REALIZE THE FULL POTENTIAL OF DATA AND AI FOR CONNECTED PRODUCTS

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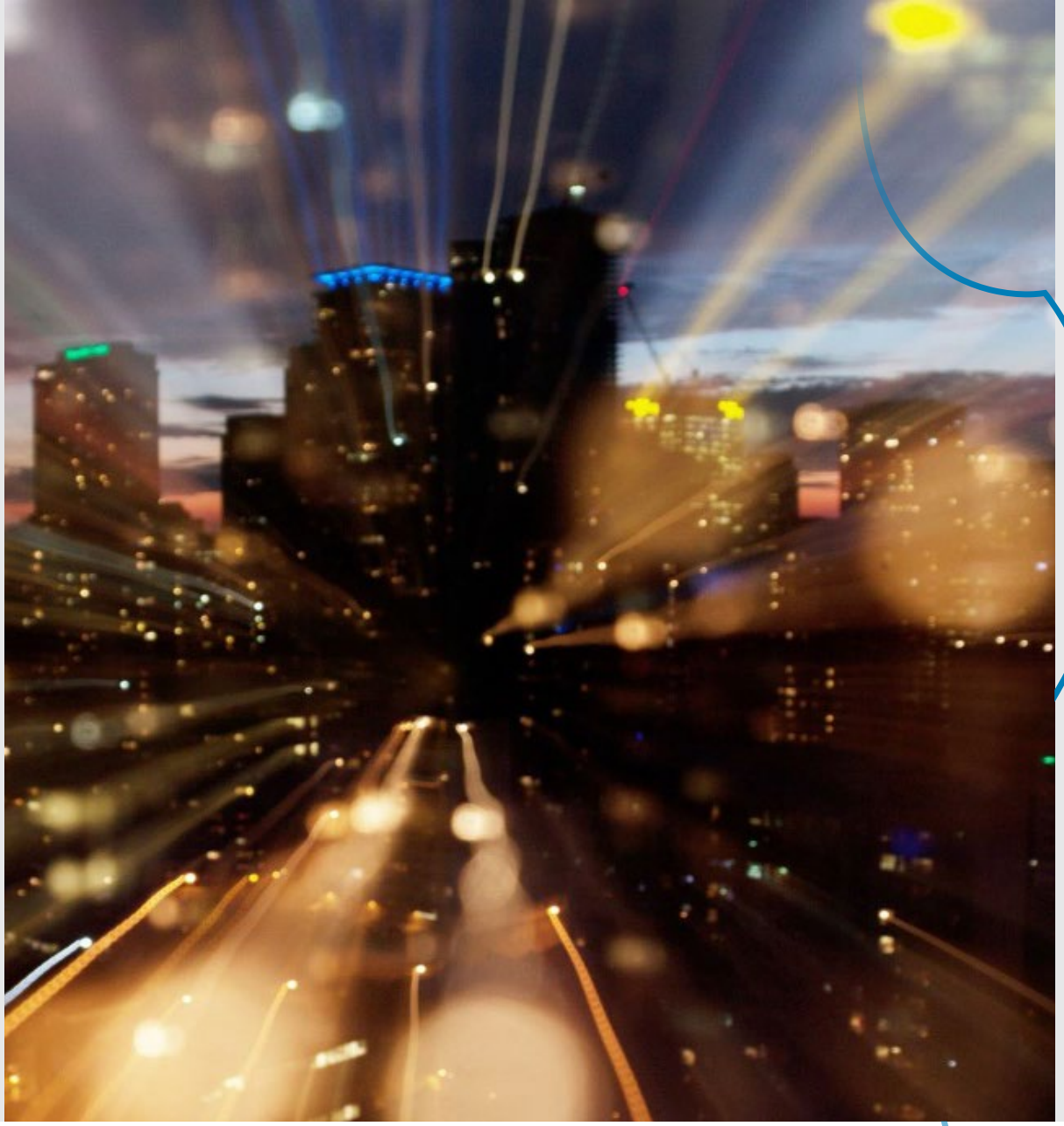


EVERYTHING IS CONNECTED

The rise of connected products means that there is now a far greater level of connectivity across the world. Data generated from connected products can be leveraged to help organizations turn traditional products into ecosystem-connected products, develop new functionalities, or identify new data-driven services.

The next generation of products and services are being developed using the power of data and artificial intelligence. Digital technologies – such as cloud, IoT, and blockchain – combined with data ecosystems can produce connected products that fully interact with users and environments.

Connected data-driven services are set to increase dramatically. A 2022 report from the Capgemini Research Institute found that almost 90% of organizations expect to receive revenue from intelligent services in the next three years. This is a significant jump from the 35% of organizations that currently offer intelligent services.

If organizations want to stay ahead in their industry, it is important that they view the new landscape of connectivity and data ecosystems from the perspective of innovation.

PUTTING DATA AT THE FOREFRONT

Data has often been treated as a byproduct of an organization's operations; rather than considering data before the design of a device, data was bolted on retrospectively.

To be successful, organizations need to stop thinking about data as an afterthought and employ a data-first approach. Data – and the use of data – should be embedded at the core of the product's entire lifecycle. To achieve this, a data ecosystem must first be created and should inform the design of the device.

Data has the power to influence more efficient design, performance, sustainability, privacy, growth, and customer engagement – and ultimately deliver better results, devices, and value. However, putting data first requires a complete overhaul of frameworks and mindset.

A DATA ECOSYSTEM AT WORK

Let's put the idea of connected products into a real-life context. A move from a standard electric water heater to an intelligent one, for example, uses data to increase customer comfort and cut energy costs.

In the design phase of an intelligent heater for a smart home, historical energy consumption is taken into account and a virtual heater model can be used to simulate usage scenarios. An AI model can be designed and implemented to control real-time comfort against energy costs.

Once the heater is built, AI-driven user acceptance testing can determine whether requirements are being met and everything is running smoothly.

Data is taken from a fleet of heaters and partner data ecosystems and then combined in real time to enable grid optimization services. This ensures grid stability and resiliency, and is more cost effective for the energy consumers.

Usage data for the heater is monitored to provide continuous feedback that can lead to improvements. Monitoring also detects anomalies early and proactively schedules maintenance.

This is one example of the value connected products can offer. Connected ecosystems create new possibilities and untapped revenue streams. But it is important to remember that these ideas can only become successful if they operate as scalable, reliable products and services.

LEVERAGING REAL TIME DATA

Adding a product to an ecosystem where it can interact with live data is a game changer when it comes to product design. Data ecosystems can also change the way you test and validate a functionality using the real usage of the products day by day.

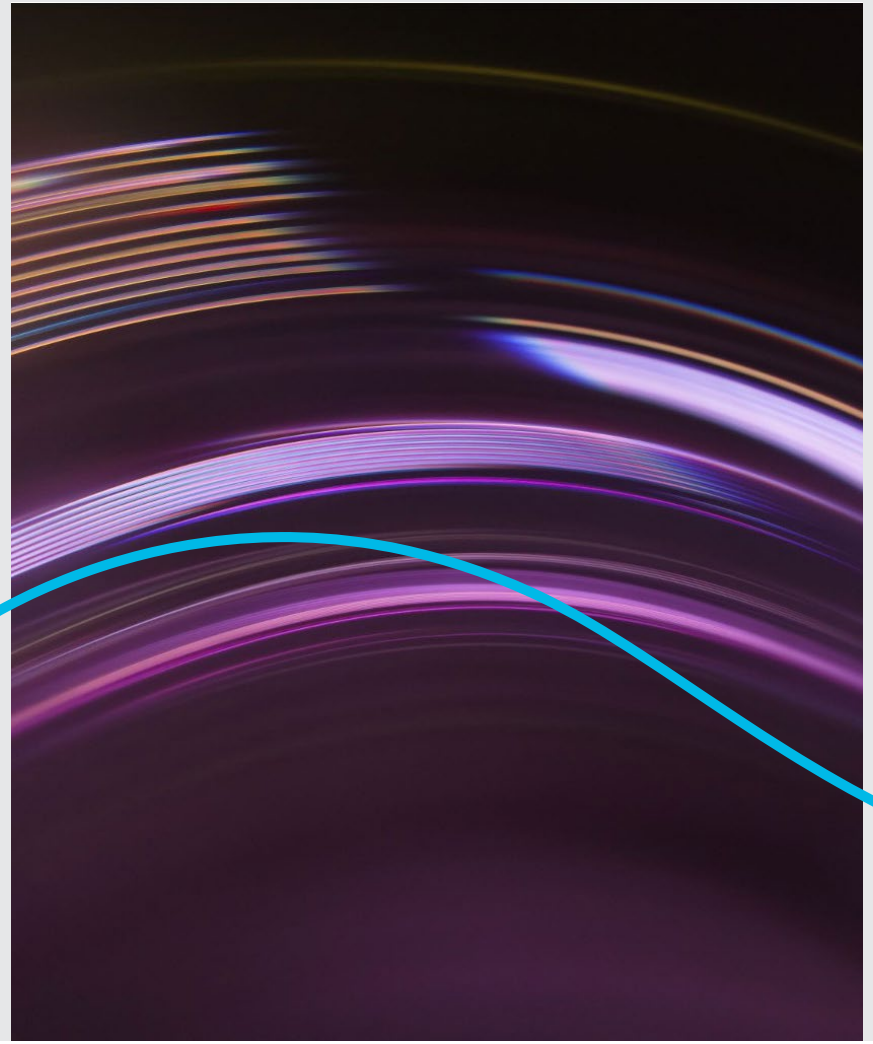
Real-time data is already in widespread use, but the key challenge is performance at scale. Discrepancies in performance arise when companies try to use this data across thousands, if not millions, of devices over various geographical locations including urban and rural environments. Organizations must also consider the ways users with varying levels of skill and needs will use this data. These are factors that will put stress on your devices and systems.

To create services that provide value in real time and manage to perform at scale, you need to move the intelligence of the product from the cloud – from the back end – directly to the device. To ensure the smooth running of a data-driven service, it is necessary to put the right solutions at the core of the design phase. There are capabilities and assets specifically developed for data ecosystems such as 890 or IDEA by Capgemini.

IMPROVING THE DESIGN PHASE

Using data correctly results in a more efficient process.

Data coming from the live usage of a product can be used to develop algorithm models to reduce R&D (research and development) costs or to accelerate the development of new products by selecting the best option from different possibilities.



With connected data you can also do simulations such as a virtual launch of the product using a digital twin. The twin accurately reflects how the process, service, or device will function in the real world. The simulation can identify issues in the product before they are launched and help gather customer feedback on the product.

A virtual launch requires fewer physical needs which, again, means lower costs and reduced go-to market times.

In-silico simulations also support sustainability by helping reduce your current footprint. This is because virtual launches do not require a lot of manufacturing of aspects that may be discarded as development progresses.

ACHIEVING CONTINUOUS IMPROVEMENT WITH DATA

To fully realize the value data offers, organizations should use it both internally and externally.

Business goals – like speeding up decision making, increasing efficiency, and automating processes – can be achieved by building a robust internal and external data platform capable of ingesting data from remote and local sources with secure pipelining and API endpoints.

A scalable, integrated platform can collect and manage AI-generated insights from a range of data sources including legacy databases. Using one central platform as a single point of access for pre-built data and AI solutions will streamline workflows and allow businesses to grow efficiently.

ADAPTING TO THE FUTURE OF DIGITAL PRODUCTS

Putting connected products into a data ecosystem and using a data source in real time – rather than collecting data to use later – is something compelling and often disruptive.

If an organization is moving from a legacy, non-connected device to an connected product, the challenges are not only technical. One of the biggest challenges can be changing people's mindset when focus shifts from one way of operating to another.

In the current climate, hiring people equipped with the right skillsets is not an easy task – and upskilling a workforce takes time. However, business is now so competitive and fastmoving that time is a luxury that companies do not have. To move swiftly, organizations need to be open to the idea of looking externally and collaborating with skilled and experienced people who can help them overcome issues connected to digital transformation.

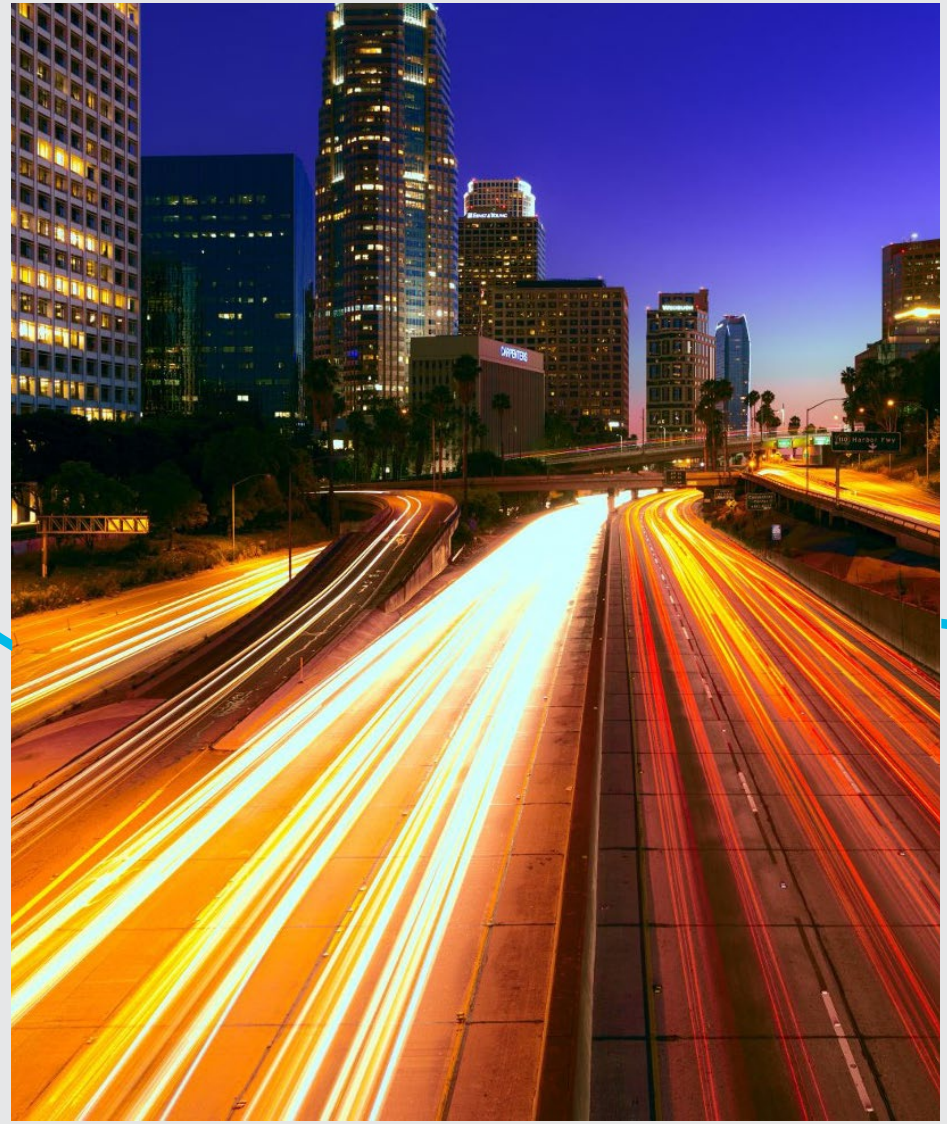
TRUST IS THE FOUNDATION OF DATA SHARING

Having access to a person's data is a privilege that is earned through trust.

First, there must be a strong incentive for users to share data with you. Offering experiences that people want to engage with – and that offer real value to the user – is the key to achieving this incentive.

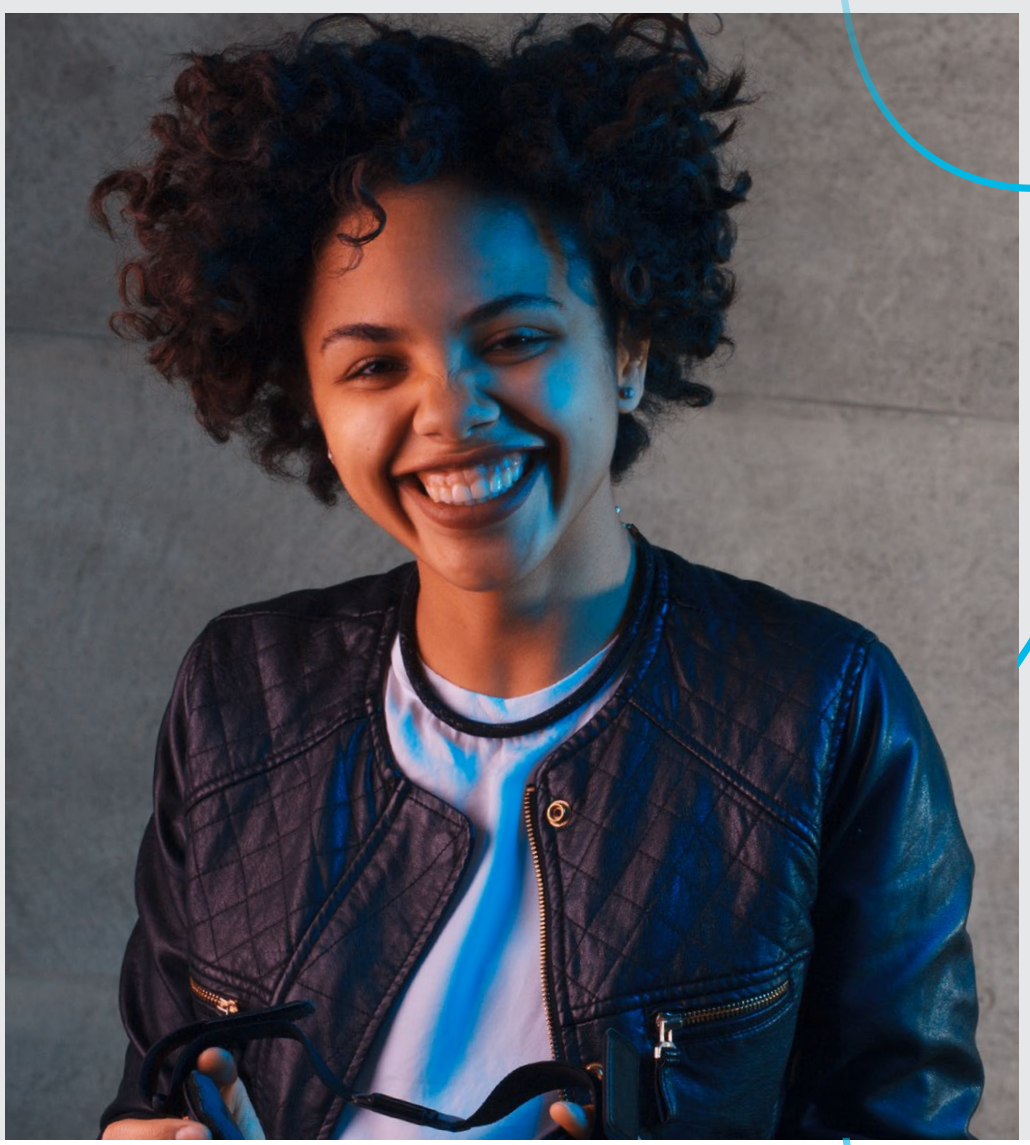
Once data has been shared, it is imperative to honor people's trust by protecting that data and providing transparency about data usage.

The protection of user data from connected devices is not just an ethical reasonability but a legal one too.



It is essential to get the customers' approval to use their data and you must be compliant with data laws and regulations-which may differ from country to country.

There are new and emerging technologies that can help ensure that you are compliant with privacy laws. One such privacy-enhancing technology is homomorphic encryption, which allows the data to be processed while still encrypted. This ensures that privacy is fully maintained and cannot be used by unauthorized users.



ACHIEVING VALUE

Organizations launching connected products should be asking themselves one fundamental question: what value will we get out of our investment?

Unfortunately, businesses often struggle to create real value from the data and the usage of algorithm models. The Capgemini Research Institute found that 76% of organizations do not have a stable infrastructure to store the data generated by connected products and services – and only 42% of them perform AI-powered data analysis. To create real value there must be a well-defined approach – a strategy on how you will transform business goals with use cases using data.

The transformation to connected products and intelligent services is a complete journey. It is not something you can solve with bottom-up experimentations and prototypes. It requires a synchronized effort from all areas of the company including leadership, HR, R&D, organization and silos, services, sales, and customer services. Value is not achieved only by designing data-driven smart products or making use of assets such as data platforms or BI analytics. Business outcomes are reached through the concerted effort of everyone involved. This requires active collaboration and a clear focus on a common goal.

Consulting frameworks enable organizations to embark on their development journey by helping them understand their current ecosystem and advising them on how to approach certain challenges from both a data and an engineering perspective.

BUILDING A CONNECTED PRODUCTS ECOSYSTEM WITH CAPGEMINI

The creation of a data-driven ecosystem of products starts with a comprehensive assessment of your current ecosystem. This will identify new value streams and detect pains points. Asset mapping determines how to tackle the pain points that have been identified.

Following the assessment phase, a proof of value is launched with embedded features and insights-driven services. This is incrementally built upon and allows us to test and learn about the product. We build product ecosystems and provide advisory consulting on products that enables prototype simulation, product development consulting, data-powered services implementations, sectorial data-driven products and services, and consumer and product analytics.

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