**Digital Transformation with Google Cloud.**

**Introduction.**

As access to Cloud computing resources has become more globally accessible and available, early adopters have been able to leverage it to create new business value.

As a result, customer expectations around the world have dramatically changed.

Customers now expect relevant and easily accessible content and information almost instantly.

They also expect services that are always running and available anywhere in the world.

No matter who your customer is, the new Cloud paradigm requires your organization to operate in new ways to meet these ever evolving and increasingly personalized expectations.

In this module, we'll explore the business and technical considerations that organizations need to think about as they embrace the Cloud.

Specifically, I'll begin by discussing how organizations need to adapt their ways of working to meet the needs of a global workforce and customer base.

Then I'll turn to traditional IT Infrastructure challenges and how businesses should think about modernization.

Then I'll explore what company wide applications are, and how have they been built historically.

I'll also touch on considerations for developing and updating applications quickly, securely, and at scale.

After that, I'll discuss the importance of data.

This includes the inevitable challenges that organizations face in capturing, storing, and leveraging their data to gain business insights and make data driven decisions.

Then I'll examine vital security considerations that must be built into an organization called Adoption Journey.

Finally, I'll give an overview of Google Cloud Solutions for digital transformation.

Let's get started.

**Enhancing productivity and collaboration**

One major challenge that organizations may face as they embrace the Cloud is changing the way they work.

This is important for two reasons.

**First**, because as consumer expectations change, business models must adapt to remain relevant.

**Second**, the traditional advantages of size and scale, are no longer as differentiating as they used to be.

Let me explain.

Traditionally, large companies with big budgets were able to operate at scale, giving them major competitive advantage.

They had the required capital to set up, maintain, and even expand their IT infrastructures, giving their employees access to the latest tools to do their jobs.

However, the universal availability of Cloud Technology gives large and small companies equal opportunity for success.

In fact, in many cases, by leveraging Cloud technology to serve customers in radically new ways, small businesses have been able to disrupt industries where large scale organizations have historically owned much of the market.

**Organizations now need to be innovative, agile, quick to market, and highly customer-focused.**

In other words, they have to change the way they work to adapt to these new business imperatives.

At Google, we believe that focusing on innovation, productivity, and collaboration, are vital to an organization's ability to make this change.

Innovation is about doing something in a surprising new way.

There are many ways to encourage innovation and increase collaboration and productivity.

At Google, we believe you can achieve these through company culture, and technology.

Let me explain.

The culture of an organization has a direct impact on employee's willingness (*voluntad*) to innovate.

Innovation relies on people being able to try things and failing without judgment.

It also depends on employees having access to the information they need to develop fresh, realistic ideas.

How teams are structured, how content is managed, and how communication flows across an organization, are all elements that significantly affect innovation.

Next, equipping people with the tools they need to succeed is also an important part of enabling innovation, and increased productivity and collaboration.

We'll learn more about some of these tools and their impact on collaboration and productivity in upcoming videos.

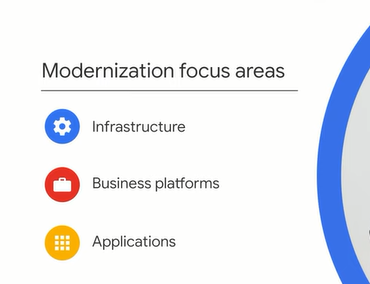
**Modernizing IT infrastructure**

We've looked at how organizations need to change the way they work to thrive in the Cloud and meet customers where they are.

Another challenge is to transform the IT backbone with which the organization runs. (*Otro desafío es transformar la columna vertebral de TI con la que funciona la organización*.)

This is especially challenging for large enterprises that have deeply entrenched and complex systems, hardware and processes that need to change.

**There are three core focus areas for modernization; infrastructure, business platforms, and applications**.



Let's look at each of these one by one.

**Infrastructure modernization** is a common term used to describe the process of replacing legacy hardware and systems and consolidating them in the Cloud.

This often poses many challenges for organizations from defining new governance policies through to ensuring that security systems are in place.

In addition, business critical applications are often running on existing on-premises infrastructure, so transitioning them to the Cloud can be a big change.

An added complexity is that most organizations want to operate a hybrid model.

This means operating across multiple public Cloud providers or a mixture of private on-premises and public Cloud solutions.

Integrating systems and information across multiple environments is complicated.

But when an organization has embraced the process of modernization, the opportunities for business transformation are huge.

Let's look at a couple of examples.

Businesses can take advantage of high performance computing in a cost-effective and scalable way.

Traditional IT required significant upfront expenditure to ensure that the hardware was in place for the just in case moments such as peaks in demand.

With cloud computing, businesses can scale in the Cloud and pay for what they use when they use it.

This has significant implications for how an organization thinks about operations and IT budgets.

Another example of modernization is Virtual Desktops.

Recently, the global pandemic has radically impacted how teams work together.

With the rapid shift to work from home, companies are confronted with a challenge of balancing security and IT resources with the demands for working from home.

Virtual desktops are pre-configured images of operating systems and applications.

This means that accessing the operating system doesn't rely on the physical device running on the operating system.

Instead, users can access the virtual desktops remotely using any endpoint device, such as a laptop, a smartphone, or a tablet.

This enables secure and scalable access to corporate resources.

Cost reductions and virtual desktops are just two examples of what businesses can do when they embrace Cloud technology and modernize their infrastructure.

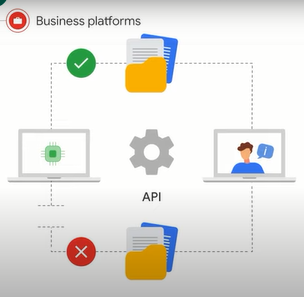
But infrastructure modernization is only the start.

Another key area for modernization is business platforms, which I'll cover next.

**Modernizing business platforms and applications.**

In the last video, we covered the first focus area for modernization.

Let's now look at the next two.

**Business application platforms** are essentially about enabling integration between systems and granting users the correct access privileges in an organization and beyond. For example, suppose a company uses a third party platform for managing parts of customer data, customers who have purchased a premium support package should be prioritized by the partner in that region, application processing interfaces, commonly known as APIs are technical tools that enable integration between applications. 

In this case, the company uses an API to integrate their partner portal application with the customer information platform.

They configure it so that the partner can only access certain information and other information remains protected.

We'll talk about business application platforms in a later module.

Now, let's look at **application modernization**.

The term application is widely used to refer to programs and software that enable people to preform various digital tasks. Apps on smartphones are one example. Another example is the software you use to create documents, spreadsheets and presentations.

Today's customers expect instant access to services wherever they are.

An organization's ability to develop and launch applications is central to their success in today's competitive market. But organizations must embrace the importance of speed and innovation without compromising security.

**One way to realize this is through developer operations or DevOps.**

**DevOps is a set of practices that aim to increase software delivery velocity, improve service reliability, and build shared ownership among software stakeholders. (***DevOps es un conjunto de prácticas que tienen como objetivo aumentar la velocidad de entrega del software, mejorar la confiabilidad del servicio y crear una propiedad compartida entre las partes interesadas del software***.)**

We explore application modernization, including DevOps and a lot more detail in another course, understanding Google cloud security and operations.

Let's now look at how organizations can leverage data to enable digital transformation.

**Unlocking the value of data.**

Leveraging data relies on being able to capture, store, and structure it in such a way that you can make informed business decisions with it. (*Aprovechar los datos depende de poder capturarlos, almacenarlos y estructurarlos de tal manera que pueda tomar decisiones comerciales informadas con ellos*).

Data is no longer only about retrospective insight, it also includes real time insight, smart predictions, and intelligent action.

Imagine you're working in a traditional large enterprise.

Lots of offices around the world, tons of documents, spreadsheets, and files, varying platforms and applications, assets and materials in various languages, and a global customer base, the wealth of available data is enormous.

Some data, like financial data, is easy to capture because it already lives in spreadsheets.

Other data is harder to capture, like content that is spread across PDF and forms or social data.

How your customers engage with you across social media platforms, for example.

Another challenge is storage and data management.

After you've captured data, how do you store it in such a way that you can gain insights from it?

With the right platform, organizations can generate instant insights from data at any scale.

Instead of analyzing data for retrospective insight, you can leverage data in real time to continually improve your service.

For example, organizations can use stream analytics tools to instantly capture consumer behavior on their website and respond in a more targeted way in real time.

When an organization has captured data and has systems in place to continue capturing it at scale, the possibilities are endless.

With machine learning and artificial intelligence, or ML and AI, you can generate insights from data both past and present, and you can also perceive, predict, recommend, and categorize data in new ways.

For example, ML enables large equipment manufacturers to schedule predictive maintenance with greater accuracy, leading to less downtime and increased productivity.

Online retailers who use smart analytics tools can ingest real time behavior data while also leveraging ML to surface the best suggestions for particular users.

With every click that the user makes, their website experience becomes more and more personalized.

ML and AI are leading to significant advancements in medicine as models trained to analyze images can identify various abnormalities to a high degree of accuracy.

These are just a few examples.

We'll explore many more in upcoming modules, along with the security, privacy, compliance, and ethical implications of leveraging data.

**Using a new built-in security model.**

One aspect of digital transformation that permeates all others is security.

Security in the Cloud requires new ways of thinking.

Traditionally, IT security models focused on keeping threats out. (*Tradicionalmente, los modelos de seguridad de TI se centraban en mantener alejadas las amenazas*).

They built an on-premises perimeter that individuals required access to in order to gain entry.

That model works when all hardware and systems were controlled and managed centrally and employees came into the office to do their work.

Now, employees want to create, share, and access information virtually.

In an increasingly global workforce, businesses need to grant access to applications and relevant data with a high degree of security.

Businesses can now do this with security built in when moving some or all of their data and infrastructure to the Cloud.

In the Cloud, the best practice for security is called a **Shared Responsibility Security Model**.

In this model, **the Cloud provider is responsible for the physical infrastructure like the undersea cables, data centers, the personnel to manage the hardware and software, and businesses are responsible for controlling data and resource access.**

This means that businesses need to think carefully about appropriate governance and policies for granting and restricting access to information and applications.

Compliance with regional regulations is also part of security and governance.

These regulations govern where data is stored and how it's managed.

Security in the Cloud is multifaceted and complex, and we'll cover it in a lot more detail in another course, Understanding Google Cloud Security and Operations.

These are just a few of the security concerns that any organization must take into account as they undergo digital transformation.

Up to this point in the module, we examined key business and technical challenges that organizations face as they undergo digital transformation.

These challenges include culture change to encourage innovation, updating IT infrastructure, modernizing business platforms and applications, and capturing, storing, and leveraging data, and finally adopting a built-In security model.

These challenges are complex, and in many cases, mission-critical for businesses to overcome in the Cloud era.

In the next video, I'll cover how Google Cloud Solutions can help companies address these challenges.

**Google Cloud solutions for digital transformation.**

Google serves over one billion users worldwide across search, Gmail and other applications.

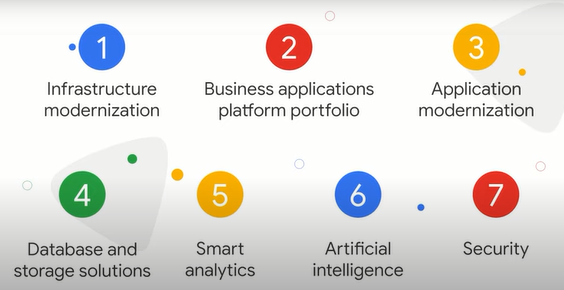
Google takes what it has learned from serving billions of users and creates Google Cloud products and solutions available to organizations around the world.

Now customers can build their own applications and manage their own workloads on the same infrastructure that Google Cloud runs to achieve their mission and serve their users.

We've grouped the products and services into solution pillars to match many organizations transformation journey.

In fact, these groupings are based on how different types of customers have already used and benefited from Google Cloud solutions.

The solution pillars are infrastructure modernization, business applications platform portfolio, application modernization, database and storage solutions, smart analytics, artificial intelligence, and security.



A common first step for digital transformation is moving parts of a traditional IT infrastructure to the Cloud.

The goal would be to make modifications with minimal impact to end users or customers, learn from the updates iteratively and ultimately meet the demands of the Cloud era.

Google Cloud and its partners offer flexible infrastructure modernization approaches from re-hosting customer's existing IT to re-platforming.

This means using new platforms and applications to enhance what you can do.

When organizations have moved some or all of their workloads to Google Cloud, they can then leverage the innovation built into Google Cloud technology to create new business value.

We cover more details about the specific products and services in another course, the value of infrastructure and application modernization with Google Cloud.

Now another challenge businesses face is **modernizing their business platforms** to enable better information flows and more secure access to systems and applications.

With Google Cloud Business Application platforms portfolio, organizations can securely unlock their data with APIs, automating processes and creating applications across Clouds and on premises without coding.

Tools in this pillar, such as Apache, API Management and Cloud Endpoints, build and automate business workflows while migrating and modernizing apps as they move to the Cloud or between Clouds.

Businesses can better serve their users through application modernization.

The tools within this pillar help businesses develop and run applications anywhere.

Businesses can both modernize legacy apps and build new ones, which helps them achieve higher return on investment and innovate faster.

Let's look at data and digital transformation.

Google Cloud database and storage solutions include tools that help businesses migrate and manage enterprise data with security, reliability, high availability, and fully managed data services.

Examples include **Cloud Spanner, Cloud SQL, and Fire store**.

The smart analytics portfolio helps businesses generate instant insights from data at any scale with a serverless fully managed analytics platform.

**BigQuery** is an industry leading example of a serverless data warehouse solution.

**Looker** is a business intelligence platform that provides a unified service to access the truest (*más verdadera*), most up to date version of your company's data.

We cover more on these and other tools in another course, innovating with data and Google Cloud.

Google Cloud, artificial intelligence tools are built to enhance innovation and improve productivity by integrating seamlessly into a company's existing workflow and products.

Google Cloud's comprehensive security solutions cover all aspects of protecting your business in this digital era.

In fact, businesses can detect, investigate, and protect themselves against online threats before attacks result in damage or loss.

These solutions also reduce the time it takes to identify threats.

It might be difficult to determine what solutions you need and how to prioritize your cloud adoption challenges.

To help organizations optimize their cloud adoption Google Cloud has developed the **Google Cloud Adoption Framework.**

This best practice guide provides a framework to assess where an organization is in its journey and what it should do next.

Refer to the linked reading or the direct link to the website for more details.

https://Cloud.google.com/adoption-framework.

Now throughout this module, I covered the business and technical challenges and the solutions that enabled digital transformation.

In the next module I will look at the role that culture plays in overcoming these business and technical challenges.

In particular, all examine how organizations can foster (*alentar*) and scale an innovation mindset to create fresh breakthrough (*descubrimiento*) experiences for customers.

**Quiz. Digital Transformation with Google Cloud.**

1. In the cloud, the recommended practice for security is called a ‘*shared responsibility security model*'. What does this mean? Select the two correct answers.

**The cloud provider is responsible for the physical infrastructure.**

**The business is responsible for access to data and applications.**

The cloud provider is responsible for access to information and applications.

The business is responsible for the physical infrastructure.

The cloud provider and the business are both responsible for the physical infrastructure.

2. Organizations have traditionally used retrospective data to gain business insights. By using cloud technology, in what new way can businesses leverage data? Select the correct answer.

**Businesses can gain real-time insights**

Businesses can unlock retrospective insights

Businesses can now evaluate corporate data

Businesses can now analyze user data

3. What factors have a direct impact on a team’s ability to innovate? Select the two correct answers.

**Ability to try new things without fear of failure or judgement**

**Team structure**

Job satisfaction

Tools and technology

Ability to delegate tasks to cross functional teams

4. Customers now expect instant access to services anytime, anywhere. What do businesses need to prioritize to meet these changing needs? Select the correct answer.

**Launching new applications quickly**

Localizing existing applications

Streamlining existing hardware (*Optimización del hardware existente*)

Updating hardware systematically

5. Infrastructure modernization is foundational to an organization's digital transformation. It is a common term used to describe what process? Select the correct answer.

**Leveraging (*aprovechar*) hidden value from legacy systems and applications with cloud technologies**

Replacing legacy hardware and systems and consolidating them on-premises

Updating productivity software and implementing cloud collaboration

Updating productivity software and implementing new governance practices