COURSEWARE

FINANCIAL OPERATIONS AND CLOUD COMPUTING BASED ON FINOPS COURSEWARE

Francisco Sepúlveda

Van Haren
PUBLISHING

Financial operations
& cloud computing
based on FinOps
Courseware

Colophon

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For further information about Van Haren Publishing please e-mail us at: info@vanharen.net or visit our website: www.vanharen.net

Publisher about the Courseware

The Courseware was created by experts from the industry who served as the author(s) for this publication. The input for the material is based on existing publications and the experience and expertise of the author(s). The material has been revised by trainers who also have experience working with the material. Close attention was also paid to the key learning points to ensure what needs to be mastered.

The objective of the courseware is to provide maximum support to the trainer and to the student, during his or her training. The material has a modular structure and according to the author(s) has the highest success rate should the student opt for examination. The Courseware is also accredited for this reason, wherever applicable.

In order to satisfy the requirements for accreditation the material must meet certain quality standards. The structure, the use of certain terms, diagrams and references are all part of this accreditation. Additionally, the material must be made available to each student in order to obtain full accreditation. To optimally support the trainer and the participant of the training assignments, practice exams and results are provided with the material.

Direct reference to advised literature is also regularly covered in the sheets so that students can find additional information concerning a particular topic. The decision to leave out notes pages from the Courseware was to encourage students to take notes throughout the material.

Although the courseware is complete, the possibility that the trainer deviates from the structure of the sheets or chooses to not refer to all the sheets or commands does exist. The student always has the possibility to cover these topics and go through them on their own time. It is recommended to follow the structure of the courseware and publications for maximum exam preparation.

The courseware and the recommended literature are the perfect combination to learn and understand the theory.

-- Van Haren Publishing

Other publications by Van Haren Publishing

Van Haren Publishing (VHP) specializes in titles on Best Practices, methods and standards within four domains:

- IT and IT Management
- Architecture (Enterprise and IT)
- Business Management and
- Project Management

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Topics are (per domain):

IT and IT Management

ABC of ICT
ASL®
CATS CM®
CMMI®
COBIT®
e-CF
ISO/IEC 20000
ISO/IEC 27001/27002
ISPL
IT4IT®
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Table of content

Self-Reflection of understanding Diagram

'What you do not measure, you cannot control.'' – Tom Peters

Fill in this diagram to self-evaluate your understanding of the material. This is an evaluation of how well you know the material and how well you understand it. In order to pass the exam successfully you should be aiming to reach the higher end of Level 3. If you really want to become a pro, then you should be aiming for Level 4. Your overall level of understanding will naturally follow the learning curve. So, it's important to keep track of where you are at each point of the training and address any areas of difficulty.

Based on where you are within the Self-Reflection of Understanding diagram you can evaluate the progress of your own training.

Level of Understanding	*Before Training (Pre-knowledge)*	*Training Part 1 (1st Half)*	*Training Part 2 (2nd Half)*	*After studying / reading the book*	*After exercises and the Practice exam*
Level 4 *I can explain the content and apply it .*					
Level 3 *I get it!* *I am right where I am supposed to be.*					Ready for the exam!
Level 2 *I almost have it but could use more practice.*					
Level 1 *I am learning but don't quite get it yet.*					

(Self-Reflection of Understanding Diagram)

Write down the problem areas that you are still having difficulty with so that you can consolidate them yourself, or with your trainer. After you have had a look at these, then you should evaluate to see if you now have a better understanding of where you actually are on the learning curve.

Troubleshooting

Problem areas:	Topic:
Part 1	
Part 2	
You have gone through the book and studied.	
You have answered the questions and done the practice exam.	

Timetable

Day 1: Introduction to FinOps and Inform Phase

- Introduction to FinOps
- Preparation and Initial Insights
- Implementation of Cost Allocation
- Forecasts and Budgets

Day 2: Optimize and Operate Phases

- Resource Usage Optimization
- Cost Optimization Strategies
- Sustainability and FinOps
- Organizational Alignment and Automation
- Metrics and KPIs for Continuous Optimization
- Connectivity with Other Frameworks
- Advancing Towards FinOps Excellence
- Resource Usage Optimization

Welcome to

Financial Operations and Cloud Computing based on FinOps

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Use Designer of PPT to visualize text in a nice and easy manner.

Do keep using the same colors and styles all the time. Choose one or two ways to visualize various details and then keep using this style.

Don’t use may different options which will make it chaotic.

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Our coming days
Safety
Breaks
Lunch
Exercises
Phones/Computers
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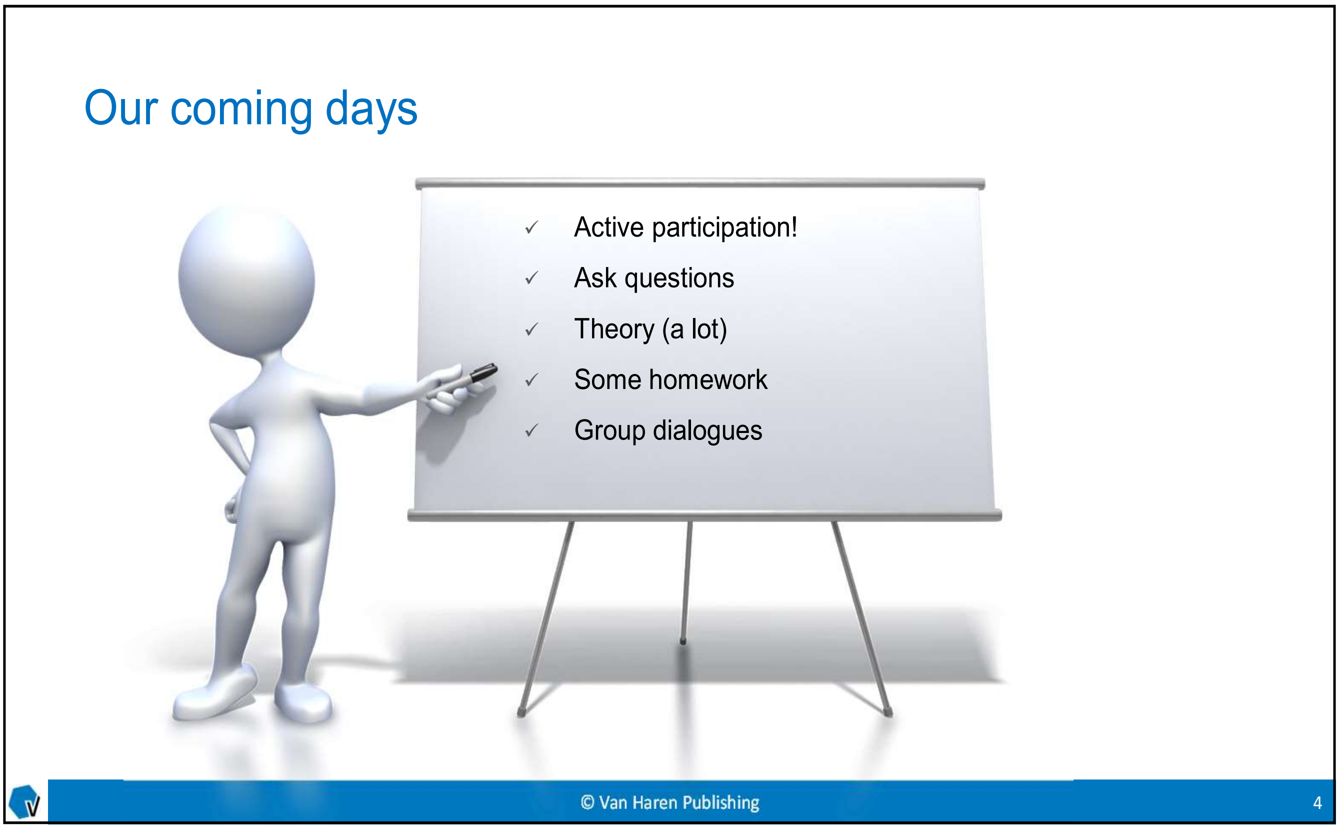
Our coming days
Active participation!
Ask questions
Theory (a lot)
Some homework
Group dialogues
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Presentation
My questions:
Who are you?
What experience do you have from Cloud Computing and FinOps?
What is your role at work?
What are your expectations?
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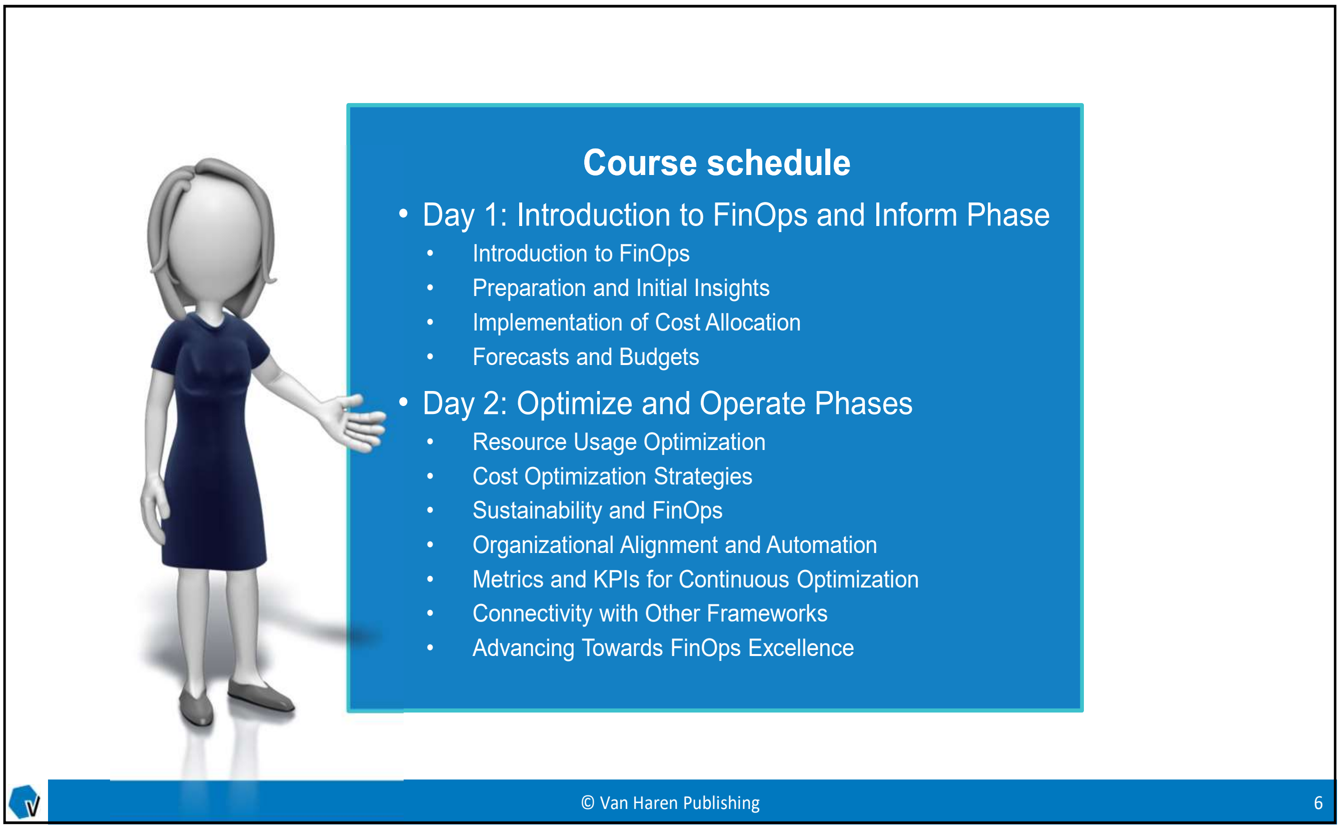
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Organizational Alignment and Automation
Metrics and KPIs for Continuous Optimization
Connectivity with Other Frameworks
Advancing Towards FinOps Excellence
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FinOps is evolving…

- ✓ From cost management to strategic value optimization,
- ✓ From isolated cloud spending to comprehensive IT financial governance,
- ✓ From periodic budget reviews to real-time financial agility,
- ✓ From departmental cost centers to collaborative value creation.

FinOps began as a response to the complexities of managing cloud costs, focusing on financial accountability and cost transparency in cloud computing. It evolved into a broader IT financial management practice, addressing budgeting, forecasting, and value realization across all IT spending. Today, FinOps is integral to strategic business planning, emphasizing cross-functional collaboration, data-driven decision-making, and maximizing the business value of IT investments.

FinOps core concept

The core concept of FinOps is to maximize the business value of cloud and IT investments through financial accountability, transparency, and operational efficiency.

It focuses on bridging the gap between finance, technology, and business units to make informed decisions that align with strategic goals, ensuring efficient use of resources and optimizing costs while fostering innovation and agility.

Cloud financial management

There is a growing movement within IT finance towards adopting FinOps, a practice that merges financial principles with operational strategies from diverse sectors like technology and business management.

Organizations possess or access an array of assets (and capabilities) which, when strategically managed, optimize cloud and IT expenditure for value maximization. FinOps frames these expenditures as investments in services and infrastructure that drive business value.

Background to 'title' 4

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INTRODUCTION TO FINOPS

Understand why FinOps is necessary, its benefits and the lifecycle

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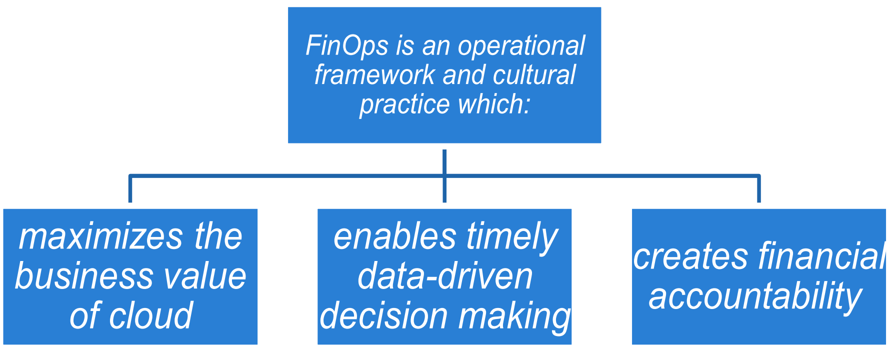
Introduction

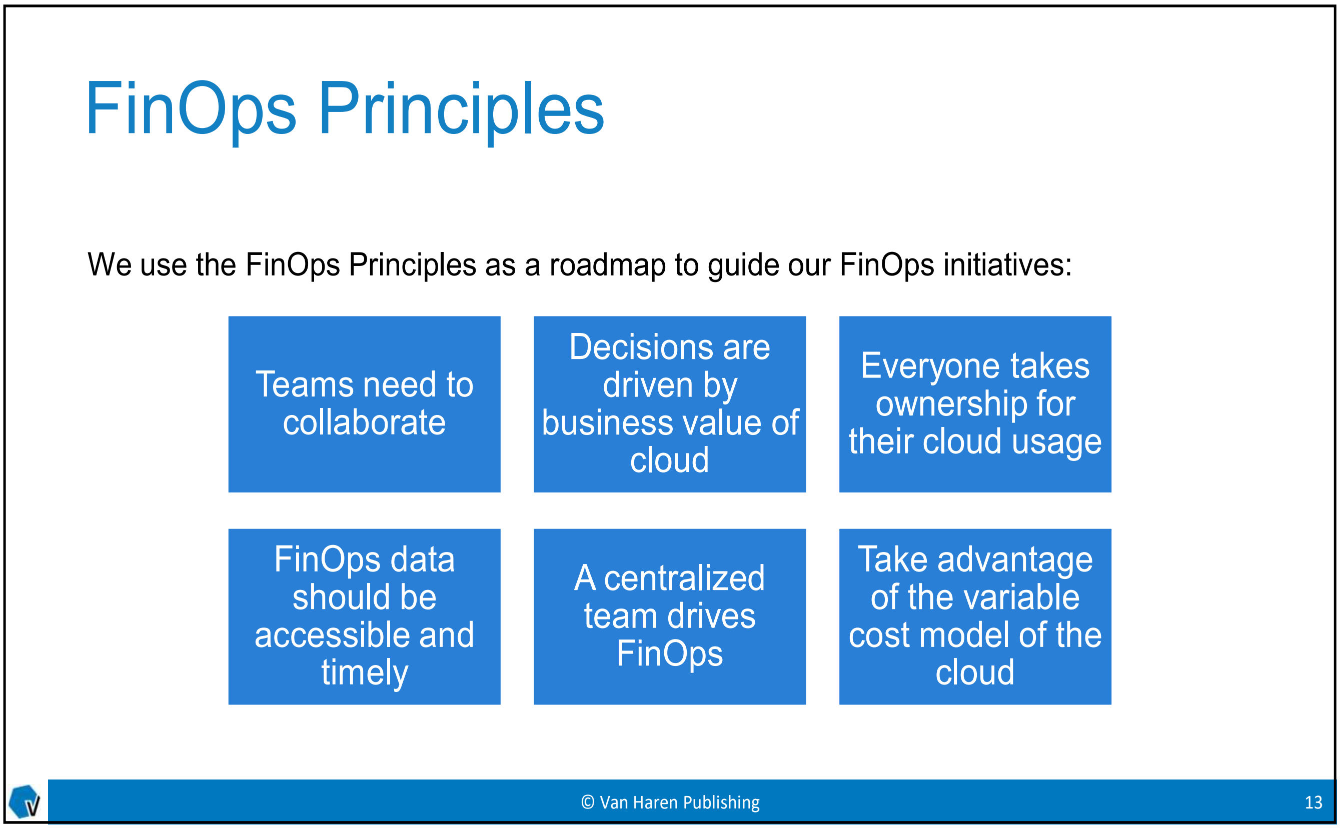
As cloud adoption grows, managing costs and optimizing resources becomes crucial.

This module will equip you with the fundamentals of FinOps, a framework that fosters collaboration between finance, engineering, and business teams to maximize the business value of cloud services through informed decision-making and cost optimization.

FinOps definition

As of February 5, 2024, the FinOps Foundation's updated definition of FinOps is:




FinOps Principles
We use the FinOps Principles as a roadmap to guide our FinOps initiatives:
Teams need to collaborate
Decisions are driven by business value of cloud
Everyone takes ownership for their cloud usage
FinOps data should be accessible and timely
A centralized team drives FinOps
Take advantage of the variable cost model of the cloud
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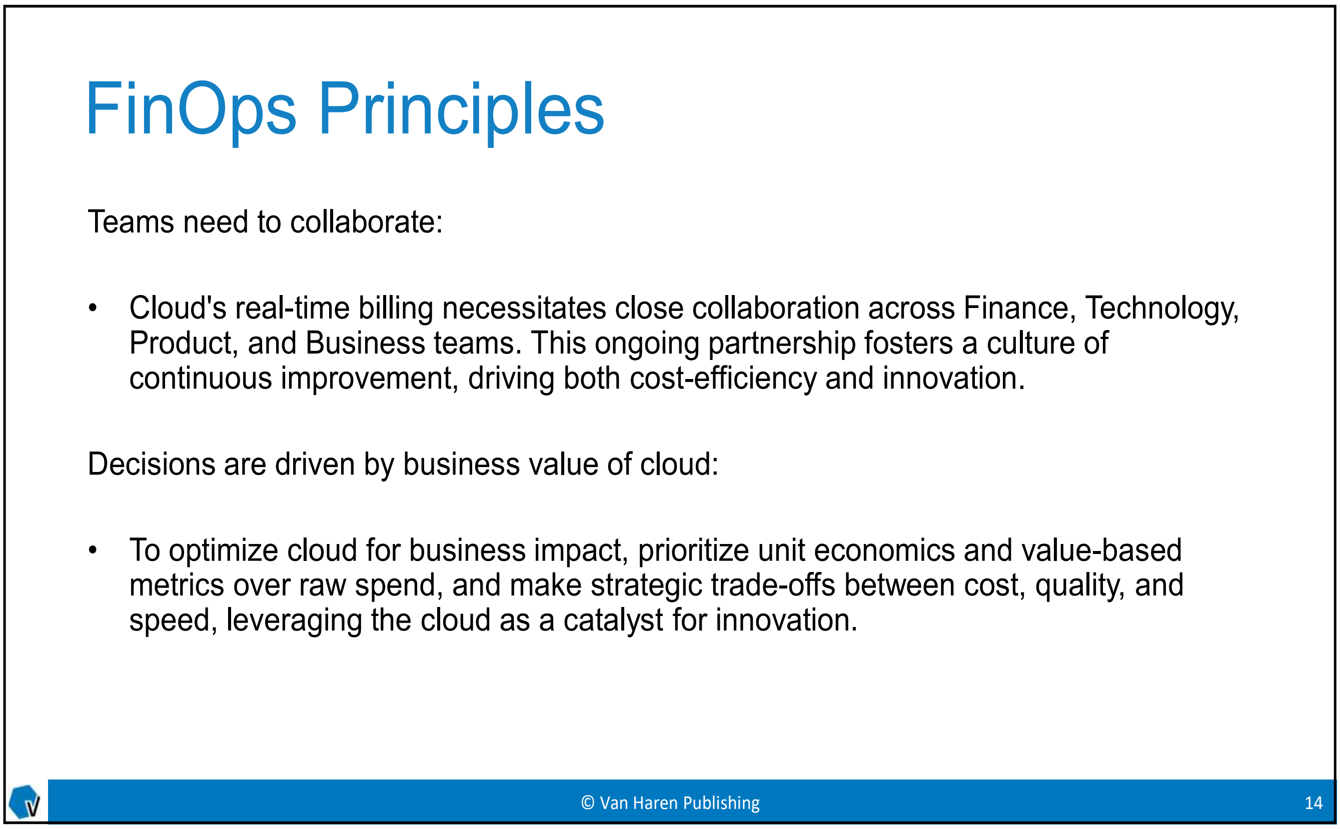
FinOps Principles
Teams need to collaborate:
• Cloud's real-time billing necessitates close collaboration across Finance, Technology, Product, and Business teams. This ongoing partnership fosters a culture of continuous improvement, driving both cost-efficiency and innovation.
Decisions are driven by business value of cloud:
• To optimize cloud for business impact, prioritize unit economics and value-based metrics over raw spend, and make strategic trade-offs between cost, quality, and speed, leveraging the cloud as a catalyst for innovation.
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FinOps Principles

Everyone takes ownership for their cloud usage:

- Empowering engineers and product teams with cloud cost ownership fosters a culture of accountability. This means considering cost-effectiveness from design inception, enabling teams to make decentralized decisions about resource usage and optimization strategies, all while managing their cloud spend against set budgets.

FinOps data should be accessible and timely:

- By instantly processing and sharing cost data, you create a feedback loop that empowers teams to make efficient decisions. Consistent visibility across all levels fosters proactive financial management. Leverage trending and variance analysis to understand cost fluctuations. Additionally, industry benchmarking lets you assess your cloud cost performance against competitors.

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FinOps Principles

A centralized team drives FinOps:

- FinOps fosters a shared accountability model, similar to security. A central team encourages best practices and enables their adoption across the organization, while individuals remain responsible for their own cloud environments.

Take advantage of the variable cost model of the cloud:

- Embrace just-in-time provisioning and agile planning, allowing you to adapt to changing needs rather than being locked into static commitments. This fosters proactive system design with continuous optimization, enabling you to avoid expensive clean-up efforts.

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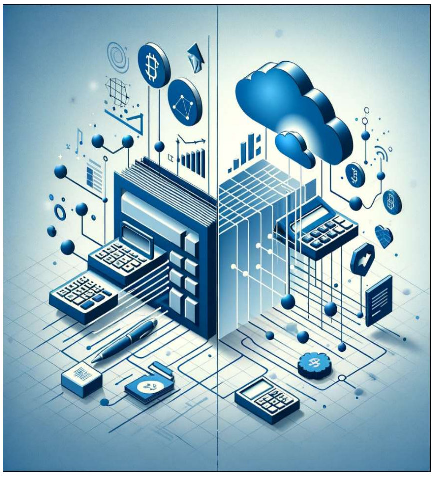
Benefits of adopting FinOps

- FinOps goes beyond cost control. It's a cultural shift that empowers engineering, finance, and business teams to make cloud decisions that maximize business value. This is achieved through a framework of best practices and shared accountability for the variable spending model of the cloud.



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Benefits of adopting FinOps

- Through a structured approach, you gain a toolkit of best practices for effective cloud cost management.
- With FinOps, distributed teams work together to make informed choices, weighing speed, cost, and quality for optimal cloud resource allocation.
- FinOps empowers teams to take ownership of their cloud usage, backed by a central group dedicated to best practices.
- FinOps provides organizations with greater visibility and control over both cloud costs and resource utilization.
- FinOps transcends cost savings. It's a strategic approach to unlock the full potential of cloud investments. By optimizing costs and driving efficiency, FinOps empowers businesses to deliver faster, higher-value services.

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Unit Economics

Unit Economics is one of the most important terms in FinOps:

- Is a method for analyzing cloud costs in relation to the value they deliver (measured by unit revenue for businesses or success of service delivery for non-profits/public sector).
- Leverages marginal cost (unit cost metrics) and marginal revenue (unit revenue metrics) specific to cloud-based services.
- Focuses on the difference between these metrics to identify the point where cloud operations become profitable (break-even point for non-profits/public sector).

Unit Economics: Example

Imagine a firm offering a cloud-based software-as-a-service (SaaS) platform, with various subscription options featuring distinct capabilities and resources for clients.

To scrutinize the unit economics, the firm could dissect the financial health of each service tier. Here's the approach:

Expenditure Review: The firm calculates both overt and hidden costs for each tier, covering cloud resources, data management, connectivity, support, and other plan-specific outlays.

Income Evaluation: The firm tallies the income from each service tier, reviewing customer subscription fees and additional income sources like extra features, enhancements, or consumption-based fees.

Earnings Analysis: Comparing the expenses and income from each service tier allows the firm to gauge its profit margin.

Unit Economics: Example

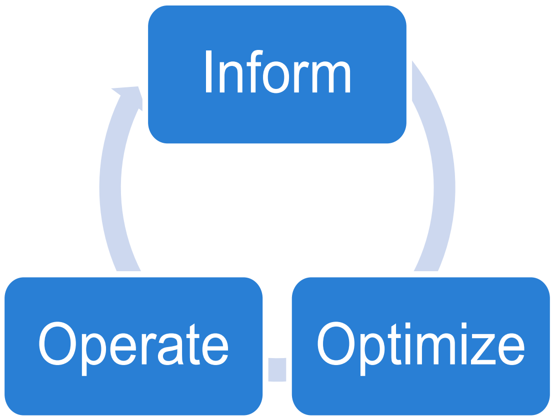
Take, for example, a specific service tier with high infrastructure expenses due to advanced features yet attracts lesser income than others. Here, the unit economics might signal the tier's unsustainability, signaling a need for reevaluation or cessation.

Through unit economics evaluation, businesses can finely comprehend the fiscal results of distinct offerings, tiers, or services. This process aids in pinpointing avenues to refine costs, bolster income, or tweak pricing models to elevate profit margins.

In the realm of FinOps, unit economics is invaluable as it allows for informed, data-backed choices and the strategic deployment of resources corresponding to the fiscal results of particular cloud-based segments.

FinOps Lifecycle

The FinOps Lifecycle outlines the iterative process that organizations go through to manage their cloud costs effectively. It is a cycle that fosters continuous improvement and is divided into three phases:

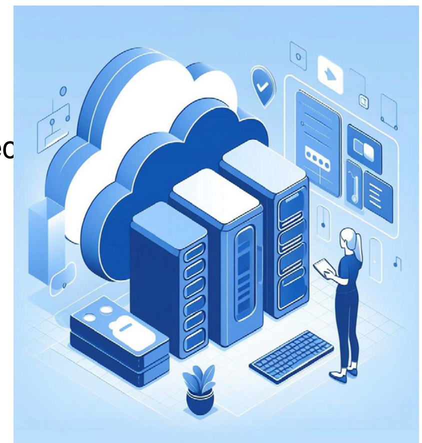


FinOps Lifecycle: Inform

This phase is about gaining visibility into cloud spending and usage. Organizations collect data to understand where and how their cloud budget is being used. This includes setting up tagging and allocation strategies to attribute costs accurately to the correct teams or projects, providing transparency and accountability.

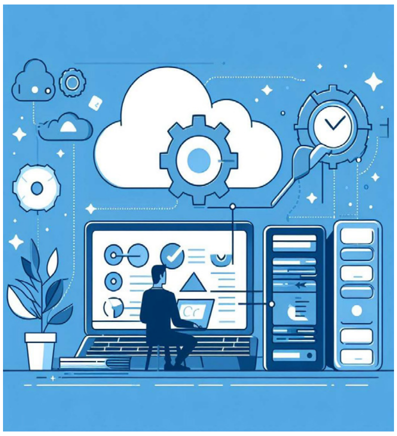
FinOps Lifecycle: Optimize

With clear information, organizations can take action to optimize their cloud spending. This involves identifying inefficient or unnecessary expenditure, choosing the right-sized resources, and taking advantage of discounts or reserved instances (RI). It's also about making cost-effec architectural decisions and encouraging a cost-aware culture.



FinOps Lifecycle: Operate

This phase involves putting the insights and optimization strategies into practice. Organizations automate cost-optimization processes, establish governance to keep spending in check, and integrate financial accountability into their operational routines. The focus is on operational excellence and embedding cost optimization into the business's day-to-day operations.



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FinOps Domains

As of March 21, 2024, a revised FinOps framework with four domains has been released:

https://www.finops.org/framework/

The four framework domains are described as key areas that yield tangible business results and the primary goals that organizations should focus on when implementing FinOps.

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FinOps Domains

Understand Cloud Usage & Cost: This means gaining a clear insight into how cloud resources are being used and what they are costing the organization. It's about having detailed visibility and comprehension of the entire cloud spend landscape.

Quantify Business Value: This involves measuring the value that cloud investments bring to the business. It's not just about tracking costs but also about understanding the return on investment and the impact on business objectives.

Optimize Cloud Usage & Cost: Here, the focus is on refining and improving the use of cloud resources to get the most value for the money spent. This means making adjustments to ensure efficiency and cost-effectiveness in the cloud services used.

Manage the FinOps Practice: This is about overseeing and directing the FinOps activities within an organization. It's the governance aspect, ensuring that the principles of FinOps are being applied consistently and that the organization's FinOps practices are mature and evolving.

FinOps Capabilities

FinOps capabilities represent the specific tasks and skills required to address the challenges of implementing FinOps practices.

These capabilities are like building blocks that enable effective FinOps implementation. They provide the foundation for:

- Education: Educating stakeholders on FinOps principles and best practices.
- Actionable Tasks: Translating broad FinOps goals into practical activities for different FinOps personas (e.g., FinOps engineer, business manager).
- Bridging the Gap: Conecting technology decisions with business objectives, ensuring cost optimization efforts align with overall business goals.

FinOps Capabilities

After the 2024 revision, the FinOps framework defines 22 capabilities:

Forecasting	FinOps Education & Enablement
Cloud Policy & Governance	Onboarding Workloads
Unit Economics	Reporting & Analytics
Anomaly Management	Budgeting
Data Ingestion	Invoicing & Chargeback
Rate Optimization	Intersecting Disciplines
Planning & Estimating	Benchmarking
Architecting for Cloud	Licensing & SaaS
Cloud Sustainability	FinOps Assessment
FinOps Tools & Services	Allocation
Workload Optimization	Managing Practice Operations

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FinOps Capabilities

Every capability comes with its own set of processes, tools, and recommended approaches, and mastery in these areas develops gradually through practice.

It's normal for a team to be more advanced in one area, such as fully understanding the comprehensive costs involved with cloud services, while still developing expertise in another, like refining how cloud resources are used for maximum efficiency. This is completely fine, especially if the strengths align with the organization's unique way of leveraging cloud services.

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FinOps Capabilities

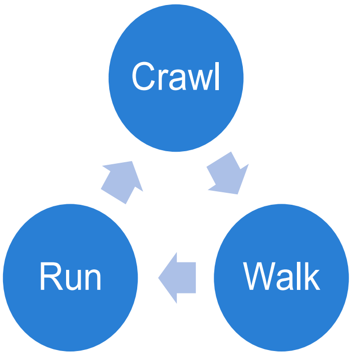
The organization should not feel pressured by the complexity, or the multitude of steps involved in FinOps. These skills are meant to be refined over time.

With each cycle of the FinOps process, there's an opportunity to concentrate on different activities that match the current priorities and requirements of the organization. So, each pass through the cycle is a chance to improve in different areas of the FinOps framework, step by step, according to what the organization needs most at that time.

Crawl, Walk, Run

The "crawl, walk, run" approach to FinOps is a metaphor for describing the maturity stage an organization goes through to adopt and apply FinOps principles and practices

This step-by-step approach recognizes that knowledge does not happen overnight, and rather it is built through a progressive journey of learning, application and change.



Crawl, Walk, Run

Crawl:

- An organization is beginning to understand what FinOps is and begins to recognize the importance of managing cloud spend.
- Teams learn the basics, such as tagging resources for better visibility or simply accessing billing data.
- The focus is on fundamental practices such as cost visibility and establishing accountability.
- Efforts are often reactive rather than proactive.

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Crawl, Walk, Run

Walk:

- Organizations have a better understanding of cloud cost management and begin to incorporate FinOps practices into their operations in depth
- There has been a shift to adopting more efficient strategies, and organizations have begun to standardize FinOps practices.
- The focus shifts to consistently applying FinOps principles across teams, with cloud spend better aligned to value.
- Processes begin to be standardized and sophisticated, such as implementing cost allocations and optimizing resource usage.

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Crawl, Walk, Run

Run:

- The "run" phase makes FinOps a well-integrated part of the organization's culture.
- Cloud spending is strategic, with advanced practices fully categorized.
- The focus is on continuous quality and outstanding financial performance, driven by data and research.
- Today, organizational agility even targets real-time decisions, for which there is a mature understanding of the interplay between technology and the levers of finance and operations.

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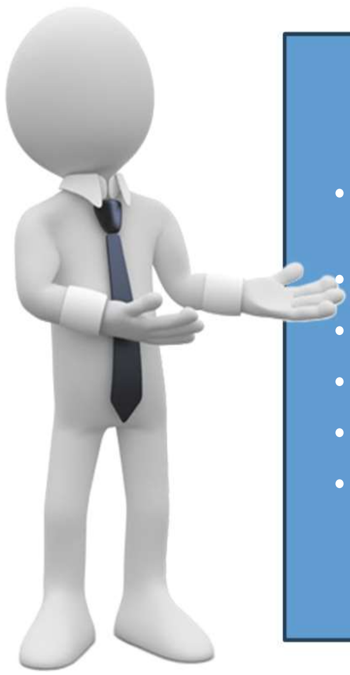

We have just talked about:

- What FinOps is and why it's essential in cloud management
- Overview of the FinOps lifecycle
- Benefits of adopting FinOps for organizations
- Definition of Unit Economics
- Domains and capabilities of FinOps
- Crawl, walk, run approach

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Knowledge Check

Identify the option that does not represent a fundamental principle of FinOps:

A. Collaboration among teams is essential
B. Context is provided through performance benchmarking
C. Cloud decisions are driven by business value
D. FinOps is directed by a central team
E. Cloud usage responsibility is shared by all

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Knowledge Check

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Knowledge Check

Identify which of the following does not describe a characteristic of FinOps:

A. It is a structured approach
B. It aims for business benefits
C. It centers on unit economics
D. It unites Finance, Technology, and Business disciplines
E. FinOps needs to be finalized before starting cloud migration

Knowledge Check

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B. It aims for business benefits
C. It centers on unit economics
D. It unites Finance, Technology, and Business disciplines
E. FinOps needs to be finalized before starting cloud migration

Knowledge Check

What is the most accurate description of unit economics within FinOps?

A. The additional cost of a new service after determining the expenses of current cloud services
B. The average cost of individual computing instances, considering all accounts, subscriptions, and projects in cloud utilization
C. The analysis of overall cloud expenses incurred to generate a specific unit of value for the organization

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Knowledge Check

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Course schedule

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  - Advancing Towards FinOps Excellence

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INFORM PHASE: PREPARATION AND INITIAL INSIGHT

Understand the current state of cloud spending and the importance of cost and usage visibility

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Traditional IT Resource Management

Traditional IT Resources Consumption Model Limitations:

- **Slow & Siloed**: Requesters (DevOps) and Approvers (Finance) operate in silos, hindering agility.
- **Inflexible Budgeting**: Predictable spending limits room for adjustments to changing needs.
- **Long Procurement Cycles**: Delays project implementation and reduces responsiveness.
- **Overprovisioning**: Intentional oversizing leads to potential waste and inefficiency.
- **High Costs & Risk**: Upfront investment risks misalignment with actual needs and potential failure.

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Traditional IT Resource Management

‘Shadow IT’, in the context of traditional data center resource procurement, refers to the practice of business units or teams within an organization acquiring and using IT resources (hardware, software, or cloud services) outside of the established procurement process.

Why shadow IT arises in traditional data centers?

- **Slow Procurement Processes**: Traditional procurement can be slow and cumbersome, with lengthy approval times and complex procedures.
- **Limited Flexibility**: The pre-approved options available through IT or finance may not perfectly align with the specific needs of a particular project or team.
- **Lack of Communication**: Sometimes, there may be a lack of communication or understanding between business units and the IT department about resource needs and availability.

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Cloud Consumption Model

Cloud computing facilitates:

- **Faster Provisioning**: On-demand resources enable quicker project implementation.
- **Pay-as-you-go Pricing**: Enables cost optimization by paying only for utilized resources. No upfront hardware costs.
- **Scalability**: Allows for elastic resource allocation based on changing needs.
- **Alignment with DevOps**: Supports faster development and deployment cycles.

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On-Premises vs. Cloud

The cloud offers agility and scalability but introduces new challenges in cost management.

Cloud Computing:

- Rightsizing resources leads to direct cost savings
- Variable resource consumption for dynamic needs
- More frequent cost reporting required (potentially daily)
- Increased cost transparency with detailed billing
- Requires new strategies for managing variable cloud spend

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Current State of Cloud Spending

Allocating costs in cloud computing can be intricate due to the dynamic nature of cloud services and the consumption-based pricing models.

Organizations often struggle to accurately track which departments or projects are responsible for specific costs.

The variability of cloud resources, such as scaling up or down to meet demand, adds another layer of complexity.

Current State of Cloud Spending

Let’s start with an example: AWS S3 total cost calculation

Considering the following pricing tiers (in USD per GB) for the US East (N. Virginia) region:

- First 50 TB / month: $0.023
- Next 450 TB / month: $0.022
- Over 500 TB / month: $0.021

And 4 AWS accounts:

- Account 1: 45 TB of monthly S3 usage
- Account 2: 32 TB of monthly S3 usage
- Account 3: 20 TB of monthly S3 usage
- Account 4: 16 TB of monthly S3 usage

Current State of Cloud Spending

In scenarios where the combined usage would push the total into a higher discount tier, using AWS Organizations would show a cost benefit.

AWS S3 pricing can be complex, as it involves various factors including storage amounts, requests, data transfer out, and additional features like S3 Glacier for archival.

To calculate the costs with volume discounts and AWS Organizations, we'll aggregate the usage across all accounts and then apply the tiered pricing.

Here is the cost breakdown per account:

Account	Usage (TB)	Cost
Account 1	45 TB	$1059.84
Account 2	32 TB	$753.66
Account 3	20 TB	$471.04
Account 4	16 TB	$376.83

Current State of Cloud Spending

The total cost calculation for Amazon S3 for the four accounts, without the benefits of AWS Organizations (hence without aggregated volume discounts), is as follows:

Total Cost Across All Accounts: $2661.38

The total cost calculation for Amazon S3 across four accounts considering the volume discounts and the use of AWS Organizations is as follows:

Total Cost Across All Accounts: $2596.86

This is just an example to illustrate that understanding the cost of resources in cloud environments can be complex.

Current State of Cloud Spending

Before diving into cost calculation and implementing FinOps, the first critical step is to thoroughly understand and manage your inventory of cloud resources.

This involves identifying all the services in use, their purposes, and how they are allocated across different departments or projects within the organization.

It's essential to have a clear inventory that includes not just the resources currently in use but also any reserved or idle services.

Proper inventory management sets the foundation for effective cost allocation and optimization, ensuring that FinOps strategies are based on accurate and comprehensive data.

Cost and Usage Visibility

Cost and usage visibility are fundamental pillars of FinOps for several reasons:

Informed Decision-Making:
Without clear visibility into cloud costs and usage, making informed decisions about resource allocation, optimization, and investment becomes difficult. You can't manage what you can't measure.

Cost Optimization:
Visibility into usage patterns helps identify potential areas for waste and inefficiency. For example, you might discover underutilized resources that can be scaled down or turned off during non-peak hours.

Shared Accountability:
FinOps fosters a culture of shared accountability for cloud costs. By making cost and usage data readily available to all relevant teams (finance, engineering, product), everyone can understand the financial impact of their decisions.

Improved Budgeting and Forecasting:
Visibility into historical costs and usage patterns allows for more accurate budgeting and forecasting. You can identify trends, predict future costs, and allocate resources more effectively.

Continuous Improvement:
Having a clear view of your cloud costs and usage enables continuous improvement within your FinOps practice. You can track the effectiveness of cost optimization efforts, identify areas where further optimization is needed, and refine your strategies over time.

