Hi, Damon again. A business case outlines the pros, cons, risks, and rewards of doing a project. Let's talk about how you might write one for a Google Cloud database migration project.

Learning objectives

- Write a business case to justify a database migration.
- Perform risk and cost/benefit analysis on a cloud migration project.
- Estimate the costs associated with database migration.

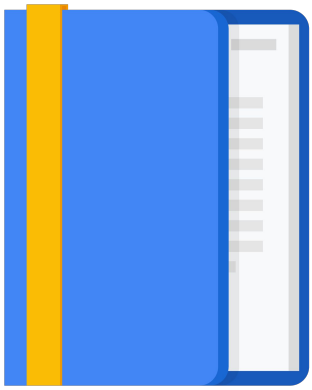
Google Cloud

In this module, you learn to write a business case to justify a database migration.

You perform risk and cost/benefit analysis on a cloud migration project, and estimate the costs associated with database migration.

Agenda

Writing a Business Case



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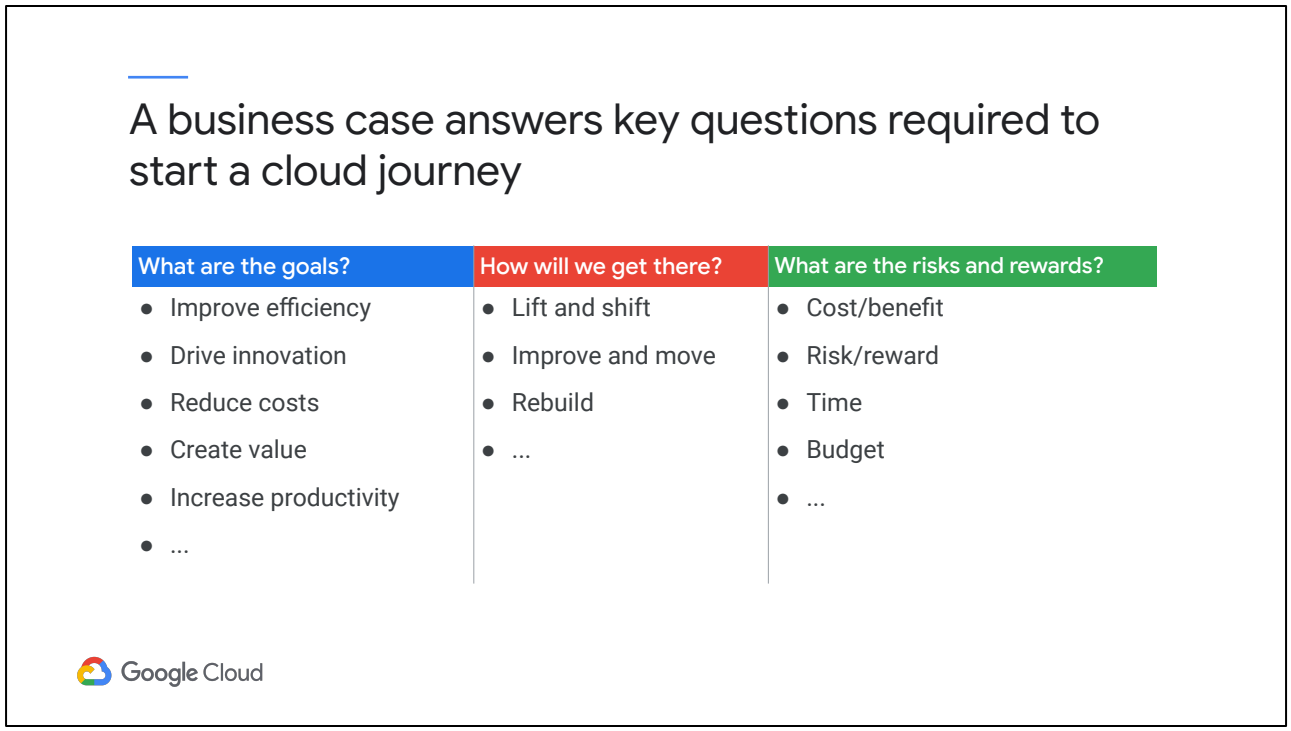
Management has many potential projects and a limited supply of resources to accomplish them. Priorities need to be made and management must decide which are worthwhile endeavors. A business case is used to justify why the company should take on your project.

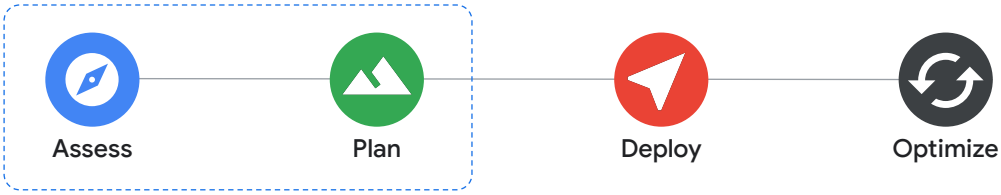
Let's start by learning why a business case is important and learn what you should include when creating one.



A business case answers key questions required to start a cloud journey.

- What are the goals? There may be many goals: improved efficiency, innovation, lower costs, increased productivity, and many others. The business case allows you to express and prioritize what your motivations are.
- The business case should include a plan for achieving your goals. Will you lift and shift your applications, improve then move them, rebuild everything, or some combination of all of these?
- Business people need to evaluate the risks versus the rewards. What it will cost compared to how much it will save or how much will we profit. Provide them with an estimate of the time and budget required.

Spending time upfront on assessment and planning will help deployment efficiency



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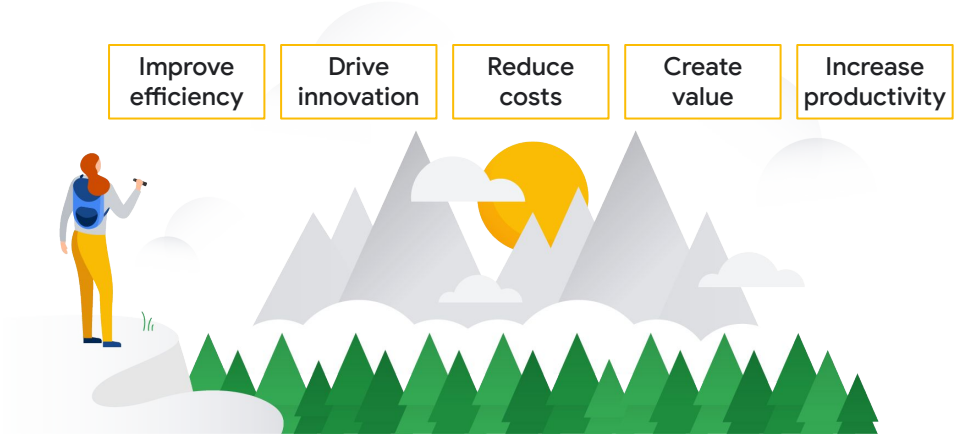
Spending time upfront on assessment and planning will help deployment go faster. This doesn't mean you need to spend a year planning every detail. But at least you need a clear understanding of where you are and where you want to get to.

The goals might be clear, but the path to get there might not be



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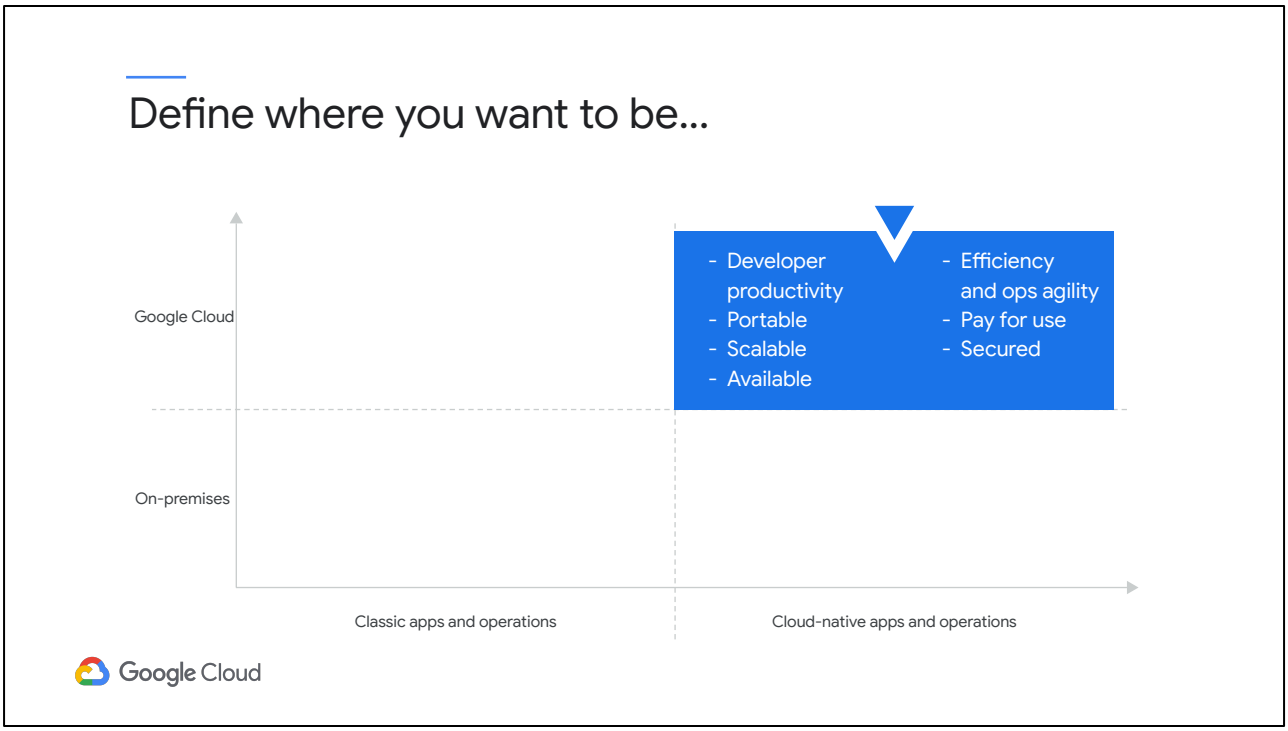
The goals might be clear, but the path to get there might not be.

Start by defining where you are and define why you want to move. If there are no problems with the current environment, migrating away from it wouldn't make sense. Maybe the current environment is too expensive; maybe it is too difficult to maintain. There might be innovations you want to take advantage of that the current environment makes impossible or impractical.

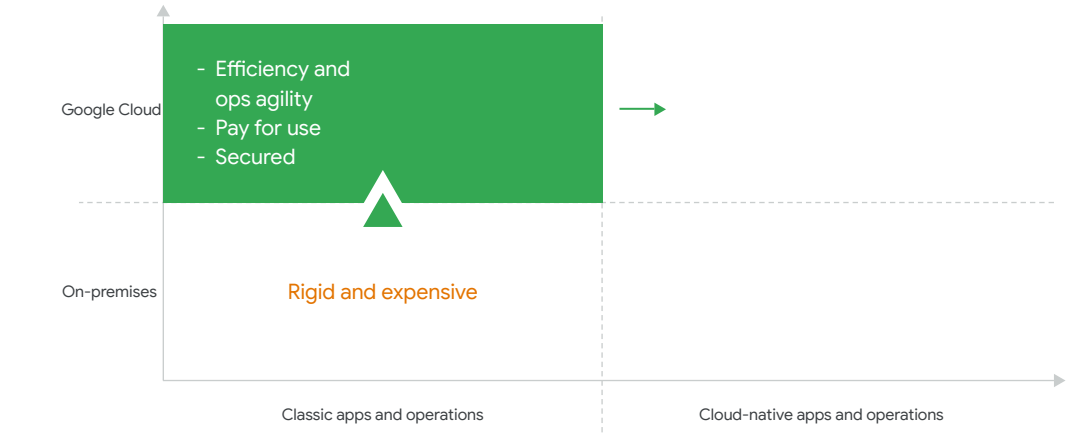


Define thoroughly where you want to get to and why. What is the end goal? Maybe the goal is to be in Google Cloud running cloud-native, microservice applications and managed services when possible.

But why is this beneficial? It might be obvious to you, but not necessarily to the business stakeholders. So, tell them.

These reasons need to be included and outlined in your business case.

Lift and shift might be your best first step to the cloud



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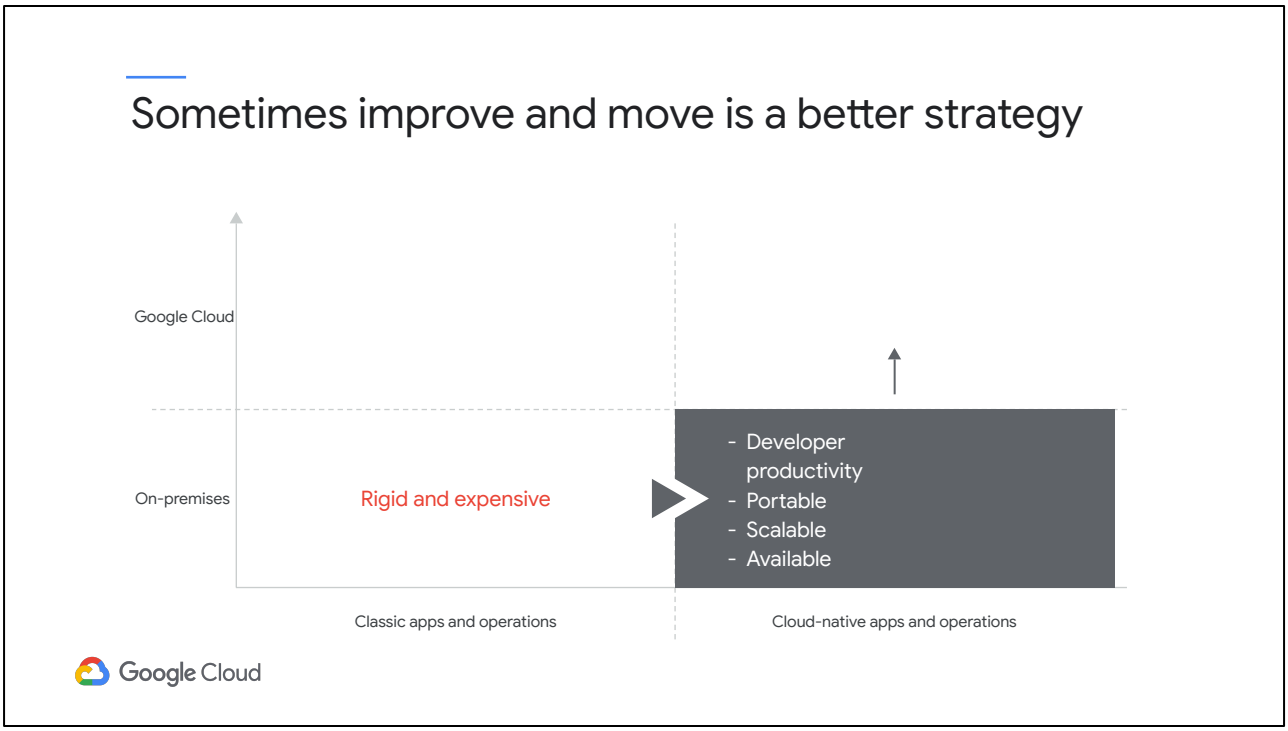
Earlier in the course, you learned about different strategies for migrating to the cloud. One strategy is lift and shift. Essentially, that means just pick up your applications and databases as they are and then move them into the cloud.

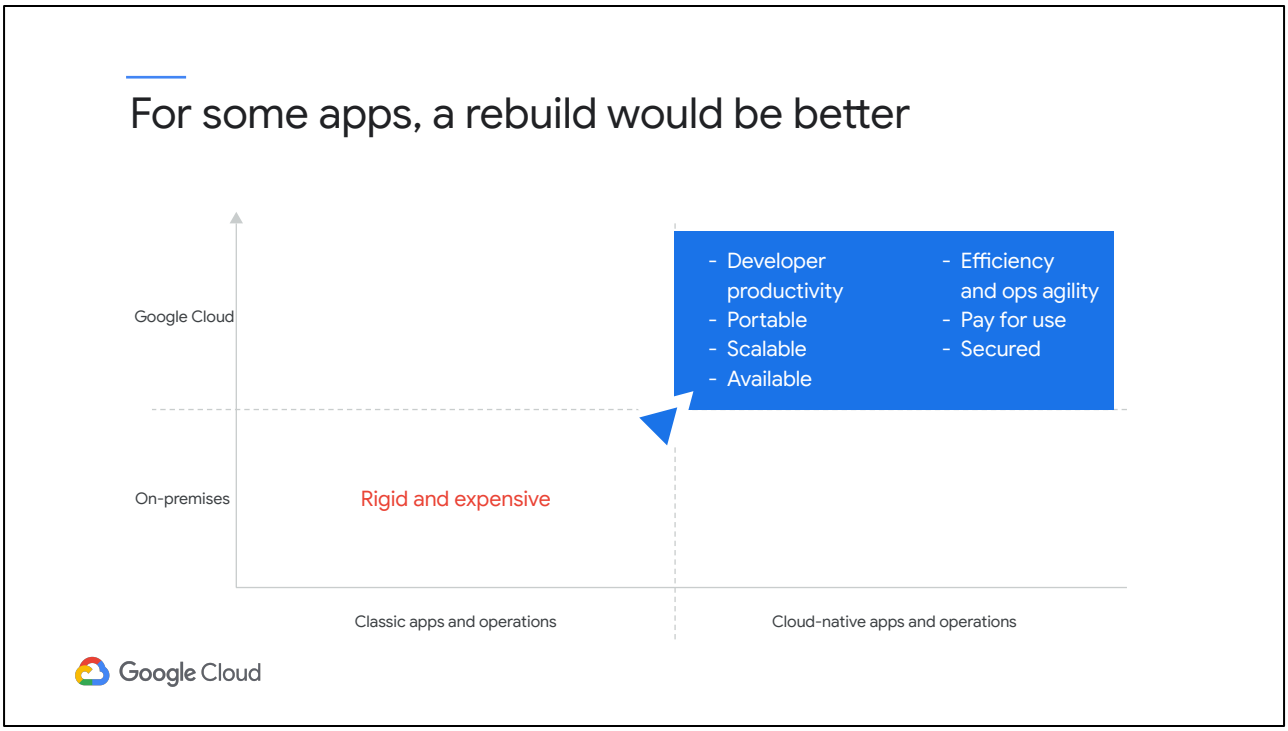
After your applications are in the cloud, you can start optimizing them. Or migrate functionality to managed services.

As discussed earlier, you can optimize a monolithic application a little at a time. Eventually, the monolith disappears as a collection of microservices grows. This is Martin Fowler's Strangler pattern.



There are times when lift and shift is not worth it. The cost and complexity of moving applications and databases to the cloud and then trying to optimize them might be too great. In the case of mainframe applications, a lift and shift approach might not be possible.

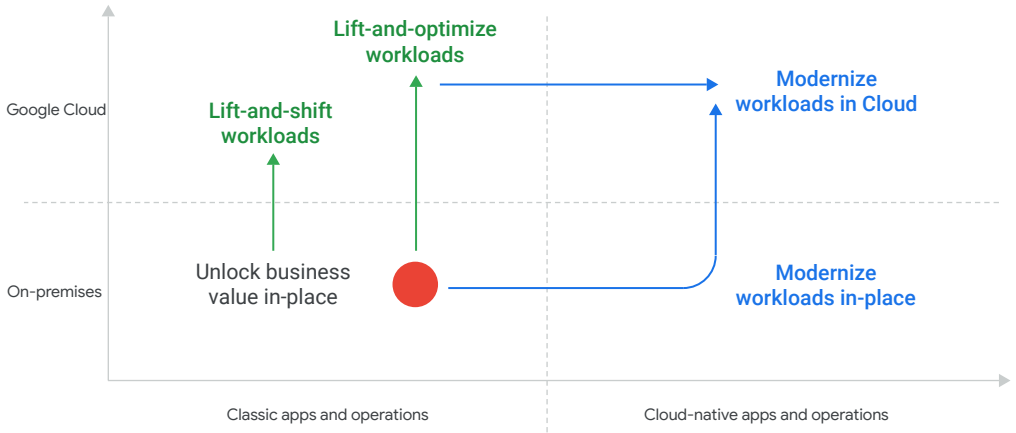
Sometimes, improve and move is a better strategy. Instead of migrating the applications and then optimizing them, refactor the applications on-premises and then move them to the cloud.



For some apps, a rebuild would be better. There's a good argument to be made that you should reimagine the business. If you were just starting out, how would the business be different given the current technology? How would your applications be different if they were designed to run on today's hyper-scale cloud platforms instead of yesterday's internal data center?

Sometimes a complete redesign, re-architect, and rebuild approach will yield better results and be cheaper over time. Companies that use this approach essentially leave the old systems where they are, build shiny new systems in the cloud, and gradually move users to the new system. Eventually, the old systems can be retired.

For most organizations, there are multiple strategies



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For most organizations, there are multiple strategies. The best approach depends on the application, its users, and its importance to the organization.

Identify which apps are best poised to move first

- Are not business-critical
- Are not edge cases
- Can be used to build a knowledge base
- Are managed by central teams
- Supportive app or line-of-business owner who likes spearheading new, innovative projects
- Have fewer system and network-to-network dependencies
- Require less app refactoring
- Do not have compliance challenges
- Do not have third-party proprietary licenses
- Can afford a cutover window

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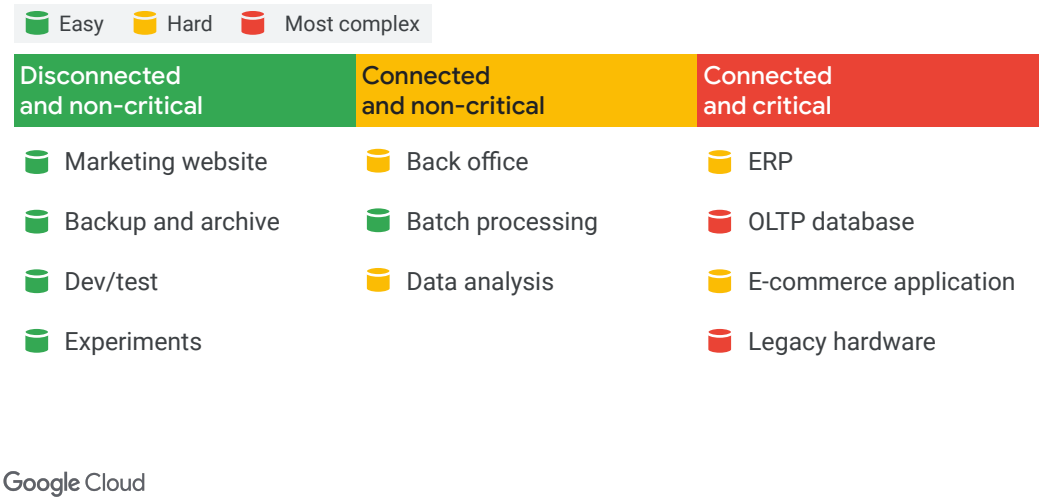
If you're just starting out or looking for a proof of concept, identify what apps would be the best to move first. Don't start with the most mission-critical, customer-facing application you can find. That is too risky. Look for an app or apps that are less risky.

You are also trying to learn and build a knowledge base. So don't look for the unusual app that is an edge case. Find something more typical.

Pick a first mover that would be tolerant of a little downtime when the switchover happens.

Careful application analysis will help manage the risk



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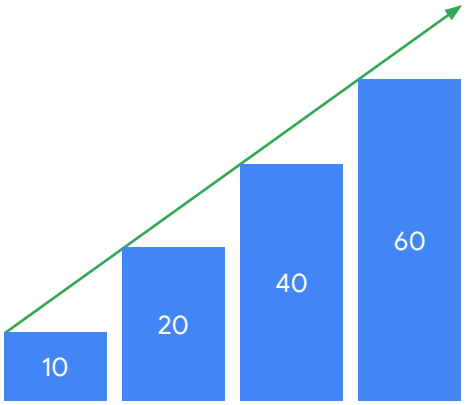
As you work on your business case, a careful application analysis will help manage the risk. Categorize applications based on both how hard they will be to migrate and how important they are to the business.

Take a look at the chart on the screen. You would certainly be more comfortable choosing the Marketing website or the Dev/test environment as first movers, as opposed to the ERP system or the OLTP database, which are both harder and more critical.

Migrate in waves

- Start with 10 really easy-to-migrate systems. Build confidence in cloud and migration.
- Gradually increase number of systems per wave, to 20… then 40… then 60… and so on.
- Adjust migration technique based on lessons from previous waves.



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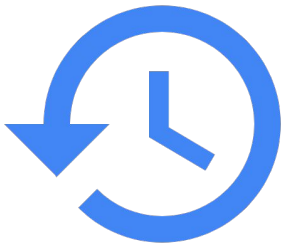
Plan your migration a few applications at a time, starting with a few easier migrations where you can learn and gain confidence and experience.

Gradually move on to the more critical and difficult systems. As you learn, you will be able to refine and optimize your migration processes.

Experience will help with time and budget estimates

Tips:

- Build a PoC.
- Start with simple applications.
- Learn from previous efforts.
- Automate as much as possible.
- Look for ways to continually optimize.



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As part of your business case, you will be expected to give time and budget estimates. We all know that, at the beginning of a project, this is often guesswork.

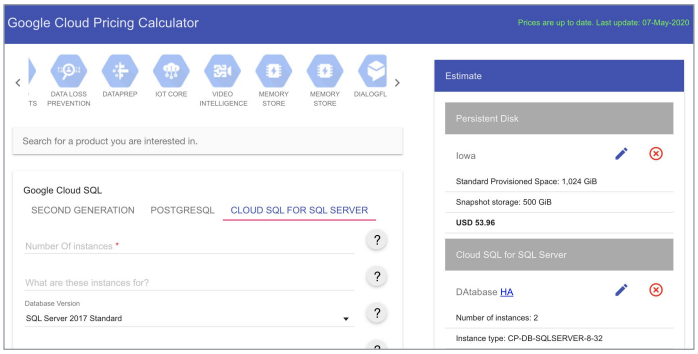
However, as you gain experience with your initial proof of concept, followed by a few first movers, you will be better equipped to refine those estimates. Business people will understand if your earlier estimates are wrong, as long as you are honest and refine those estimates over time.

Your estimates will improve over time if you first build a PoC, then migrate some simple applications. You will learn from previous efforts. Automate as much as possible and always be looking for ways to optimize your deployment processes.

Running applications will help refine your cost estimates

Tips:

- Use the Google Cloud Price Calculator for initial estimates.
- Compare estimates with actual costs.
- Analyze real cost to help improve estimates.



Google Cloud

Running applications will help refine your cost estimates. Use the Google Cloud Price Calculator for initial estimates. Compare estimates with actual costs, and analyze real costs to help improve estimates for future migrations.

Use a standard approach to risk assessment and mitigation

Application	TCO On-Premises	TCO in Cloud	Business Value	Budget to Move	Time Required	Risk
Marketing website	$10K/month	$3K/month	Medium	$25K	1 month	Low
...						

Google Cloud

Use a standard approach to risk assessment and mitigation. This type of estimate shouldn't be very complicated.

Estimate the total cost of ownership both in the cloud and on-premises. Don't just calculate the cost of running an application on Google Cloud and compare that to buying a server from Dell or HP. Total cost of ownership includes many things: administrative cost, the build, power, licenses, support, and so on.

Estimate how much the migration will cost and how long it will take. Give a simple high, medium, or low estimate of risk and value. This kind of analysis gives the business people the information they need to make the right decisions for the organization.

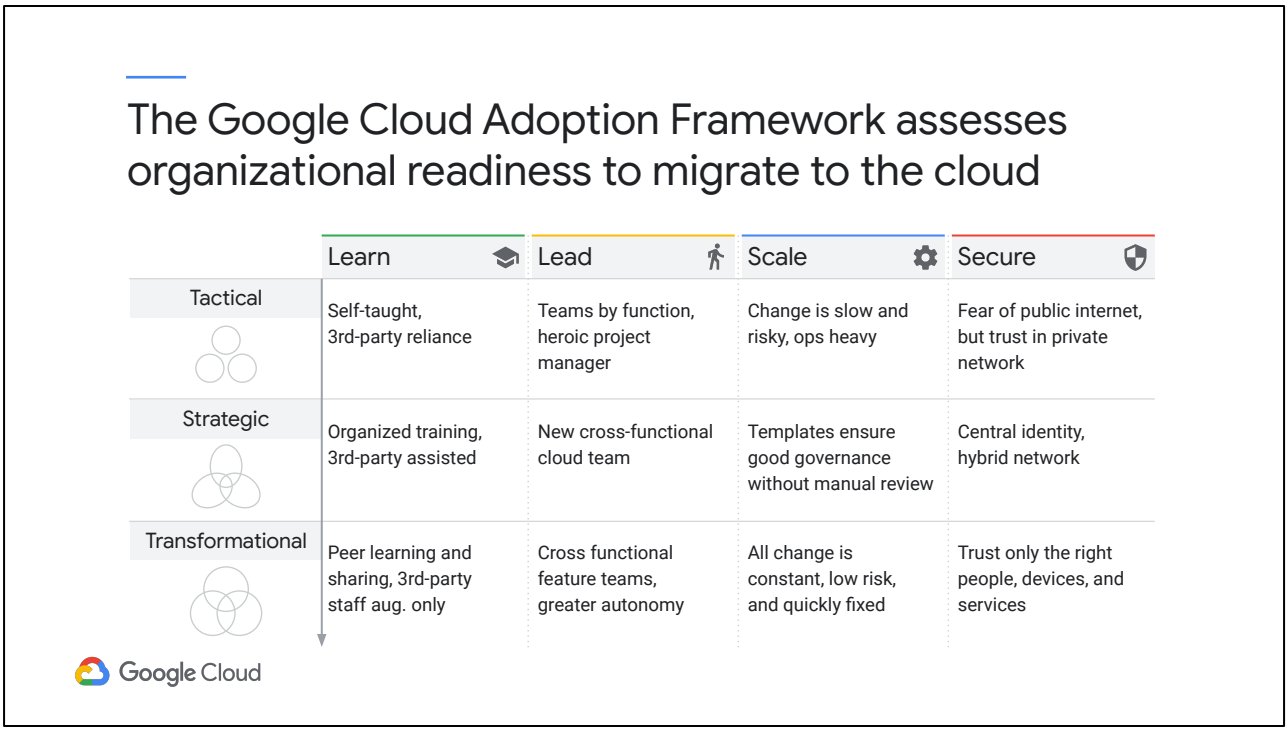
Reshape the culture

- Sync with cross-functional teams early and often.
- Help teams understand the benefits of the cloud, the project's process, desired goals and outcomes, etc.
- Identify a "champion."

Google Cloud

You will likely encounter pushback when moving to a new environment. Developers are invested in their current environments, which they devoted considerable time to learning. Moving to something new may seem risky and unnecessary to them.

- This requires a cultural shift. Develop cross-functional teams and train them so they understand the benefits of Google Cloud and are comfortable and knowledgeable using it.
- Help them understand the benefits, the processes, and goals.
- Identify a "champion" within the organization: someone with authority who will fight for you when you get pushback.

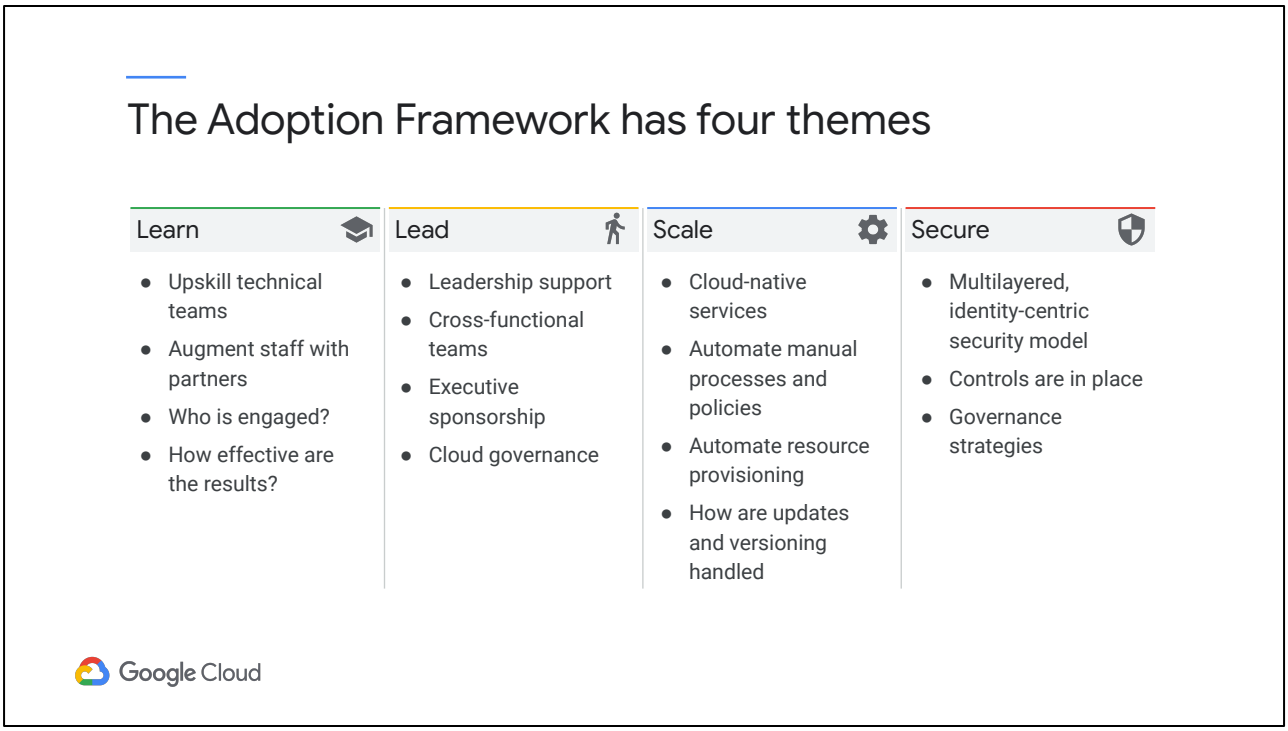


The Google Cloud Adoption Framework assesses organizational readiness to migrate to the cloud.

The Adoption Framework builds a structure on the rubric of people, process, and technology that you can work with, providing a solid assessment of where you are in your journey to the cloud and actionable programs that get you to where you want to be.

It's influenced by Google's own evolution in the cloud and many years of experience helping customers.

The adoption framework has four themes and three phases.



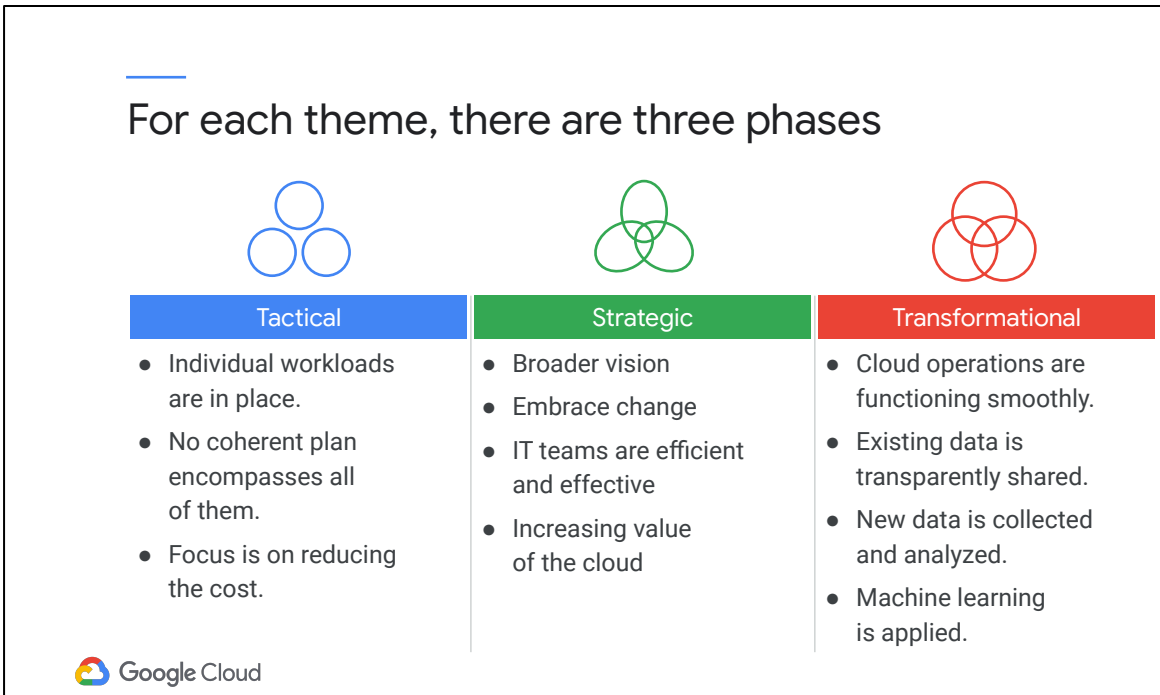
The four themes are: learn, lead, scale, and secure.

- **The *learn* theme** evaluates the quality and scale of the learning programs you have in place to upskill your technical teams and your ability to augment your IT staff with experienced partners. Who is engaged? How widespread is that engagement? How concerted is the effort? How effective are the results?

- **The *lead* theme** measures the extent to which IT teams are supported by a mandate from leadership to migrate to the cloud and the degree to which the teams themselves are cross-functional, collaborative, and self-motivated. How are the teams structured? Do they have executive sponsorship? How are cloud projects budgeted, governed, assessed?

- **The *scale* theme** is the extent to which you use cloud-native services that reduce operational overhead and automate manual processes and policies. How are cloud-based services provisioned? How is capacity for workloads allocated? How are application updates managed?

- **The *secure* theme** is the capability to protect your services from unauthorized and inappropriate access with a multilayered, identity-centric security model. It is also dependent on the advanced maturity of the other three themes. What controls are in place? What technologies are used? What strategies govern the whole?



For each theme there are three phases: tactical, strategic, and transformational.

- In the ***tactical*** **phase**, individual workloads are in place, but there is no coherent plan encompassing all of them with a strategy for building out to the future.

- In the ***strategic*** **phase**, a broader vision governs individual workloads, which are designed and developed with an eye to future needs and scale. You have begun to embrace change, and the people and processes portion of the equation is now involved. IT teams are both efficient and effective, increasing the value of harnessing the cloud for your business operations.

- In the ***transformational*** **phase**, cloud operations are functioning smoothly. You've turned your attention to integrating the data and insights garnered from working now in the cloud.
  Existing data is transparently shared. New data is collected and analyzed. The predictive and prescriptive analytics of machine learning are applied. Your people and processes are being transformed, which further supports the technological changes. IT is no longer a cost center, but has become instead a partner to the business.

Activity: Making the business case

Open the Enterprise Database Migration case study.

Read the case study and then follow the instructions for Activity 2: Making the business case.

Google Cloud

In this activity, you begin the process of creating a business case for moving to Google Cloud.

Open the Enterprise Database Migration case study from earlier in the course.

Read the case study and then follow the instructions for Activity 2: Making the business case.

Review: Making the business case

Google Cloud

In this activity, you were asked to create a value versus risk assessment for the RIO Health Systems case study. Obviously, some of the numbers are really just guesses given we don't have enough information. But, this is the sort of assessment you would want to undertake when justifying a move to the cloud when doing a business case.

Application name	TCO on-premises	TCO in Google Cloud	Business Value (H, M, L)	Budget to move	Time required	Risk (H, M, L)
SAP	$1M/yr	$750,000/yr	H	$240,000	6 Months	H
B-B eCommerce	$400,000/yr	$300,000/yr	H	$40,000	1 Months	H
Marketing Web App	250,000/yr	$150,000/yr	H	$10,000	1 Week	M
CRM System	$40,000/yr	$35,000/yr	H	$20,000	2 Weeks	M
Logistic Database	$75,000/yr	$55,000/yr	M	$40,000	1 Month	M
Data Warehouse	$2M/yr	$800,000/yr	M	$120,000	3 Months	L
Recruiting Database	$5,000/yr	$1,000/yr	L	$20,000	2 Weeks	L
Conference Room Scheduler	$500/yr	$100/yr	L	$10,000	1 Week	L
Internal Web / Blog	$100/yr	$100/yr	L	$10,000	1 Week	L

Here is an example of a completed business case. You may pause the video to review it in detail.

Module review

In this module, you learned how to:

Write a business case to justify a database migration.
Perform risk and cost/benefit analysis on a cloud migration project.
And estimate the costs associated with database migration.

Thank you for attending this course on Enterprise Database Migration to Google Cloud. This video is the final lecture.

In this course, you learned how to migrate on-premises enterprise databases to Google Cloud.

You evaluated on-premises database architectures and planned migrations.

You learned how to choose the appropriate Google Cloud services to run your database on. These include Compute Engine, Kubernetes Engine, Cloud SQL and Bare Metal Solution.

You learned about Google's methodology for migrating to Google Cloud. And the steps in the methodology which are assess, plan, deploy, and optimize.

You deployed a secure network architecture using Terraform to automate resource creation.

You learned to run and to administer SQL Server and Oracle databases on Google Cloud.

Lastly, you learned to test and monitor database migrations and leverage tools to automate data transfer.

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