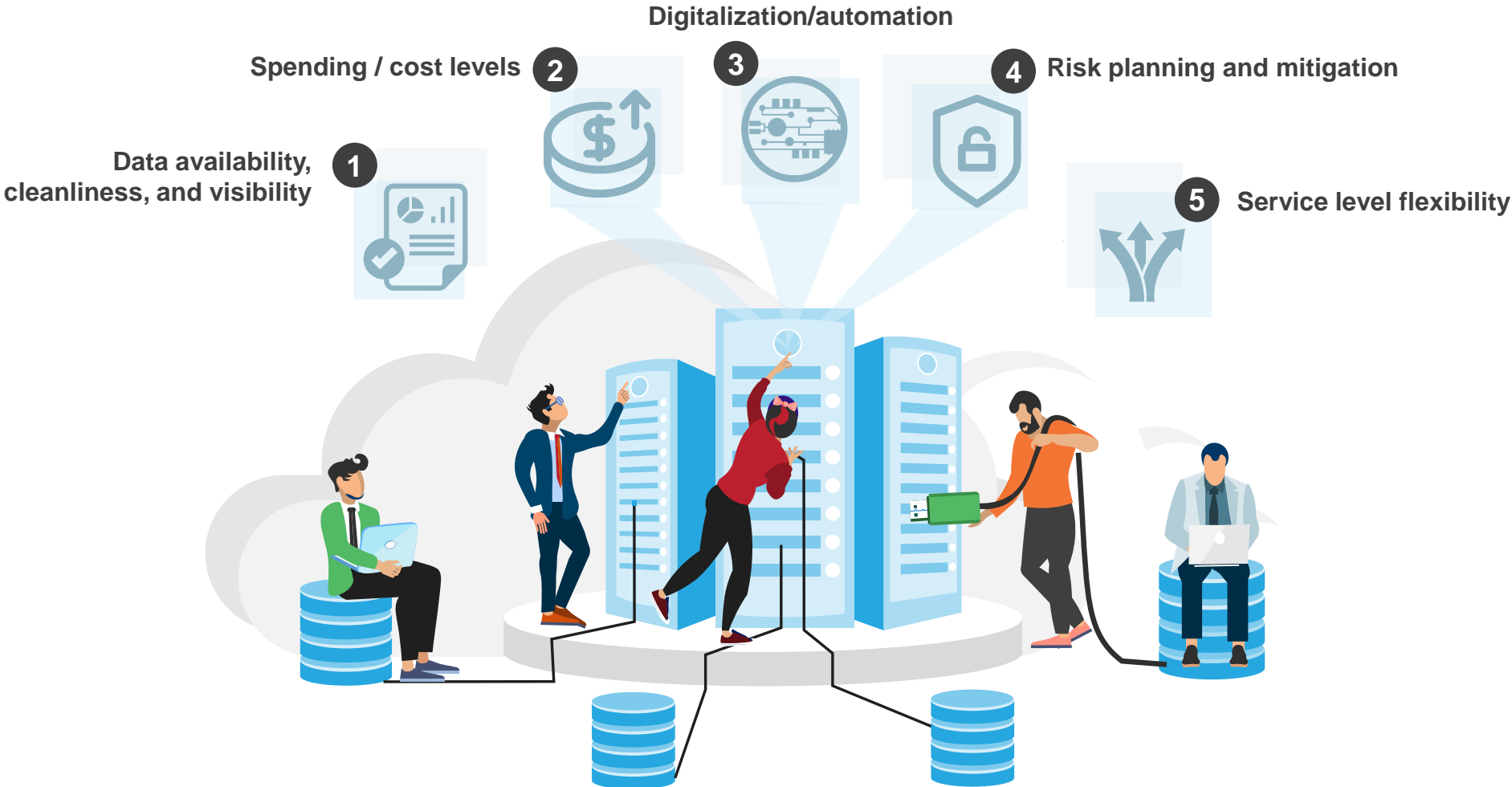
- Evolving into a digital-first business
- Key levers for business resiliency
- Challenges around unstructured data
- Emergence of IDP
- Key components of intelligent automation

Evolving into a digital-first business is becoming increasingly important for organizations to remain resilient and competitive

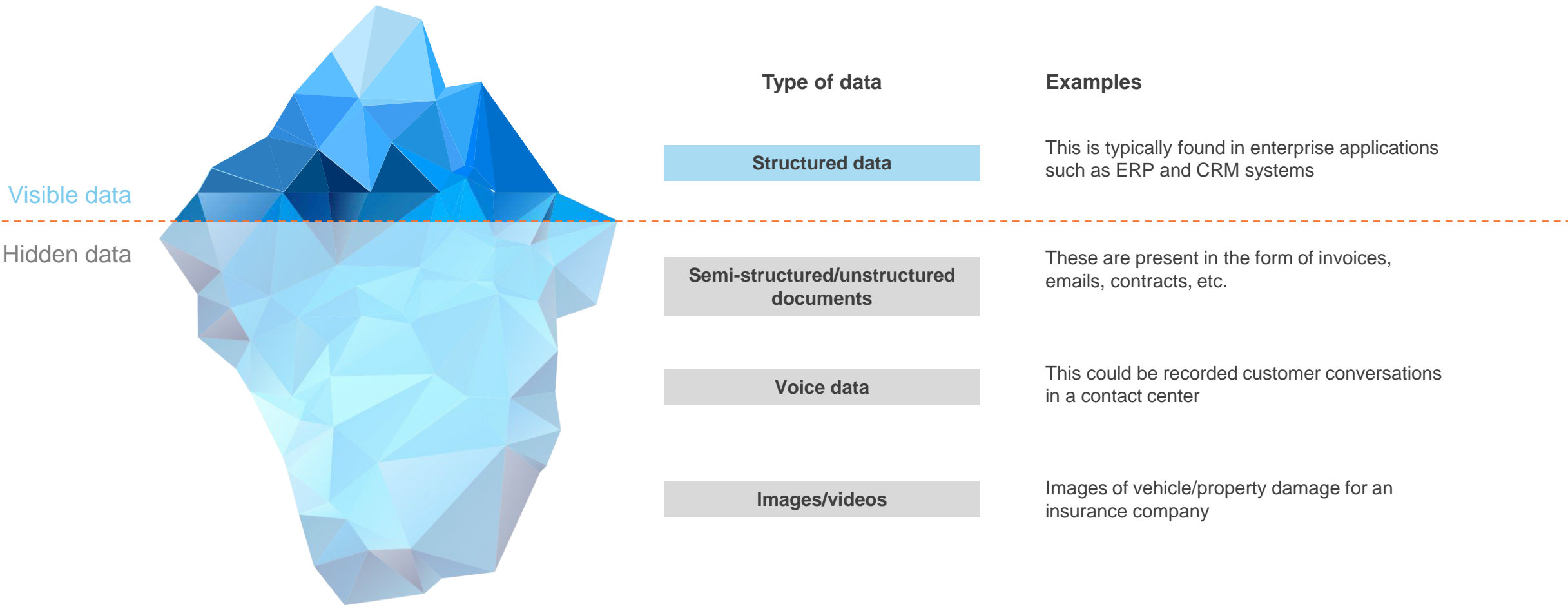


As enterprises move along this journey, data availability and digitalization have been identified as key digital levers to ensure business resiliency

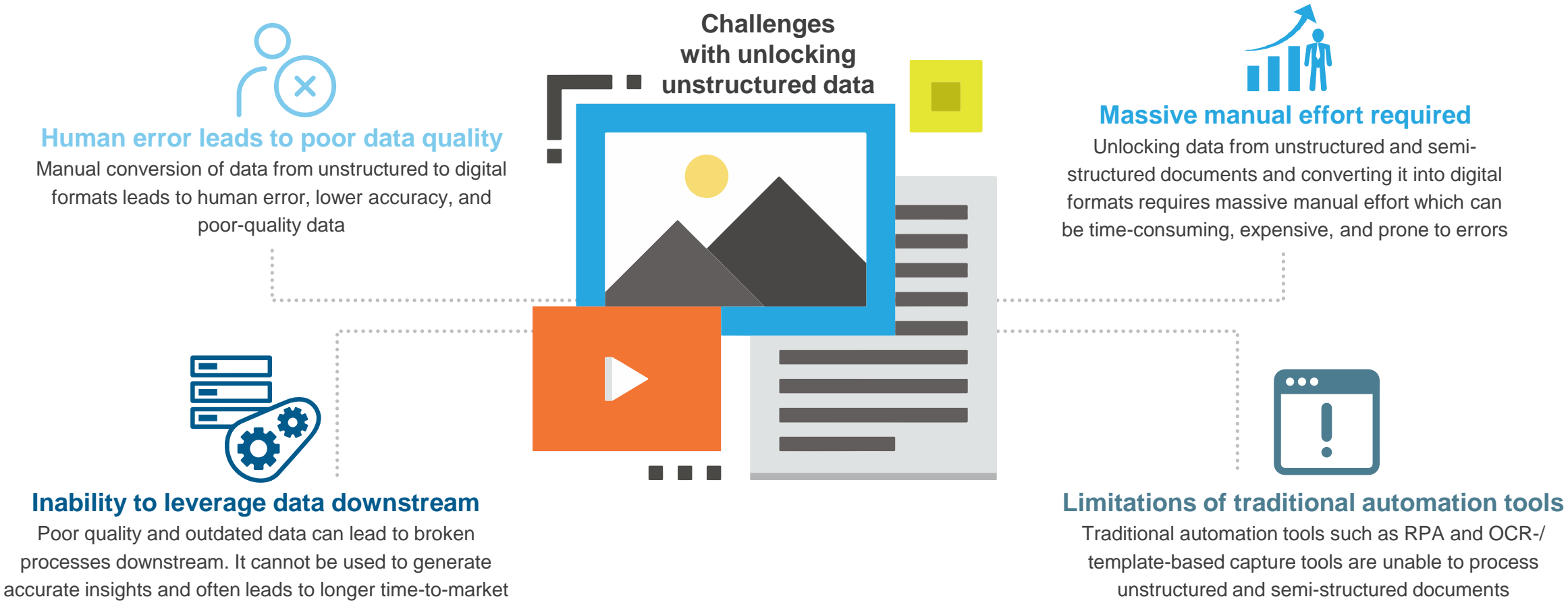
Key levers for business resiliency



However, while digital-first enterprises need to be data driven, over 80% of enterprise data is locked within unstructured formats and is unavailable for downstream applications

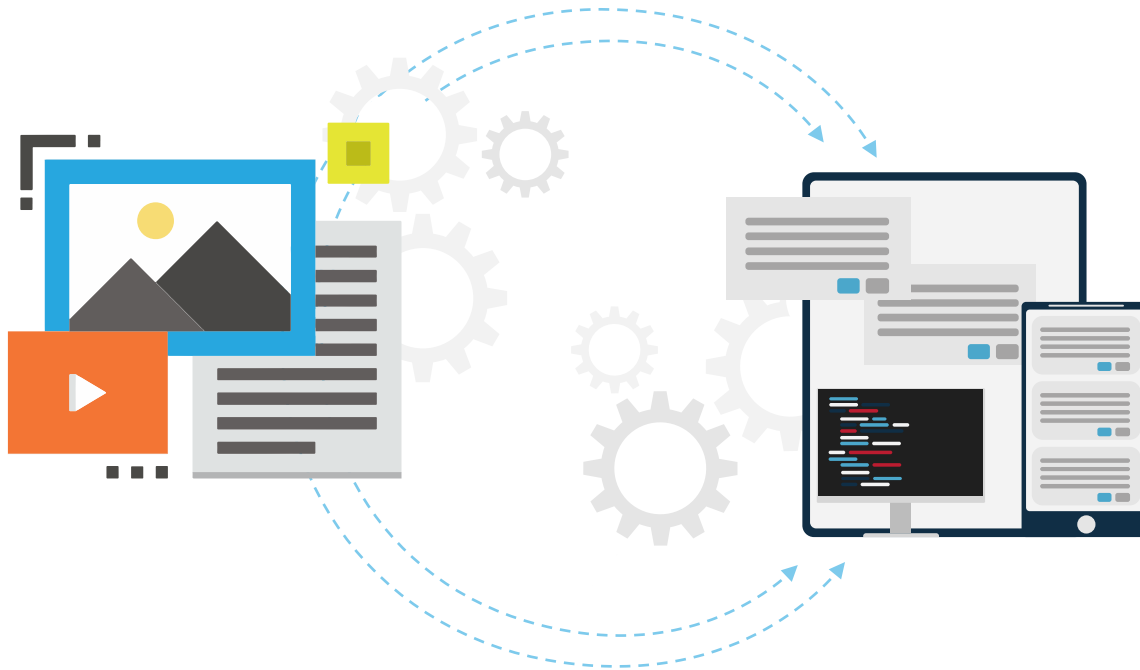


Enterprises face multiple challenges while trying to unlock meaning from unstructured data



The large number of document-based processes in an enterprise limit digital transformation outcomes due to these factors.

Intelligent Document Processing (IDP) has emerged to overcome these challenges, leveraging AI to address document processing and automate conversion of unstructured data into digital formats



Address limitations of traditional RPA/OCR

It adds a layer of probabilistic decision-making over traditional technologies, such as RPA and OCR, thereby achieving a higher degree of automation

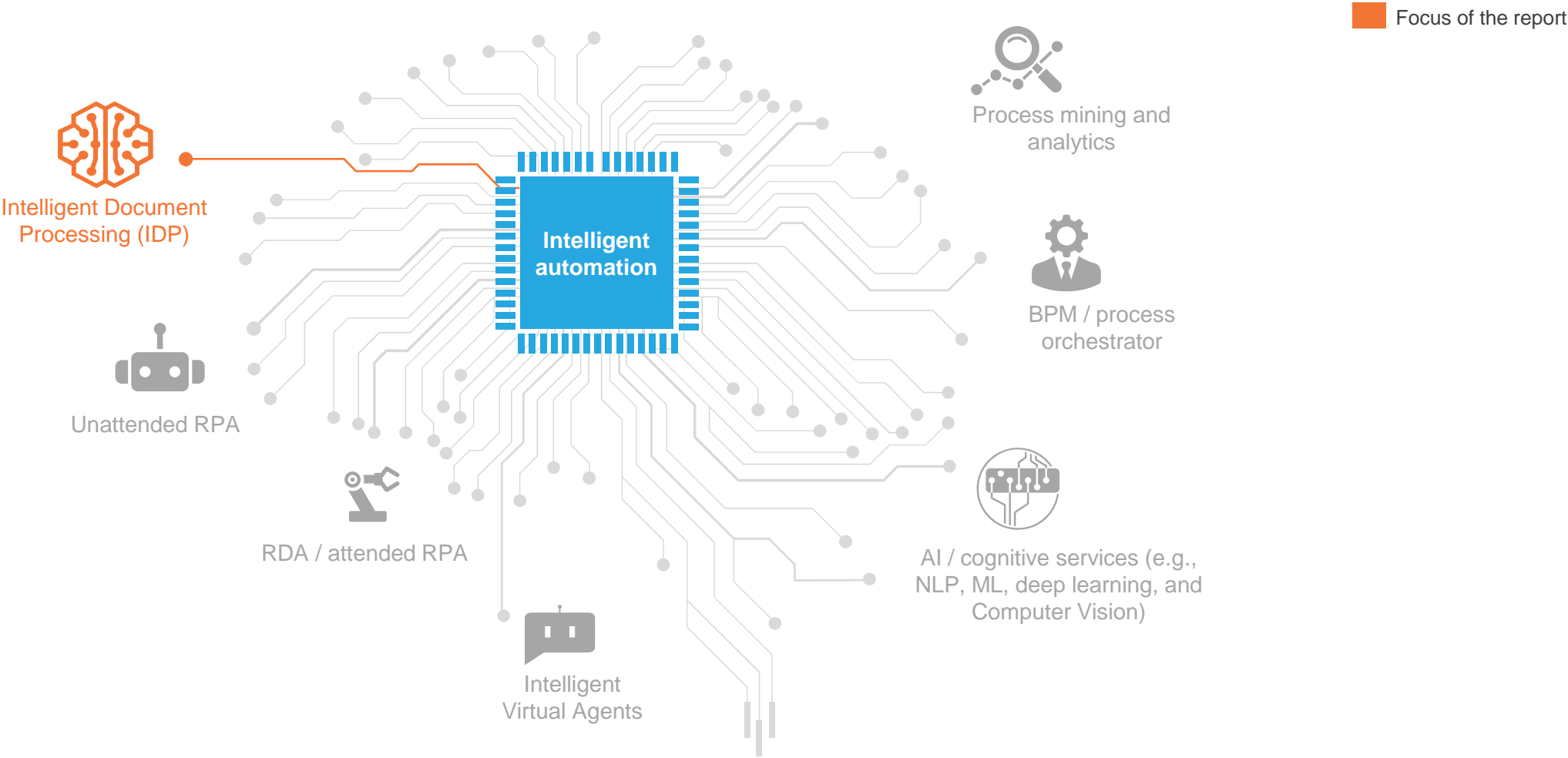
Automate document processing

IDP solutions can ingest, classify, and extract data from semi-structured and unstructured documents using ML techniques, which can be further fed into downstream applications

Clean data upfront

It provides high quality and timely data, which can be further fed into other applications and used in downstream processes

IDP forms a key component within the broader intelligent automation ecosystem



02

What is IDP and why is it important?

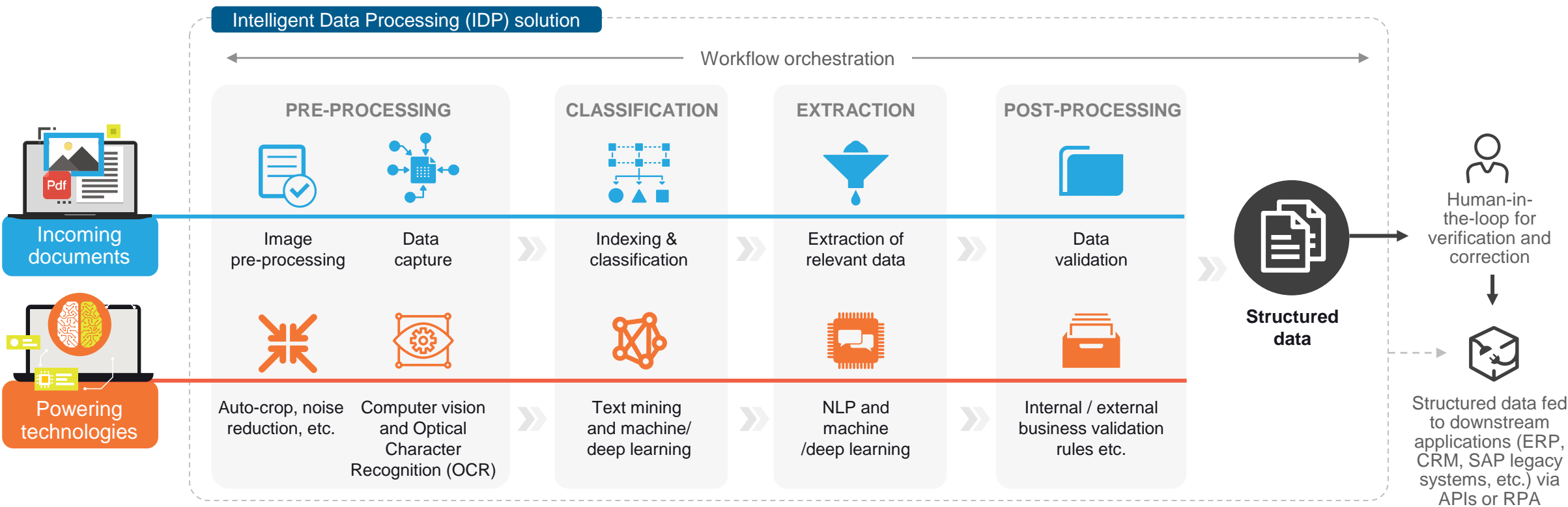
- Understanding enterprise grade IDP solutions
- OCR vs. IDP
- Types of documents and data
- Key benefits of IDP software solutions
- Key core technologies powering IDP capabilities

Understanding enterprise-grade IDP solutions

IDP software solutions blend the power of AI technologies to efficiently process all types of documents and feed the output into downstream applications

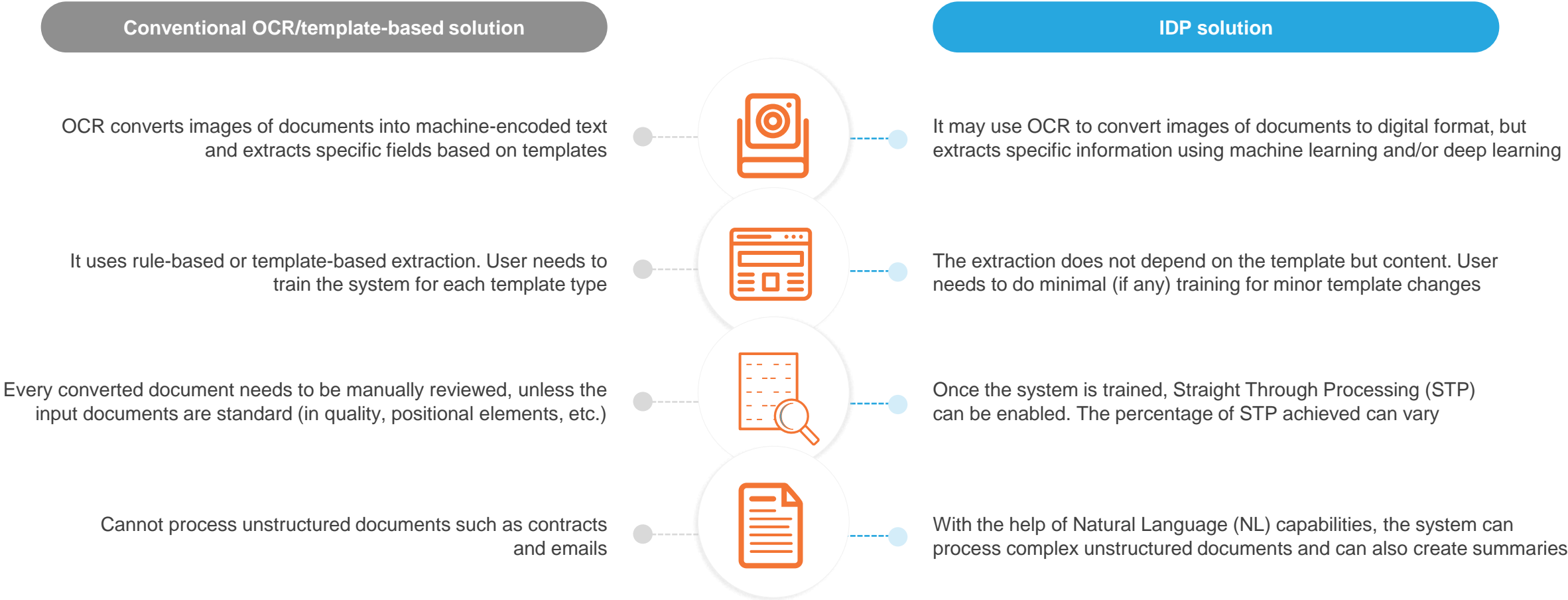
An enterprise-grade IDP solution performs the following actions:

- **Pre-processing:** performs image pre-processing to increase the quality of the scanned document and uses OCR/computer vision technology to capture data
- **Classification:** indexes and classifies the documents into categories using text mining & ML/deep learning capabilities
- **Extraction:** extracts relevant data, leveraging NLP and ML/deep learning capabilities for further processing
- **Post-processing:** validates the extracted data with the help of pre-defined taxonomies, data dictionary, and business validation rules






OCR vs. IDP

IDP solutions are capable of processing documents with greater accuracy and are more resilient to changes in document templates than traditional OCR



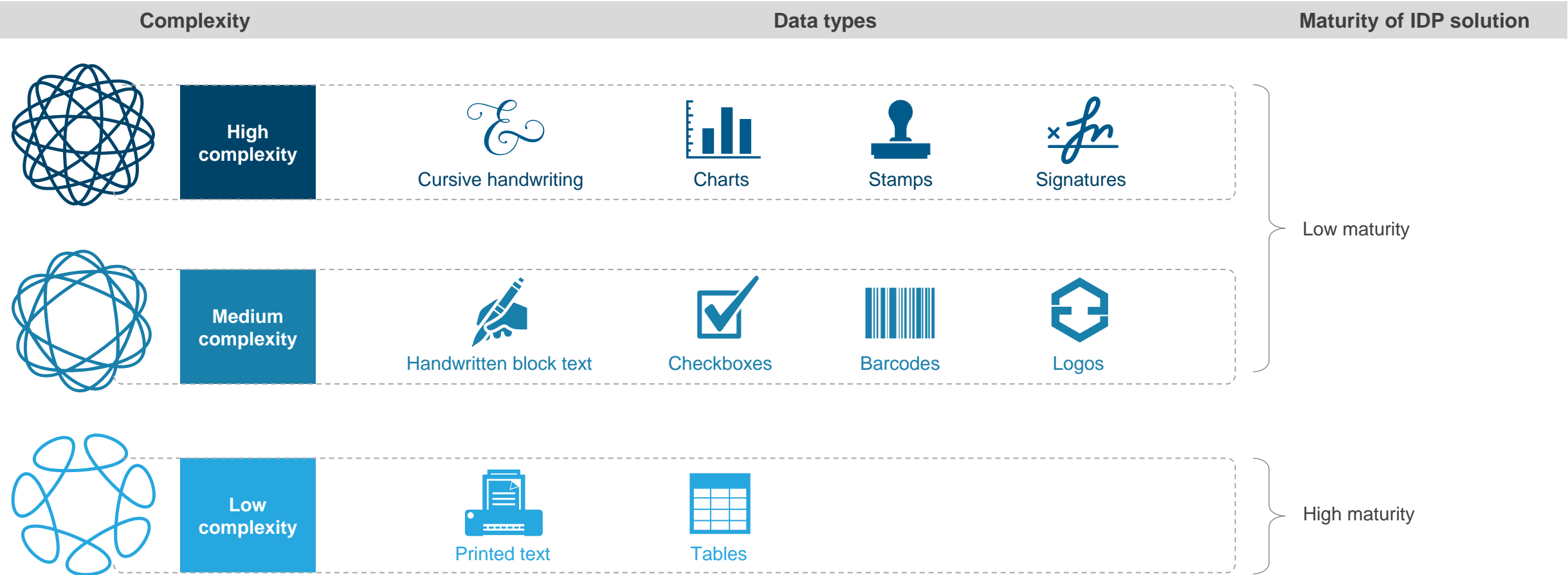
Document types processed using IDP solutions

IDP solutions can process structured, semi-structured, and unstructured documents

	Structured documents	Semi-structured documents	Unstructured documents
 Definition	Structured documents can be mapped into a pre-defined template with a fixed layout and tags to separate semantic elements	Semi-structured documents are those documents which have either variability of layout or variability of semantic expression but generally contain some general keys as to the documents organizational structure	Unstructured documents do not conform to a pre-defined data structure and lack keys to separate semantic elements. The information may be in text-heavy documents, images, or videos.
 Type of use cases	Standard forms such as medical/vehicle registration forms and government forms	Invoices, purchase orders, shipping documents, bill of lading, paystubs, and checks	Contracts, lease agreements, loan documents, emails, news articles, financial statements, annual reports, and objects in images
 Processing capabilities	<ul style="list-style-type: none">• OCR recognizes printed characters and converts images into machine-readable text• AI/ML helps in handling variance in quality of documents during extraction• Post-training, the system can achieve high accuracy and STP levels with little human involvement	<ul style="list-style-type: none">• AI/ML is used to train the system to identify, classify, and extract relevant information using tags, which can be linked to a position or visual elements or a key phrase• Reasonable accuracy and STP levels can be expected, with some human intervention in review and correction of the data processed	<ul style="list-style-type: none">• NLP is used to interpret and extract information out of free-flowing text in natural language. It can conduct sentiment analysis, topic identification, entity extraction, and intent analysis• Natural language generation can be used to process datasets and documents to summarize text and generate custom reports in human language• Lower STP levels, as human review and/or interpretation may be required to generate the required output

IDP document data types

Within semi-structured and unstructured documents, complexity of extraction may vary based on data types present



Key benefits of IDP software solutions



Operational impact

- Streamlines document tracking
- Increases productivity and efficiency of digital & non-digital workforce
- Faster turnaround times due to increased Straight Through Processing (STP)
- Improves accuracy with minimum manual intervention
- Improves employee experience
- Improves compliance and governance



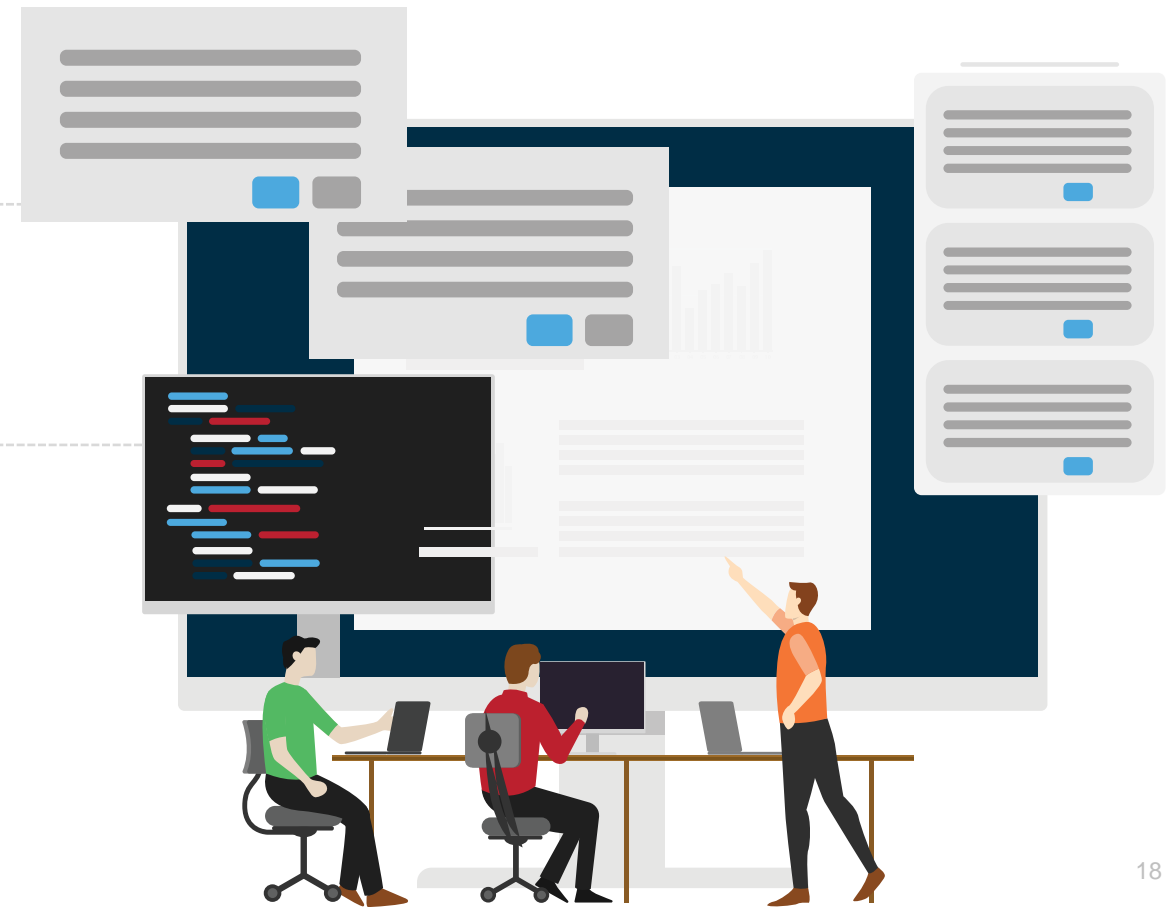
Cost impact

- Reduces the overall cost of processing huge volumes of data
- Generates quick Return On Investment (ROI)

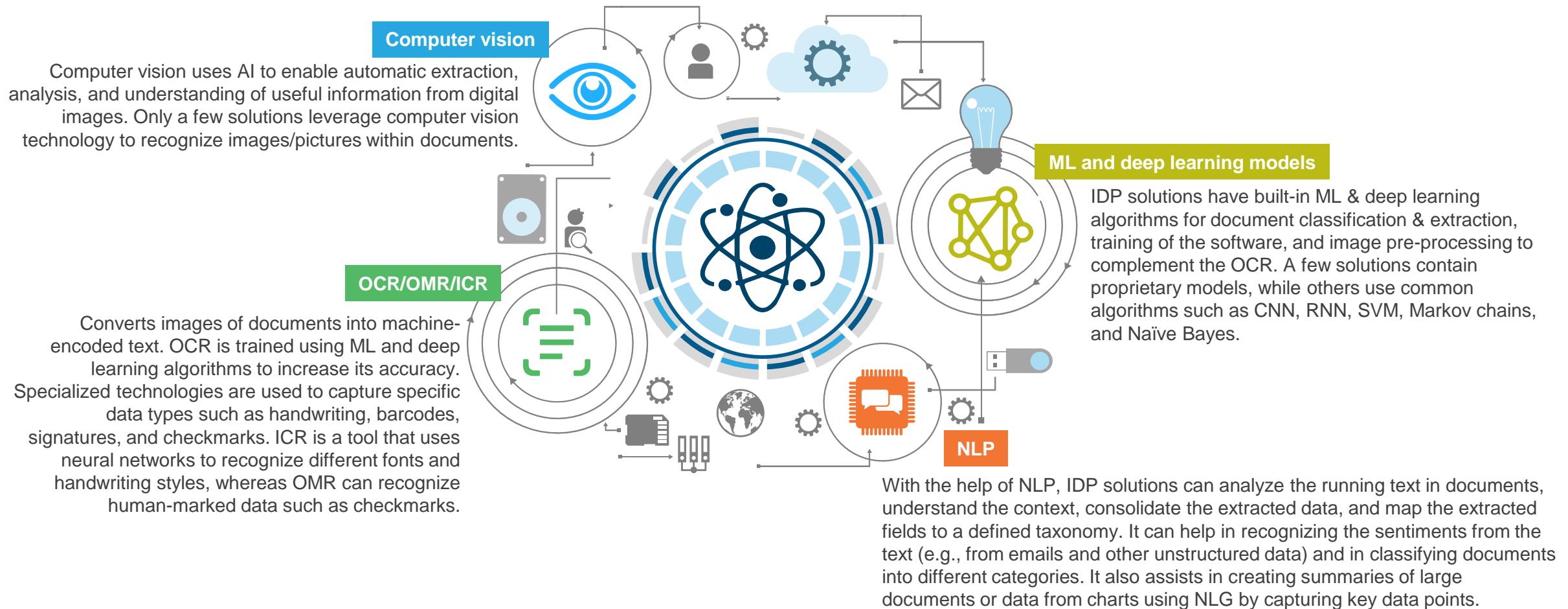


Business impact

- Improves customer satisfaction when used in a customer-facing process such as customer onboarding
- Impacts top-line growth, for instance, by enabling creation of new products
- Enables business continuity and builds enterprise resilience



OCR, computer vision, ML & deep learning models, and NLP are the key core technologies powering IDP capabilities



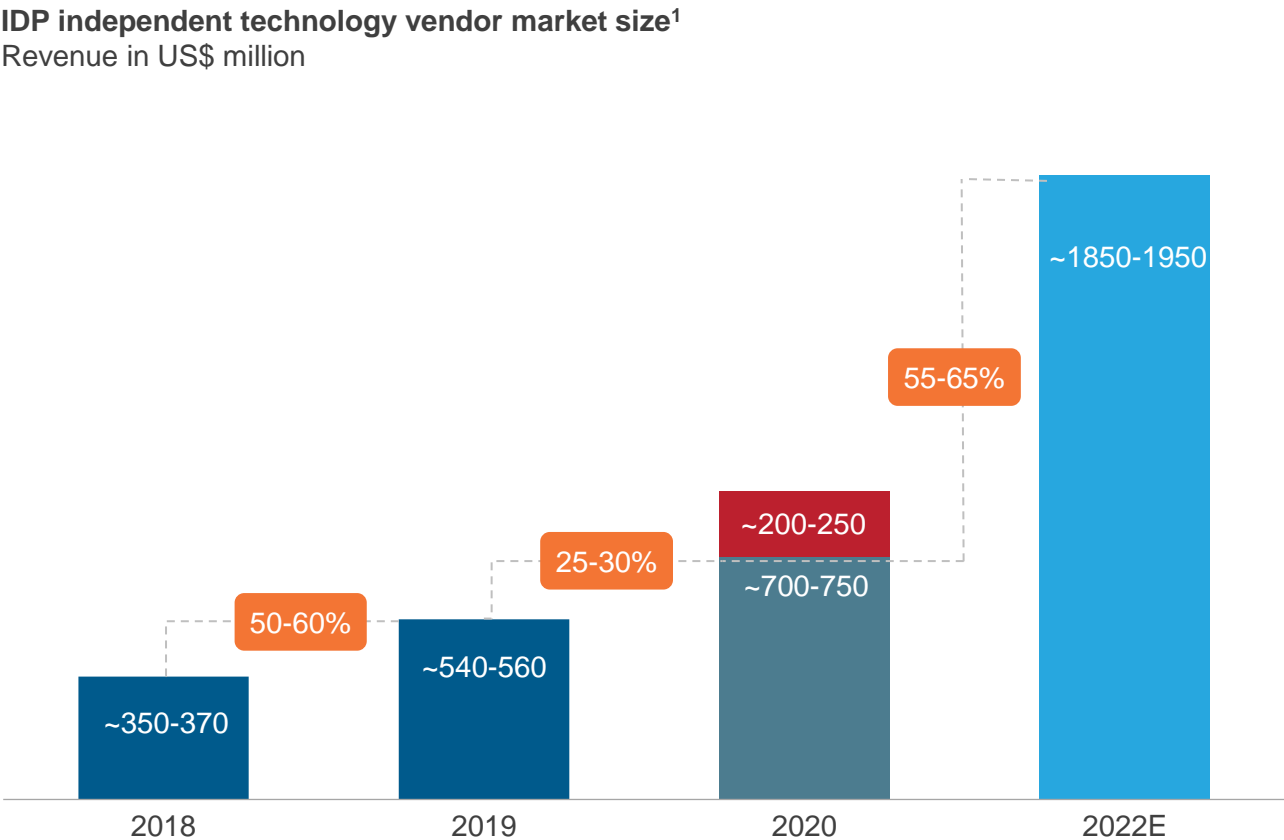
03

IDP market characteristics

- IDP adoption
- IDP adoption trends by
 - Industry
 - Geography
 - Process area
 - Buyer size
- Drivers for IDP adoption
- Buyer satisfaction

While the COVID-19 pandemic has impacted the growth of IDP market in the short term, its adoption is expected to increase, driven by strong demand for automation

IDP independent technology vendor market size¹
Revenue in US\$ million



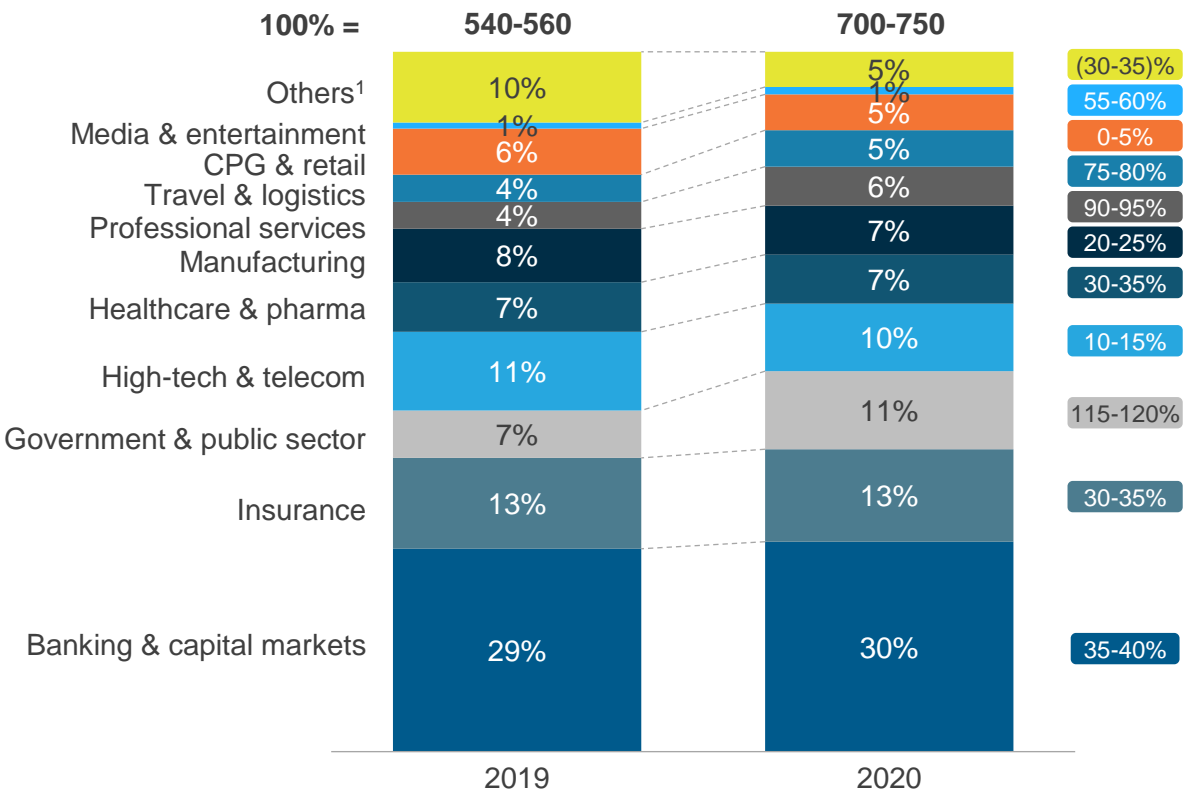
- COVID-19 tempered the growth of the IDP market in 2020, as uncertainty pushed enterprises to put automation projects on hold in Q2 2020. However, Q3 and Q4 not only saw the demand recover, but also accelerate, as enterprises looked to automation to solve new challenges and cope with work-from-home models
- The market grew at a rate of 25-30% and stood at ~US\$700-750 million at the end of 2020
- The pandemic has amplified the importance of automation and enterprises are looking to reduce dependence on manual processing and accelerate their automation journeys
- Driven by mounting demand for automation success stories of IDP, the market is expected to show increased adoption in coming years and grow at a rate of 55-65% annually
- The key growth drivers of IDP adoption are:
 - Strong demand for automation to reduce costs, increase operational efficiencies, and build business resiliency
 - Rising need for enterprises to process large volumes of semi-structured and unstructured documents with greater accuracy and speed
 - Increased adoption of complementary technology solutions such as RPA and the demand to enable end-to-end process automation
 - Improved sophistication of AI technologies, which significantly increases accuracy rates of IDP solutions as compared with traditional OCR solutions

¹ Based on revenue estimates of 27 IDP technology vendors projected out to estimate the total IDP technology vendor market. It does not include revenue generated by service providers, consultancy firms, or system integrators
Source: Everest Group (2021)

While BFSI enterprises are the early adopters of IDP solutions with over 40% share, adoption among other enterprises is expected to increase

IDP software market size by buyer industry
License revenue in percentage; US\$ million

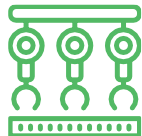
XX CAGR (2019-20)



- Banking and insurance continue to be the largest adopters of IDP solutions and account for ~30% and ~13% of the IDP market respectively
- The adoption in BFSI is mainly driven by the need to process huge volumes of semi-structured and unstructured documents such as KYC documents, invoices, claims, and records
- Government & public sector and professional services have shown significant growth in 2020, driven mainly due to increased need to improve efficiency, compliance, and reduce dependence on manual processing
- Various COVID-19-related use cases have also emerged in sectors that were most impacted by it such as government and public, healthcare and pharma, insurance, and airlines
- The adoption of IDP solutions is growing in the manufacturing and healthcare & pharma industries. These industries have experienced increased deployment of IDP solutions across multiple use cases such as invoices, order forms, change requests, records patient onboarding, and health records management
- CPG & retail, travel & logistics, and telecom are also deploying IDP solutions to process documents in proof of delivery, custom declarations, bills of lading, driver logs, maintenance logs, etc.

¹ Others include energy, real estate, shared services, utilities, hospitality, and legal
Note: Based on the capability assessment of 27 IDP technology vendors
Source: Everest Group (2021)

KYC, invoice processing, insurance claims, patient onboarding, patient records, proof of delivery, and order forms are the most common use cases of IDP solutions



Processes

Finance & accounting

Human resources

Procurement

BFSI industry specific

Healthcare industry specific

CPG & retail industry specific

Manufacturing industry specific

Use cases

Finance and accounting processes such as accounts payable and accounts receivable have widely implemented IDP solutions for increasing efficiency and reducing errors in processing.

HR processes such as employee onboarding, resume screening, applications processing, and benefits management have seen increased adoption of IDP solutions.

IDP solutions are used in the procurement function to process documents such as contracts, forms, procurement claims, bill of lading, and weight tickets.

BFSI industry-specific use cases such as KYC documents, insurance claims, mortgage documents, bank statements, and checks processing have seen strong adoption in the market.

IDP solutions are used in healthcare & pharma industry-specific use cases related to R&D, patient onboarding, patient records, patient surveys, physician referrals, and processing claims-related documents.

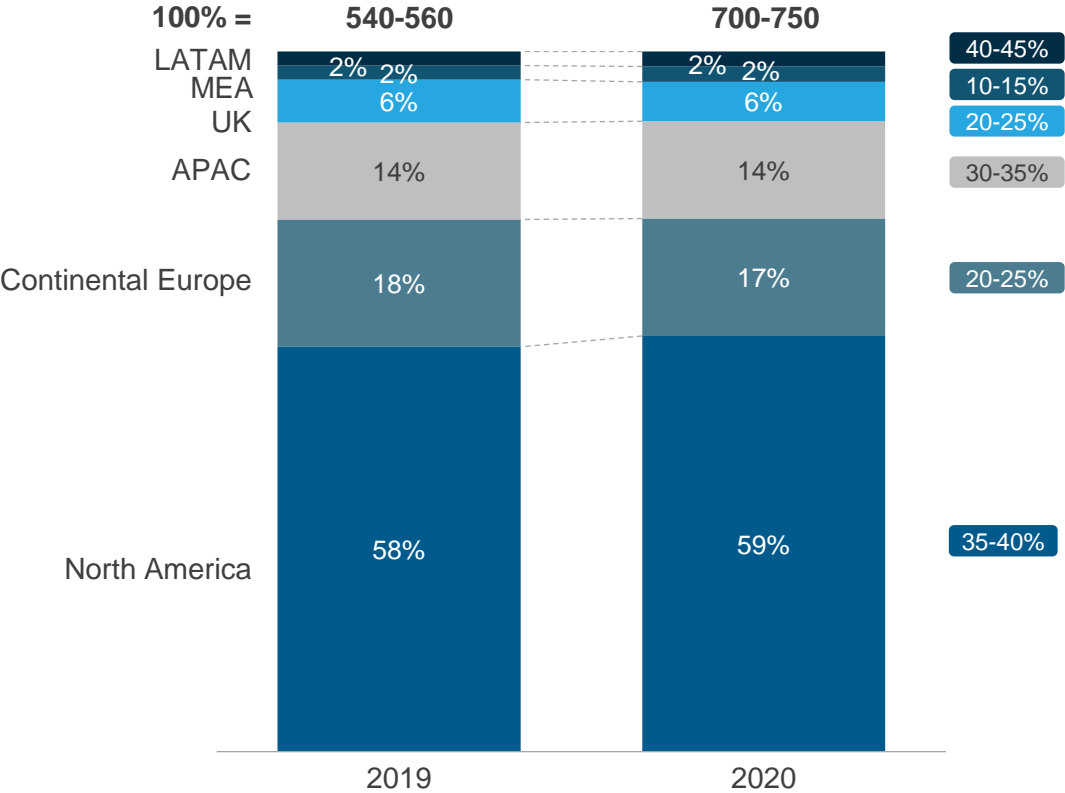
CPG & retail industries use IDP solutions for processing documents such as proof of delivery, custom declarations, bills of lading, driver logs, and maintenance logs.

The manufacturing industry has a lot of paper-laden manual work in areas such as invoices, order forms, change requests, proposals, and quality assurance records. A lot of this work is being automated through IDP.

North America continues to account for more than 50% of the market share, while APAC is growing rapidly

IDP software market size by buyer geography
License revenue in percentage; US\$ million

XX CAGR (2019-20)



- North America continues to be the largest market for IDP software solutions, experiencing a strong growth rate of around 35-40%. The growth is primarily driven by mature BFSI and healthcare sectors and technological advancements
- The growth in the APAC market can be attributed to strong enterprise growth in the region, rapid technological advancement, as well as a growing need to improve operational efficiencies. Availability of regional language capabilities and increased sophistication of IDP software products has facilitated greater adoption
- Continental Europe grew at a relatively lower rate than the market, primarily due to slower economic growth in the region
- The emerging market of LATAM also experienced a healthy growth rate, mostly driven by continued success stories in mature geographies, as well as increased availability of easily deployable pre-packaged solutions. However, LATAM and MEA are still largely untapped and offer considerable growth potential

Note: Based on the capability assessment of 27 IDP technology vendors
Source: Everest Group (2021)

Adoption of IDP solutions in industry-specific processes, especially in BFSI and healthcare, experienced significant growth

IDP software market size by business process/function
License revenue in percentage; US\$ million

CAGR (2019-20): <25% 25-50% >50%

100% = 700-750

	Industry-specific	55%	
	F&A	23%	
	Procurement	4%	
	HR	3%	
	Web-based/e-commerce	3%	
	Contact center	2%	
	Mailroom	1%	
	Others	10%	



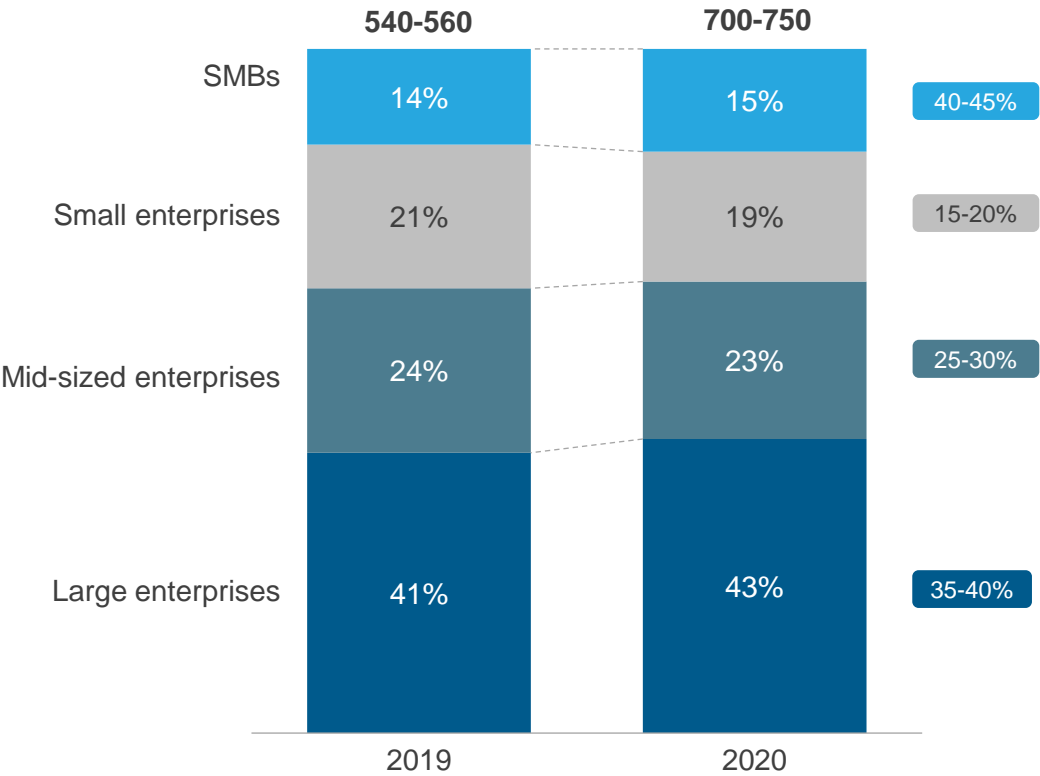
- Industry-specific processes continue to dominate the adoption of IDP solutions with the highest growth rate. Within industry-specific processes, BFSI segment with use cases in processes such as customer onboarding, mortgage processing, trade financing, and claims processing, has experienced the highest adoption of IDP solutions
- IDP solutions are also largely deployed within F&A, for accounts payable and accounts receivable use cases, to deal with the high volume and error-prone nature of these processes
- Other processes such as mailroom, procurement, and HR applications have also seen increased adoption owing to enhanced focus of enterprises to reduce operational costs and increase workforce productivity

1 Others include government customs form processing, food and beverages industry-specific processes, etc.
Note: Based on the capability assessment of 27 IDP technology vendors
Source: Everest Group (2021)

IDP solutions find applications across enterprises, regardless of size; volume of documents and time spent on processing are the key criteria for applicability

IDP software market by buyer size¹
License revenue in percentage; US\$ million

XX CAGR (2019-20)



- Large buyers continue to have the highest adoption. A significant chunk of adoption among large buyers is driven by RPA partners and system integrators
- Mid-size enterprises, small enterprises, and SMBs also experienced healthy growth in the market. Availability of point solutions, focused on specific business function or industry, are leading to greater adoption by these enterprises
- Flexibility, in terms of commercial models that do not require huge upfront costs, can lead to further adoption by small and mid-sized enterprises

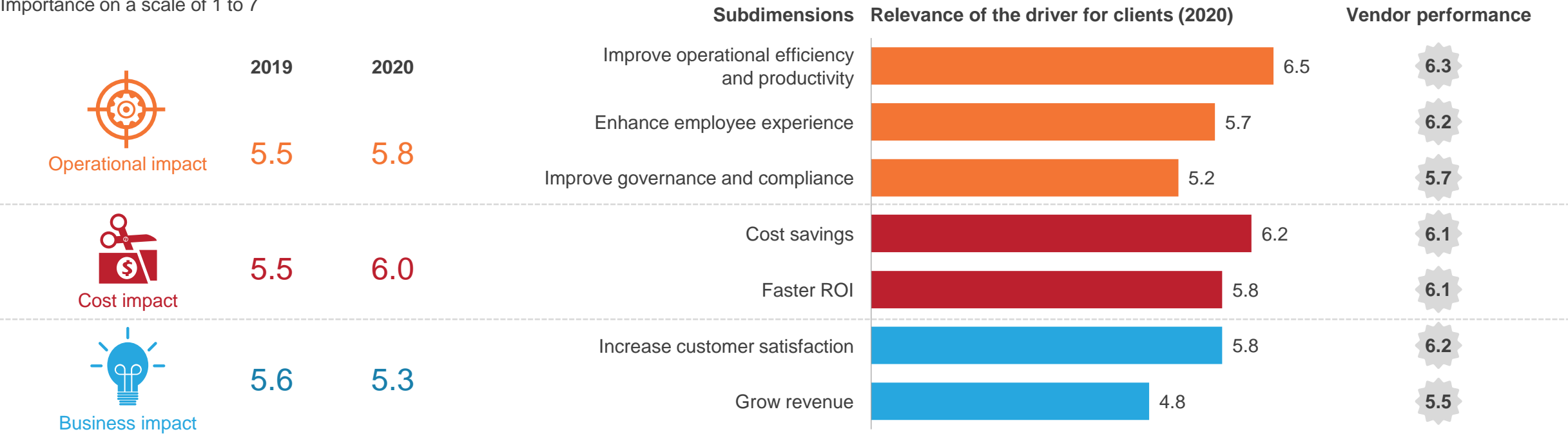
¹ Buyer size is defined as large (>US\$5 billion in revenue), mid-sized (US\$1-5 billion in revenue), small (US\$50 million-US\$1 billion in revenue), and SMBs (<US\$50 million in revenue)
Note: Based on the capability assessment of 27 IDP technology vendors
Source: Everest Group (2021)

Market trends | drivers for IDP adoption

While improving operational efficiency and productivity remains a key driver of IDP adoption among buyers, cost impact has also become equally relevant

Key factors driving IDP adoption

Importance on a scale of 1 to 7



- Improving operational efficiency and productivity continues to be a key driver for IDP adoption. Over the past year, enterprises have started to accord equal importance to cost impact as well as business impact, especially with increasing focus on faster ROI and increasing customer satisfaction
- Enterprises are highly satisfied with the ability of vendors to help them achieve operational efficiencies, while there is significant scope for vendors to help enterprises improve governance and compliance and grow their revenue

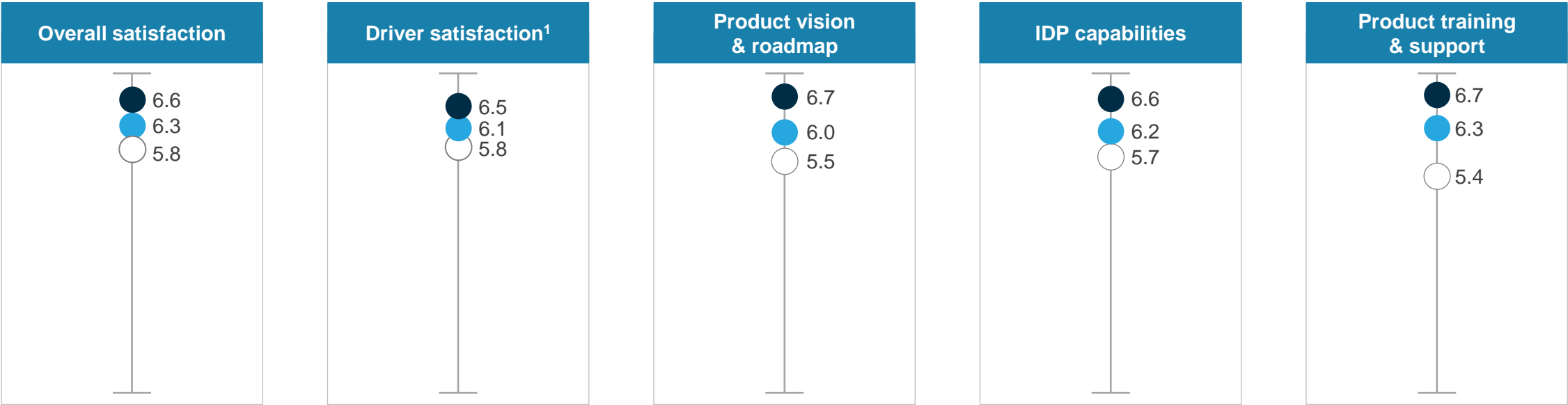
Sample: Based on feedback collected from 70+ enterprise buyers in 2021
Source: Everest Group (2021)

Market trends | overall buyer satisfaction

While buyers are satisfied with IDP vendors on their overall performance, they expect better product training and support capabilities from them

IDP vendor KPIs
On a scale of 1-7, 7 being the highest

Buyer score axis ● 80th percentile ● Median ○ 20th percentile



- Buyers have indicated high overall satisfaction with IDP vendors, with appreciation for core IDP product capabilities
- However, there is scope for vendors to improve product training & support, product vision & roadmap, and help them achieve their objectives of adopting IDP solutions
- Within IDP capabilities, while scalability, cognitive capabilities, and ease of use were frequently recalled as key strengths by buyers, analytics capabilities and pre-training of the software were identified as areas of improvement

Sample: Based on feedback collected from 70+ enterprise buyers in 2021
Source: Everest Group (2021)

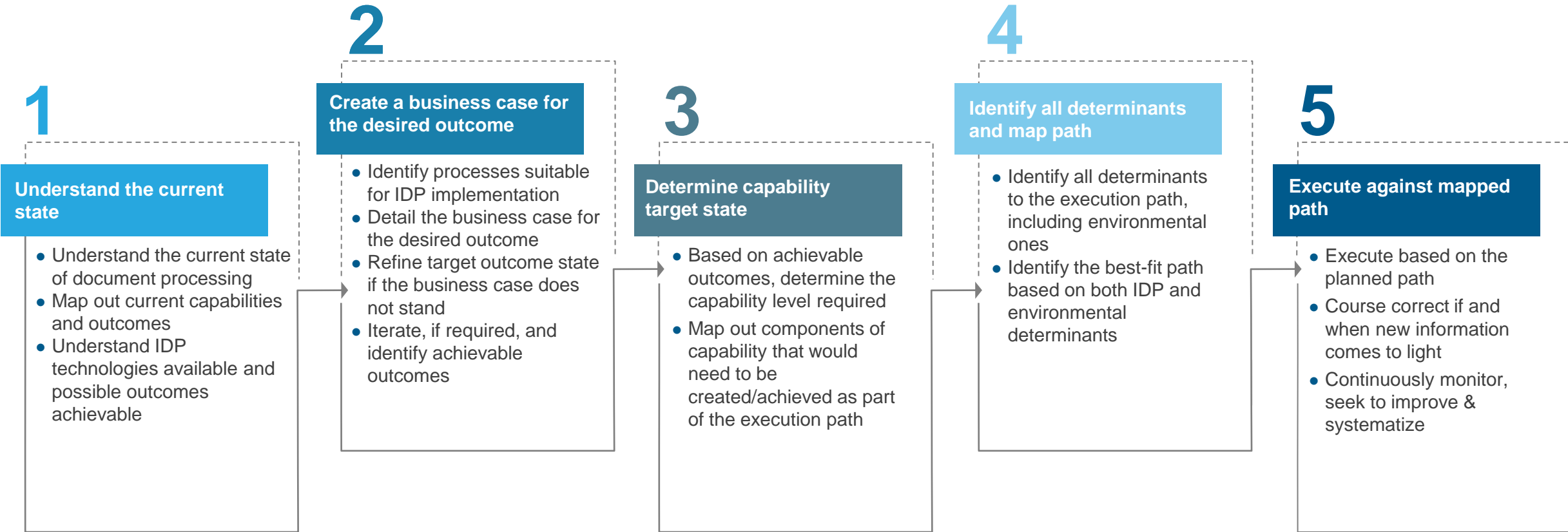
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The IDP journey

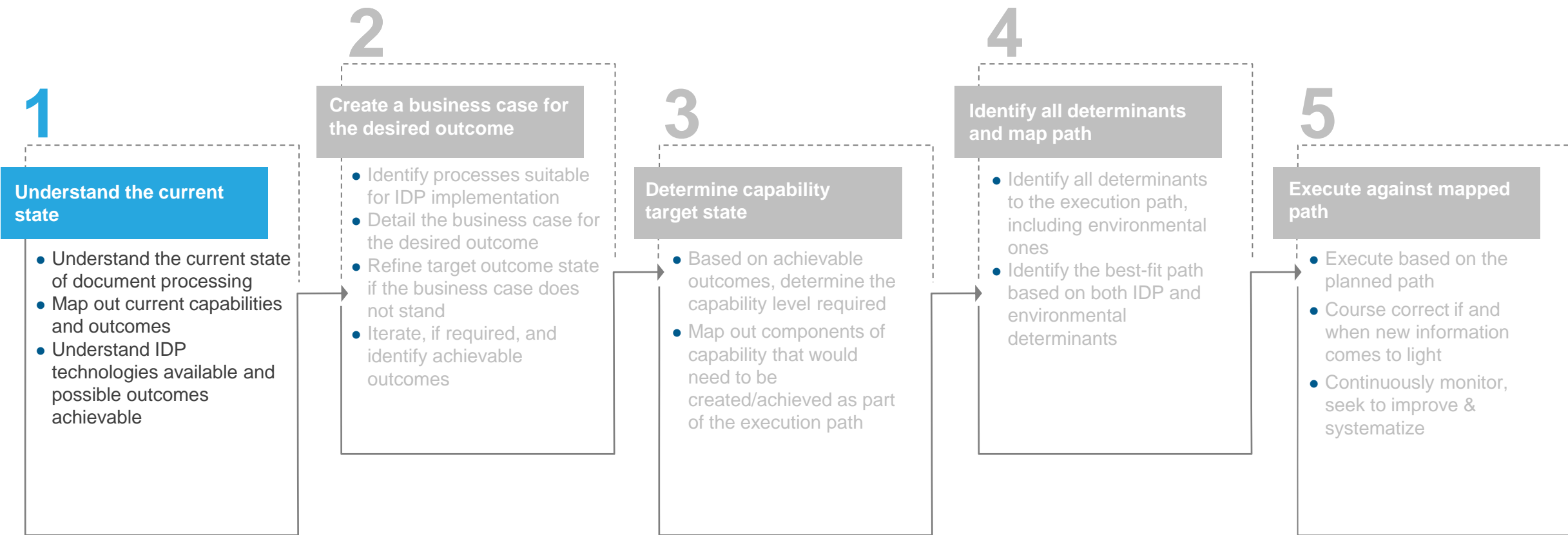
- Understand current state and market capabilities
- Building a business case – what is the right outcome target state?
- Determining the capabilities required to achieve identified outcomes
- Identify all determinants and map path
- Execute against mapped path

For enterprises that are thinking about IDP adoption programmatically across the organization, the following approach can be taken

Enterprises can break down their IDP journey into five distinct steps

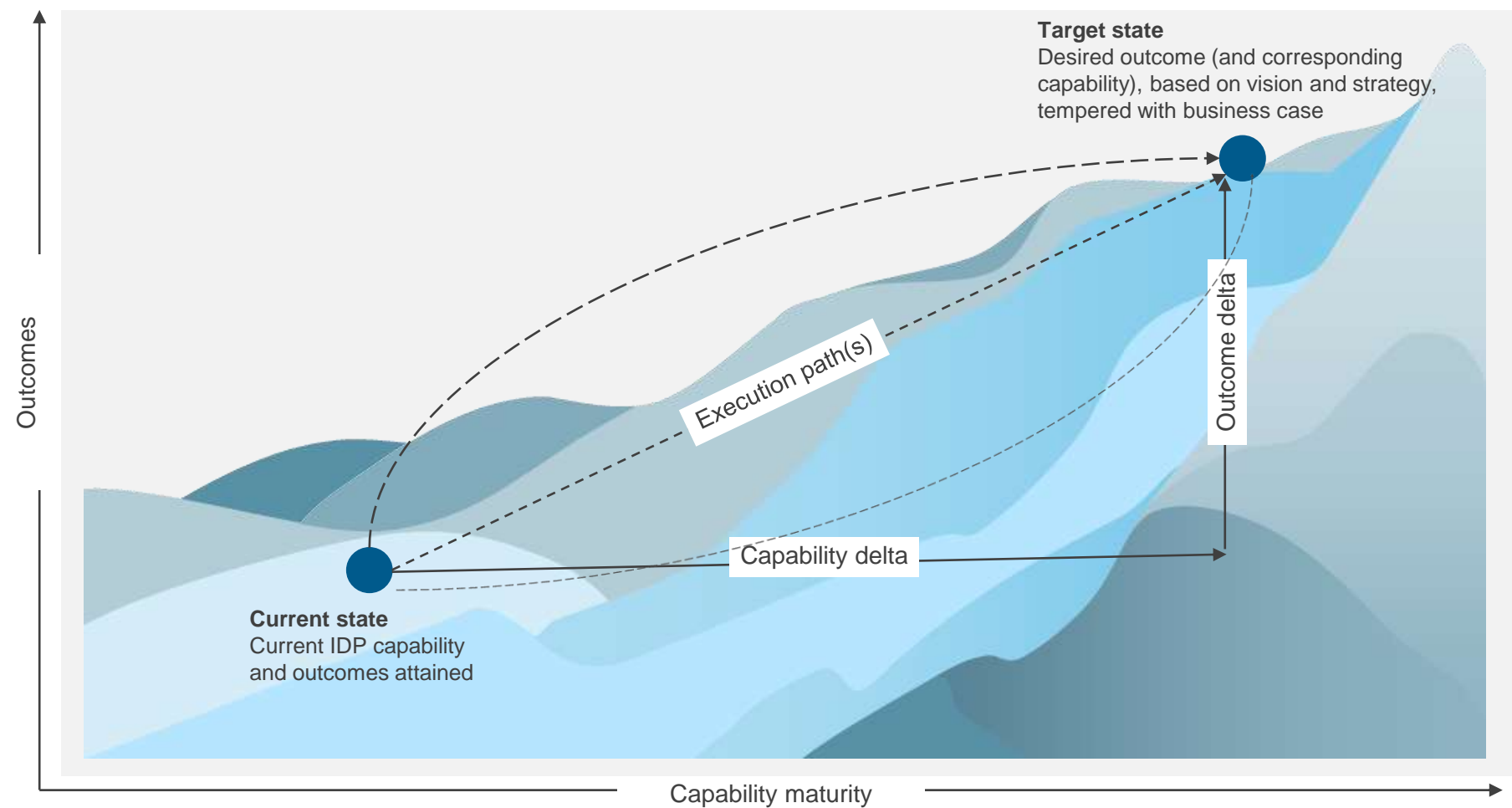


Enterprises can break down their IDP journey into five distinct steps



It is important for enterprises to understand their current and desired target outcome states to map a best-fit execution path for their IDP journey

1



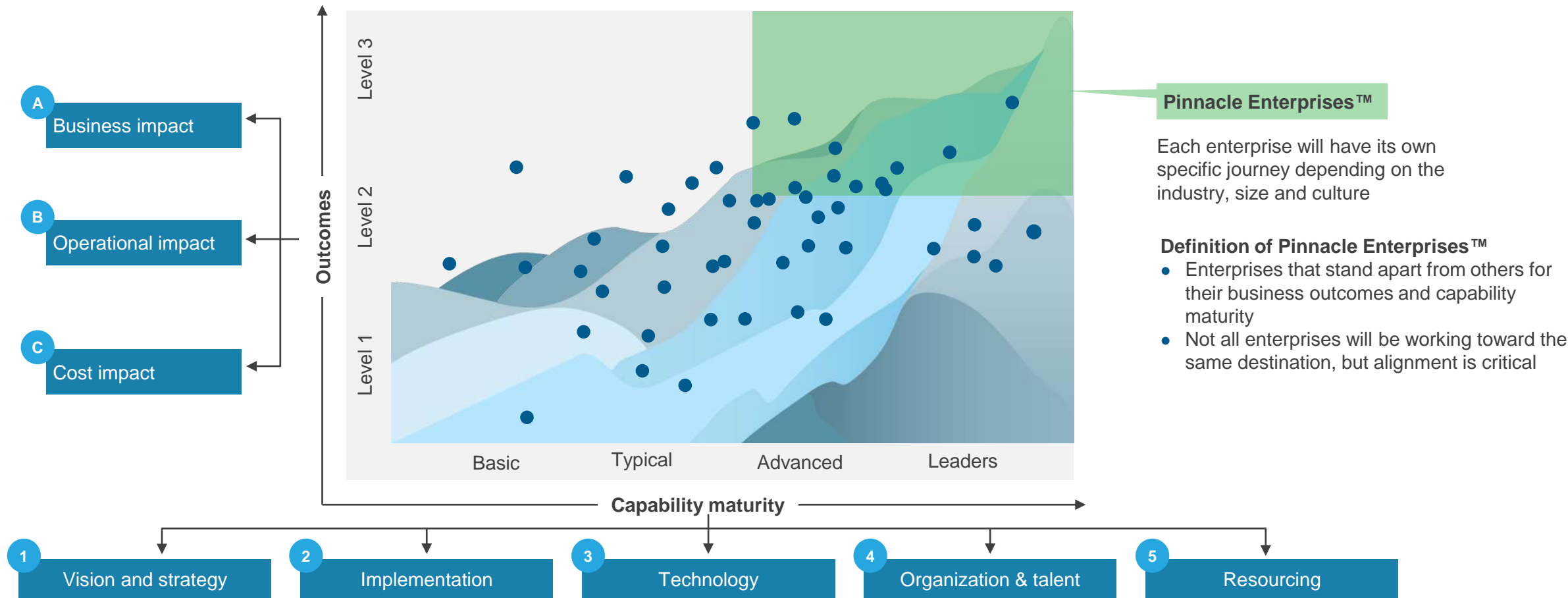
- The IDP journey for every organization begins with an understanding of its current state of maturity and its aspirational target state
- While the current and target states outline the gaps to be bridged, the actual execution path to be followed to bridge those gaps will depend on multiple factors, as described in subsequent pages

The Pinnacle Model® provides a framework to help enterprises measure the IDP journey's current and target states, both in terms of outcomes and capabilities

1

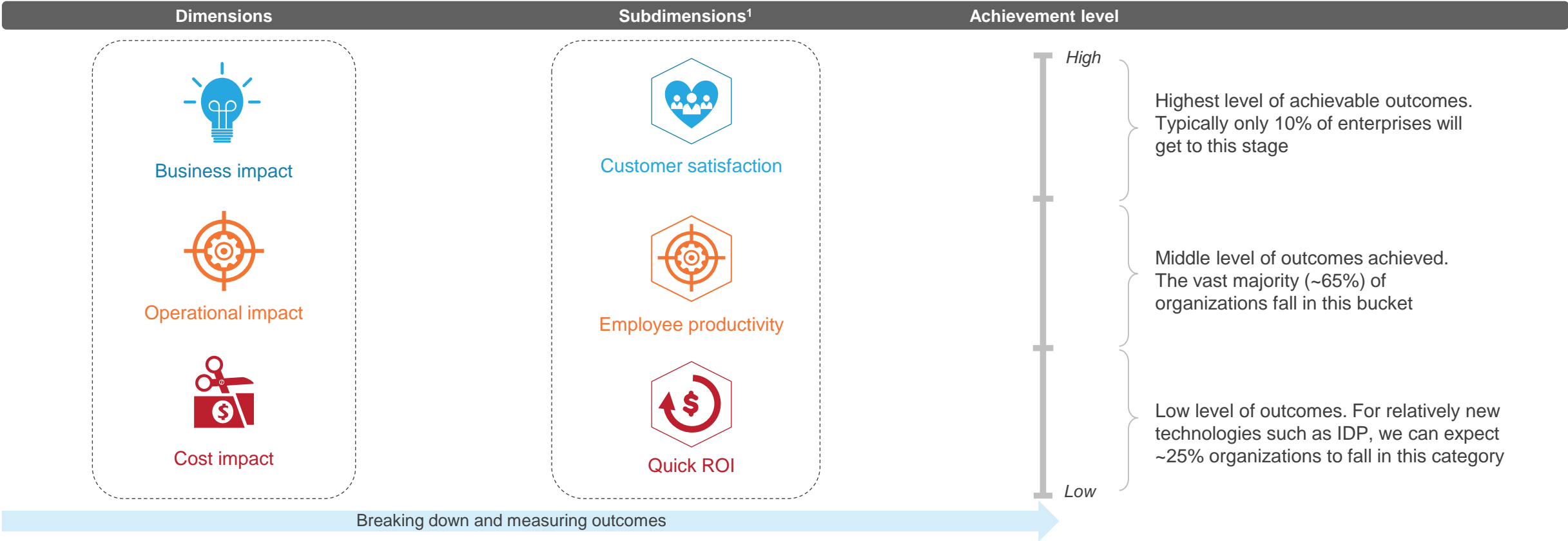
NOT EXHAUSTIVE

Everest Group Pinnacle Model® for mapping an enterprise's journey to become a Pinnacle Enterprise™



Outcomes: Use the Pinnacle Enterprise® outcomes model to understand your current state and goals for the desired target state

1

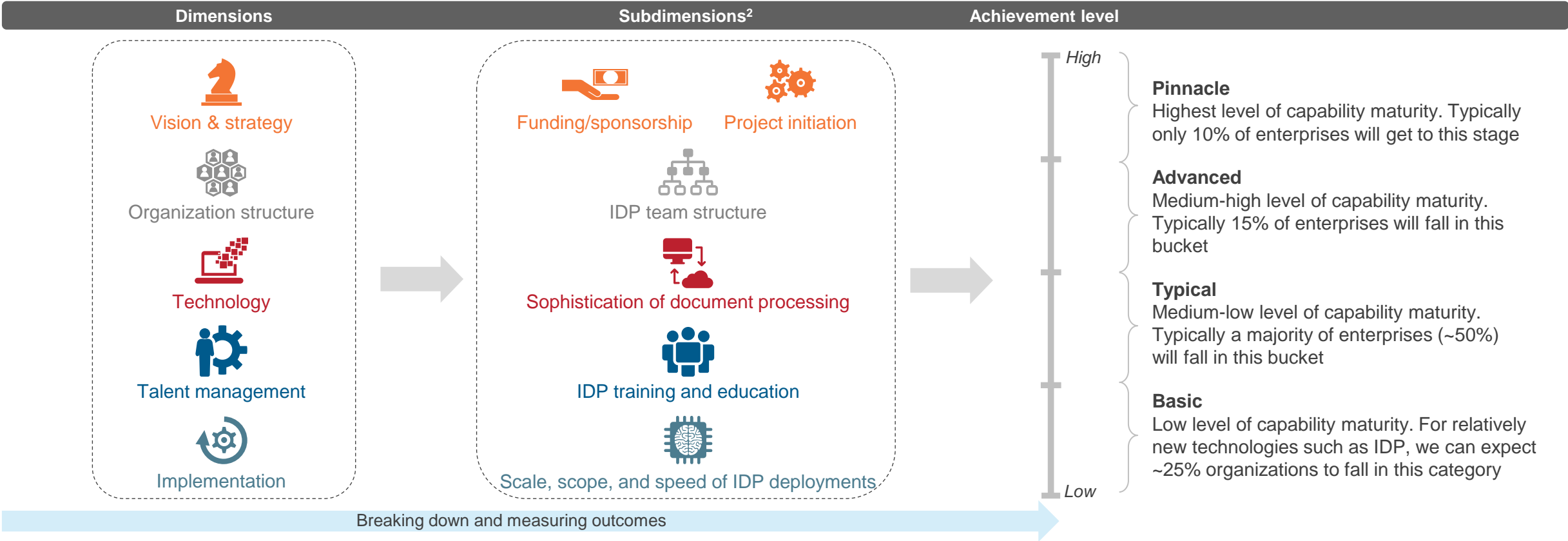


- Overall, we can measure the outcome through a combination of three factors: cost impact, operational impact, and business impact
- We can further break these down into subdimensions that fall into one of the three buckets depending on the level of the outcome achieved. The exact measure of outcomes will vary significantly by the scope of IDP implementation

¹ Not exhaustive

Capability: The Pinnacle Enterprises® Capability Maturity Model (CMM)¹ can help enterprises understand their current state of capabilities and subsequently where they want to get to

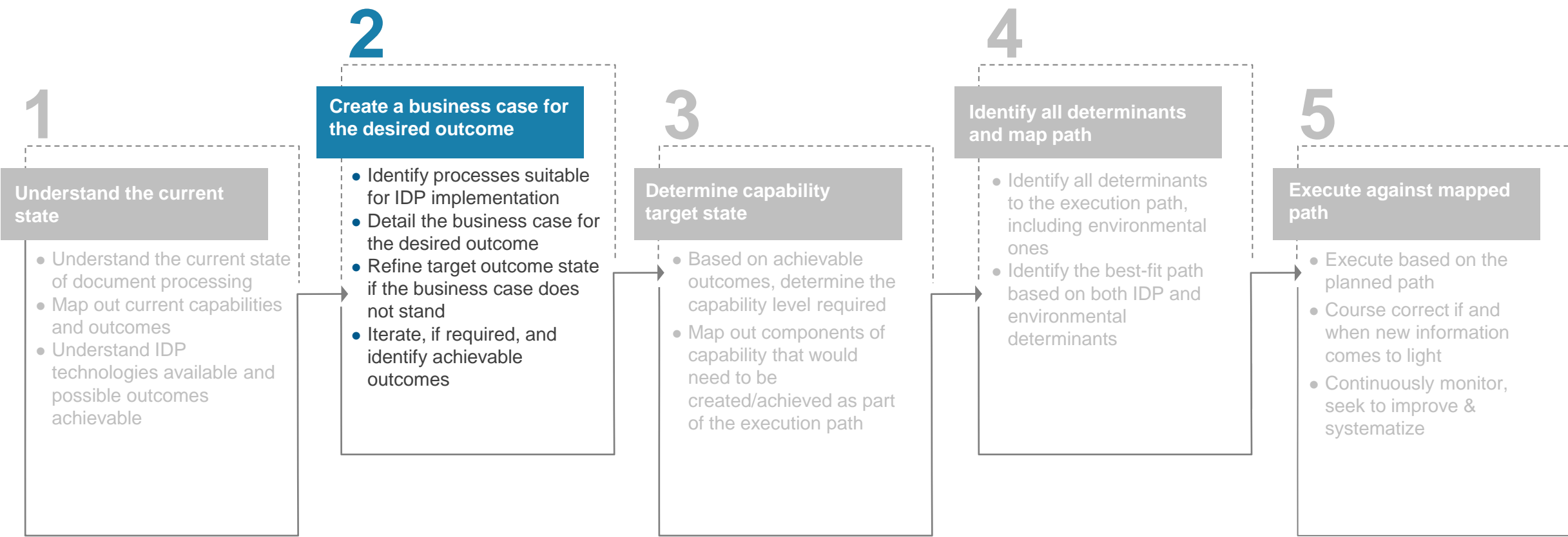
1



- Overall, capability is measured through a combination of five factors – vision & strategy, implementation, organization & talent, technology, and resourcing
- Each of these is further broken down into subdimensions, which can be measured as falling in one of the four buckets depending on the maturity level: basic, typical, advanced and pinnacle

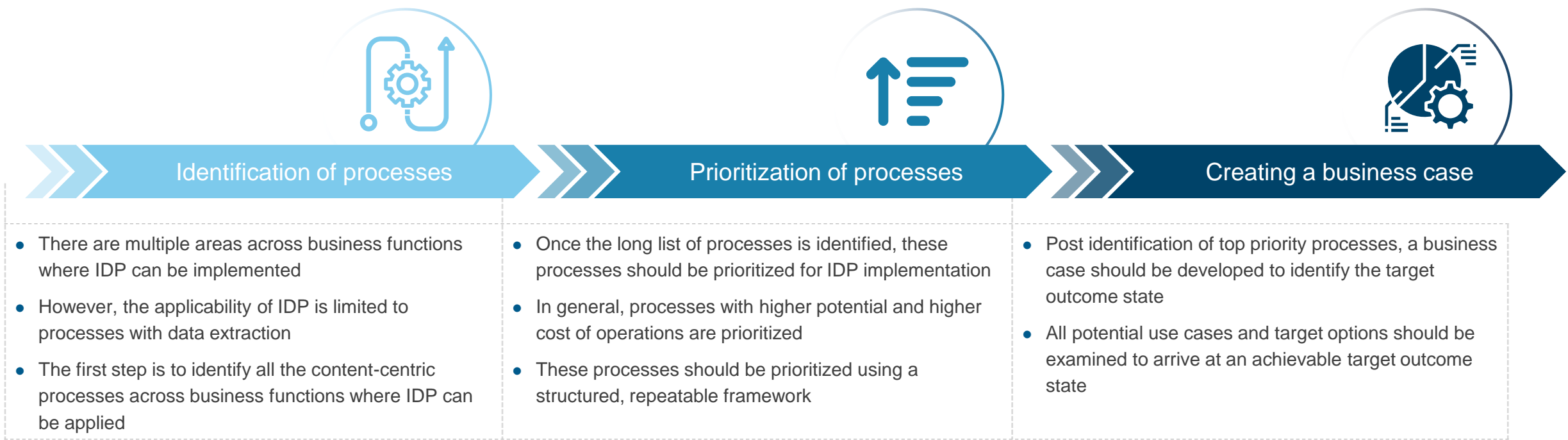
¹ Refer to pages 97-111 for the detailed model, dimensions, and subdimensions
² Not exhaustive

Enterprises can break down their IDP journey into five distinct steps



Create a business case and refine target outcome state, if required

2



Enterprises should identify and prioritize potential processes for IDP adoption. Once potential processes are identified, business case should be created to refine the achievable target outcome state.

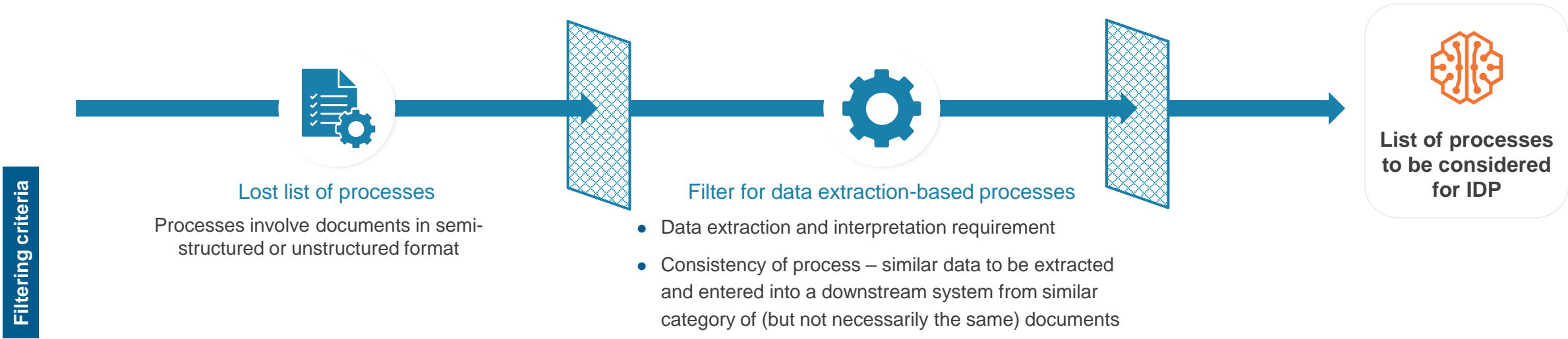
Create a business case and refine target outcome state, if required

List of data extraction-based processes should be identified through a filtering approach

2



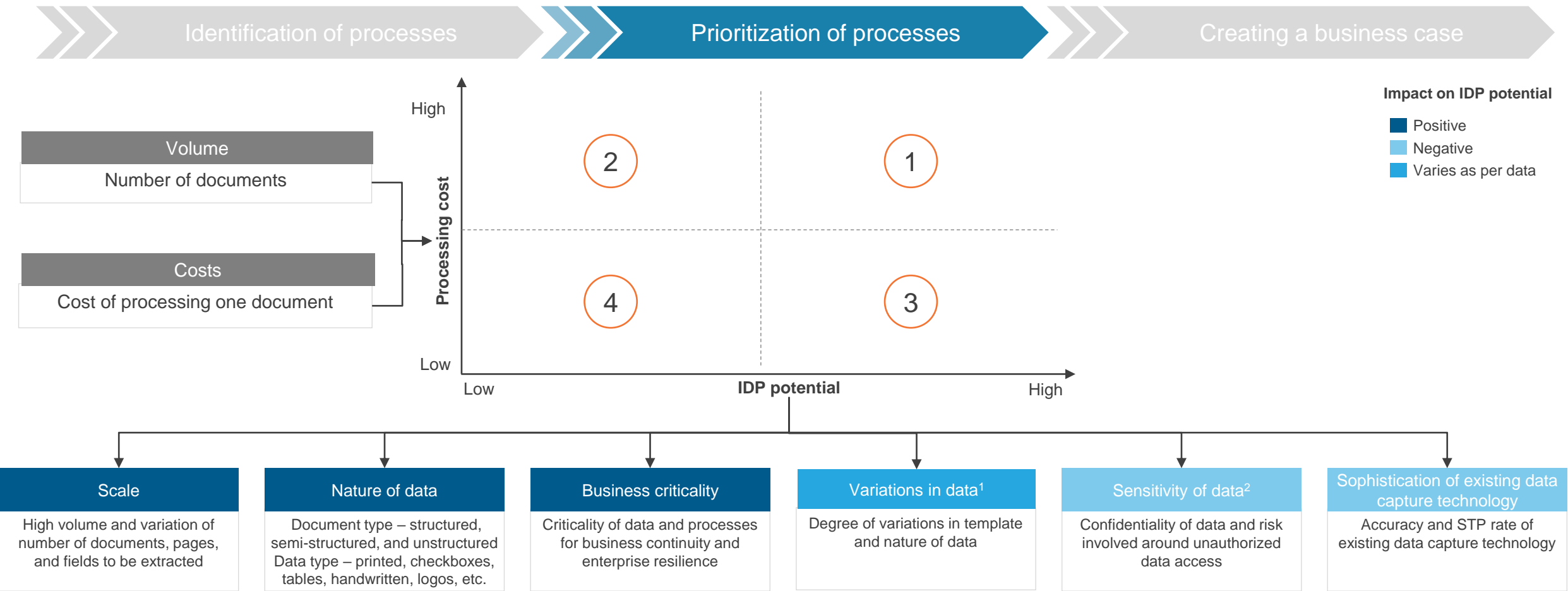
Applicability of IDP



Prioritization framework | enterprise processes

The identified data extraction-based processes should be prioritized for IDP implementation, leveraging a structured and repeatable framework

2



¹ Variations in data can have both positive and negative impact on IDP potential. Please refer to the next page for more details
² Sensitivity of data is becoming a less critical parameter as there are various ways to circumvent this (such as redaction/masking of data)

Create a business case and refine target outcome state

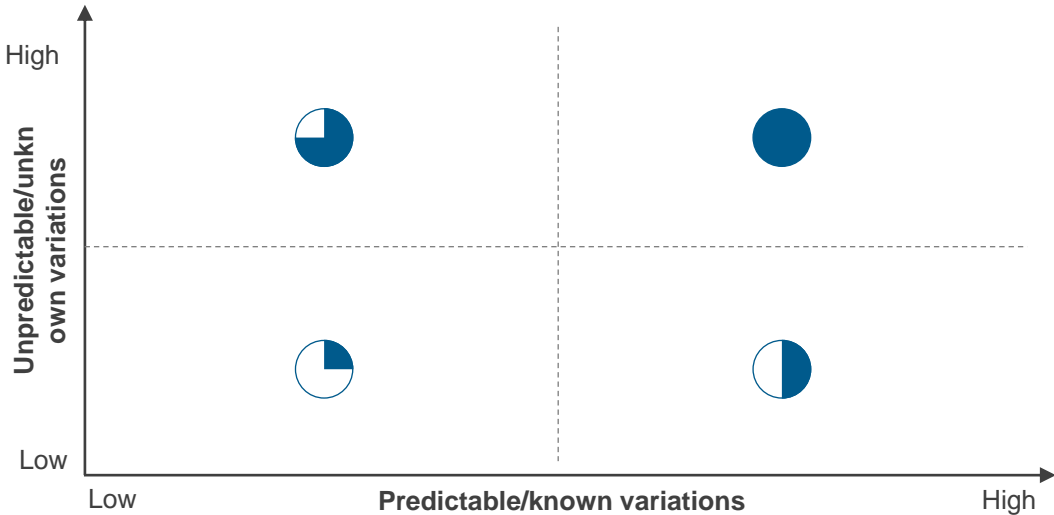
Variations in data can have both negative and positive impact on IDP potential, depending on nature of variations

2



Variations in data

Measure of new variations, typically over longer periods of time. High number of new variations has negative impact on the IDP potential



Relative impact on IDP potential

Low High

Measure of expected variations, typically observed within a defined timeframe. High expected variations can have positive impact on IDP potential as the system can be trained to handle these variations

Example 1	Example 2
Consider a process that involves 10 different known variations in the nature of data/documents and unknown variations that keep occurring over longer periods. In this case, the model has to be continuously trained for new variations at regular intervals, which continuously increases training costs and has negative impact on the IDP potential.	Consider a process that involves 15 different known variations in the nature of data/documents and the likelihood of new variations is limited. In this case, the model can be trained to handle those 15 variations to yield high level of accuracy. Over time, the training cost decreases and reaches a steady state, yielding higher ROI.





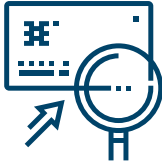

Illustration 1: A bank evaluating its KYC-AML (anti-money laundering) business function for IDP implementation identifies the processes to be considered for IDP

2

ILLUSTRATIVE

KYC-AML value chain

Processes to be considered for IDP implementation

					
KYC (onboarding, refresh, etc.)	Enhanced Due Diligence (EDD) / sanctions	Monitoring/surveillance	AML reporting	Fraud management	Chargeback
Document management	List/media screening (PEP, sanctions, media, etc.)	Activity/transaction monitoring	Alert management/investigation	Hardware monitoring	Escalation management
Customer risk assessment and data profiling	External data checks	AML monitoring for Money Service Businesses (MSB)	Compliance reporting	Navigation and link analysis	Dispute/recovery management
Compliance and quality checks	Data stream validation/notification	Trade surveillance	Data sharing requests/reporting	Transaction screening	Model validation and refinement
Platforms					
Analytics					

Once the processes are identified, ones with high processing cost and high IDP potential should be considered for further evaluation

2

ILLUSTRATIVE

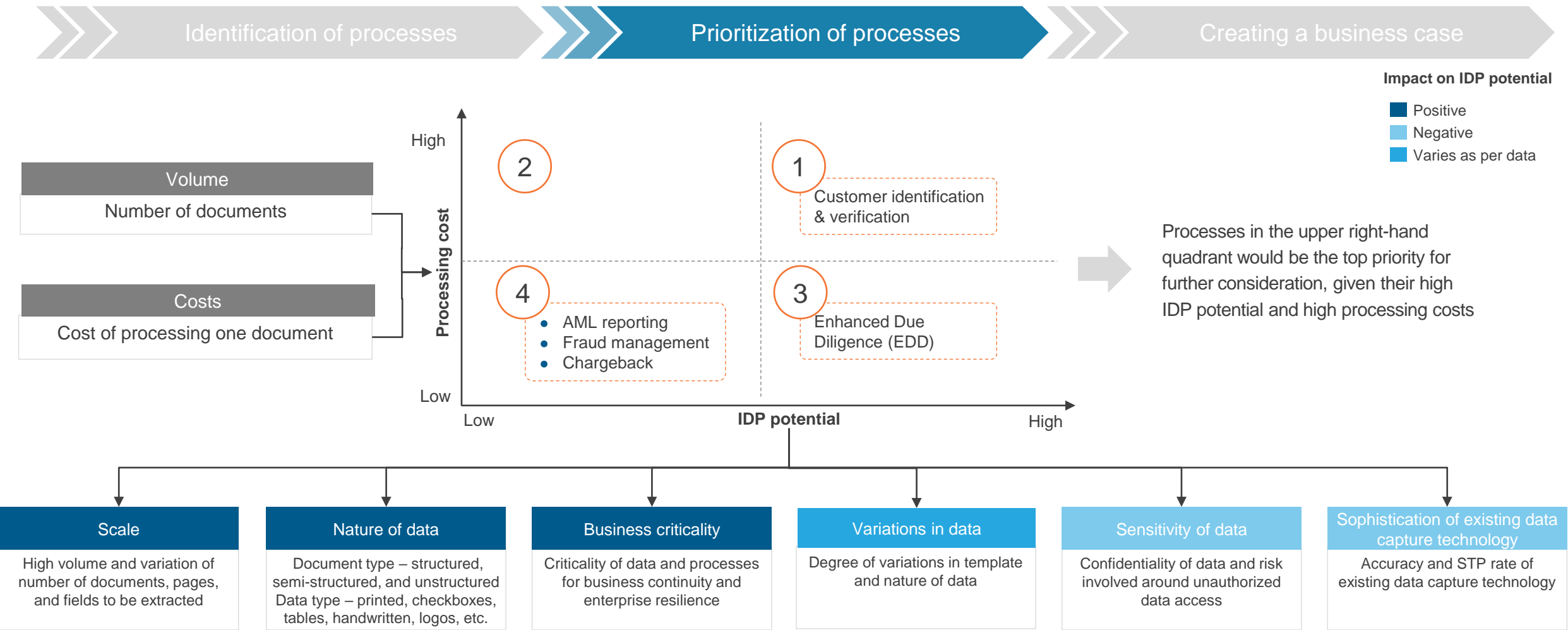
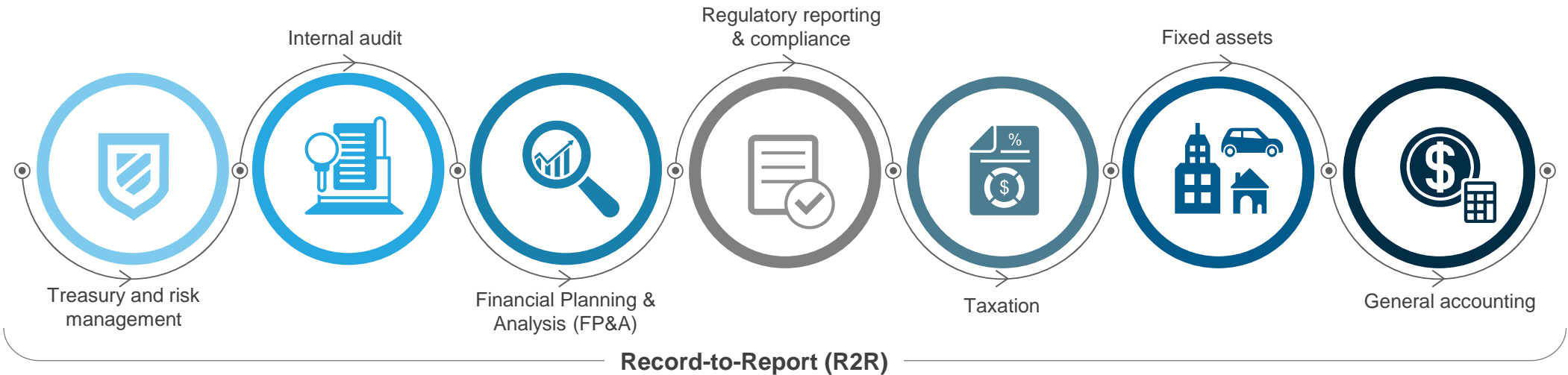


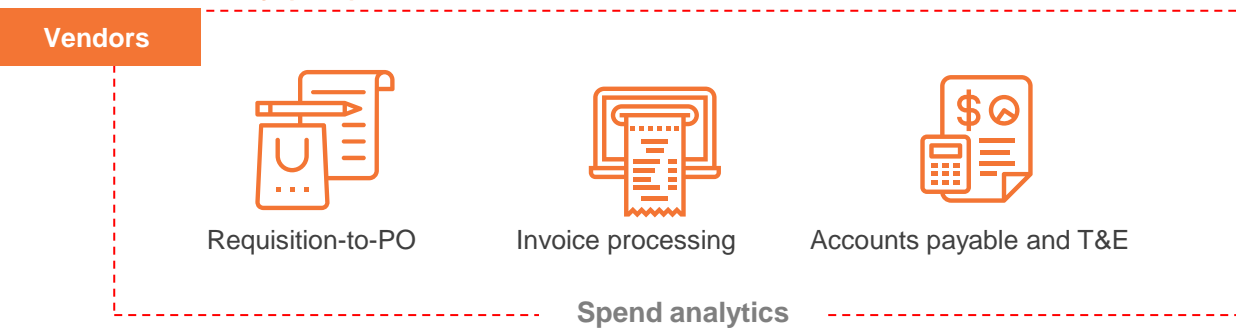
Illustration 2: Consider an organization evaluating its Finance & Accounting (F&A) business function for IDP implementation

2

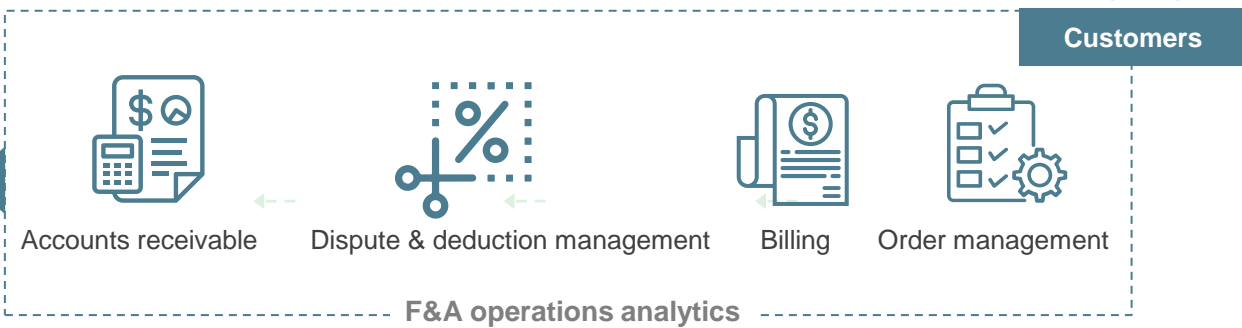
Finance and Accounting (F&A) value chain



Procure-to-Pay (P2P)



Order-to-Cash (O2C)



The list of processes to be considered for IDP implementation are identified based on content-centricity, data extraction requirement, and consistency of information to be extracted

2

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Detailed description of processes within F&A

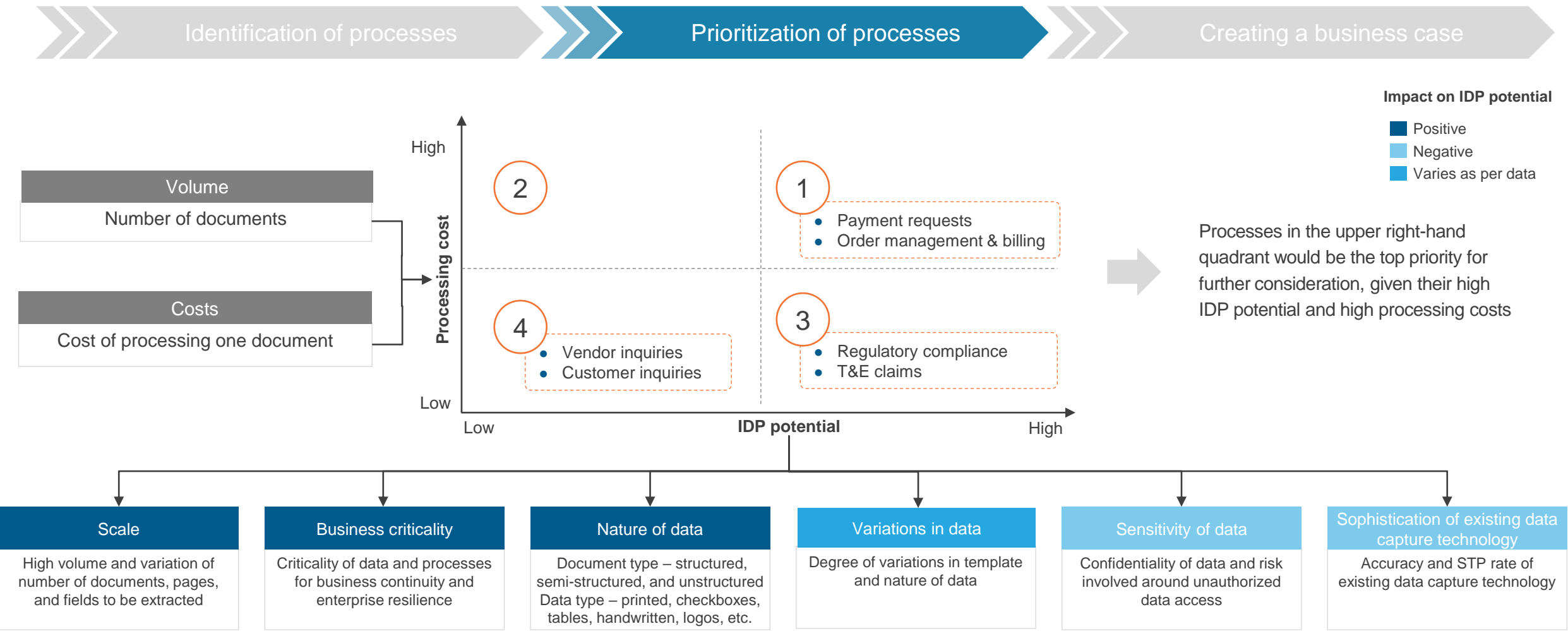
<div>Strategy</div> <div>Judgment intensive</div> <div>Transaction intensive</div>	<div>F&A strategy</div> <ul style="list-style-type: none">F&A strategy, including tax and risk positionAccounting policy and controlShareholder relationsM&As/divestituresExternal reporting					
	<div>Internal audit</div> <ul style="list-style-type: none">StrategyEstablishing annual audit planConducting auditsReports and recommendations	<div>Budgeting/forecasting</div> <ul style="list-style-type: none">StrategyBudget analysis and approval processBuilding line-item budgetForecasting roll-ups and consolidationForecasting analysis and approval process	<div>Capital budgeting</div> <ul style="list-style-type: none">StrategyAdministering approval processProject reporting	<div>Treasury and risk management</div> <ul style="list-style-type: none">StrategyBank relations and administrationCash management and forecastingInvestmentsDebt managementForeign exchangeTreasury risk management	<div>Management reporting and analysis</div> <ul style="list-style-type: none">StrategyRegular reportingData extractionAnalysisAd hoc analysis and special projectsCost accounting	<div>Regulatory reporting and compliance</div> <ul style="list-style-type: none">StrategyData extractionManagement Discussion and Analysis (MD&A)Regulatory reportingCompliance program
	<div>Fixed assets</div> <ul style="list-style-type: none">Maintaining master dataMerger, acquisition, and consolidation of assetsPost depreciation	<div>General accounting</div> <ul style="list-style-type: none">StrategyProcessing general entriesAccount reconciliationsInter-company accountingPreparing trial balancesPerform closingsManaging consolidationsCost accounting	<div>Accounts receivable</div> <ul style="list-style-type: none">StrategyCustomer setupBillingCash applicationsCredit and collectionsCustomer inquiriesReporting	<div>Tax</div> <ul style="list-style-type: none">StrategyTax accountingTax planning and analysisTax complianceTax audit	<div>Accounts payable and T&E</div> <ul style="list-style-type: none">StrategyMaintaining master dataProcessing payment requestsProcessing travel & expense (T&E) claimsAdministering EDI/P-cardMonth-end closingVendor inquiriesReporting	

XXX: Processes to be considered for IDP implementation

Once the processes are identified, ones with high processing cost and high IDP potential should be considered for further evaluation

2

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Considerations when creating a business case for the identified process

It is important to understand the different components of the business case so that it is created keeping in mind the different target outcome states

2

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Productivity gain

Manual hours saved in terms of cost with help of IDP

Productivity gain is a function of 3 factors:

- Field level accuracy
- Enterprises' threshold setting of confidence level



Straight Through Processing (STP)

Percentage of viable documents that are processed touchless (without human intervention)

STP rate is a function of two factors:

- Field level accuracy
- Enterprises' threshold setting of confidence level

When the confidence level of all the fields is higher than the threshold settings of respective fields, the document will be processed without human intervention (STP).

- In the case of unstructured documents IDP solutions typically provides productivity gain but don't enable STP, as each document needs to be validated by human operators. For semi-structured documents, IDP provides both STP and productivity gain
- Typically, business cases are created around STP rates and productivity gain, which reflect the direct cost savings
- High document level accuracy enables STP. However, in some industries such as banking and financial services, compliance requirements and sensitivity of data always demands human-in-the-loop, even though STP can be achieved

Create a business case and refine target outcome state

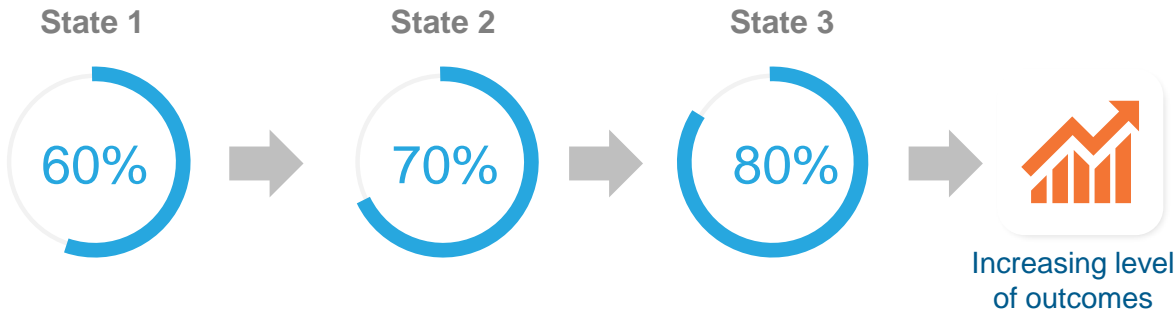
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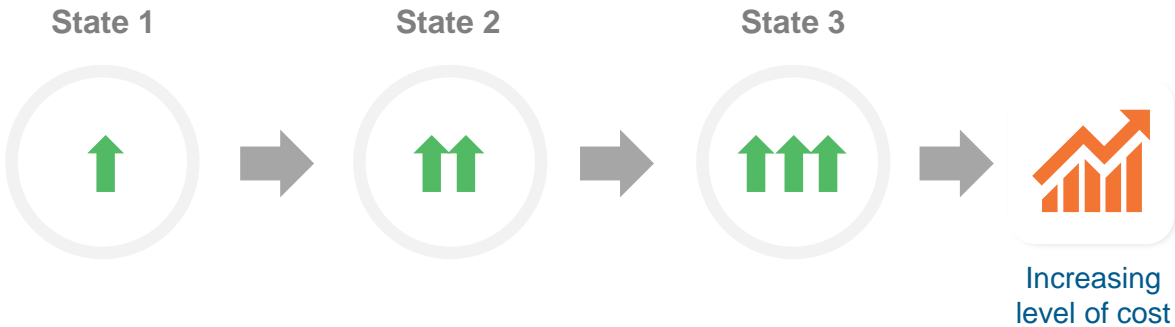


STP rate

STP rates differ based on complexity/nature of document



Training cost



— Sophistication of IDP solutions —

— Static cost (includes license cost, implementation cost, and maintenance cost) —

- Accuracy of the IDP solution and consequently STP rates increase with training, i.e., the system learns and gets better as it is exposed to larger volumes of documents
- As we move from one state to another (higher STP and accuracy), the system needs to be trained on increasing volumes of documents. This leads to an increase in training cost as we move from one state to another, all other costs remaining static

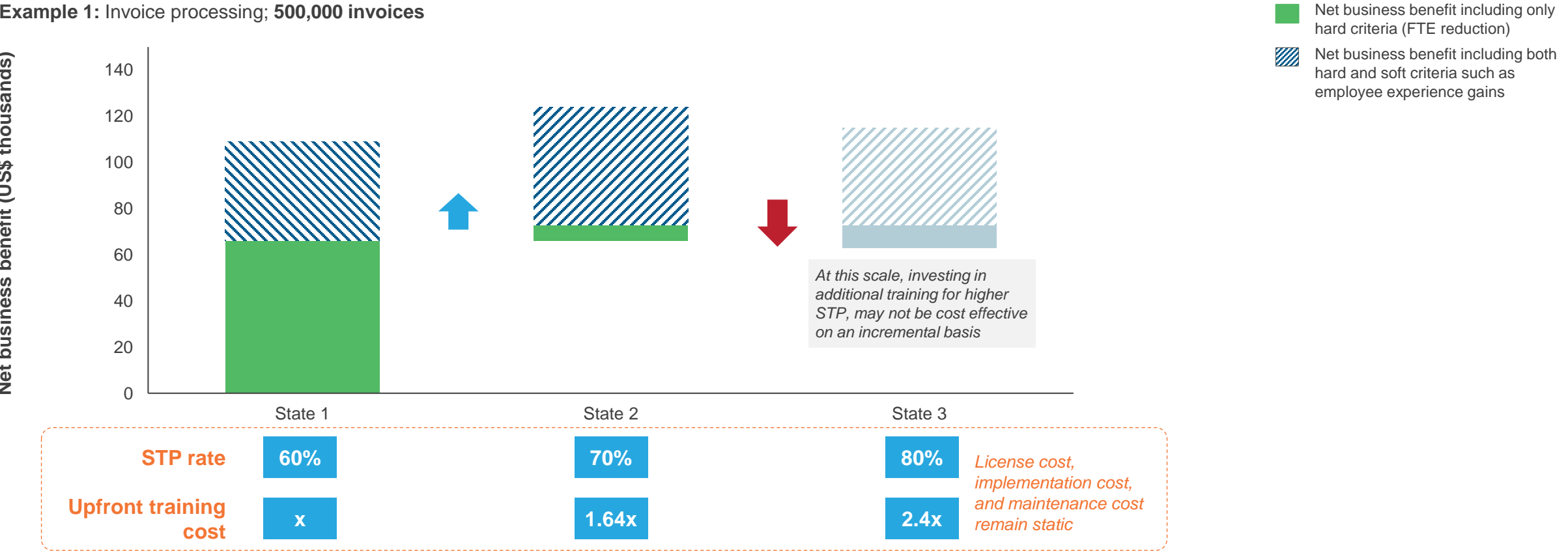
Create a business case and refine target outcome state

Enterprises need to target appropriate STP given the possibility of diminishing returns

2



Example 1: Invoice processing; 500,000 invoices



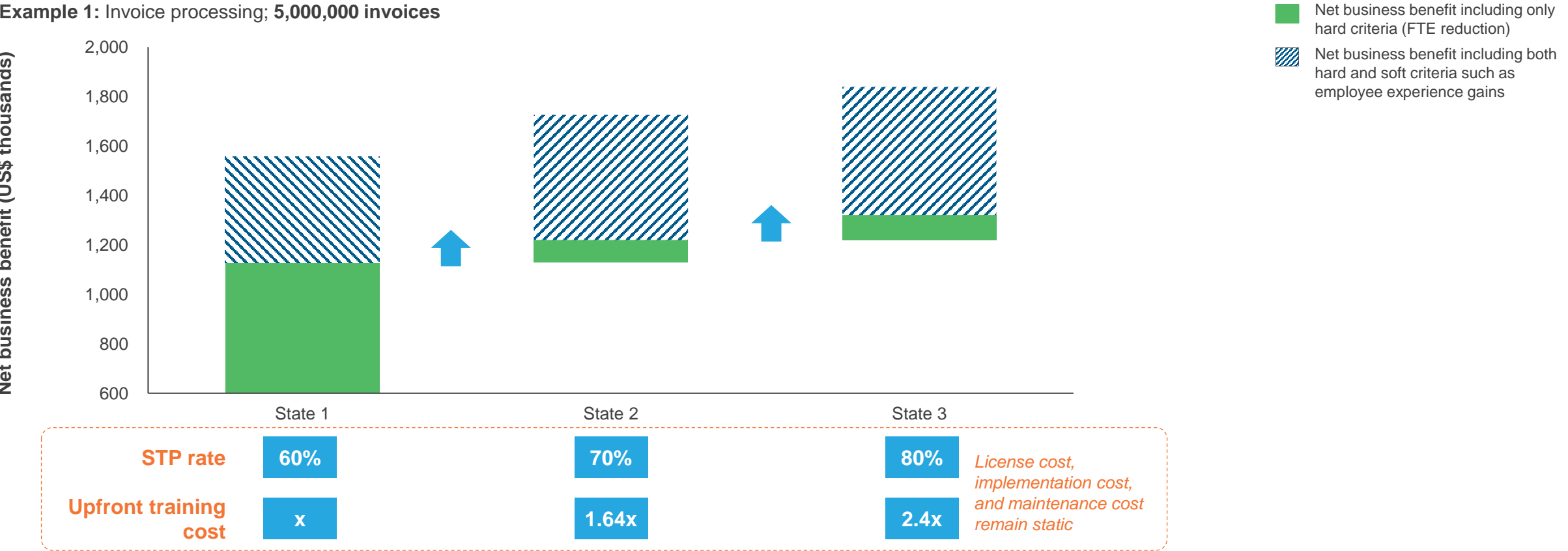
Create a business case and refine target outcome state

Enterprises need to target appropriate STP given the possibility of diminishing returns

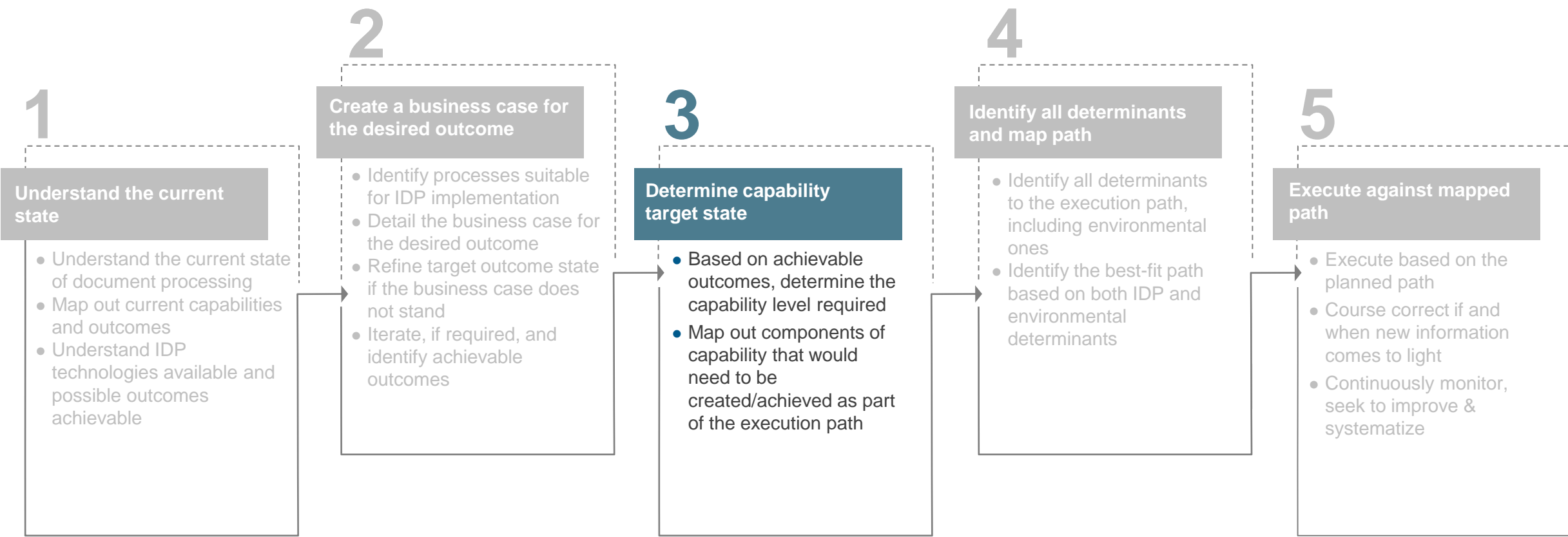
2



Example 1: Invoice processing; 5,000,000 invoices



Enterprises can break down their IDP journey into five distinct steps



Define target capability state

Having determined an achievable outcome, enterprises should then seek to map out corresponding capability requirements to achieve the desired outcome

3

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Technology

Capability elements	Basic	Typical	Advanced	Pinnacle
Software learning	No training data sets are generated from manual review	Automatic generation of training batches during manual review; automatic feeding of data sets into the system for training	Automatic generation of training batches during manual review along with feature for enterprise users to approve training sets to improve accuracy	Automatic generation of training batches during manual review along with feature for enterprise users to approve training sets to improve accuracy; approval mechanism at admin level as well
Classification of documents	Do not have the ability to automatically classify documents	Ability to identify discrete documents with low accuracy, leveraging basic statistical approach	Ability to identify discrete documents with medium accuracy, leveraging basic ML-based approach	Ability to identify discrete documents and different pages within a stream of documents with high accuracy, leveraging advanced neural networks
Flexibility with ML algorithms	One fixed pre-built ML algorithm for every use case / document type	Different pre-built ML algorithms for different use cases / document types	Different pre-built ML algorithms for different use cases / document types with an option for user to select the appropriate algorithm	Feature to recommend best ML algorithm to user to choose from different pre-built algorithms
Sophistication of document processing	Basic OCR for digitizing content	OCR- and ML-based; document classification, data capture, and extraction using machine learning and validation	OCR, auto ML, and NLP; document classification, data capture, and extraction using real-time/active learning, auto ML, NLP, intent analysis, and validation	OCR, domain ontology, deep learning, auto ML, and NLP; document classification, data capture, and extraction using real-time/active learning, intent analysis, and validation

Required capability

Technology






Capability elements	Basic	Typical	Advanced	Pinnacle
Complexity of data handled	Block letters (typed)	Block letters (typed) and tables	Block letters (typed or handwritten), checkboxes, bar codes, and logos	Block letters (typed or handwritten), checkboxes, bar codes, logos, stamps, charts, signatures, and cursive writing
Pre-built use cases	No pre-built use case	Simple use cases involving semi-structured data such as invoice processing, customer onboarding, and claims	Complex use cases involving unstructured data such as contracts, and legal documents	Use cases that involve extracting information from free-flowing text as well as NLG
Hosting type	Physical, desktop-based	On-premise, server-based	Private cloud-based, hybrid	Public cloud-based, hybrid
Ancillary technologies	Stand-alone IDP solution	IDP solution integrated with BPM tool and RPA	IDP solution integrated with BPM, RPA, and analytics	IDP solution integrated with BPM, RPA, analytics, and other AI solutions

Note Refer to pages 97-106 to understand the Capability Maturity Model (CMM)

Everest Group organizes IDP capabilities according to five key components of enterprises' IDP journey

Journey components

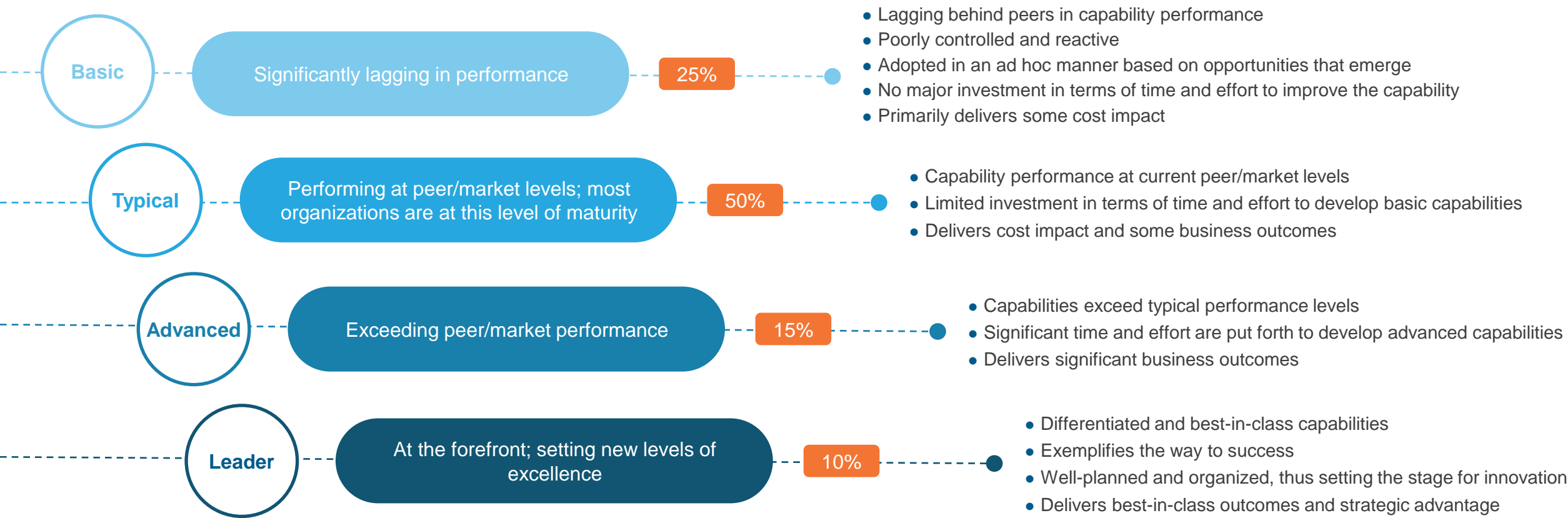
Key focus area

	Vision & strategy	<ul style="list-style-type: none">• To understand the vision of the organization for IDP and the drivers behind its adoption• To assess the organization's readiness for IDP adoption from a process and security perspective
	Organization structure	<ul style="list-style-type: none">• To assess the governance model for IDP initiatives and the extent of collaboration among the implementing groups• To analyze the talent management strategy for the organizational change caused by IDP adoption
	Technology	<ul style="list-style-type: none">• To assess the extent to which various components of IDP technologies such as OCR, software learning, computer vision, and analytics are being utilized• To assess the level of sophistication of various IDP technologies deployed
	Talent management	To assess the sourcing strategy, training, and education programs for various IDP skills
	Implementation	To assess the scale and scope of IDP adoption along with the pace at which IDP has been adopted – in terms of number and types of documents processed






Enterprise IDP capability is assessed across four maturity levels

The four capability maturity levels

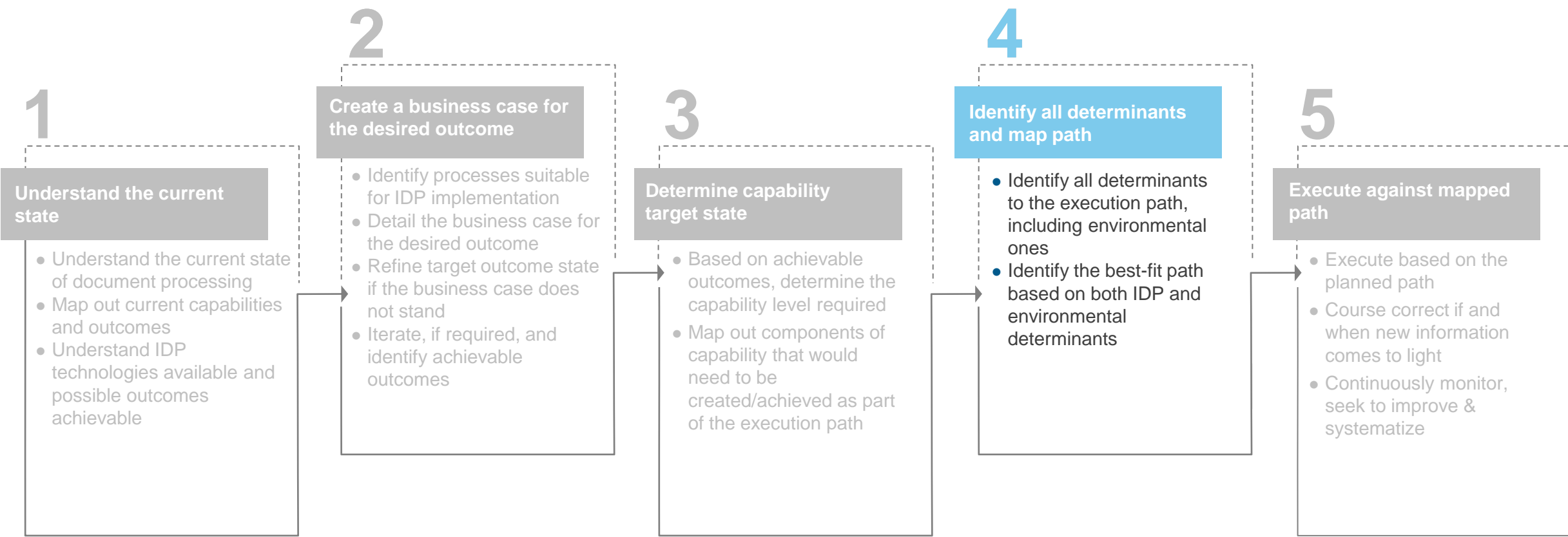
XX% Approximate share of enterprises at each maturity level



Enterprise IDP capability is assessed across over 25 capability elements

Journey components		Capability	
	A. Vision & strategy (7 capabilities)	A1. Primary drivers of IDP adoption A2. Funding/sponsorship A3. Project initiation A4. Security & risk preparedness for IDP	A5. Metrics and KPIs for measuring benefits/impact of IDP A6. Metrics and KPIs for measuring effectiveness of IDP initiatives A7. Targeted document types for IDP adoption
	B. Organization structure (8 capabilities)	B1. IDP team structure B2. Scope of automation CoE B3. Roles and responsibilities of CoE B4. Primary use of performance data	B5. Focus on tracking/optimizing the benefits achieved B6. Level of employee engagement B7. Nature of impact on employees B8. Reusability of models
	C. Technology (7 capabilities)	C1. Software learning C2. Classification of documents C3. Flexibility with ML algorithms C4. Sophistication of document processing	C5. Pre-built use cases C6. Hosting options C7. Ancillary capabilities
	D. Talent management (2 capabilities)	D1. Sourcing of IDP talent/skills D2. IDP training and education	
	E. Implementation – scale, scope, and speed (4 capabilities)	E1. Distribution of IDP projects by stage E2. Scale of IDP adoption E3. Scope of IDP deployments across functions E4. Speed of IDP adoption	

Enterprises can break down their IDP journey into five distinct steps



The IDP journey will take different forms based on two sets of determinants – IDP-related (science) and environmental (art)

4



IDP journey

Determination of IDP target state

IDP determinants

- Current outcome and capability
- Business case
- Achievable target state outcome
- Corresponding target state capability

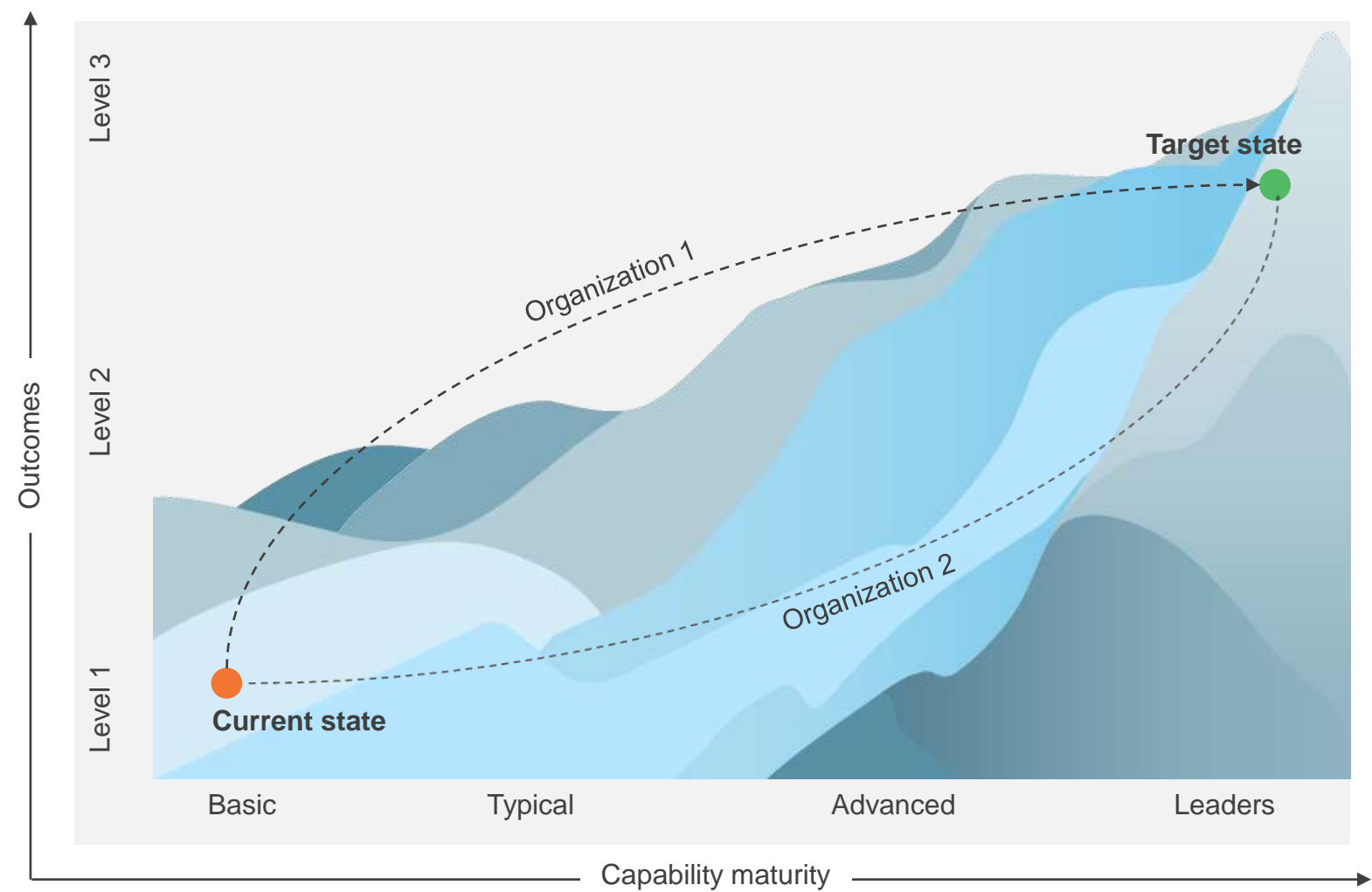
Execution path to be followed

Environmental determinants

- Organization structure
- People-centricity
- Availability of training data
- Initiating stakeholder(s)
- Risk appetite
- Existing automation partnerships
- Distributed workforce

Given the same current and target states, enterprises' culture, structure, and other environmental determinants influence the routes they take





4



Two enterprises starting their journeys at the same low level of IDP maturity and wishing to reach the same advanced target state may take significantly different execution paths; the path would largely depend on environmental determinants.

IDP execution paths can be broken down into four key phases

Everest Group breaks down enterprises' IDP execution path into four key phases

	Phase 1	Phase 2	Phase 3	Phase 4
	Planning 	Piloting 	Scaling up 	Steady-state 
Key Focus	<ul style="list-style-type: none">• Business case• Proof of Concept (POC)• Tool selection• Develop IDP strategy	<ul style="list-style-type: none">• Select initial use cases• Run pilot projects• Monitor performance• Involve automation CoE	<ul style="list-style-type: none">• Refine IDP strategy• Establish / refine the IDP governance model• Scale up across functions / geographies• Embed IDP capabilities in the automation CoE• Identify new opportunities	<ul style="list-style-type: none">• Institutionalize the governance model• Continuously improve• Create awareness
	<ul style="list-style-type: none">• Overcome conceptual barriers to IDP implementation and build awareness• Identify opportunities• Develop the business case• Align stakeholders (such as senior management and IT) to get backing for the POC• Select tools/partners• Identify skills sets required• Develop an implementation approach and roadmap	<ul style="list-style-type: none">• Get executive backing and funding• Develop/train skill sets for IDP implementation• Select and prioritize processes• Set up infrastructure and design architecture• Implement initial use cases / pilots• Monitor performance• Involve automation CoE• Raise awareness and enable upskilling/reskilling	<ul style="list-style-type: none">• Act on lessons learned to refine the IDP strategy and establish/refine the IDP governance operating model• Scale training and teams• Scale up across functions/geographies• Scale up upskilling/reskilling of resources• Set up a dedicated team and continuously identify new opportunities for IDP adoption	<ul style="list-style-type: none">• Ensure operations with robust governance and controls• Integrate a culture of innovation and design thinking across the organization

Use case: consider two distinct organizations with different characteristics, both seeking to reach similar target states from similar current states in the IDP journey for their expense management process

4

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Consider two organizations with the same current state and achievable target state

- **Current state:** The organizations run a single T&E system with a workflow for submission of expense claims along with documents of proof by employees, followed by a manual verification and approval process. All the expense details are manually entered by the employees. Each organization also has seven FTEs currently employed in the manual expense proof validation process
- **Achievable target state:** 60% STP rate for all expense proof documents

The ideal execution path for each organization would depend on environmental determinants such as those detailed below:

Environmental determinants

Organization A – conservative energy firm

Organization B – e-commerce firm

Centralized ----- Organization structure ----- Decentralized

High people centricity ----- People centricity ----- Low people centricity

Operations driven ----- Initiating stakeholders ----- IT driven

Low risk appetite; heavy regulation ----- Risk appetite ----- High risk appetite

Centralized workforce ----- Workforce location ----- Distributed workforce

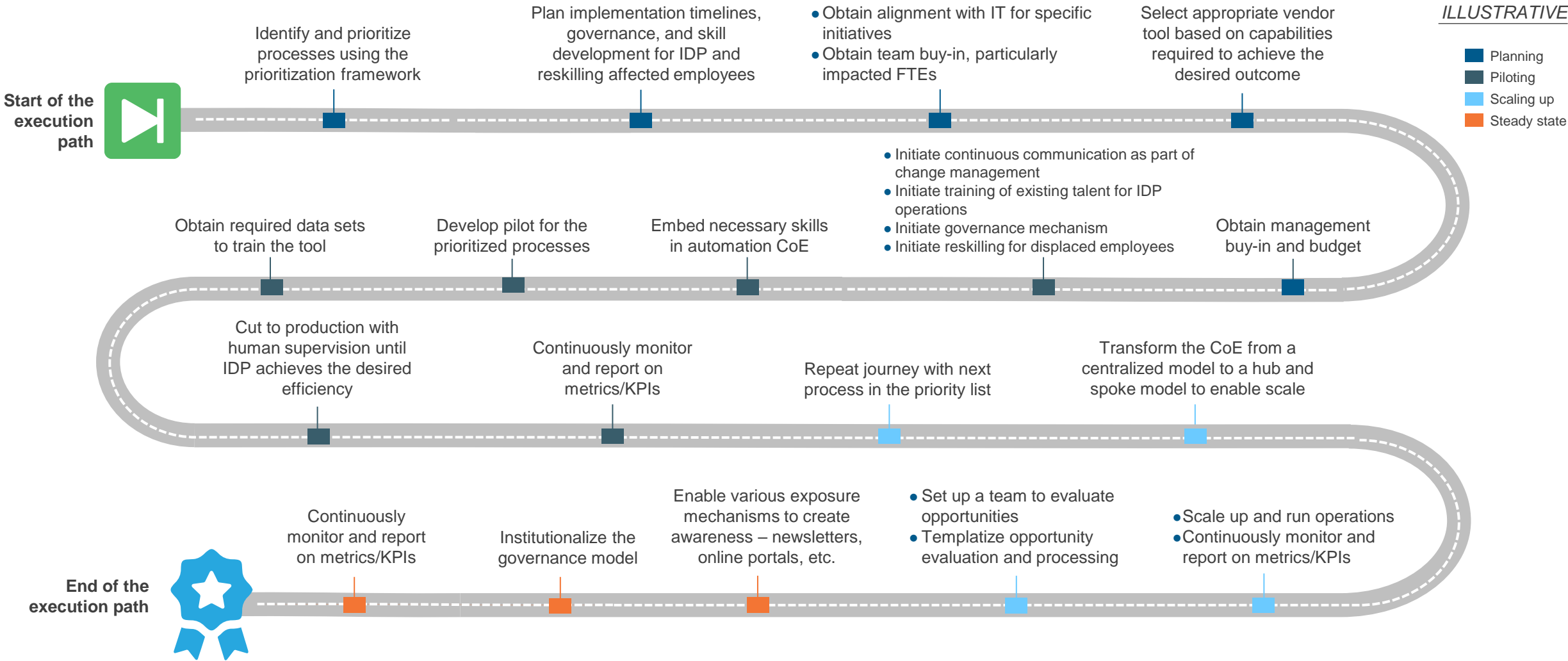
None on the automation front ----- Existing automation partnerships ----- Existing relationship with automation vendor

Few historical documents and extracted values are available ----- Availability of training data ----- All historical documents and extracted values are available

While all enterprises will likely follow a set of steps in the execution path ...

4

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... the nature of those steps will vary based on environmental determinants¹

4

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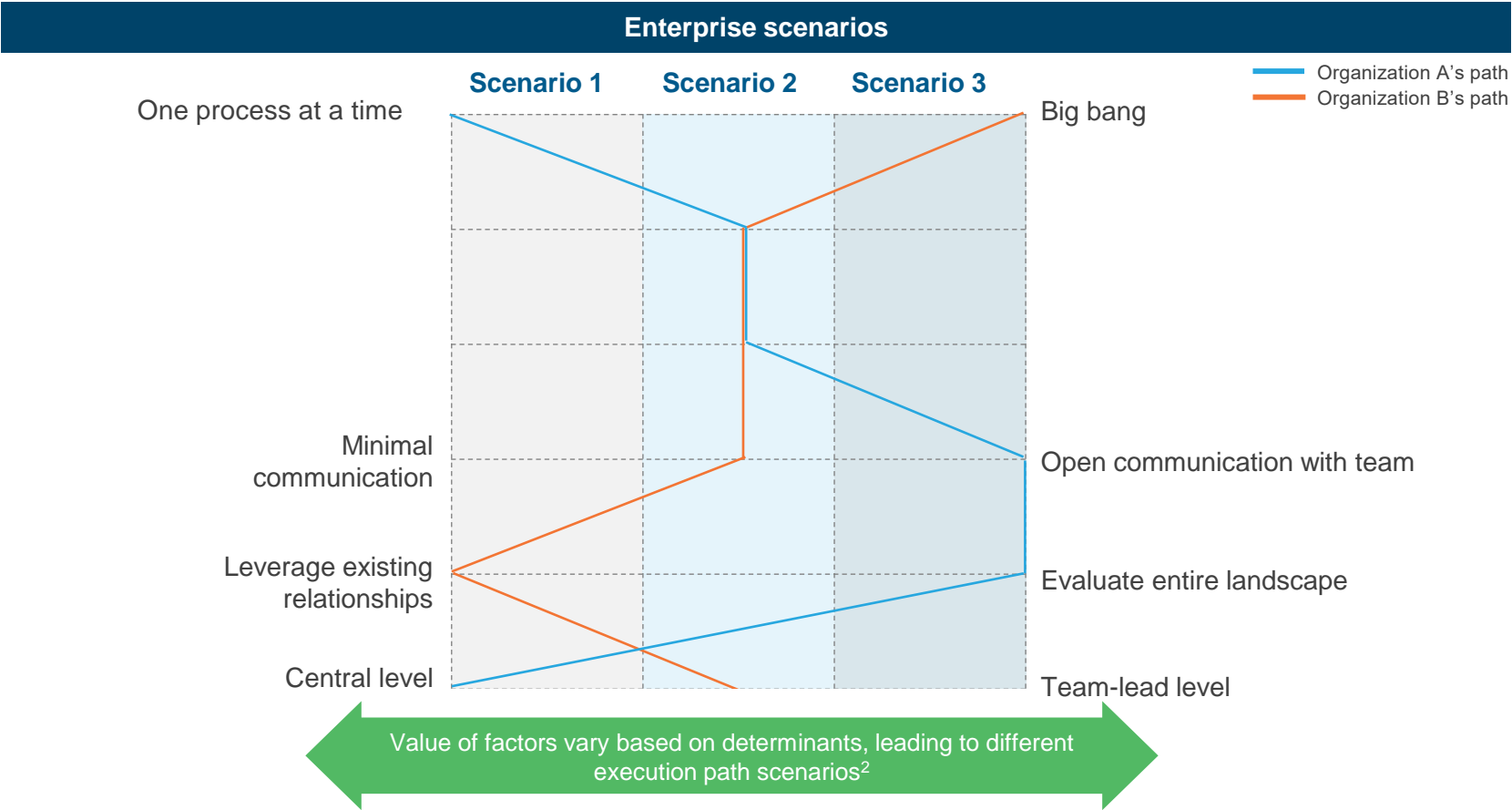
#	Steps	Determinants	Path options																				
1	Identify and prioritize processes using the prioritization framework	<ul style="list-style-type: none"> Risk appetite Current outcome and capability 	<ul style="list-style-type: none"> Implement one process at a time Implement logical groups of processes sequentially Big bang implementation 																				
2	Plan implementation timelines, governance, and skill development for IDP and reskilling affected employees	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 																				
3a	Obtain alignment with IT for IDP implementation	<table> <tr> <th>#</th><th>Steps</th><th>Determinants</th><th>Path options</th></tr> <tr> <td>6a</td><td>Initiate continuous communication as part of change management</td><td> <ul style="list-style-type: none"> People centrality Initiating stakeholders </td><td> <ul style="list-style-type: none"> Low to no communication Medium frequency of communication at BU level Frequent communication driven by IT/Central </td></tr> <tr> <td>6b</td><td>Initiate training of existing talent for IDP operations</td><td> <ul style="list-style-type: none"> NA </td><td> <ul style="list-style-type: none"> NA </td></tr> <tr> <td>6c</td><td>Initiate governance mechanism</td><td> <ul style="list-style-type: none"> Risk appetite </td><td> <ul style="list-style-type: none"> Minimal, ad hoc governance Standard set of tracking for metrics </td></tr> </table>	#	Steps	Determinants	Path options	6a	Initiate continuous communication as part of change management	<ul style="list-style-type: none"> People centrality Initiating stakeholders 	<ul style="list-style-type: none"> Low to no communication Medium frequency of communication at BU level Frequent communication driven by IT/Central 	6b	Initiate training of existing talent for IDP operations	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> NA 	6c	Initiate governance mechanism	<ul style="list-style-type: none"> Risk appetite 	<ul style="list-style-type: none"> Minimal, ad hoc governance Standard set of tracking for metrics 					
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¹ Refer to pages 107-111 for the overview of the environmental determinants and the various path options for the enterprise at each step

Execution paths differ based on environmental determinants (page 1 of 2)

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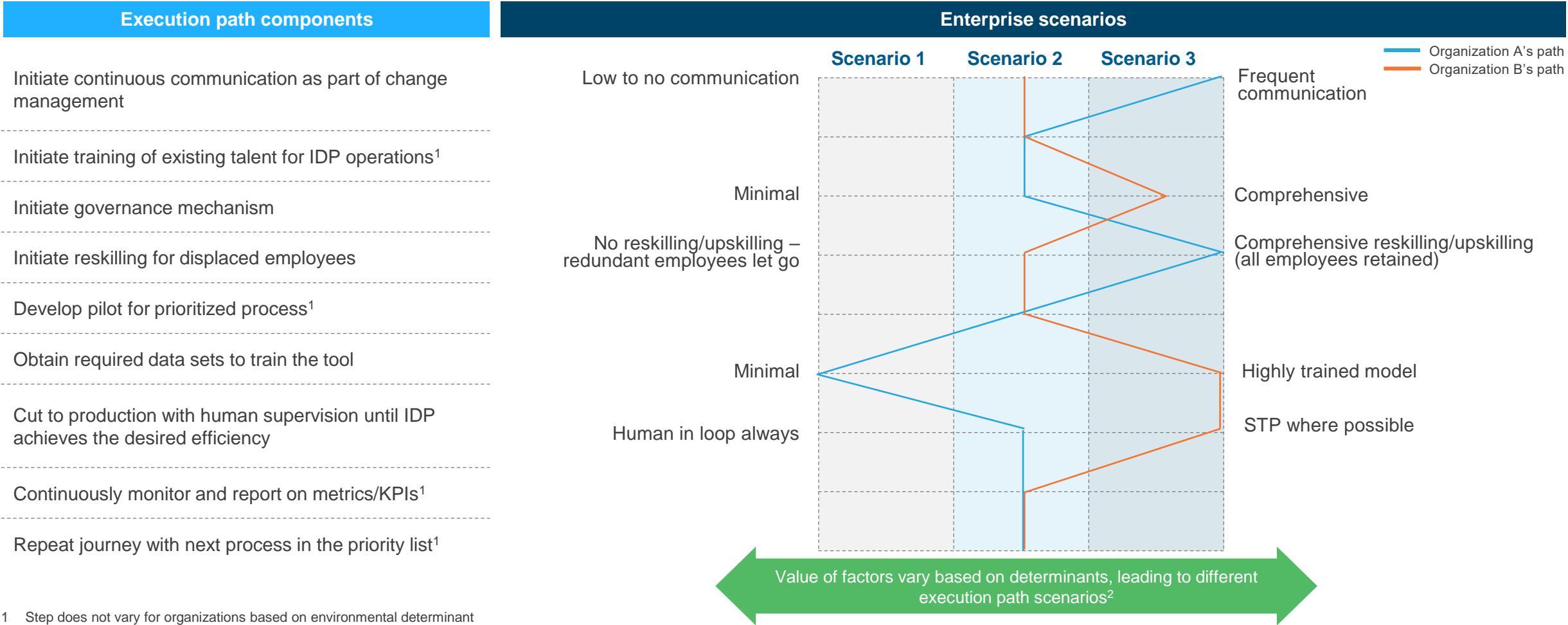
Execution path components
Identify and prioritize processes using the prioritization framework
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Obtain team buy-in, particularly impacted FTEs
Select appropriate vendor tool based on capabilities required to achieve the desired outcome
Obtain management buy-in and budget



¹ Step does not vary for organizations based on environmental determinant
² Refer to Appendix pages 107-111 for variation of execution path by determinants

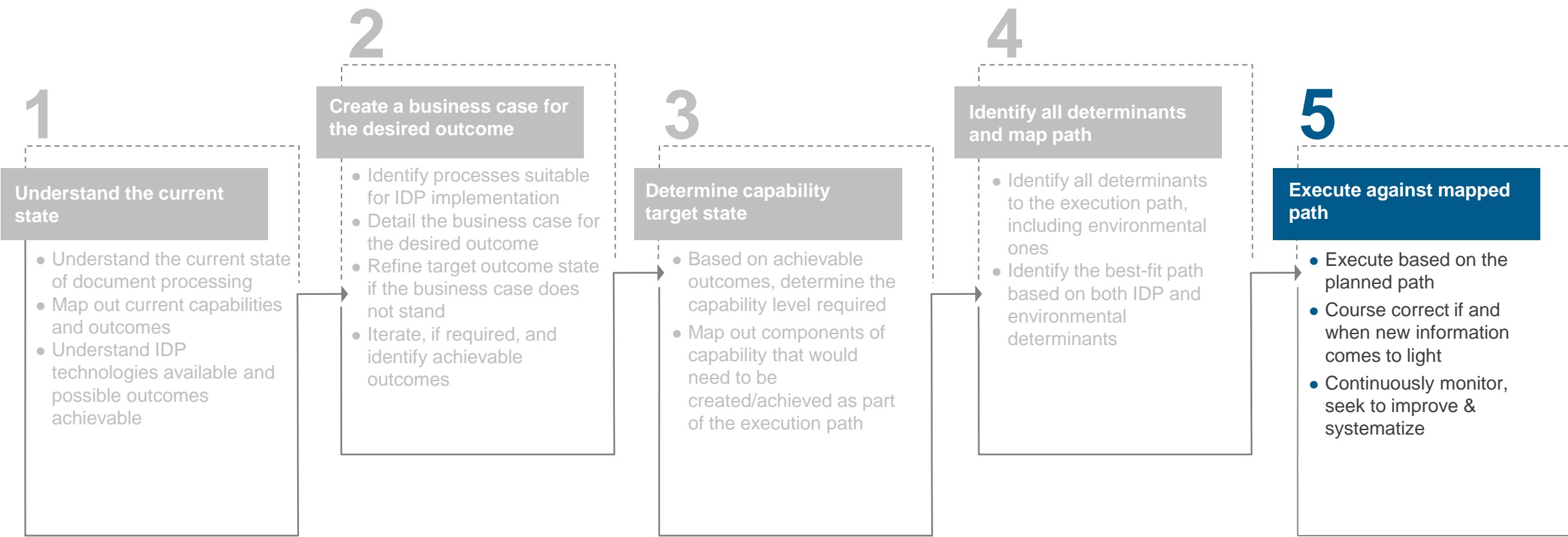
Execution paths differ based on environmental determinants (page 2 of 2)

ILLUSTRATIVE



¹ Step does not vary for organizations based on environmental determinant
² Refer to Appendix pages 107-111 for variation of execution path by determinants

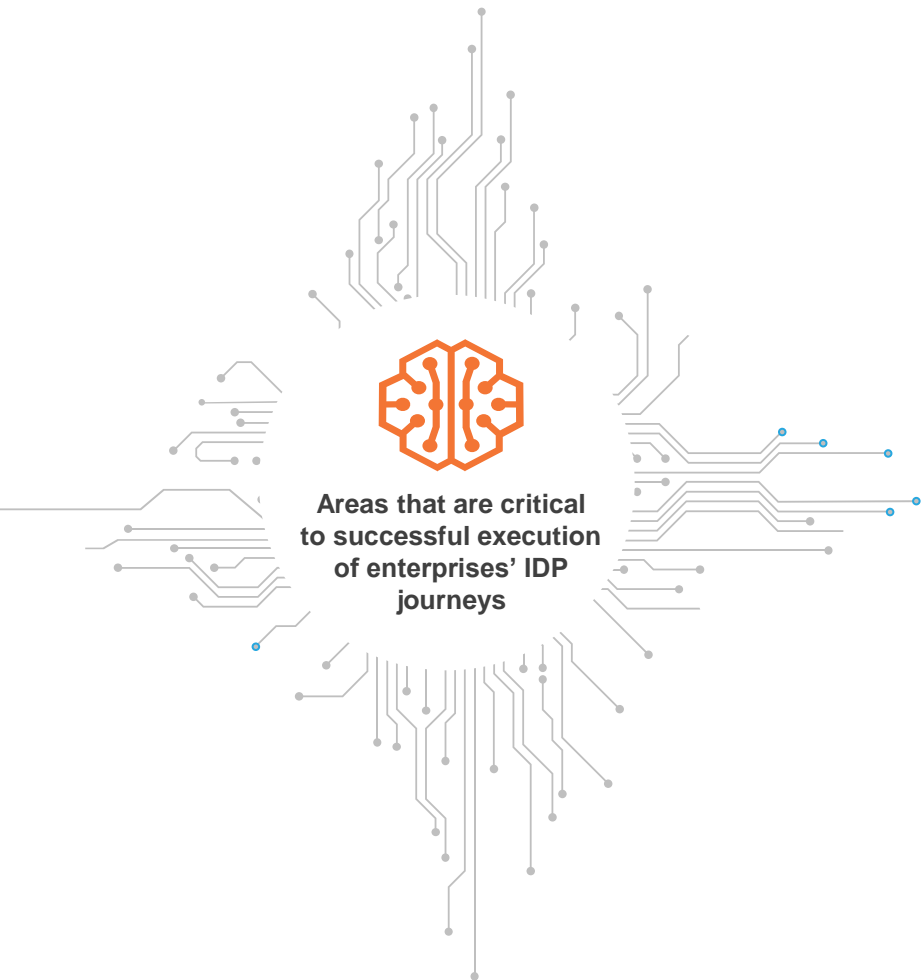
Enterprises can break down their IDP journey into five distinct steps




Having mapped the best-fit execution path, enterprises could leverage a variety of tools to develop an execution strategy and accelerate their IDP journeys

5


Identifying and prioritizing
processes for IDP adoption




Selecting the right
enterprise-grade IDP solutions

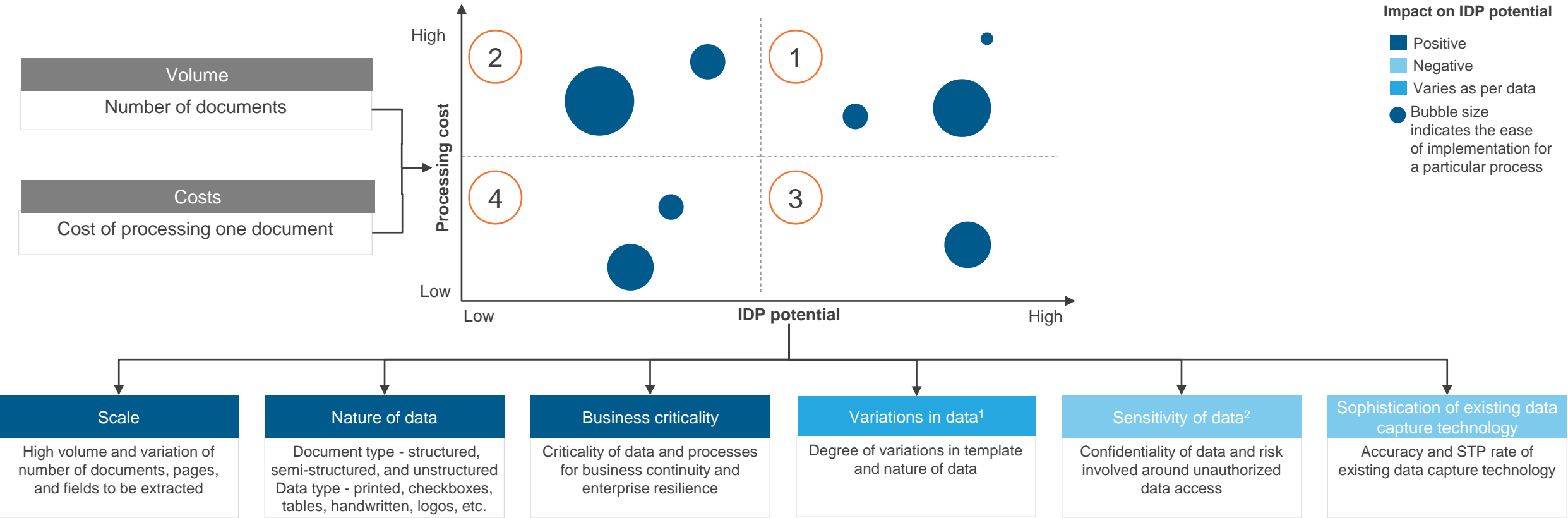
Identifying and prioritizing processes for IDP adoption

Processes should be prioritized for IDP using a structured, repeatable framework



ILLUSTRATIVE

The framework below helps identify high priority processes for IDP based on the overall IDP potential and cost of processing. Additionally, the relative ease of implementation consideration helps prioritize within quadrants.

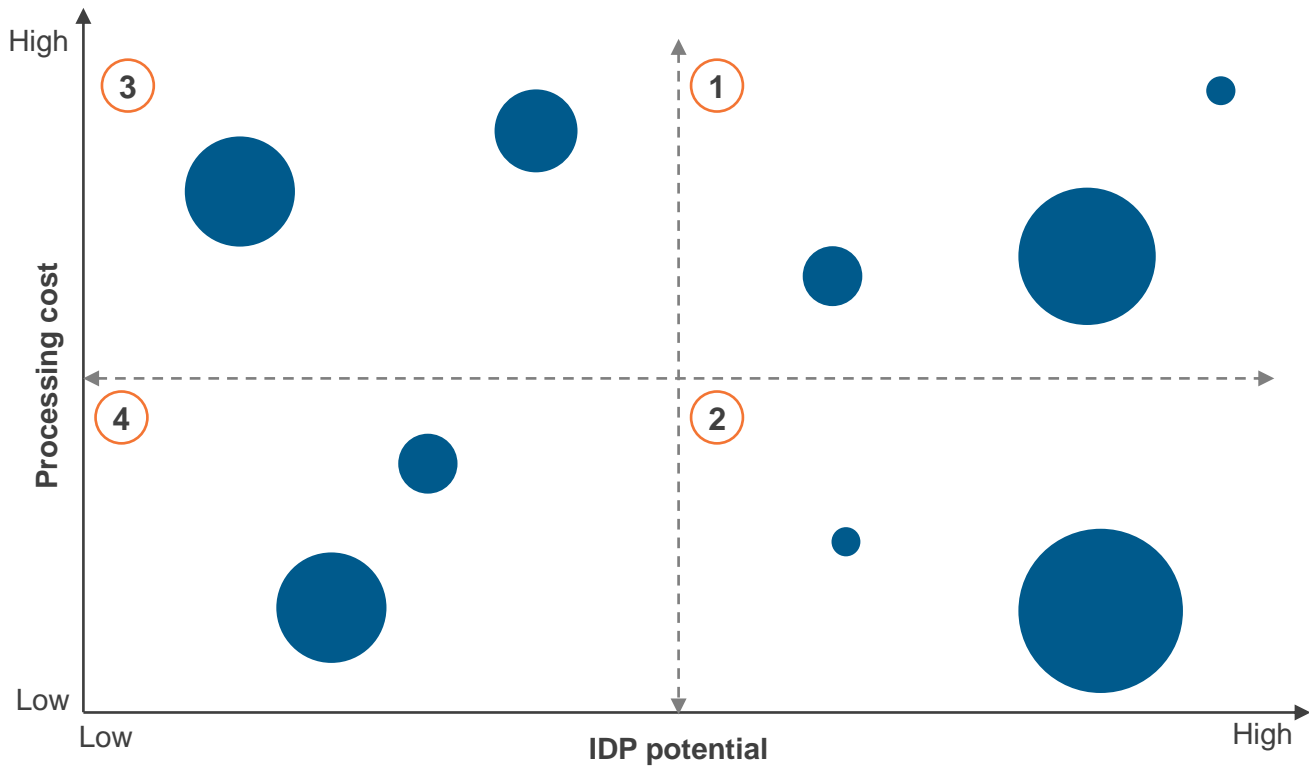


1 Variations in data can have both positive and negative impact on IDP potential. Please refer to the next page for more details
2 Sensitivity of data is becoming a less critical parameter as there are various ways to circumvent this such as redaction/masking of data



Identifying and prioritizing processes for IDP adoption

For phases 1 and 2, easily implementable processes that deliver the maximum net benefit should be considered; for further scale, other processes can be considered as well



Phases 1 (Planning) and phase 2 (Piloting)

- Select processes from quadrant 1 for phases 1 and 2
- As phase 1 is the POC, it should ideally address the process within the high-priority process quadrant (quadrant 1) that is the easiest to implement
- For phase 2, organizations can choose between easily implementable processes in quadrant 1 or more complex processes, depending on the confidence gained from POC and other organizational nuances

Phases 3 (scaling up) and phase 4 (steady-state)

- For phases 3 and 4, i.e., when scaling up beyond pilots, quadrant 1 continues to be the first priority, typically moving from easier- to harder-to-implement processes
- Upon exhaustion of processes in quadrant 1, processes in quadrants 2 and 3 can be selected (those processes for which the business case still makes sense)
- Typically, quadrant 4 processes are left as is, even in the high maturity phases, as likely there is not much of a strong business case for them. As technology matures, some of these processes may become attractive from a business case perspective, at which point they can be considered

Selecting best-fit enterprise grade solution

The IDP software market today majorly comprises two types of solutions: package-based and platform-based



Types of solutions in IDP software market

Package-based solutions



Refers to the IDP software solutions offered as package or closed solutions, where the vendors or the implementation partners will predominantly oversee the customization, configuration, and deployment of the solution

- **Pros:**
 - Dedicated resources and solutioning experts can assist enterprises in deploying the product across complex use cases
 - Consistency in terms of accuracy and performance
- **Cons:** Inability to build new use cases or tinker with existing ones



Platform-based solutions

Denotes the IDP software solutions offered as platforms (can be part of a larger intelligent automation platform), which AI-savvy enterprise users can use to build and deploy specific use cases themselves, or with support from the vendor or implementation partners

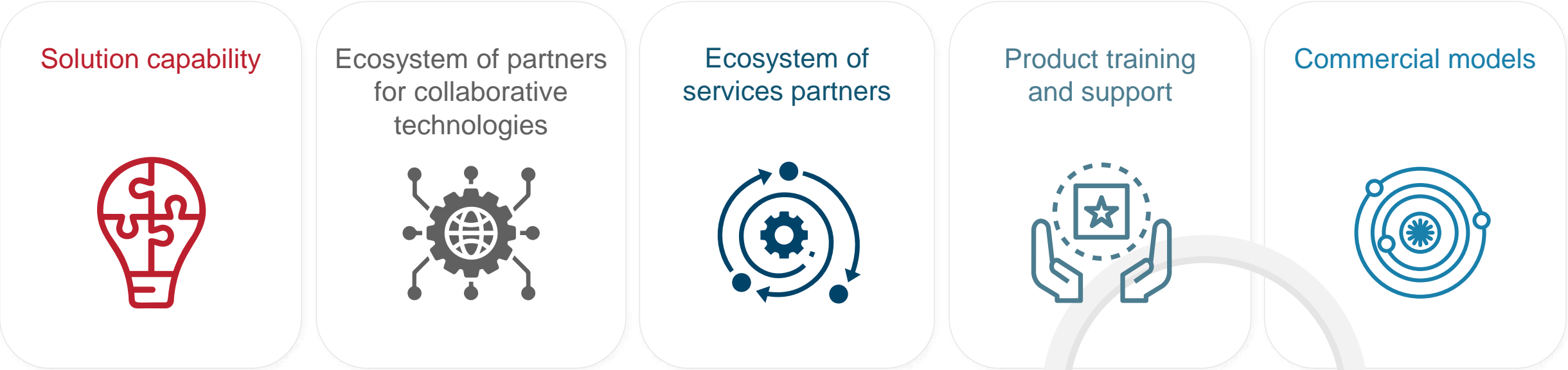
- **Pros:**
 - Enterprises can build use cases on their own
 - Allows for experimentation with choosing the best-fit models and greater degree of control
- **Cons:** Given the current state of maturity and scarcity of skilled resources, most enterprises end up having to use external support for new use cases, thereby diluting the promise of a platform solution

Currently, both models are viable in the market. Given the scarcity of skilled resources today, most platform solutions end up being made available as package-based solutions, except in the case of mature enterprises with dedicated data science talent.

Selecting best-fit enterprise grade solution



Key factors to consider when selecting an enterprise-grade IDP solution







Selecting best-fit enterprise grade solution

Solution capability



Core technology capabilities



Capabilities	Brief on the capability
 Image pre-processing	Improves quality of images and handwritten documents with features such as auto crop, background editor, and noise reduction.
 Document classification	Refers to automatic classification and sorting of incoming documents and the ability to route them to desired destinations.
 ML & deep learning algorithms	Built-in ML & deep learning algorithms for image pre-processing, document classification, data extraction, and training of the software are the core of IDP solutions. Some vendors have developed proprietary models, while others use common algorithms such as CNN, RNN, SVM, Markov chains, and Naïve Bayes.
 NLP	With the help of NLP, IDP solutions can analyze the running text in documents, understand the context, consolidate the extracted data, and map the extracted fields to a defined taxonomy. It also helps in recognizing the sentiments from the text (e.g., from emails and other unstructured data) and classifying into different categories.







Selecting best-fit enterprise grade solution

Solution capability



Other technology/product capabilities



Capabilities		Brief on the capability
	Configuration and set-up GUI	Allows administrators to add new use cases, define fields that need to be extracted, upload the documents by batches, manage user access controls, customize the accuracy thresholds for classification & extraction of fields, and modify business validation rules.
	Review GUI	The interface of the platform where processed documents are reviewed. It displays the confidence level for classified & extracted fields that failed to meet the defined thresholds, highlights fields that violate business rules or fields with incorrect/missing data, and allows business users to manage the work queue of processed documents.
	Analytics dashboard	Analytics dashboard provides a view of multiple document processing projects and allows tracking of various parameters such as STP rate, process-level SLAs, batch-level & field-level processing, manual worker performance, number of errors fixed, and time taken to fix the errors.
	Workbench for enterprise IT users	Workbench allows enterprise IT users to manage the workflow of processes, access ML libraries, and integrate RPA capabilities. It gives flexibility to experiment on the best-fit ML algorithms for different use cases.
	Unstructured document processing	Classify and extract data fields from unstructured documents such as emails, documents with free-flowing text, images, etc. It can further conduct sentiment analysis, topic identification, entity extraction, and intent analysis on such documents.
	Processing different data types	Allows users to process and extract data types of varying complexities. Low-medium complexity data types include printed text, tables, barcodes, and block handwriting, whereas high complexity data types include logos, signatures, freestyle handwriting, and charts.








Selecting best-fit enterprise grade solution

Solution capability



Other solution considerations



Capabilities	Brief on the capability
 Pre-trained solutions	Pre-trained, out-of-the box solutions come with reasonable accuracy (~70-80%) for common use cases such as invoice processing. These are generally trained by ingesting a variety of documents for a particular domain or use case into ML models. It significantly reduces initial training time & effort and allow enterprises to start production quickly.
 Security features	Security features of IDP solutions include ability to encrypt, hide, or redact confidential data fields using various technologies before review, role-based access control for various features, and adherence to enterprise IT security standards & regulatory compliance requirements.
 Hosting	IDP solutions can be deployed on cloud, on-premise servers, and desktops. Cloud is the most widely adopted deployment mode, whereas on-premise and desktop deployment could be considered by industries such as BFSI and healthcare in use cases with stringent data security and compliance requirements. Given the growing demand for cloud, vendors are increasingly moving towards a cloud-native architecture with containerized microservices.
 Pre-built connectors	Pre-built connectors allow the IDP platform to integrate and communicate directly with third-party applications such as BI platforms, ERP systems, and other legacy information systems.
 Mobile capture	Ability to directly upload low-quality documents from mobiles for processing. It ensures quality of images captured at source through features such as real-time feedback and user guidance. Certain IDP solutions also have the ability to process incoming documents and images from mobile device.
 Multi-lingual document processing	Availability of multi-language support for extraction and user interface. Increasingly, IDP solutions for non-Latin scripts are also coming into play. Few vendors are also able to identify and process multiple languages within the same document.
 User interface	An easy to use and intuitive user interface with low code/no code features, drag and drop functionality, etc., helps in reducing the time taken in training resources, achieving higher adoption, and enabling general business users to use the IDP solution.

Selecting best-fit enterprise grade solution

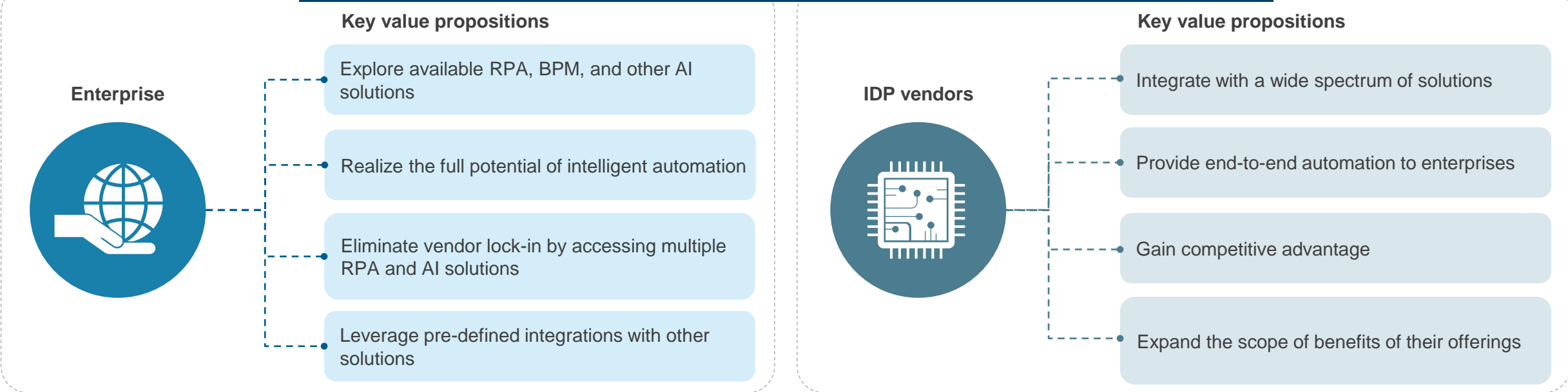
Ecosystem of partners for collaborative technologies



Why technology partner ecosystem is an important consideration for enterprises while choosing an IDP vendor

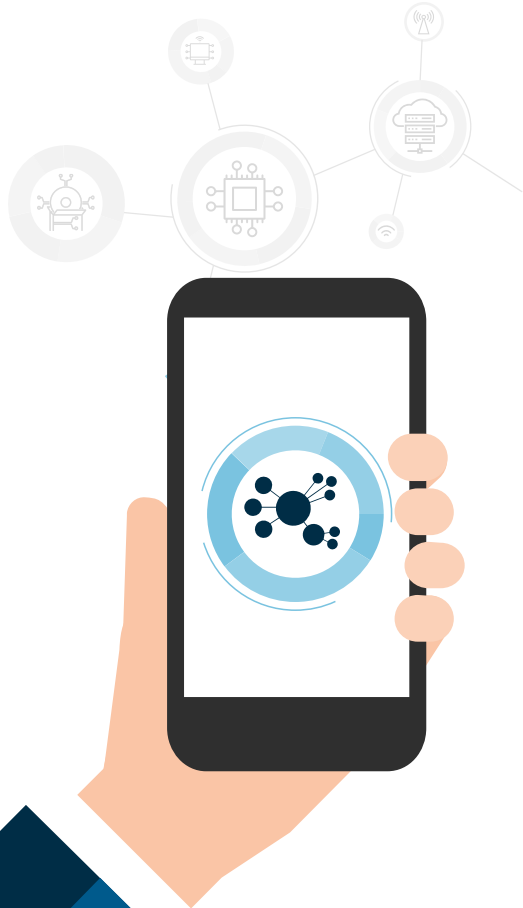
- IDP solutions are capable of extracting data from complex documents, but they can be combined with complementary technologies such as RPA, BPM, and other AI technologies to perform end-to-end automation
- Solutions packaged with IDP and RPA help enterprises improve operational efficiency & increase cost savings
- If an enterprise’s chosen IDP vendor can provide access to a broad partner ecosystem for collaborative technologies, it would help the enterprise to expand its automation capabilities in an expedient fashion. It would reduce the hassle to reconfigure the deployment and integrate with collaborative technologies
- Some IDP vendors partner with providers of best-in-class AI technologies such as NLP and OCR to provide flexibility to enterprises

What a robust partner ecosystem of collaborative technologies means for enterprises and IDP vendors



Selecting best-fit enterprise grade solution

Ecosystem of services partners



Why training partners are important for enterprises while choosing an IDP vendor?

- Training partners provide their implementation and training expertise to help enterprises configure and deploy IDP solutions
- Since IDP solutions are evolving rapidly, training partners are required to train employees on new features/capabilities of the solution
- In order for enterprises to achieve global scale of deployments, they need trainings to be available in a variety of languages. This is one of the key value propositions that they bring to the table

Why implementation partners are important for enterprises while choosing an IDP vendor?

- Implementation partners include system integrators that help enterprises in implementing IDP solutions and overcoming challenges in deployment
- They can also be leveraged to overcome challenges in areas such as governance, business case realization, and scaling up
- Enterprises can also leverage them to set up automation CoEs

Why BPO partners are important for enterprises while choosing an IDP vendor?

- Many IDP vendors offer the option of a managed-services construct through partnerships with leading BPO providers
- Enterprises can choose to outsource the human-in-the-loop and validation activities to a BPO partner
- This can significantly reduce the time taken for implementation and eliminates the need to train employees



Selecting best-fit enterprise grade solution

Product training and support

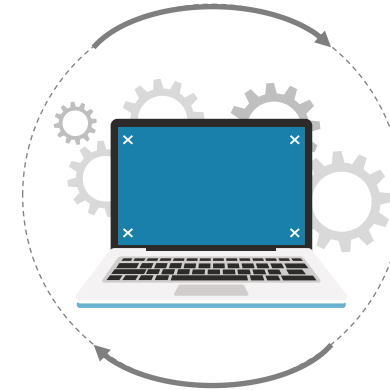


Two main tenets of product training and support



Robust product support and maintenance services

- Product support and maintenance are very important for a smooth journey experience and hence, enterprises should look for an IDP vendor that offers robust and continuous product & maintenance support
- Uniform product update/release cycles and maintenance services help enterprises avoid/minimize challenges with their deployments, especially when IDP is being used for multiple processes. An enterprise's IT and operations department should not be burdened with issues resulting from inadequate product support, but rather be assisted to ensure the most efficient use of limited resources



Easy access to comprehensive product training

- Since the market is in an early stage, most vendors provide in-person or classroom training to enterprises, but some vendors have started to offer online training courses
- Self-paced online training courses with robust training documentation that can be downloaded and viewed offline allow enterprises to accelerate their learning curve & usage, and hence should be considered while selecting an IDP vendor
- Many vendors are also developing online community ecosystems where users can interact with each other for brainstorming and troubleshooting. Platforms may also come with embedded help tools to help learn on the job






Selecting best-fit enterprise grade solution

Commercial models



One-time fee

The IDP vendor or the System Integrator (SI) charges a one-time implementation fee that covers integrating the solution with the client's existing system, training the software, and providing implementation support

Subscription-based pricing models		
	Volume-based licensing	Enterprises pay on a monthly or annual basis, depending on the volume and complexity of the documents. This may be on a per page or per document basis
	Per-process-based model	Enterprises pay on a per-process or per-case basis, irrespective of the number of pages processed in the use case. The price of the use case depends on various factors such as complexity
	Fixed-fee model	Each installation is licensed monthly/annually to operate on a single machine, irrespective of the number of documents/processes handled by the IDP product. This makes it cost-effective for some enterprises
Progressive pricing model		
	Outcome-based pricing	Mutually-agreed pricing based on the quality of output or outcomes (e.g., minimum STP rate or accuracy rate), typically observed when IDP solutions are included as part of the broader BPS/IT contracts
Perpetual pricing model		
	One-time fee model	This requires enterprises to pay a one-time upfront fee to purchase a perpetual license and an annual maintenance fee. While it might result in higher savings in the long run, an increasing need for flexibility to scale has driven down the adoption of this model

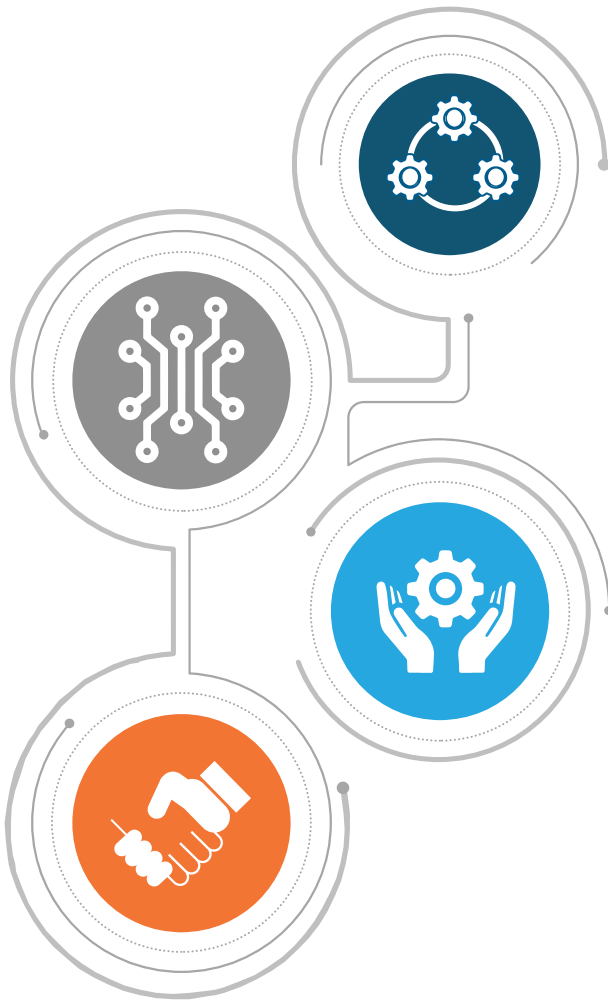
While assessing an IDP vendor, enterprises should consider the vendor’s investment and product roadmap to ensure a smooth journey in the future



Vendor’s investments and product roadmap

Technology
Enterprises should consider IDP vendor’s future investments in the solution/technology such as NLP & other cognitive capabilities and assess whether it aligns with their objectives

Technology partnerships
IDP vendors that have technology partnerships with best-in-class intelligent automation solution providers help enterprises in their automation journey



Processes and use cases
Knowing the processes, document types, and data types for which data can be extracted in the future, is an important factor while selecting an IDP partner. Enterprises should also consider the roadmap for pre-built solutions, additional languages supported, etc.

Training & support
Future roadmap of training & support for new use cases, product upgrades, etc., are essential to continue a smooth journey in the future

05

Challenges and best practices

- Challenges
- Best practices
 - Talent management
 - Change management
 - Preparedness and performance monitoring
 - Governance and expectations alignment
 - Data availability
 - Role of CoE
- Case study

Challenges



Availability of data for training

- Some processes require large volumes of sample data to train the solution to attain the desired accuracy levels
- Creating a repository of previous data and preparing it for training is a task in itself, which sometimes hampers smooth adoption of IDP solutions
- Training algorithms depends not only on the volume of data, but also the associated structured values for training purpose. These factors significantly affect the training approach. Variance mix of data and resolution of images received for training purposes impacts the accuracy level of solutions at production



Internal resistance

- Resistance in acceptance & adoption of AI and related digital transformation initiatives
- Resistance from operations team for a new solution
- Buy-in of all teams is necessary for successful implementation



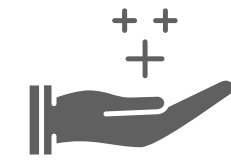
Lack of understanding of IDP solution

- Buyers' lack of understanding of AI technologies and how they solve business problems
- Enterprises' inability to distinguish between IDP and OCR-/template-based solutions



Expectation mismatch

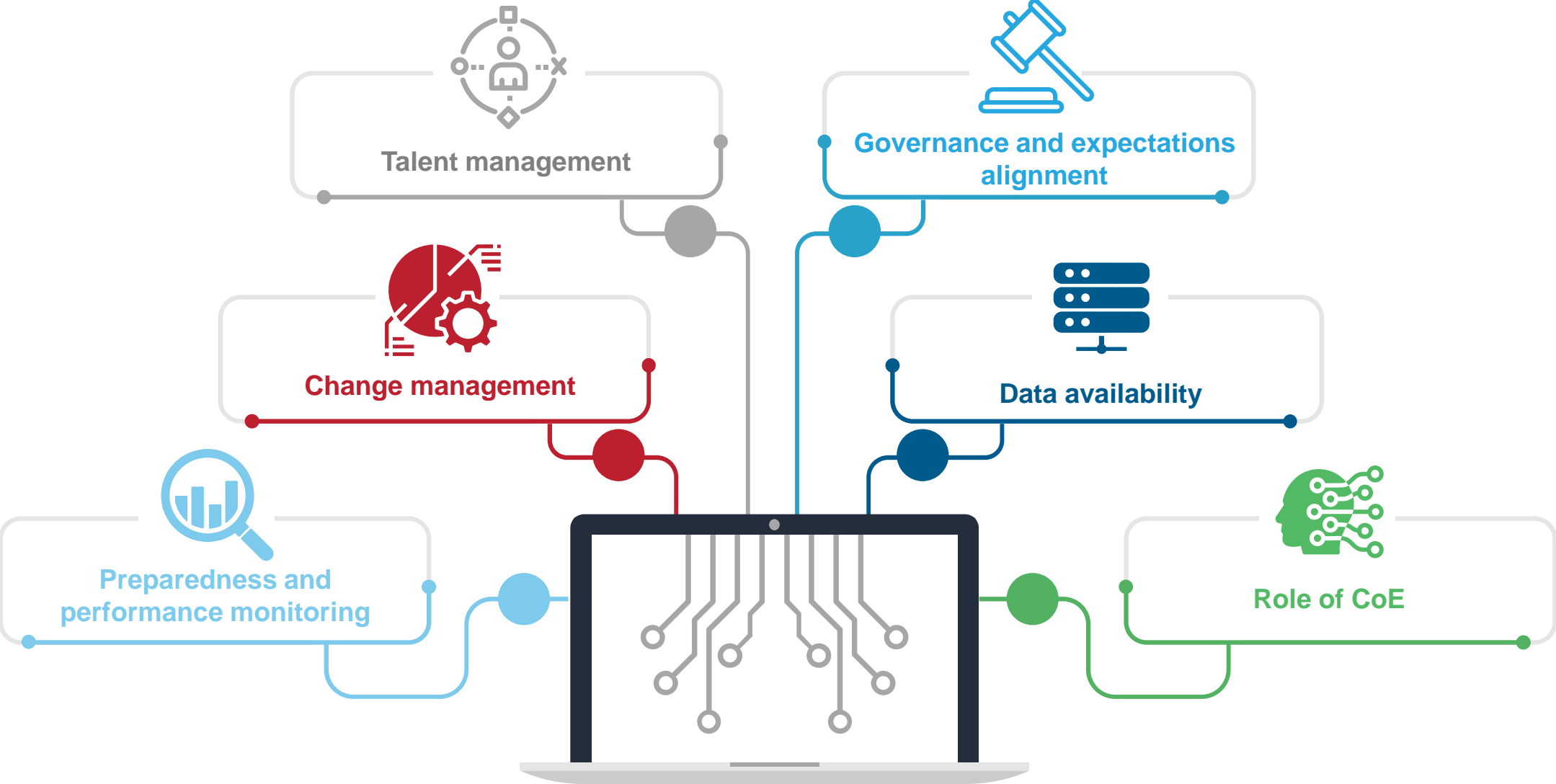
Successful implementation of IDP solutions depends on the complexity of use cases. Enterprises, especially business users, sometimes expect unrealistic ROI from IDP solutions due to their lack of understanding of ML-based solutions and the hype in the market. Hence, the scope of project and expectations should be clearly defined upfront



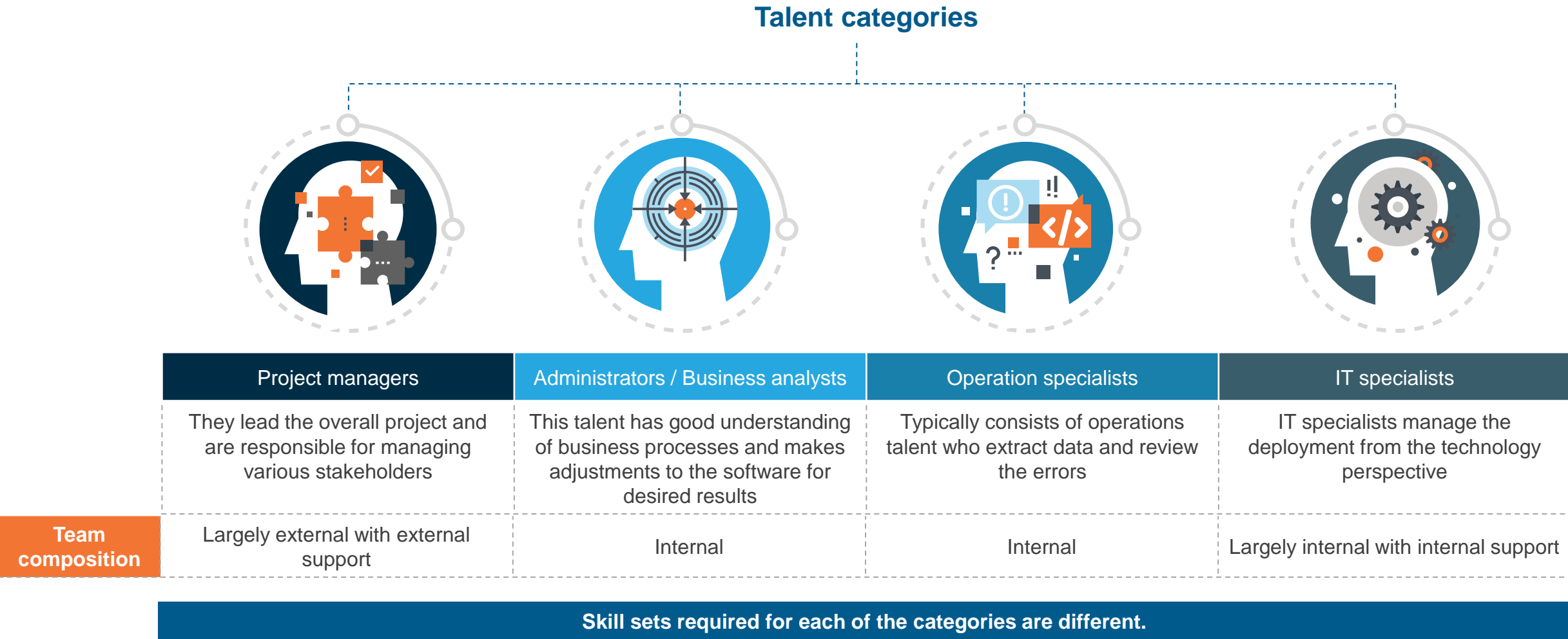
Difficulty in estimating total benefits

It is difficult for enterprises to estimate the overall benefits to develop a business case due to various factors such as variability in training and human-in-the-loop construct

Best practices



Best practices | talent management (page 1 of 2)
Types of talent categories required for successful IDP implementation



Best practices | talent management (page 2 of 2)

Training and development



Creating awareness around capabilities & benefits of IDP solution

- Initial orientation of project managers and administrators/BAs to understand IDP solutions and how ML can increase efficiency helps in aligning the talent to the change
- Better awareness helps in engaging business resources better in automation initiatives



In-depth classroom/online training on the software

- Conducting dedicated training via classroom or online sessions for administrators / business analysts and operation specialists to provide them hands-on training on IDP solution is a very effective way to transition existing talent to get used to IDP solutions
- It takes two to four weeks to train employees on the IDP solution so that they can start using it themselves

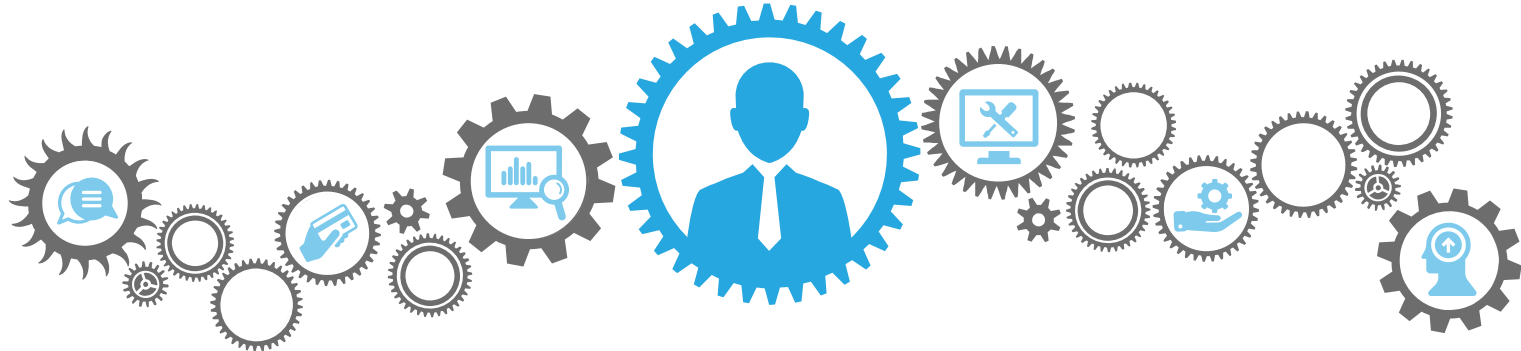


Support forum and help guides

Online support forum and help guides are useful for business analysts and operations specialists for quick resolution of their queries

Best practices | change management (page 1 of 2)

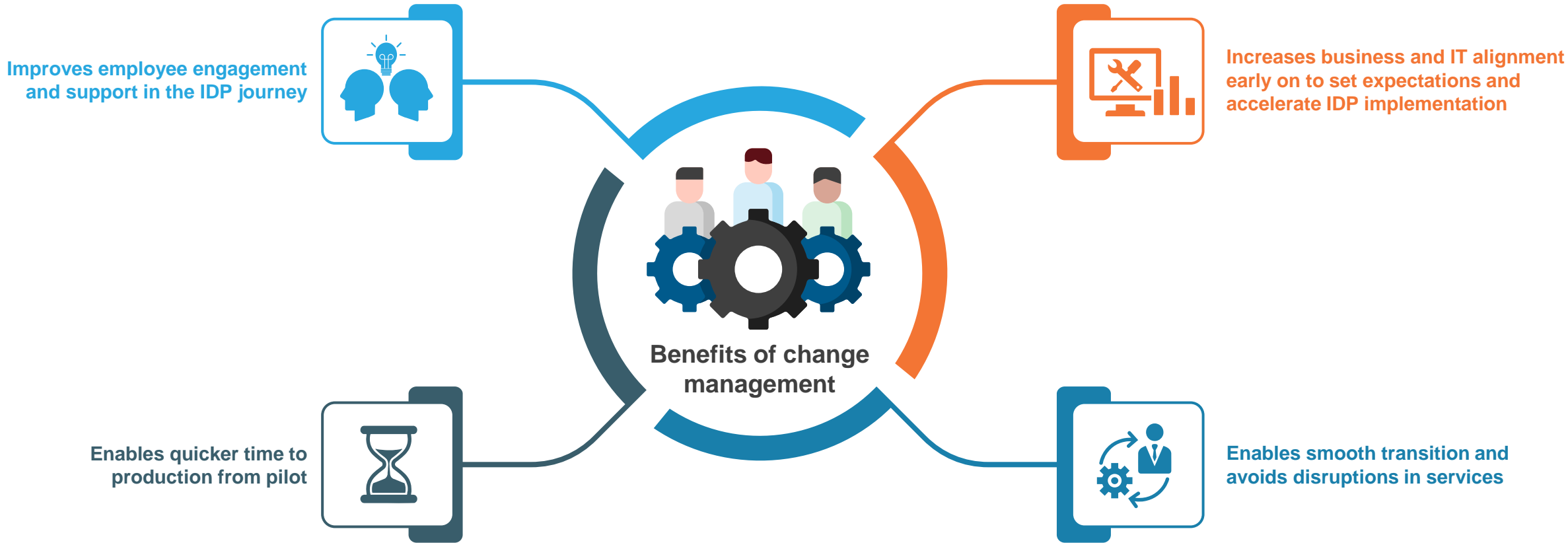
Key factors in a change management program



Communication	Getting buy-in from executive management & other support teams	Setting up robust metrics to monitor impact of IDP	Alignment between IT and business functions	Process ownership	Training programs (reskilling and upskilling)
Communication should follow a two-pronged approach – one from the top management indicating organization-wide initiatives and other being tailored and personal to improve involvement of end users in the IDP journey	<ul style="list-style-type: none">• Strategic focus and executive backing lend direction to the IDP journey• Low or late buy-in from executive management may slow the implementation process. Thus, gaining key stakeholders’ support is critical	<ul style="list-style-type: none">• One of the important parameters in determining the success of IDP lies in continuously evaluating its performance• Identify and redefine existing metrics to continuously monitor and measure impact of IDP initiatives	<ul style="list-style-type: none">• Challenges arise when the IT teams and business functions are not aligned on objectives/expectations• Clear alignment between IT and business right from the start and proper division of responsibilities between business and IT teams leads to a smooth IDP journey	<ul style="list-style-type: none">• Change or confusion in management may lead to a delay in the transformation• Process ownership and drive by management generates support and push for employees to take the transformation journey seriously	<ul style="list-style-type: none">• Training resources to operate with IDP by educating them on usage of IDP solutions and associated benefits is critical• Identifying the impact of IDP implementation on existing resources and planning an alternate path for impacted resources through reskilling / upskilling is essential

Best practices | change management (page 2 of 2)

Robust change management is important for a smooth journey and faster implementation

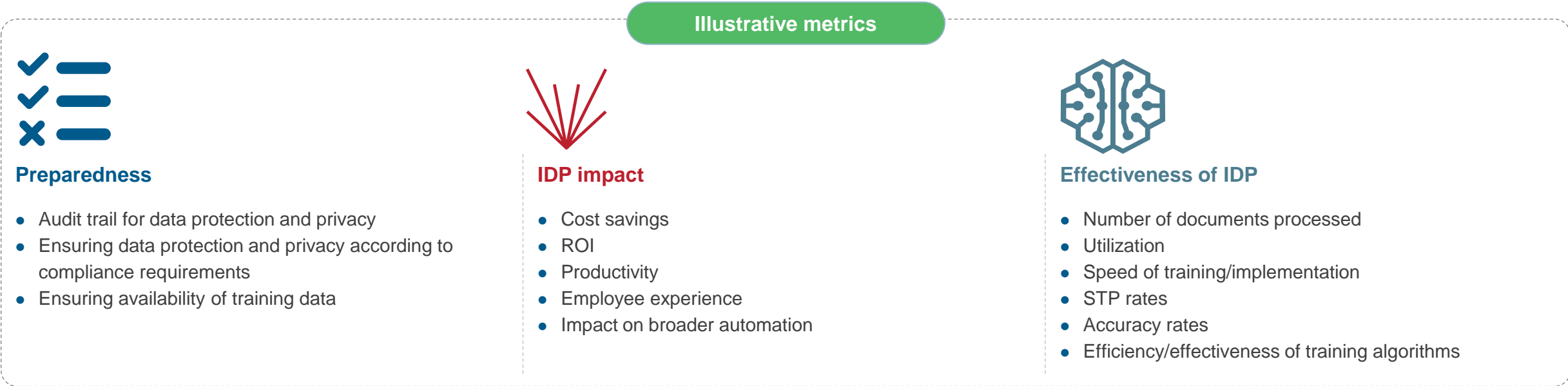


Best practices | preparedness and performance monitoring

Preparing data environment, identifying, or revamping the existing KPIs or metrics are essential to ensure a successful IDP journey

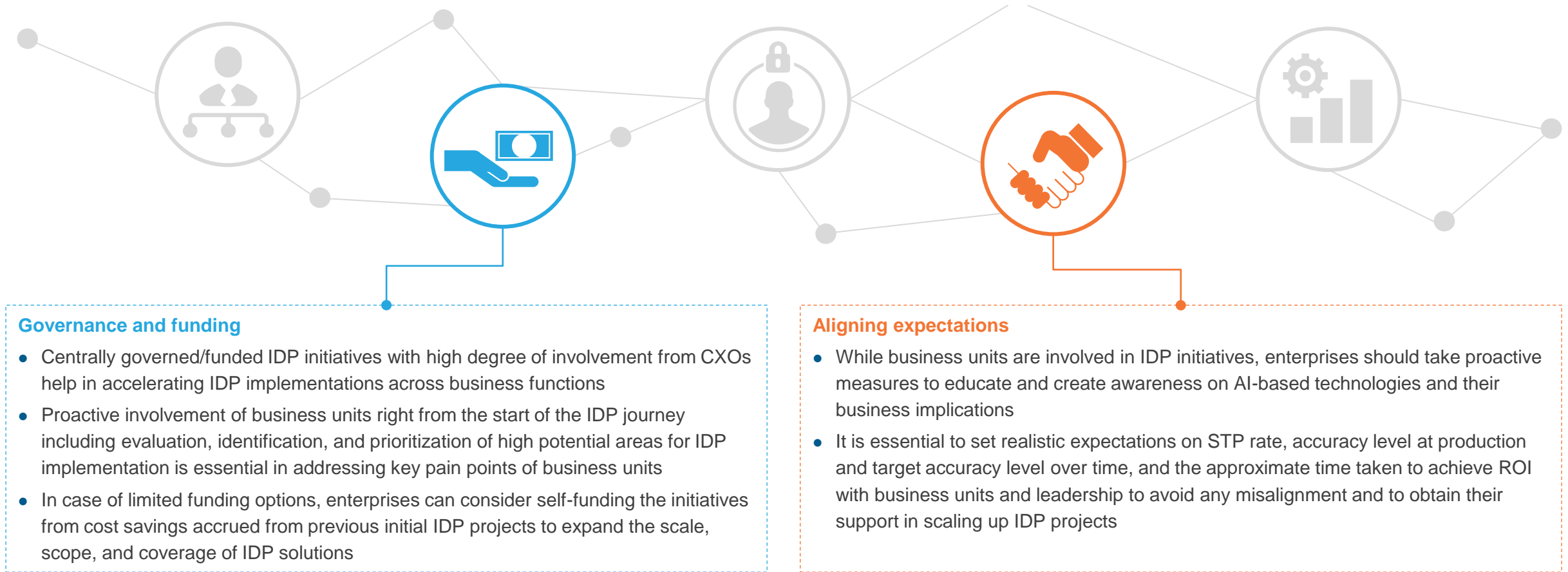
Preparedness and performance monitoring

- Proactively identify and define KPIs to measure and monitor effectiveness and impact of IDP solutions
- Continuously monitor and revise KPIs and raise the bar to increase ROI from IDP measures
- Enterprises should take measures to collect and centrally manage all relevant documents and data required for training purposes

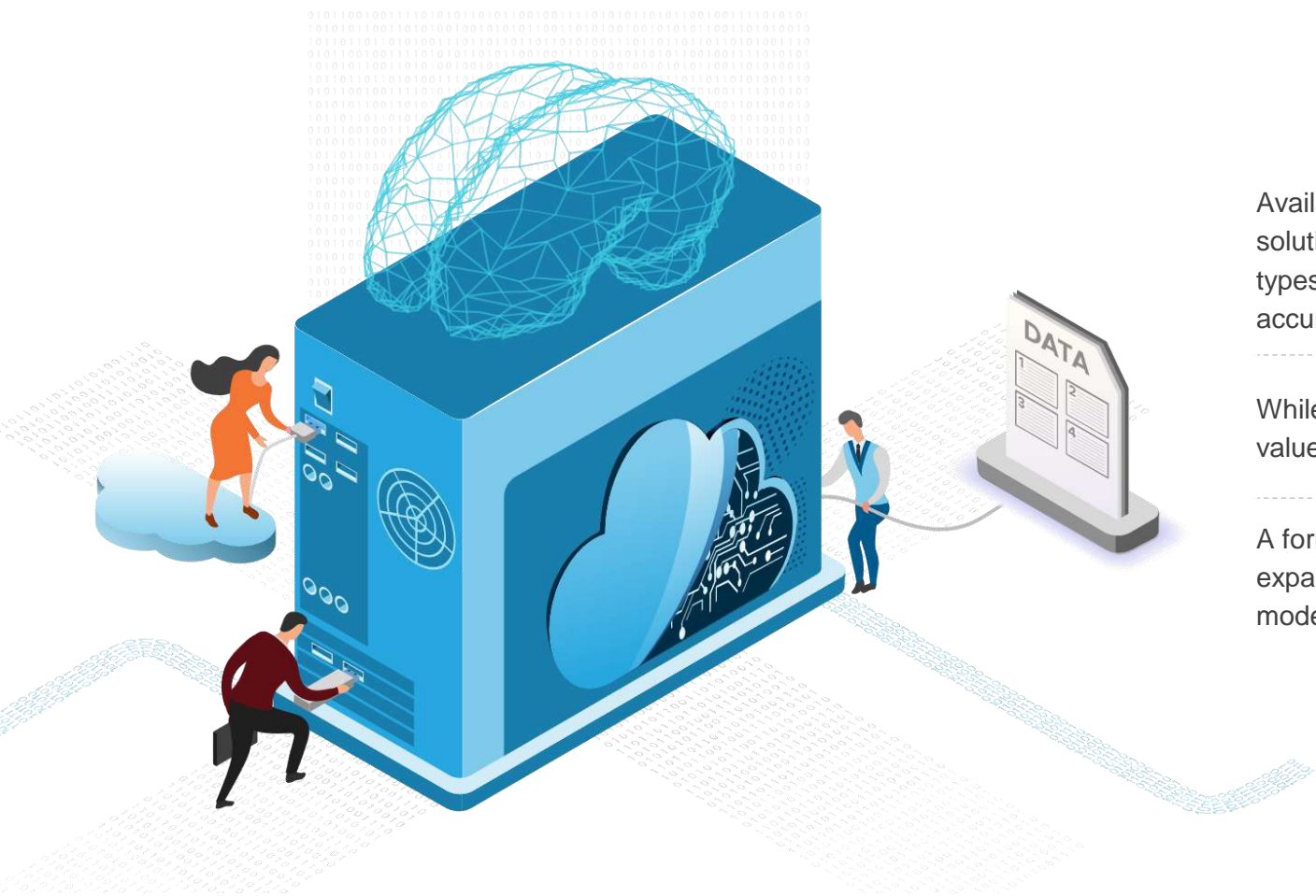


Best practices | governance and expectations alignment

Well-structured governance and funding mechanisms and aligning with business units on expectations from IDP initiatives play a key role in the success of an enterprise's IDP journey



Best practices | data availability



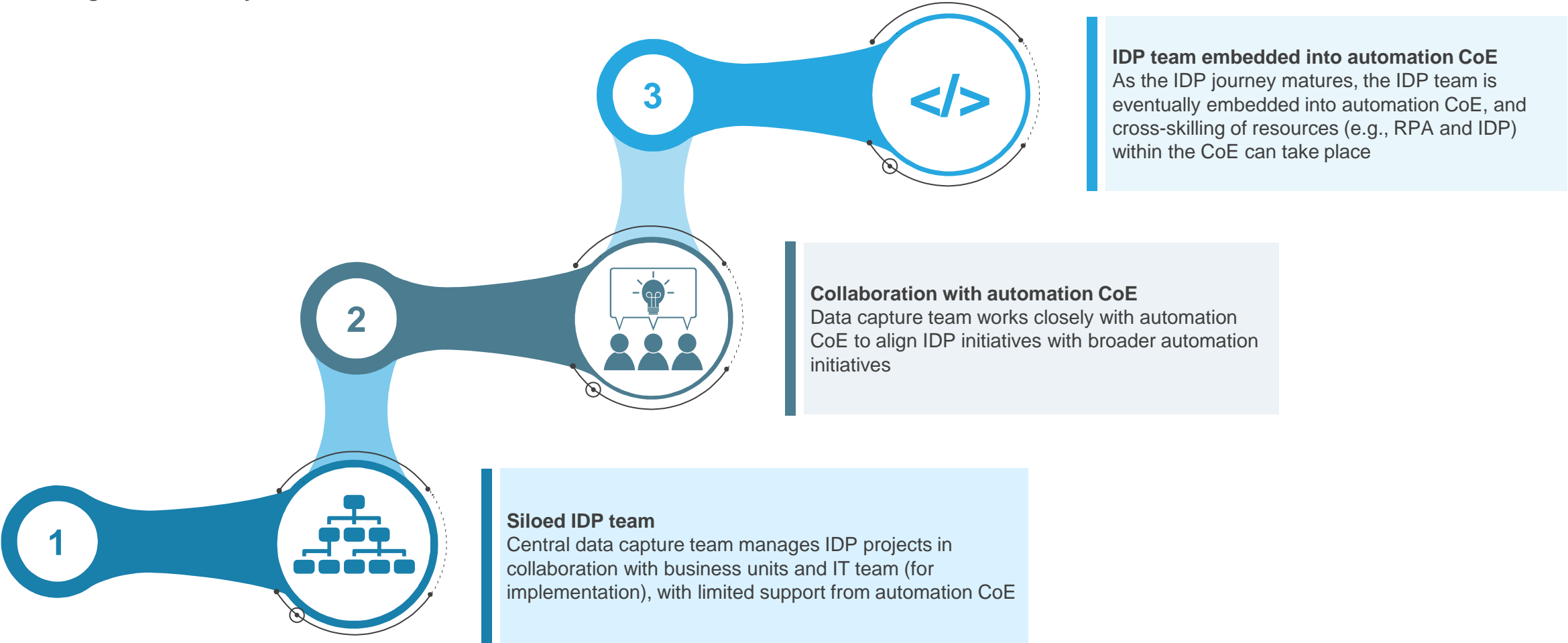
Availability of training documents is key to derive the maximum benefits from IDP solutions. Historical documents, representing most of the variations in document types encountered in operations, are essential to train the model to achieve better accuracy at productionx

While volume and variations are important, availability of corresponding structured values for the sample documents are also essential in training the model

A formal and well-structured centralized data management practice will help to expand the scope and scale quickly, as documents can be used for training the model for other use cases

Best practices | role of CoE

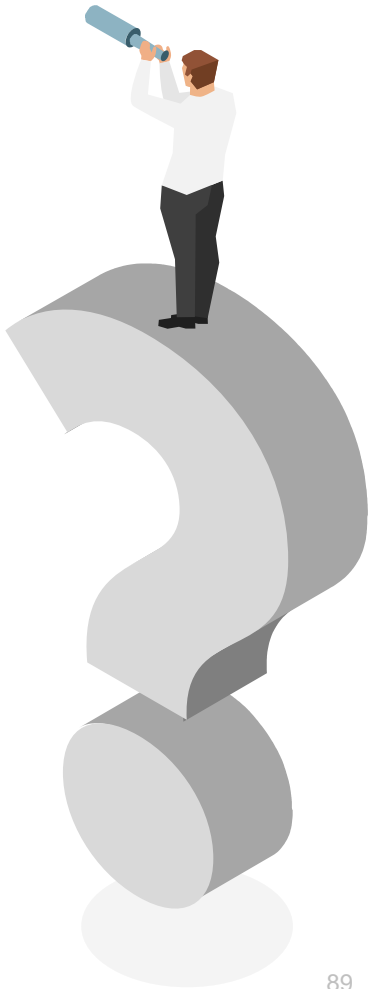
Increasing level of maturity



Best practices | role of CoE

The why and how of setting up a CoE

When is a CoE set up and why is it needed?	What services does a CoE offer?	How should a CoE be set up?
<ul style="list-style-type: none">• A CoE provides a strong centralized structure and governance for IDP-related aspects within various departments, ensuring strategic connections with all the stakeholders involved, providing a forum to share resources and discuss some of the challenges and best practices• It encourages use of existing extraction and classification models, prevents inconsistency of the content created, and ensures standardization of the processes. It identifies and reduces duplication of effort across initiatives within the enterprise, thus further improving ROI• It is beneficial to set up a CoE during scaling up when there are numerous processes for which IDP is being used, the number of document types is large, and when more than one Business Unit (BU) of the organization is involved	<ul style="list-style-type: none">• CoE is typically responsible for maintaining development standards and proven practices and trends, and for centralizing resources• It can track, measure, and report performance of key metrics, essential while comparing developments and deficiencies in adopting IDP across business units/functions. This could also help in demonstrating success of the IDP initiative to the upper management or C-level executives• CoE can also play a role in identifying opportunities for IDP implementation within the organization and help drive those initiatives to completion• It also helps in governance, value management, training, education, and spreading awareness of IDP, its benefits, and success stories	<ul style="list-style-type: none">• The current maturity of CoEs: Many enterprises are in the piloting phase and do not have a dedicated CoE for intelligent automation operations. There is a model wherein the IDP teams / Subject Matter Experts (SMEs) from individual business units collaborate to establish certain standards and lead IDP initiatives – typically in a reactive fashion• CoE structure for organizations that are ahead in IDP maturity:<ul style="list-style-type: none">– Centralized CoE operations: CoE operates out of a central location. This team is responsible for the program governance and leads IDP initiatives for the entire organization– Hub and spoke model: The hub / central team is responsible for all the strategic activities and governance. The dedicated IDP teams / SMEs within individual business units, act as spokes, and are responsible for carrying out operations for the respective BUs (contextualized to the BU)



Best practices | role of CoE

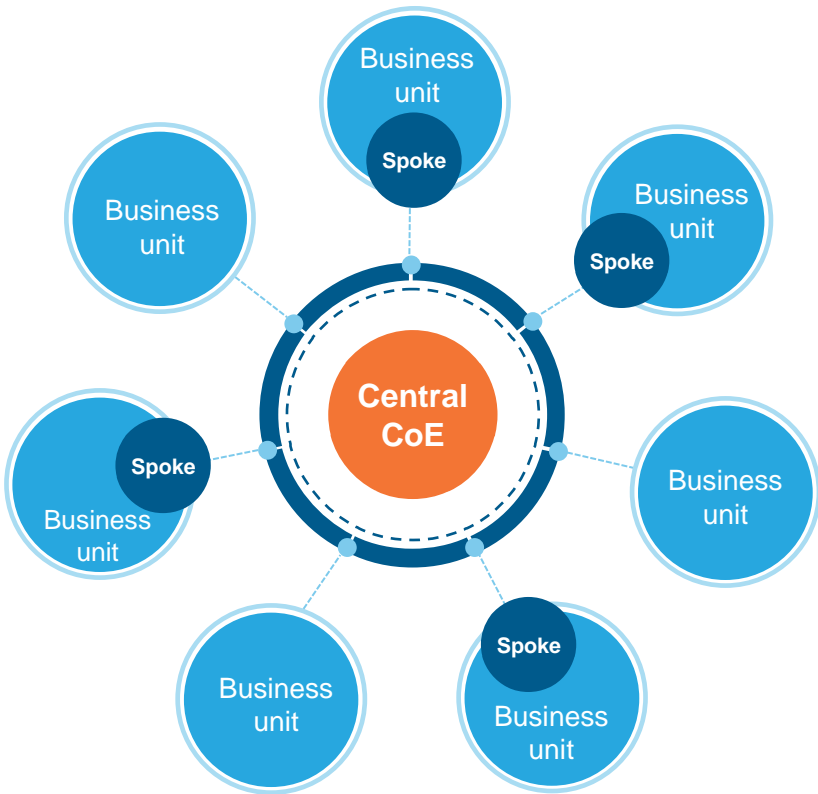
There are different CoE models adopted by enterprises that are well ahead in IDP maturity, the most common of which are centralized and hub & spoke

Centralized CoE model



The centralized CoE handles all the strategic and operational functions for all the IDP initiatives across the organization

Hub & spoke CoE model



The central hub handles the strategic functions. The spokes are IDP teams that are aligned to individual BUs to handle operational functions

Best practices | role of CoE

While centralized CoE offers strong governance and standardization, the hub & spoke CoE model provides greater local knowledge and specialization

Centralized CoE	The hub and spoke CoE model
Advantages	
<ul style="list-style-type: none">• The centralized CoE can liaise with various corporate functions and involves the relevant stakeholders to create the organization’s IDP capabilities• It can maximize adherence to corporate IDP policies, governance, and management reporting by having all the staff under one roof and following the required procedures• There will be stronger coordination and communication between strategic and operational activities such as adding new document types, training, and testing models for various IDP initiatives• It can result in cost efficiency, with only one center to run and manage	<ul style="list-style-type: none">• The central hub will play a role in creating the core IDP capabilities and governance mechanism at the corporate level, which the spokes can leverage to operationalize IDP in their respective BUs• The spokes can develop new use cases for IDP, complemented with their local or functional knowledge• The spokes can develop new IDP use cases in adherence with local policies and procedures and can specialize in deploying models that are applicable only in their respective BUs• For non-specialized IDP use cases, resources can be pooled/shared and run from the central hub
Considerations	
<ul style="list-style-type: none">• A centralized CoE can become too rigid in its pursuit of adherence to policies and procedures• It can become too inward-looking and miss out on new IDP opportunities or business innovation• Sometimes, it can become too remote from BUs to fully understand their needs and differences	<ul style="list-style-type: none">• Availability of IDP talent may be limited in certain BUs• May be more challenging to standardize policies• Greater effort is required to manage ongoing communications, training, and policy updates• There may be duplication of knowledge, which can minimize the benefits of the shared mode

Case study | University of Southern California

A leading university is leveraging IDP to improve operational efficiency

Overview

University of Southern California, a leading private research university based in Los Angeles, California, carried out a self-assessment study to determine the different areas where AI can be leveraged to further streamline its operations. The USC Business Services department, which was already in the process of implementing a new financial management system, was identified as a potential area to implement an IDP solution to digitize and automate its invoice intake process.

The department receives over 300,000 invoices in a year with over 10,000 a week during peak volume, of which about half have to be processed manually before being passed on to downstream applications for further processing. Furthermore, the university has a wide base of over 25,000 vendors because of which it receives invoices in a variety of styles ranging from scanned images to documents with handwritten text. The university decided to partner with AntWorks for its IDP platform to minimize manual intervention in invoice processing, reduce errors and turnaround time, and make faster payments to its vendors, while freeing up its employees' time for higher value work.

Challenges	Benefits
<ul style="list-style-type: none">• The department had previously tried to implement a different IDP solution, however, the initiative failed as the solution was unable to scale up and cater to the volumes required• Due to the rigidity of the downstream financial management solution, several customizations needed to be made to the IDP solution to accommodate downstream requirements• Over 3000 campus staff had to be educated on the best practices to adopt while sending invoices such as not writing on top of the invoices and maintaining scan quality	<ul style="list-style-type: none">• The IDP solution has been able to extract information from various invoice types including handwritten text with reasonable accuracy, thus considerably reducing human intervention• The solution was deployed on the university's private cloud, thus easing the security and compliance requirements while speeding up the implementation time• With the initial learnings and successes, the university plans to expand adoption of IDP as well as RPA to address more use cases such as legal contracts and cardholder agreements

Learnings / winning insights
<ul style="list-style-type: none">• Be clear with the requirements and expectations from the IDP solution. Ensure that requirements in terms of solution scalability are also adequately addressed during the POC• Build clarity on the requirements of downstream systems early on to ensure a smooth integration with the IDP solution• Having control over input image quality has a significant impact on the accuracy level of extraction. Educate relevant stakeholders on best practices to adopt while sending documents• During implementation, having separate environments for development, testing, and production ensures that any changes in development do not slow down the testing process and overall implementation of the solution

06

Future outlook

Outlook for 2021-22 (page 1 of 2)

Accelerated demand post recovery

- The IDP technology vendor market was negatively affected due to the COVID-19 crisis. However, as the economy recovers, the IDP market is experiencing accelerated demand, driven by increasing need for enterprises to adopt automation solutions for processing large volumes of semi-structured and unstructured documents with greater accuracy and speed
- Greater awareness about the prevalent use cases has paved the way for broader adoption of IDP solutions

Adoption by industries

- Industries, such as manufacturing as well as travel and logistics, which were severely affected due to the COVID-19 crisis, are expected to post lower growth of IDP adoption in the near-to-medium term
- Accelerated adoption of IDP solutions is expected in industries such as healthcare, telecom, and government & public sector, that have been able to recover relatively faster

Go-to-market strategy

- IDP vendors are expected to offer more out-of-the-box, pre-trained IDP solutions to meet the demand for faster ROI and quicker deployment
- Progressive pricing models, such as outcome-based pricing based on STP rates, will become more prevalent as the enterprises are likely to demand flexible and progressive pricing options with smaller upfront outlays
- Given the prevalence of remote work, more IDP vendors are expected to offer online support for training and user guidance through embedded help tools, detailed manuals, and user communities



Outlook for 2021-22 (page 2 of 2)

Increase in partnerships

- As the demand for end-to-end automation solutions goes up, partnerships among RPA, IDP, and process mining vendors to provide integrated solutions to their clients are expected to rise
- Increase in the number of strategic partnerships of IDP vendors with service providers and system integrators for services such as reselling, training, consulting, and implementation is expected

Technology trends

- The COVID-19 crisis has led to more openness among enterprises to adopt cloud-based services, including the private cloud deployment option, which is expected to grow further
- NLP technology in IDP solutions is expected to get more advanced to address complex unstructured document use cases, which may include understanding running text, context, and sentiments, consolidating the extracted data, and mapping the extracted fields to a defined taxonomy
- IDP solutions are expected to provide greater control and configurability in terms of enterprise-grade features such as configuration & set-up GUI, review GUI, workbench for IT users, and analytics dashboard
- Advances in the mobile IDP technology are expected to pick up
- Availability of multi-language support for extraction and user interface is expected to increase with greater adoption of IDP solutions
- Further innovation and continuous development is expected on core AI technology, including greater use of GANs, weak supervision, and transfer learning, to make the AI pieces more efficient

Mergers and acquisitions

The market may undergo an accelerated consolidation phase with mergers and acquisitions taking place amongst various providers



07

Appendix

- Enterprise IDP capability maturity model
 - Environmental determinants
 - Variance in execution path steps for organizations by environmental determinants
 - Glossary of terms
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Enterprise IDP CMM

Vision & strategy



Capability elements	Basic	Typical	Advanced	Pinnacle
Primary drivers of IDP adoption	Business case focused on generating quick cost savings	Business case focused on increasing workforce productivity, efficiency, and quality along with generating cost savings	Business case is focused on improving governance & compliance along with increasing productivity, efficiency, quality, and business resilience, as well as generating cost savings	Business case focused on employee experience, disrupting business model with holistic and futuristic view of digital landscape evolution along with improving governance & compliance, employee experience, efficiency, quality, and business resilience, as well as generating cost savings
Funding/ sponsorship	Primarily sponsored/funded by local/regional business unit budget	Primarily sponsored/ funded by the global shared services budget	Primarily funded by global business function's budget	Primarily funded by the central enterprise budget; sponsorship from CXO
Project initiation	Siloed approach with no CoE support; mostly initiated by imaging / data capture team	Projects are initiated by local/regional business units with limited support from automation CoE	Projects are initiated by global business functions OR global shared services; multi-pronged approach with substantial support from the automation CoE	Projects are initiated by corporate OR global business functions OR global shared services; multi-pronged approach with robust CoE support

Enterprise IDP CMM

Vision & strategy



Capability elements	Basic	Typical	Advanced	Pinnacle
Security and risk preparedness for IDP	No major changes made to security and risk policies and worked around existing ones to accommodate changes required for IDP	Some changes to security and risk policies were made to accommodate IDP environments and scenarios	Proactively evaluated and planned for mitigation of security and compliance risks associated with IDP and associated AI deployments; set up unique risk management protocols and controls for IDP and AI deployments	Included security and risk leaders in IDP projects to proactively evaluate and plan for mitigation of security and compliance risks and unique requirements essential for IDP and associated AI deployments; set up unique risk management protocols and controls for IDP and associated AI deployments
Targeted document types for IDP adoption	Template-based documents (data in pre-defined template)	Template-based documents and documents with significant semi-structured data with limited variations	Template-based high volume documents and documents with significant semi-structured data with high variations	Template-based high volume documents and significant unstructured data (large multi-page documents such as legal contracts, low quality images, checks, and handwritten documents)

Enterprise IDP CMM

Vision & strategy



Capability elements	Basic	Typical	Advanced	Pinnacle
Metrics and KPIs for measuring benefits/impact of IDP (such as cost savings, ROI, speed, productivity, accuracy, compliance, and employee experience)	The organization currently does not use any well-defined metrics to measure returns from IDP investments; metrics used are ad hoc, poorly controlled, and reactive/chaotic	The organization has defined some basic cost and efficiency metrics along with existing IT metrics, which are repeatable in projects to measure returns from IDP investments	The organization has defined new metrics (employee experience, productivity, and speed) along with basic cost and efficiency metrics and existing IT metrics, which are repeatable in projects; the metrics are standardized across the organization to track the returns on IDP investments	The organization has defined new metrics (employee experience, speed, productivity, efficiency, cost, etc.) that are standardized across the organization and continuously optimizes the metrics to measure impact of IDP investments in near real time
Metrics and KPIs for measuring the effectiveness of IDP initiatives (such as accuracy rate, speed of configuration/ implementation, STP rate, time taken to process a document, and number of documents processed)	The organization currently does not use any well-defined metrics to measure effectiveness of IDP initiatives; metrics used are ad hoc, poorly controlled, and reactive/chaotic	The organization uses some basic metrics such as number of documents processed along with existing IT metrics, that are repeatable in projects, to measure the effectiveness of IDP initiatives	The organization has defined a series of new metrics such as speed of configuration/ implementation, STP rate, time taken to process a document, number of documents processed that are standardized across the organization to track and measure the effectiveness of IDP initiatives as well as defined policies, procedures, and practices driven by flexibility to accommodate unique aspects of different business units	The organization has defined new metrics (speed of configuration/ implementation, efficiency of pre-trained algorithms, etc.) that are standardized across the organization; continuously optimizes the defined metrics, policies, procedures, and practices, to measure the impact of IDP investments and share best practices across different business units

Enterprise IDP CMM

Organization structure



Capability elements	Basic	Typical	Advanced	Pinnacle
IDP team structure	No dedicated IDP team within the organization; largely handled by existing imaging / data capture	Decentralized structure; each business unit forms a dedicated team for IDP initiatives leveraging both existing imaging / data capture team and additional skill sets	Centralized dedicated IDP team that defines and implements IDP initiatives for the entire organization	IDP team embedded in automation CoE that can either be centralized or decentralized (hub & spoke model) to cross leverage skill sets to implement IDP initiatives
Scope of automation CoE	Less than 30% of IDP projects are governed by the CoE	Around 30-60% of the IDP projects are governed by the CoE	Around 60-80% of the IDP projects are governed by the CoE	More than 80% of the IDP projects are governed by the CoE
Primary use of performance data	Monitoring performance of IDP applications	Monitors performance of IDP applications; refines the model to improve accuracy	Monitors staff productivity along with performance of IDP applications locally to find gaps in existing processes to optimize and streamline them to increase efficiency	Analyzes performance data centrally to identify gaps in existing algorithms and proactively refine the model across business functions / regions to improve accuracy and STP rates
Focus on tracking/optimizing effectiveness and benefits achieved	Collection and usage of performance and impact data are ad hoc, sporadic, and uncoordinated	Performance and impact data is collected periodically (quarterly) to produce reports and dashboards to gain new insights that improve operational efficiency	Performance and impact data is collected periodically (monthly) to produce reports and dashboards to gain new insights that improve operational efficiency and enhance efficacy of training algorithms	Performance and impact data is regularly collected/monitored weekly and used in a coordinated fashion to make operational decisions

Enterprise IDP CMM

Organization structure



Capability elements	Basic	Typical	Advanced	Pinnacle
Roles and responsibilities of the CoE	Drive the roll-out and implementation of IDP projects and ensure coordinated communication with relevant stakeholders; loosely defined roles, responsibilities, and skill sets required	Ensuring quality and compliance through well-defined standards, procedures, and guidelines, owned and developed by the CoE for broader digital initiatives; drive the roll-out and implementation of IDP projects and ensure coordinated communication with relevant stakeholders; some key roles and responsibilities are well-defined	Approves all IDP procedures before they are put into deployment, assesses suitability of IDP vs. other document processing tools for use cases, and ensures quality and compliance through well-defined standards, procedures, and guidelines, owned and developed by the CoE for broader digital initiatives; drives the roll-out and implementation of IDP projects and ensures coordinated communication with relevant stakeholders; well-defined roles, responsibilities, and skill sets required	Cross-leverage of automation/AI training and education program to develop talent for IDP initiatives; approves all IDP procedures before they are put into deployment, assesses suitability of IDP vs. other document processing tools for use cases, and ensures quality and compliance through well-defined standards, procedures, and guidelines owned and developed by the CoE. Drives the roll-out and implementation of IDP projects and ensures coordinated communication with relevant stakeholders; well-defined roles, responsibilities, and skill sets required that are regularly reviewed and optimized
Reusability of models	No reusable models	Reusability of models is limited to business units	Reusability of models across business units and geographies	Reusability of models across business units, geographies, and similar document types (through transfer learning)

Enterprise IDP CMM

Organization structure



Capability elements	Basic	Typical	Advanced	Pinnacle
Level of employee engagement	Few people proactively engaging in some of the IDP initiatives	More believers who engage in IDP initiatives	Organization-wide employee engagement; some internal experts to facilitate engagement; developing a culture of innovation and design thinking	IDP initiatives are recognized as an integral component of the broader digital strategy (automation/AI); rewards system for contribution; Integrated culture for design thinking and innovation
Nature of impact on employees	No attempt to redeploy/reskill/upskill employees released due to IDP initiatives	Modest attempts made to redeploy employees released due to IDP initiatives in other areas (such as minimal investment and management commitment)	Significant attempts made to reskill and redeploy employees released due to IDP initiatives by providing alternate career paths (for example, education program set up for reskilling)	Significant attempts made to reskill/upskill employees released due to IDP initiatives to do higher value work and provide alternate career paths in broader automation initiatives (for example, education program set up for reskilling and upskilling)

Enterprise IDP CMM

Technology



Capability elements	Basic	Typical	Advanced	Pinnacle
Software learning	No training data sets are generated from manual review	Automatic generation of training batches during manual review; automatic feeding of data sets into the system for training	Automatic generation of training batches during manual review along with feature for enterprise users to approve training sets to improve accuracy	Automatic generation of training batches during manual review along with feature for enterprise users to approve training sets to improve accuracy; approval mechanism at admin level as well
Classification of documents	Do not have the ability to automatically classify documents	Ability to identify discrete documents with low accuracy, leveraging basic statistical approach	Ability to identify discrete documents with medium accuracy, leveraging basic ML-based approach	Ability to identify discrete documents and different pages within a stream of documents with high accuracy, leveraging advanced neural networks
Flexibility with ML algorithms	One fixed pre-built ML algorithm for every use case / document type	Different pre-built ML algorithms for different use cases / document types	Different pre-built ML algorithms for different use cases / document types with an option for user to select the appropriate algorithm	Feature to recommend best ML algorithm to user to choose from different pre-built algorithms
Sophistication of document processing	Basic OCR for digitizing content	OCR- and ML-based; document classification, data capture, and extraction using machine learning and validation	OCR, auto ML, and NLP; document classification, data capture, and extraction using real-time/active learning, auto ML, NLP, intent analysis, and validation	OCR, domain ontology, deep learning, auto ML, and NLP; document classification, data capture, and extraction using real-time/active learning, intent analysis, and validation

Enterprise IDP CMM

Technology



Capability elements	Basic	Typical	Advanced	Pinnacle
Complexity of data handled	Block letters (typed)	Block letters (typed) and tables	Block letters (typed or handwritten), checkboxes, bar codes, and logos	Block letters (typed or handwritten), checkboxes, bar codes, logos, stamps, charts, signatures, and cursive writing
Pre-built use cases	No pre-built use case	Simple use cases involving semi-structured data such as invoice processing, customer onboarding, and claims	Complex use cases involving unstructured data such as contracts, and legal documents	Use cases that involve extracting information from free-flowing text as well as NLG
Hosting type	Physical, desktop-based	On-premise, server-based	Private cloud-based, hybrid	Public cloud-based, hybrid
Ancillary technologies	Stand-alone IDP solution	IDP solution integrated with BPM tool and RPA	IDP solution integrated with BPM, RPA, and analytics	IDP solution integrated with BPM, RPA, analytics, and other AI solutions

Enterprise IDP CMM

Talent management



Capability elements	Basic	Typical	Advanced	Pinnacle
Sourcing of IDP talent	Leverage only vendor resources	Leverage vendor resources and existing data capture / imaging resources with proper training on IDP	Leverage vendor resources, existing data capture / imaging resources, and limited automation resources	Leverage broader automation resources by cross-skilling IDP and automation resources, enabling resourcing across automation initiatives as per the required bandwidth
IDP training and education	Basic initial IDP training by vendors	Well-structured IDP internal training program in addition to initial training by vendors; focused on implications of IDP	Integrated external and internal, well-structured training programs that are continuously reviewed and optimized	Well-structured IDP internal and external training programs that are integrated with broader automation training programs that are continuously reviewed and optimized








Enterprise IDP CMM

Implementation



Capability elements	Basic	Typical	Advanced	Pinnacle
Distribution of IDP projects by stage	Most of the IDP projects are in the planning stage	Most of the IDP projects are in the pilot stage	Most of the IDP projects are being scaled up from the pilot stage	Most of the IDP projects are in steady-state implementation stage
Scale of IDP adoption	Less than 10% of the viable documents leveraging IDP solutions	Around 10-30% of documents leveraging IDP solutions	Around 30-60% of documents leveraging IDP solutions	More than 60% of documents leveraging IDP solutions
Scope of IDP deployments across functions	One document categories	Two to four document categories	Five to eight document categories	More than eight document categories
Speed of IDP adoption	One IDP license per year on an average	Two to five IDP licenses per year on an average	Five to 10 IDP licenses per year on an average	More than 10 IDP licenses per year on an average

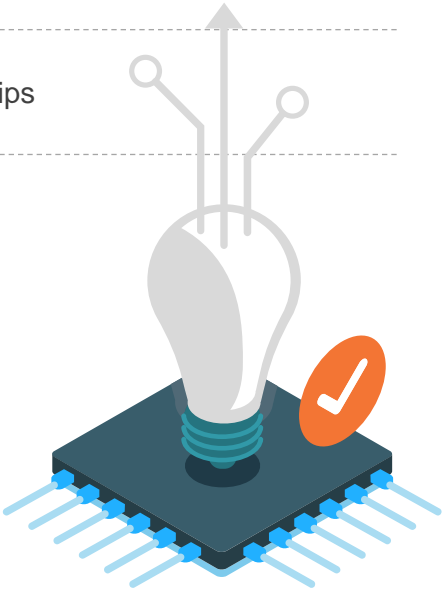
Environmental determinants

	Organization structure	Highly centralized, with some independent decision-making	Partially centralized with portions of decision-making federated to BUs	Largely federated decision-making – BUs have a large degree of freedom to make their own decisions
	People centrality	Highly people-centric organization – the overall culture is people driven rather than efficiency driven	Middle-ground organization with focus on people as assets, with efficiency also playing a role	Efficiency- and/or technology-driven organization
	Initiating stakeholder(s)	Operations-driven initiatives – driven by operations analysts trying to make their jobs easier	IT-driven initiatives with BU support	Centrally-driven, typically by the C-suite or one level below, with all BUs and IT falling in line
	Workforce location	Office-based workforce – FTEs working only from office locations	Hybrid – some FTEs working remotely while some working from office or FTEs working remotely as well as from office as required	Distributed workforce – FTEs working remotely
	Risk appetite	Low risk appetite – need to have multiple layers of checks and balances for any initiative	Medium risk appetite – willing to take risks in select scenarios, especially when dictated by the market	High risk appetite – willing to take risks in the hope of market leadership and payoff
	Existing automation partnerships	No existing automation partnerships	Medium risk appetite – willing to take risks in select scenarios, especially when dictated by the market	Existing partnerships with organizations that also play in the automation space
	Availability of training data	Documents are not maintained properly; few documents and associated values are available and accessible	Documents are managed properly; most of the documents are available, but the associated extracted values are not readily available	Documents are managed properly; most of the documents and associated extracted values are easily available and accessible

Variance in execution path steps for organizations by environmental determinants

Planning

Steps	Determinants	Path options
1 Identify and prioritize processes using the prioritization framework	<ul style="list-style-type: none">• Risk appetite• Current outcome and capability	<ul style="list-style-type: none">• Implement one process at a time• Implement logical groups of processes sequentially• Big bang implementation
2 Plan implementation timelines, governance, and skill development for IDP and reskilling affected employees	N/A	N/A
3a Obtain alignment with IT for IDP implementation	N/A	N/A
3b Obtain team buy-in, particularly impacted FTEs	People-centricity	<ul style="list-style-type: none">• Open communication with the team – affected and unaffected members• Selective communication to impacted employees• Minimal communication
4 Select appropriate vendor tool based on capabilities required to achieve the desired outcome	<ul style="list-style-type: none">• Existing automation partnerships• Risk appetite	<ul style="list-style-type: none">• Leverage existing relationships• Evaluate other vendors while leveraging existing relationships• Evaluate the entire vendor landscape afresh
5 Obtain management buy-in and budget	<ul style="list-style-type: none">• Organization structure• Initiating stakeholders	<ul style="list-style-type: none">• Buy-in and budget at BU level• Buy-in and budget at IT• Buy-in and budget at central level



Variance in execution path steps for organizations by environmental determinants

Piloting

Steps	Determinants	Path options
6a Initiate continuous communication as part of change management	<ul style="list-style-type: none"> • People-centricity • Initiating stakeholders 	<ul style="list-style-type: none"> • Low to no communication • Medium frequency of communication at BU level • Frequent communication driven by IT/central team
6b Initiate training of existing talent for IDP operations	NA	NA
6c Initiate governance mechanism	Risk appetite	<ul style="list-style-type: none"> • Minimal, ad hoc governance • Standard set of tracking for metrics • Comprehensive governance, including dashboards for measuring performance, speed, and accuracy
6d Initiate reskilling for displaced employees	People-centricity	<ul style="list-style-type: none"> • No reskilling/upskilling – impacted FTEs may be downsized or reassigned • Upskilling only for high-performing employees, rest reassigned/downsized • Reskilling/upskilling of all employees (all retained)
7 Develop pilot for the prioritized process	NA	NA
8 Obtain required data sets to train the tool	Availability of data	<ul style="list-style-type: none"> • Minimal training at production, with model learning during operations • Highly trained model starting with high level of accuracy at production
9 Cut to production with human supervision until IDP achieves the desired efficiency	<ul style="list-style-type: none"> • Availability of data • Risk appetite 	<ul style="list-style-type: none"> • Always employ a human in the loop • Employ a human in the loop only for verification of highly sensitive processes • Allow STP where possible, with only exceptions requiring human intervention
10 Continuously monitor and report on metrics/KPIs	NA	NA
11 Repeat journey with the next process in the priority list	NA	NA



Variance in execution path steps for organizations by environmental determinants

Scaling up

Steps	Determinants	Path options
12 Embed necessary skills in the automation CoE	<ul style="list-style-type: none">• Organization structure• Initiating stakeholders	<ul style="list-style-type: none">• Centralized talent pool for IDP managed by automation CoE• Decentralized talent pool for IDP with high degree of collaboration with automation CoE• Siloed talent pool for IDP collaborating with automation CoE on ad hoc basis
13a Scale up and run operations	NA	NA
13b Continuously monitor and report on metrics/KPIs	NA	NA
14a Set up a team to evaluate opportunities	Organization structure	<ul style="list-style-type: none">• Centrally nominated and controlled• Centrally controlled with nominations from business units• Truly cross-functional, nominally centralized
14b Templatize opportunity evaluation and processing	NA	NA



Variance in execution path steps for organizations by environmental determinants

Steady-state

Steps		Determinants	Path options
15	Enable various exposure mechanisms to create awareness – newsletters, online web portals, etc.	NA	NA
16	Institutionalize the governance model	NA	NA
17	Continuously monitor and report on metrics/KPIs	NA	NA



Glossary of key terms used in this report (page 1 of 2)

Artificial intelligence	Artificial intelligence is referred as the ability of the system to use its cognitive intelligence to learn how to interpret unstructured content, use relationships and patterns to build a fuzzy structure around it, and then leverage this structure to respond in a similar form as the input itself
BPM tools	Business Process Management tools are process optimization solutions with process design, execution (through workflows and orchestration of different BPS technology systems), and monitoring (through analytics) capabilities
BPO	Business Process Outsourcing refers to the purchase of one or more processes or functions from a company in the business of providing such services at large or as a third-party provider
Buyer	The company/entity that purchases outsourcing services from a provider of such services
Cognitive automation	Cognitive automation refers to the ability of a system to learn how to interpret unstructured content, such as natural language, and use analytical capability to derive and present inferences in a pre-defined/structured fashion – for example, a system that classifies a person’s mood into a pre-defined bucket based on his/her tone and language
Computer vision	A type of AI technology that aims to achieve automatic visual understanding through an image or a sequence of images
Deep learning	A subfield of machine learning concerned with algorithms and inspired by the structure and function of the brain called artificial neural networks
FTE-based pricing	Input-based pricing structure; priced per resource type with significant price differences between onshore and offshore (such as per onshore clerk and per offshore clerk)
FTEs	Full-time equivalent is a unit that indicates the workload of an employed person
GIC	Global In-house Center is a shared service or delivery center owned and run by a parent organization
Horizontal business processes	Horizontal business processes refer to those processes that are common across the various departments in an organization and are often not directly related to the key revenue-earning business. Examples include procurement, finance & accounting, and human resource management
Machine learning	A type of artificial intelligence that provides computers with learning capabilities without explicit programming
NLP	Natural Language Processing is a cognitive intelligence-based methodology to interpret human languages
OCR	A technology that involves the recognition of printed characters and converting images into machine-encoded text

Glossary of key terms used in this report (page 2 of 2)

Offshoring	Transferring activities or ownership of a complete business process to a different country from the country (or countries) where the company receiving the services is located. This transfer is done primarily for the purpose of gaining access to a lower-cost labor market, but may also be done to gain access to additional skilled labor, to establish a business presence in a foreign country, etc. Companies may utilize offshoring either through an outsourcing arrangement with a third party or by establishing their own Global In-house Centers (GICs) in offshore locations, among other business structures
POC	Proof of Concept is a realization of a certain method or idea in order to demonstrate its feasibility or a demonstration in principle with the aim of verifying that some concept or theory has practical potential
RDA	RDA of attended RPAs that are deployed on user desktops; these are triggered by users instead of being orchestrated from a central control tower
Semi-structured data	Semi-structured data is content that does not conform to a pre-defined structure but nonetheless contains tags / other markers to separate semantic elements and enforce hierarchies. In short, it has a self-describing structure. The placeholders of the content can be in varied sequences
Semi-structured documents	It refer to the documents that contains useful information in some basic structure such as in the form of tables, titles to identify the content, etc. These may vary from document to document. Examples of semi-structured documents include invoices, purchase orders, bills of lading, etc.
Structured data	Structured data is content that conforms to the pre-defined structure of content in terms of tags to separate semantic elements and enforce hierarchies of records and fields. Moreover, the placeholders for the content have a pre-defined sequence
Transaction-based pricing	An output-based pricing structure priced per unit transaction with significant price differences between onshore and offshore
Unstructured data	Unstructured content refers to information that either does not have a pre-defined data model or is not organized in a pre-defined manner. Unstructured information is typically text-heavy, but may contain data such as dates, and numbers
Unstructured documents	It refer to the documents that contains information in form of free flowing text and does not conform to any pre-defined structure. Examples of unstructured documents include contracts, legal documents, letters, articles, etc.
Vertical-specific business processes	Vertical-specific business processes refer to those processes that are specific to a department within an organization and are often directly related to the key revenue-earning business. Examples include lending process in the banking industry and claims processing in the insurance industry



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