



The data journey in higher education

Achievable and sustainable data strategies that create proactive university experiences.

CGI Higher Education Advisory insights



The data-led, proactive university

Universities are dynamic environments that rely upon real-time, proactive operations. Many institutions are therefore looking to data as the key to enabling powerful benefits.

Data is a vital asset that permeates every aspect of modern higher education: recruitment, admissions, learning analytics, student interventions, institutional effectiveness, operations throughout the digital IoT campus, financial optimisation, and environmental, social and governance (ESG) programmes.

The concept of the data-led university therefore goes far beyond simply establishing reporting solutions. A comprehensive data journey uses data-based knowledge to forecast events and revolutionise decision-making, driving tangible operational benefits through automation and artificial intelligence (AI) solutions that create dynamic higher education experiences.

This transformation into a proactive, data-driven Digital Led University can propel your institution to become a world leader. As a centre for innovation and the pursuit of knowledge, you'll be empowered to respond effectively to evolving student needs, delivering personalised and enriched learning experiences that will help shape the future of education.

Furthermore, a data-driven strategy will keep your university at the cutting-edge of advancements, opening up new avenues for groundbreaking research and innovative educational approaches that will contribute significantly to solving societal challenges.



Harnessing data responsibly

In today's rapidly evolving technological landscape, universities stand at the forefront of innovation and knowledge dissemination. To remain at the cutting edge, higher education must responsibly embrace generative AI and other emerging technologies, using the power of data to create boundless benefits.

Data governance

A robust set of data-centric activities help control your university. Managing and maintaining high quality data is therefore central to deriving tangible and sustainable benefits from your data.

Data governance enables this by focusing on "what, where and how" your data is used, creating a solution to deliver usable, secure, compliant and readily available data and data roles across your organisation.

This will enable your university with confidence in its financial and sustainability commitments, as well as helping you to prepare for data evolution. For example, with the impact of the growth of AI, as well as the importance of curating data.

But as we move into the realm of data-driven advancements, it is crucial to balance progress with ethical responsibility. By optimising a robust data strategy, you can unlock the true potential of generative AI whilst ensuring it is curated responsibly to foster positive impacts on research, education, and society as a whole.

The benefits



Reduce costly duplication and decrease associated ingestion, transformation, storage and misuse of data costs.



Reduce the risk of security or compliance costs.



Provide clarity and consistency from a clean, consistent master data model, creating an untapped value proposition from your data.



Eliminate data silos.



Improve data integrity.



Ensure clean data and simplify maintenance of data.



Optimise analytics.



Reduce overheads.

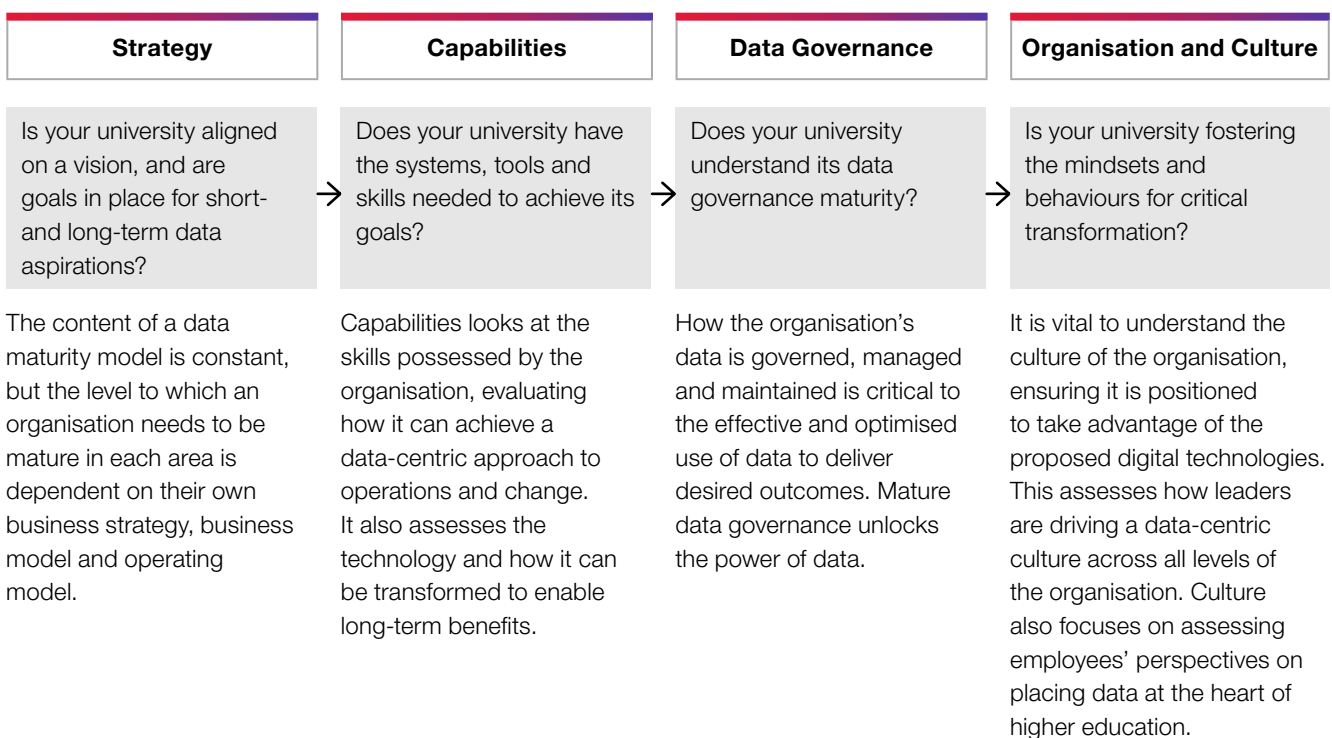


Robust strategies to exploit emerging technology, including AI and IoT.





An understanding of your data maturity is divided into 4 areas:



Organisational data maturity

Every university is different and therefore has a different level of data maturity.

Your data had been built over many years, across countless assets. It has the power to become your greatest asset, but is often locked in silos. Understanding where you are on the data transformation journey is therefore essential, and requires an understanding of multiple areas to ensure you develop a clear and actionable data strategy tailored to your university.

	Level 1 Basic	Level 2 Explorative	Level 3 Operational	Level 4 Innovative	Level 5 Transformative
Business Strategy	Reporting is sporadically used to depict historical events	Data is only used for ad hoc reporting	Analytics is used to help drive operational decisions	Data is used in business decision making	Data is embedded in business strategy
Resource	Limited or no data resources and skills	Data skills are supplementary to existing roles	Data teams are created with specific roles	Data resources sit across the organisation in specific, dedicated roles	Chief data officer sits on the board
Data	Data is rarely used to drive insight and is used for basic reporting	The only data available is internal data	Multiple data sources are used to create deeper insight	External data is used to support greater insight	Multi-dimensional data sources are integrated into business data
Culture	Data is vaguely understood by a few	Data is an individual uncoordinated activity	A data architecture approach is adopted to manage data	A data governance approach is created to foster a data culture	Data strategy underpins business and technology strategy
Architecture	Data is randomly ingested and managed	There is no data architecture strategy	Some architectural principals exists pertaining to data	An enduring data architecture strategy is in place	Data architecture is designed to leverage the power of data
Data Governance	Data is an afterthought	Data governance is manual and individually managed	There is an approach to data quality and security	A data governance strategy is in place	Data governance is integrated across the organisation

The three-pillar approach

These pillars incorporate the key components and solutions required for your university to achieve a sustainable and deliverable strategic data transformation.

Vision & Strategy	Data Fundamentals	Analytics & Science
<ul style="list-style-type: none">• Vision• Strategy• Investment planning• Transformation roadmap• Benefits realisation planning• Organisational and cultural change	<ul style="list-style-type: none">• Legacy data migration• Data quality• Master data management• Big data• Cloud/virtual data	<ul style="list-style-type: none">• Data visualisation• Data optimisation• Data forecasting• Data prediction• Artificial intelligence



Pillar 1 – vision and strategy

It is essential to establish a clear vision that empowers your university to embed data throughout all that you do. The first step is to create a data strategy that aligns, underpins and supports the delivery of your desired outcomes.

Data vision

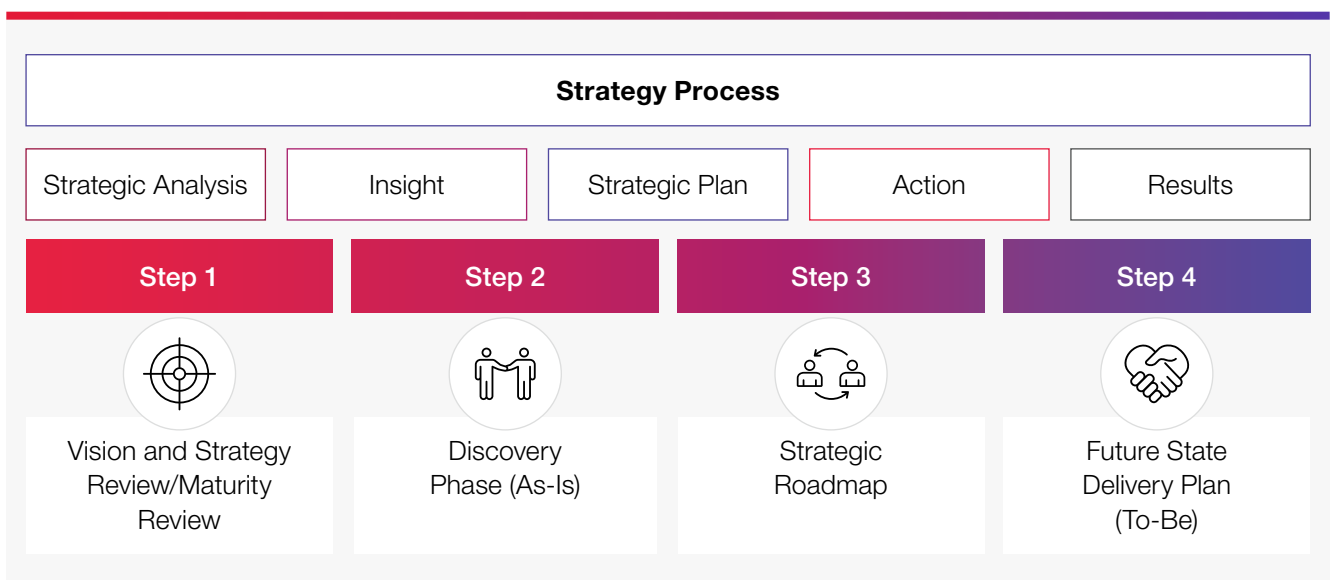
Your vision should provide a very personalised and specific insight into your university, its culture and direction. Determining a shared vision is central to the process of change; it amplifies success by setting a clear outcome to achieve, inspiring and empowering all to deliver accordingly.

A vision for data is no different. An experienced data transformation partner will work closely with you and your leadership teams to understand your institution and the outcomes critical to your success, helping you to set an effective, unambiguous goal for your data vision.

Data strategy

A robust and sustainable data strategy that aligns directly to your business and IT strategy is essential if you are to successfully deliver usable, accessible, quality data that supports higher education experience transformation.

Whilst data is the key to establishing your proactive university, this can only be achieved with a robust, yet simple strategy that is understood and supported by executive leaders and employees. To help you achieve a functional data strategy based upon your specific organisational evaluation and planning, we recommend a strategy cycle.



Pillar 2 - data fundamentals

Before you can leverage data to make informed, strategic decisions, it needs to be in a useable state. By this, we mean your data must be clean, accessible and stored using a methodology aligned to your university in terms of culture, organisational plan, and strategic direction.

These data fundamentals must be carefully curated from the start to fit your needs, thereby allowing you to build a complex and reliable data analytics and data science capability based upon strong foundations.

Data centralisation and migration

You can more easily and efficiently manipulate, organise and leverage your university's data when it is centralised. Specifically, an aggregated location can enable more in-depth analysis than disparate systems and databases, enabling you to draw meaningful insights from seemingly unrelated data.

Whilst migrating your data from a legacy system (whether an on-premise storage solution or already established way of working) to a centralised location might seem daunting, a transformation partner will help make this transition seamless using best practice methodologies combined with bespoke strategies to fit your university's vision.

We understand your IT landscape is unique, and therefore a centralised database is not necessarily the most efficient, cost effective or appropriate way to handle your data. Assessing your environment is therefore an essential part of the data roadmap to understand the most suitable implementation options, whether that be a federated data model (where multiple data repositories are mapped into a single repository), or another bespoke solution to fit your requirements.

Big data

The definition of big data changes with time. Whilst in previous decades big data comprised of gigabytes, it can now span into the hundreds of petabytes of information available from a wide variety of IoT devices, data scraping software and enterprise scale management platforms.

The vast data available to your university can be overwhelming, and merely adopting an effective access and storage solution does not make data meaningful. Afterall, we can only derive value from data when we can understand, analyse and leverage it to make strategic decisions.

It is therefore essential that you are able to summarise vast quantities of data into sets of metrics and trends that humans (or when further along your data journey, machines) can use to make truly impactful decisions.



Pillar 3 - data analytics and data science

Now having established your sustainable data platform, you can begin to reap the benefits of data to achieve meaningful insights.

Data analytics and data science can deliver:

- An empowered decision making and policy making capability
- Resource allocation and planning to better respond to your rapidly evolving student demographic's expectations
- Stronger retention and student success
- Curriculum evolution
- Dramatic operational improvements in the form of a proactive Digital Led University.

The challenge is understanding how to leverage your avalanche of data to deliver these benefits ethically and effectively.

An ethical approach to data

It is essential that the higher education sector prioritises security, privacy and ethical considerations, particularly given your global target audience of students.

Responsibility, transparency, and open compliance with regulations must therefore be built into your data strategy.

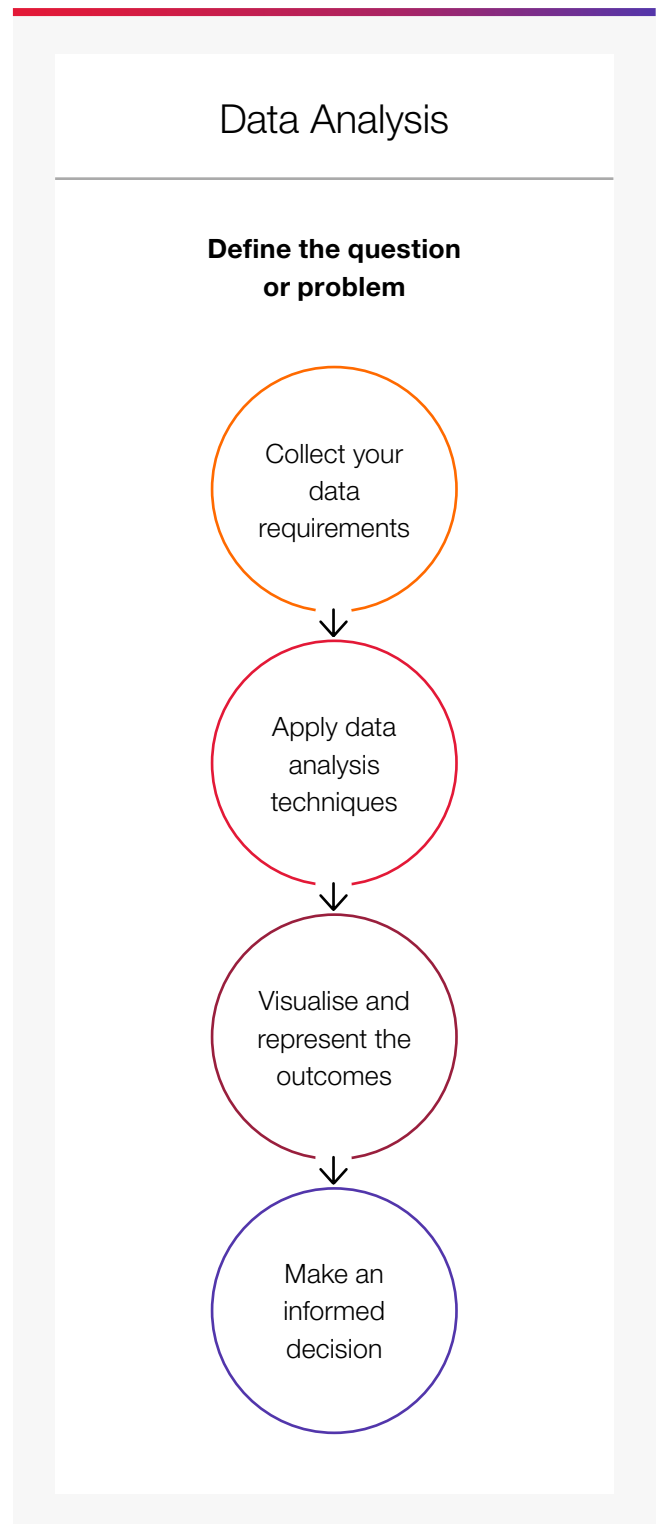
Data analytics

The power of data can only be realised once you are able to extract tangible metrics, trends and analysis to make informed decisions.

The first step in your data analysis journey is therefore to define the question you need your data to answer; this question should align to your data strategy and vision. Once you've decided on a clear problem for your data to address, and have ensured the data is workable to achieve this, your university can apply analytical techniques.

We recommend a four-step approach to implement targeted analytical techniques consistently:

- 1. Collect your data requirements** - Having your data cleaned and centrally stored as recommended in the data fundamentals pillar enables you to effectively target specific requirements for your analysis, thereby reducing your overheads and efficiently realising the power of your data.
- 2. Apply data analysis techniques** - Data analytics can take many forms, such as parsing your data using SQL, Python or even through Microsoft Office's suite of applications. An expert partner will guide you through the most appropriate technique for your data, and further along your data journey can help build a platform for more complex scientific techniques.
- 3. Visualise and represent the outcomes** - A key part of the analytics process is to present your data in a digestible manner to answer your defined question or problem. PowerBI, Microsoft Excel and other more bespoke solutions help present easy to understand data for effortless decision making.
- 4. Make informed decisions** - The steps in your analytical process must enable easy decision-making. Once your data has been analysed using the appropriate techniques, you can confidently address your question or problem.



Data science

Modern tools and techniques have allowed data science to create a new world of opportunities and benefits.

Data science (or data-driven science) could be considered as the interdisciplinary field where statistics, coding and business come together. The overarching aim of data science is to extract insight, knowledge and analysis from large, complex and often untapped data to help you derive data-driven decisions for your university.

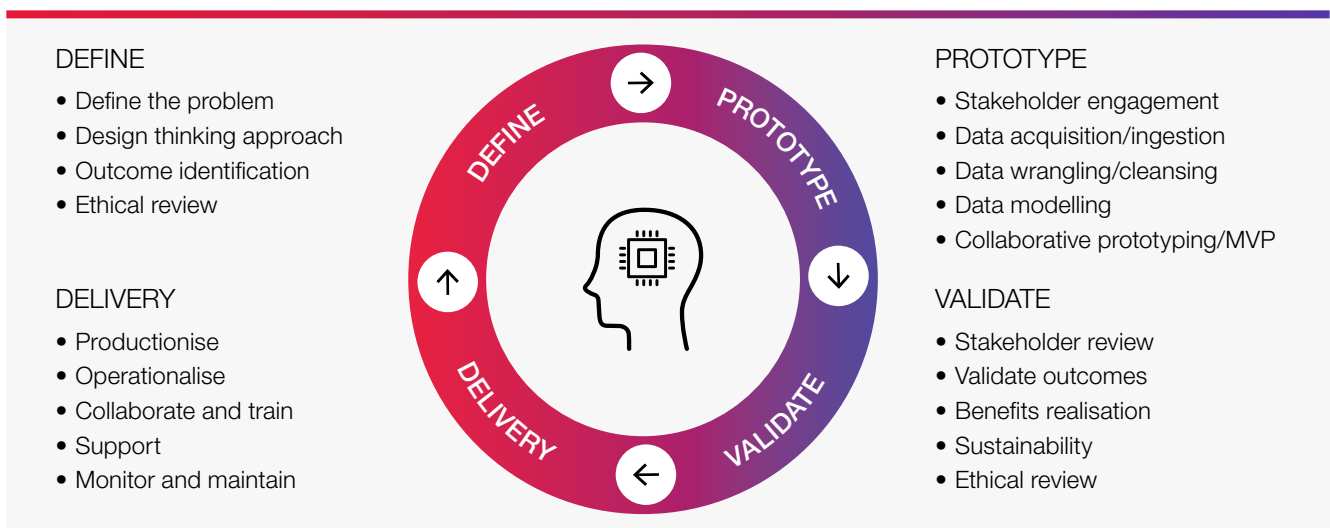
Wherever you are on your data journey, data science will empower your organisation with new capabilities based upon large volumes of structured or unstructured data.

This ranges from:

- Statistical mathematical models that enhance and bring new dimensions to analytical reporting.
- Natural language processing techniques that help to understand and categorise large-scale textual data.
- Automating and interpreting your data through building machines that learn from your history.
- Providing a 360-degree view of university stakeholders, from enrollment to alumni, to help personalise and predict behaviour and outcomes.
- Using static or moving imagery to create augmented or virtual reality solutions.
- Interpreting or providing automated support to complex imagery, such as in critical clinical or health and safety environments.
- Even building your own metaverse.

Data science accelerator

We recommend a tried and tested data accelerator process to help you understand how data science can support your university. This provides an agile, design thinking approach to unpack and understand complex higher education problems, and defines outcomes through prototyping fit for purpose ethical solutions.

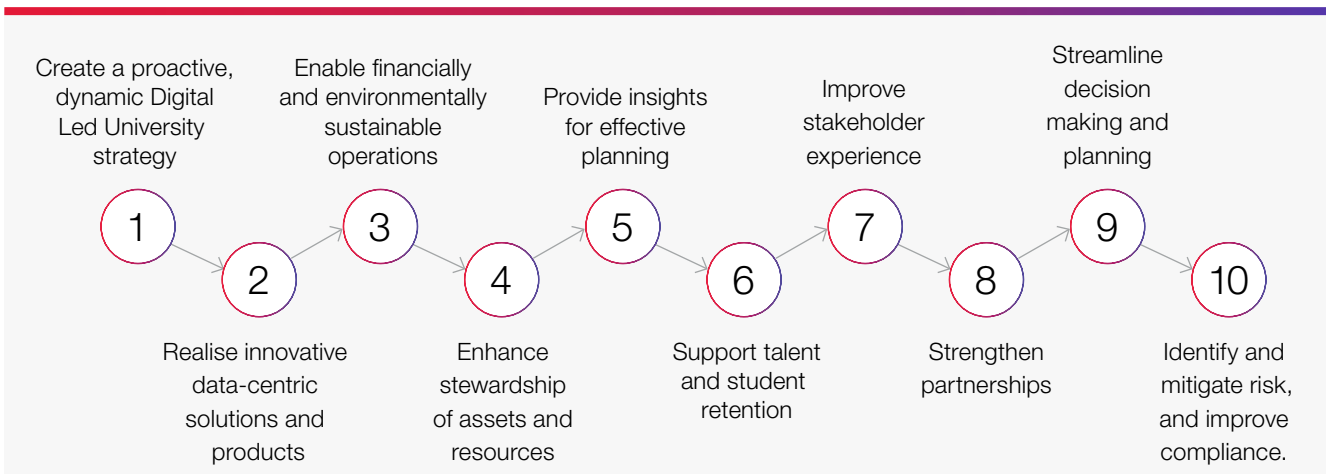


CGI Higher Education Advisory Services

For over 45 years, organisations have trusted CGI to transform their operations with innovative and reliable services and solutions. Committed to supporting our clients for every step of their digital journeys, we established our [Advisory Services](#), where our experts utilise their vast knowledge and experience of delivering world-class IT to collaborate closely with you, to help unlock your organisation's full potential.

In our ever-evolving world, technology provides higher education institutions with unlimited opportunities to continuously adapt, but we understand that digital transformation isn't simple. That's why we developed our vision for the secure, sustainable and proactive [Digital Led University](#), to help you develop the right solutions which are aligned to your specific needs whilst revolutionising the world of higher education.

Working with our Data Advisory experts to solidify your data strategy and capability, we can create high quality, clean data and convert it into decisions and processes that will cement your position as a higher education world leader.

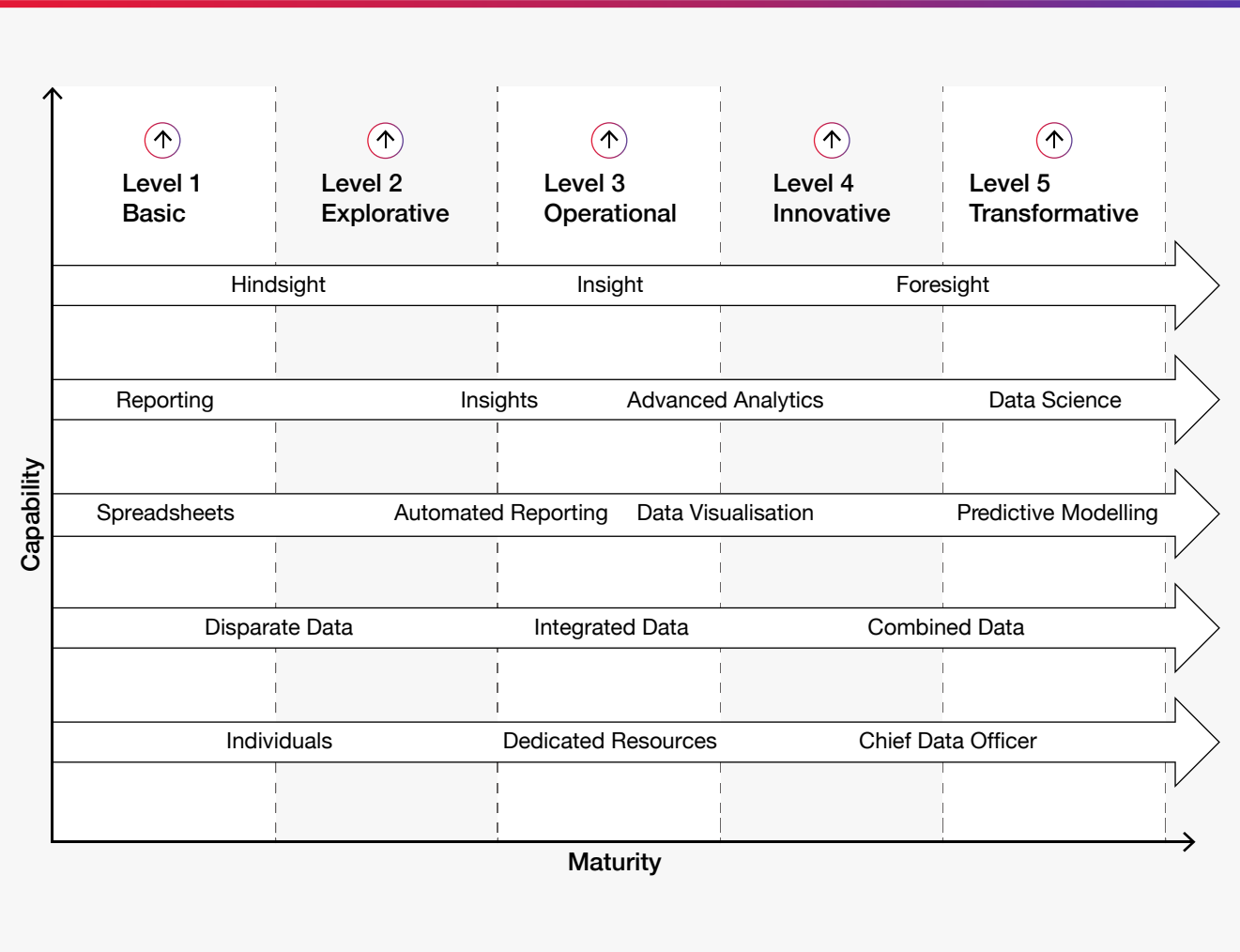


CGI data maturity assessments

Our Data Advisory experts have defined the key steps to help you build an ethical, sustainable and achievable solution that places data at the heart of your organisation. This begins with a data maturity assessment.

Every university is different, and consequently so are their data transformation journeys. That’s why we start by helping to define your specific data vision, and depending on your data maturity, readiness and capability, we design a tailored, unique strategy based upon your needs.

A clear understanding of data maturity must therefore underpin every journey. Using our CGI data maturity framework, we will identify your university’s level of data maturity, and work together to address any areas that are preventing you from achieving your desired data strategy.



Empowering your journey towards transformative data

Having assessed your data maturity, we then use our three-pillar approach to support and cement your data journey. These pillars incorporate the key services and solutions required for your university to achieve a sustainable and successful strategic data transformation.

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By collaborating closely with you and your leadership teams, we work to deeply understand the outcomes critical to your success, helping you to align your university's needs and ambitions with an effective, unambiguous data vision.

We also identify the hidden data within various technical debts and grey areas to gain a comprehensive understanding of data assets across your institution, helping you to leverage these to their full potential.

A flexible approach is essential throughout the journey, allowing for challenges that might arise, and constant innovation with the integration of new data sources as your smart campus evolves. There are exciting opportunities to develop curated, ethical, and bias-managed recommendations which are carefully regulated and controlled, ensuring your data strategy transforms the challenge of generative AI into a valuable, continuously evolving asset that enriches data-driven learning experiences.

Together, we can capitalise on the power of data to move your organisation towards a level 5, transformative data-led university that is at the cutting-edge of advancements.



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