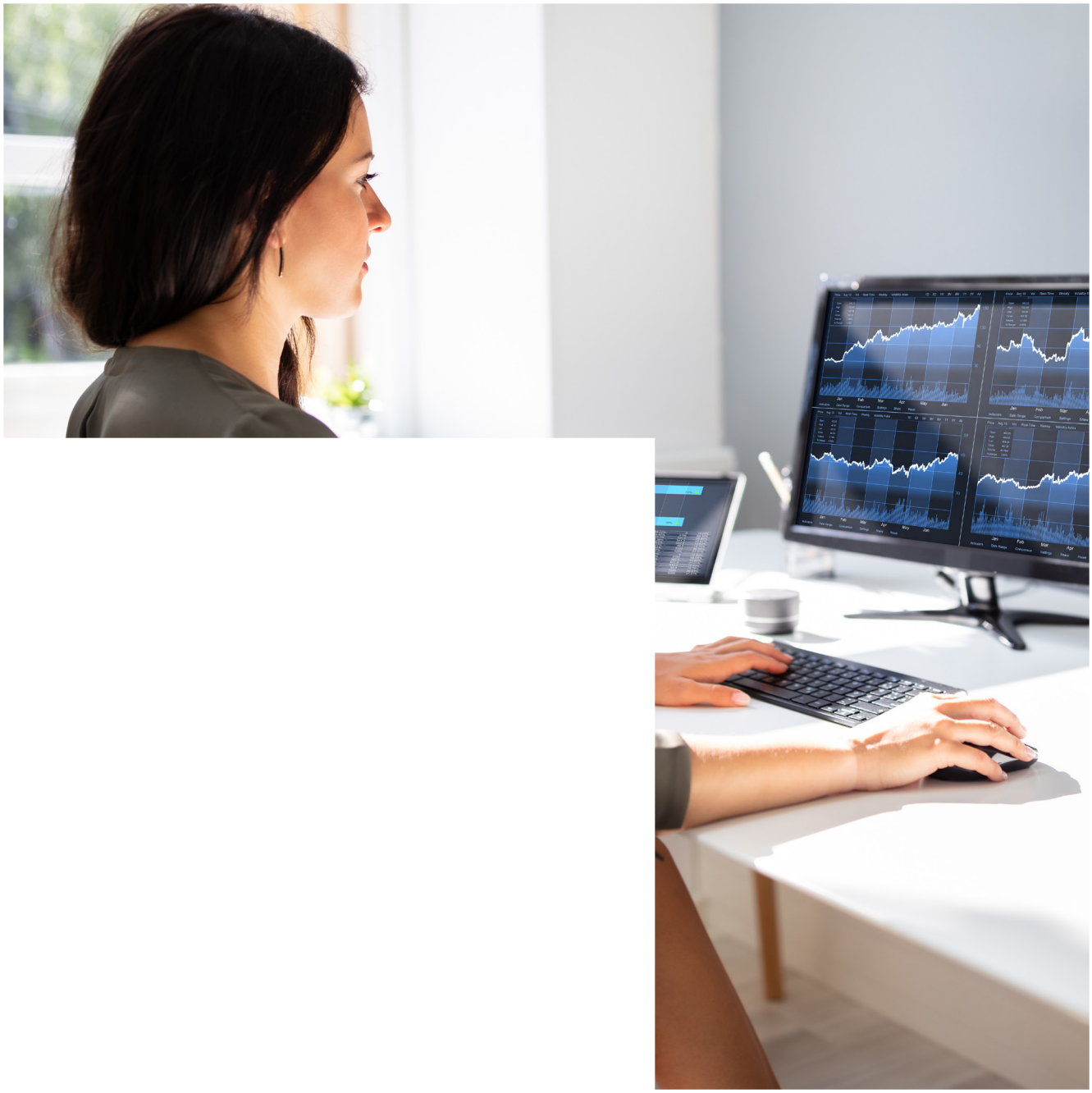


Data and Analytics

The technology and processes to place data at the heart of digital transformation.

An Advisory Services PoV

The role of data and analytics

Data and analytics encompasses the way information is managed and analysed to support and drive improved decision making, business processes and overall outcomes.

Data is therefore a key pillar for digital transformation, as every interaction in the digital world generates data that enables organisations to create baselines and benchmarks. Data also helps an organisation accurately indicate its progress towards objectives.

Whilst data was traditionally consumed by managers for traditional reporting and analytics activities, in today's rapidly changing market clients expect data to:

- Be delivered in real time to enable quick decision making
- Generate intelligence in the form of predictive and prescriptive models that enable optimised operating models
- Be available for self-service purposes with improved quality and security.

By effectively collating data across your key IT systems, you will therefore be able to benchmark, track and report on performance in support of your organisation's digital transformation.

This reporting can be both internally focused on your employees and operations, and externally focused on customers and business outcomes to gain a comprehensive understanding of your organisation's performance.

So, a modern service ecosystem relies upon data to enable fact-based decision making. This requires the careful orchestration of a comprehensive data strategy that allows data to be discovered, analysed and utilised to generate actionable insights that deliver desired results and continual improvements.

Whilst it may be daunting to take the first steps toward data collation, measurement and analysis, CGI will work with you to:

- Articulate the current state of your data transformation journey
- Build a holistic data strategy that guides your organisation
- Clearly define measurable key performance indicators (KPIs) for success
- Focus on a few use cases to validate your strategy and inspire broader adoption
- Deliver consistent communications and a strong feedback loop across all stakeholders.

Data is a critical component of any organisation's Digital Backbone, working alongside people, processes and technology to drive successful exploitation activities.

Measuring performance

Whether internally or externally-facing, a mature digital service must employ a performance framework that incorporates data and evidence from multiple sources.

Traditionally, service metrics are siloed and often solely encompass operational measurements such as response speed and service downtime, therefore failing to capture true user experience. Where customer feedback is actively sought, this is typically a separate activity rather than integrated into a holistic analysis of service performance.

The goal of using multiple data sources is therefore to provide a cross reference between user experience, service outcomes and more traditional service level agreements (SLAs) and key performance indicators (KPIs). This ensures service performance data is correlated against the direct experiences of customers and employees, providing an aggregated view for more outcomes-focused, actionable insights that improve overall user experience.

Aligning customer and consumer needs with traditional measurements of performance quality is thus essential to establish a truly transformed service. A performance framework should therefore include:

Voice of the service

Traditional metrics such as SLAs and operational level agreements (OLAs).

Voice of the device

Device monitoring (predictive and reactive), response times, down time, etc.

Voice of the agent

Quantitative measures including call response times, and qualitative measures such as questionnaires.

Voice of the customer/user

Customer satisfaction scorings (CSAT surveys), A+B testing, sentiment analysis, mood surveys, interviews with senior stakeholders.

The aggregation of data to measure service performance is key to obtaining a holistic view of the customer.

Feedback from a CSAT survey specifically provides early insight into the voice of the user. To discover a more holistic view of a service and the level of satisfaction, we recommend that organisations adopt experience-driven metrics and create a dashboard for an aggregated view. We also encourage the adoption of a virtuous feedback loop, to validate efforts to improve the service as part of formal continual service improvements (CSI).

There are various tools available to provide this capability, with factors such as budget impacting an organisation's choice. Using our extensive knowledge and experience, we can work with you to understand your organisation's specific needs and recommend the right tool. We can also provide support and guidance on implementing and fine tuning your solution.

Big data

Big data is the fuel for today's analytics applications.

Before big data platforms and tools were developed, many organisations could use only a small fraction of their data in operational and analytics applications. The rest of the data often got pushed to the side as so-called "dark data", which was processed and stored but not put to further use. Effective big data management processes however, enable businesses to better utilise all data assets.

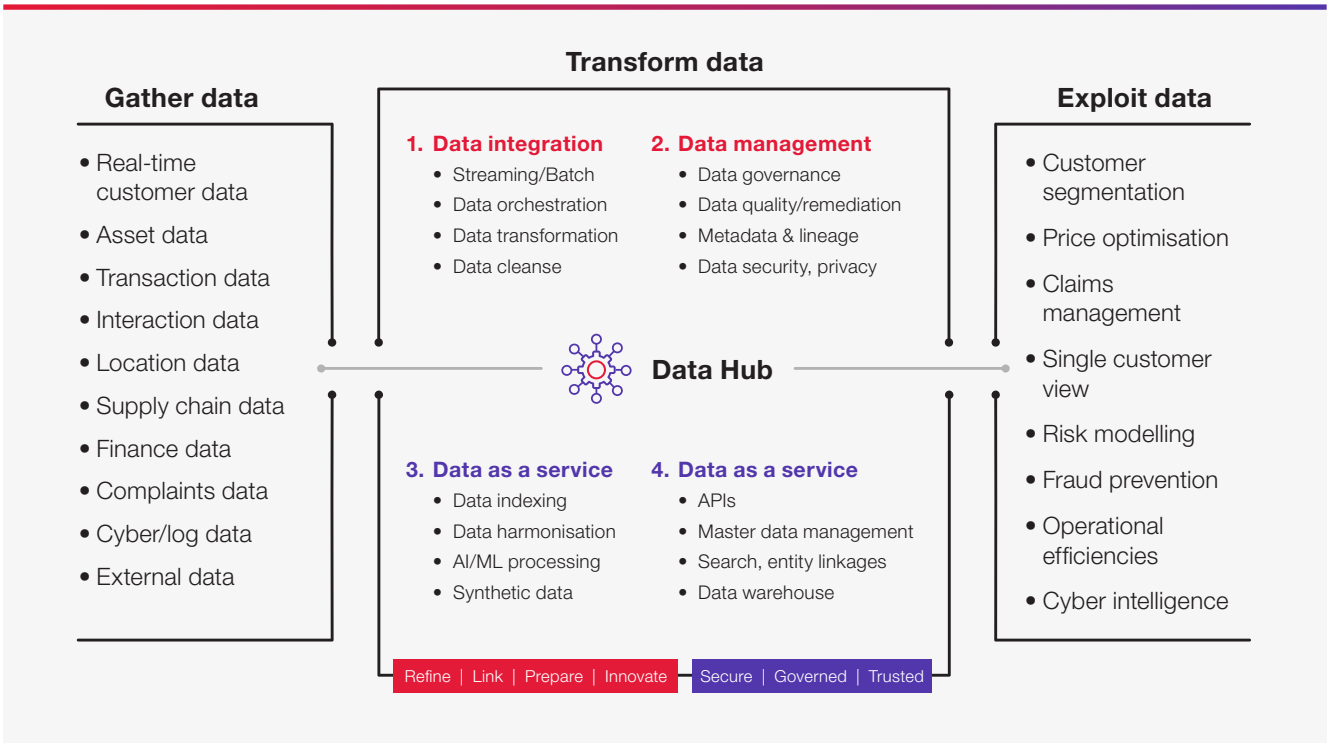
This expands the kinds of data analytics that organisations can run and therefore the business value they can achieve.

Big data creates increased opportunities for machine learning (ML), predictive analytics, data mining, streaming analytics, text mining and other data science and advanced analytics disciplines.

Using those disciplines, big data analytics applications help businesses:	**If done well, the end results include:**
• Better understand customers • Identify operational issues • Detect fraudulent transactions • Manage supply chains • And much more.	• More effective marketing and advertising campaigns • Improved business processes • Increased revenue • Reduced costs • Stronger strategic planning • Better financial results • Competitive advantages over business rivals.

Many IT organisations struggle to provide the capability to maximise the potential of structured and unstructured data.

This is where CGI Advisory Services' proven data hub pattern can help, enabling clients with an enterprise data analytics capability to tackle complex big data challenges.



DataOps

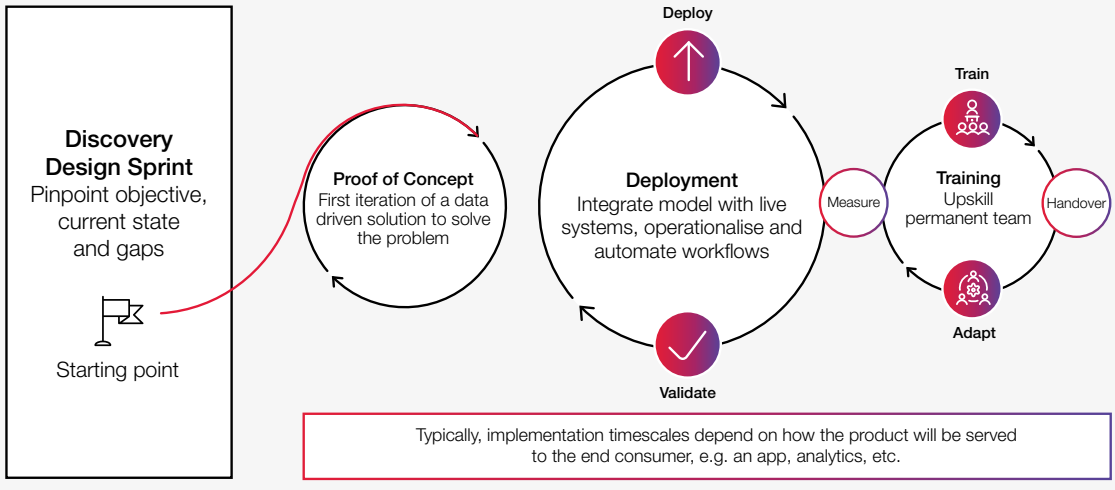
Using data to enhance customer experience and accelerate operational efficiencies.

DataOps is a set of practices, processes and technologies that combine an integrated and process-oriented perspective on data with automation methods from agile software engineering, fostering a culture of continuous improvement, quality, speed and collaboration in data analytics. Whilst DataOps began as a set of best practices, it has matured into a new and independent approach to data analytics.

DataOps applies to the entire data lifecycle, from data preparation to reporting, and recognises the interconnected nature of the data analytics team and information technology operations.

It incorporates the Agile methodology to shorten the cycle time of analytics development in alignment with business goals, and also draws upon the DevOps approach to enable continuous delivery. Where DevOps leverages on-demand IT resources, automates the testing and deployment of software, and merges this software development and IT operations together to improve velocity, quality, predictability and scale, DataOps incorporates these same improvements into data analytics.

It can be daunting to know where to start when adopting any new methodology, but this is where CGI Advisory Services can assist. We have a proven methodology to deliver data and analytics initiatives, including the upskilling of your team and empowering them to adopt recommended DataOps best practices.



Technology infrastructure

With the exponential growth in data both within internal IT systems and businesses (including social media), it is more crucial than ever to implement the necessary technologies and infrastructure to collate, analyse and enable rapid decision making.

The technology to enable this began when the Hadoop distributed processing framework was developed. A broad ecosystem of supporting technologies was built around Hadoop, including the Spark data processing engine. In addition, various NoSQL databases were developed, offering more platforms for managing and storing data that SQL-based relational databases weren't equipped to handle.

The common technologies that are options for big data environments include:

- Processing engines
- Storage repositories
- NoSQL databases
- SQL query engines
- Data lake and data warehouse platforms
- Commercial platforms and managed services.

Data analytics technologies and techniques are widely used in commercial industries to enable better informed business decisions.

Cloud

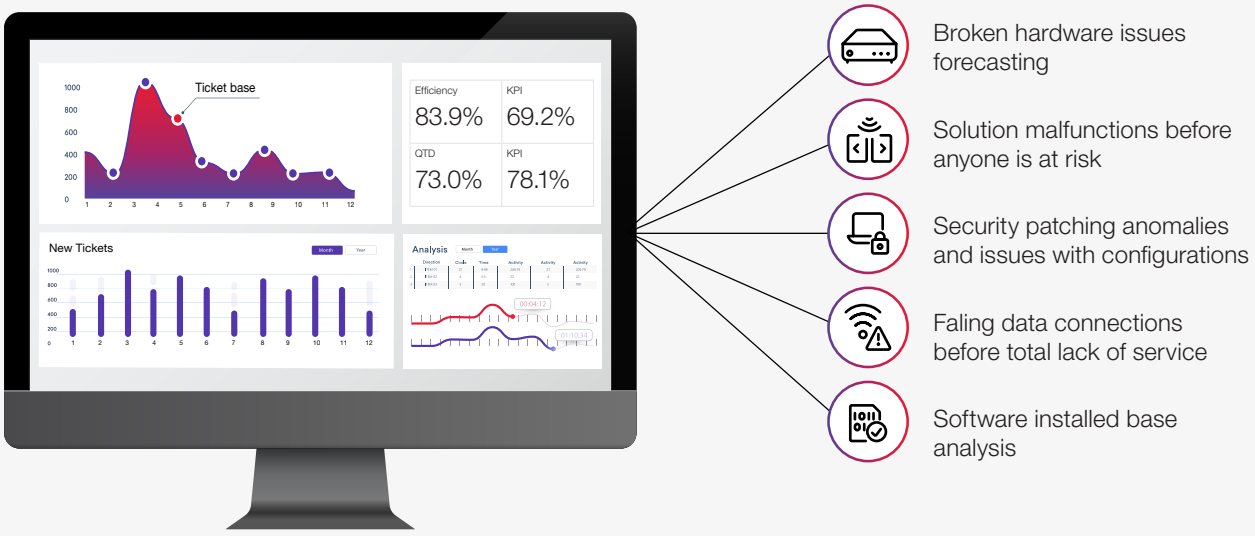
With the advent of artificial intelligence (AI) and machine learning (ML) comes the ability to rapidly identify trends and anomalies, which in turn enables predictive monitoring and appropriate interventions to be made. However, this is dependent on large datasets, and the cost to purchase the necessary on-premise hardware and manage growing datasets is becoming exponentially high.

As such, many organisations are looking to run big data systems in the cloud, often using vendor managed platforms that provide big data as a service to simplify deployments and ongoing management. All major public cloud providers have their own offerings, but how do you know which is right for your organisation? This is where CGI Advisory Services can assist, providing the solutions and guidance to meet your organisation's specific needs.

Service analytics

When pooling your data from different systems together, you can spot trends and anomalies to predict potential service failures and take the necessary steps to address them. As a result, a reactive organisation that is subject to issues that arise transforms into a proactive organisation that foresees potential issues and deals with them before any loss of service or impact on performance. Furthermore, this delivers significant cost avoidance.

Whilst IT leaders are aware of the significant advantages of a more proactive approach, we understand that a significant proportion of time is spent on “keeping the lights on”, and it can therefore be difficult to know where to start. This is where CGI Advisory Services can help, using our tried and trusted methods for intelligent application management to provide you with an effective automated machine learning solution to predict service incidents.



CGI Advisory Services

Advisory services

- **Data Strategy**
  Get the most business benefit from your data.
- **Target Architecture Design**
  Plan a future-proof analytics platform for your business.
- **AI Design Sprint**
  One week sprint to go from business problem, to data problem, to AI solution concept.
- **Data Hub Design Sprint**
  One week sprint to define the first or next step for your data management landscape.

Developing capabilities

- **Data Platform** We build you the next-generation data management and analytics capability, expandable with machine learning solutions.

  Including data integrations, ETL tools and logic, data modelling, data warehouse to cloud migrations, IoT data collection etc.
- **ML Operations**
  We create the infrastructure for running production-grade machine learning solutions.

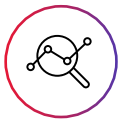
  Automated re-training and deployments, monitoring etc.

Providing solutions

- **ML / AI / IA** solutions to improve your products and drive automation and operational efficiency.
- Visualised and mobile ready **insights into data** to help you lead and optimise your business.
- Enabling wide **utilisation and sharing for data and analytical models** for internal and external use cases.
- **Productised solutions** for specific use cases.
- **DataHub, AIAdvance360, Faker, Pulse, Machine Vision, SI360, ID360, GeoData 360, Smart Ticketing.**

Our solution

Data and analytics can help organisations to unlock their full potential – but only when done right. We understand that adopting the relevant data tooling and technologies isn't simple, so CGI Advisory Services is here to help you select and develop the right solutions, transforming the way your organisation works with data that empowers you to understand the present, predict the future and influence outcomes.



Data insights

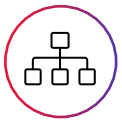
Use AI to uncover non-obvious relationships and patterns buried in the data to provide new perspectives to the line of business.

Segmentation to find right customers

Use AI/ML to explore credit worthy customers and making the approval process streamlined for customers. Understand customer needs and offer core, value add services.

KYC, AML & credit modelling

Use analytics & AI to improve KYC, AML checks and fraud to provide assurance and compliance. Improve credit risk modelling to improve business performance.



360° view

Use analytics & AI to provide a unified and holistic view of each customer, product, service, program, location and market.

Better experience & operations optimisation

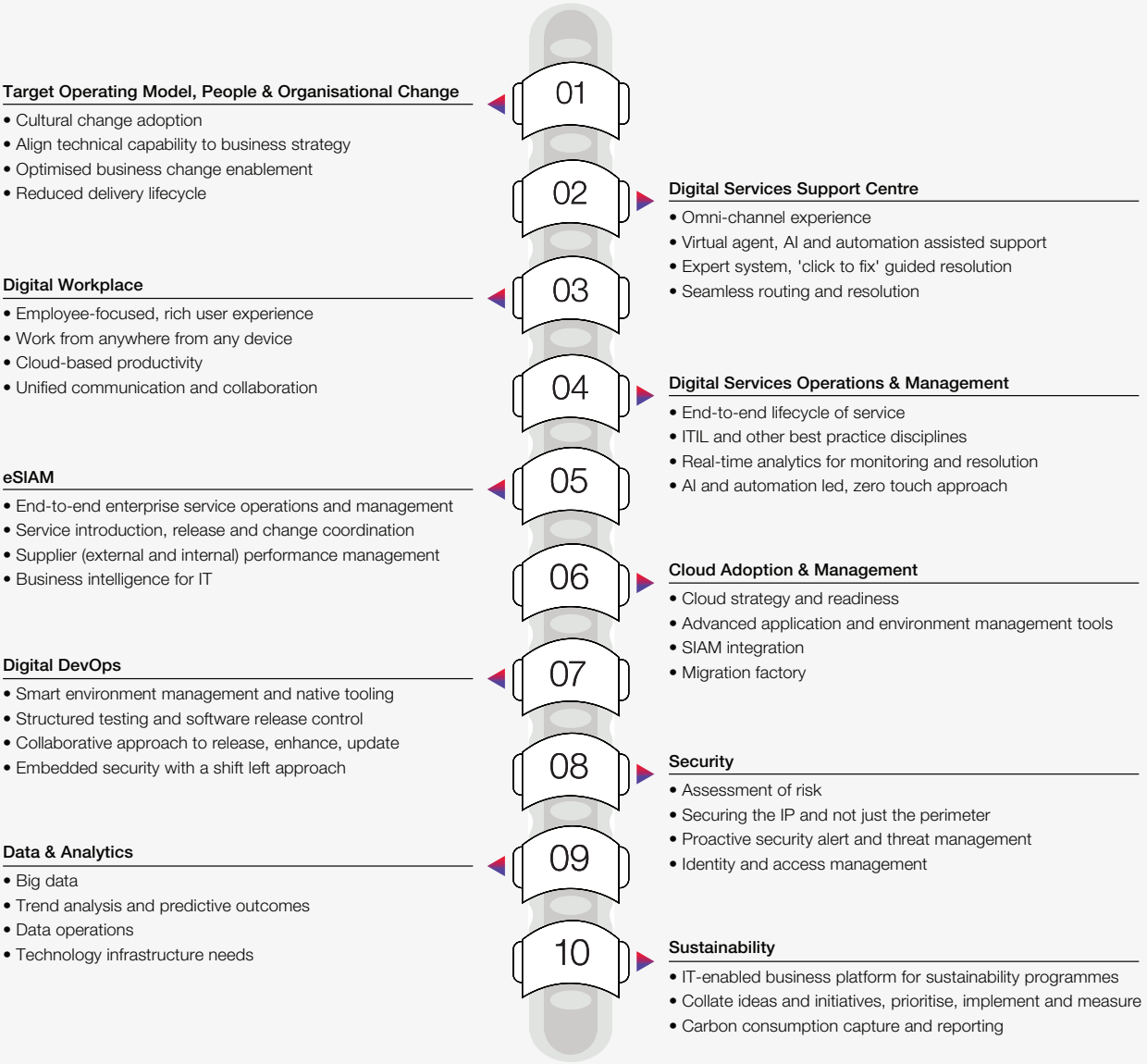
Use AI & RPA to automate and optimise programs and services to gain efficiency and improve workflow and experiences.

Cash flow forecasting

Use ML to predict cash flow needs and offer pre-approved line of credits to clients. Understanding lending needs of customers in a proactive manner based on performance data is a key industry trend.

Data and Analytics is part of our Digital Backbone

The Digital Backbone is our methodology for encouraging digital transformation and enabling IT as an extension of our clients' organisations. Because data is at the heart of any digital transformation initiative, we have made it a key anchor of our Digital Backbone.



About CGI

Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across 21 industry sectors in 400 locations worldwide, our 88,500 professionals provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

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