FOCUS - ACTING ON CLOUD IMPACT

A FinOps framework to optimize costs and help reduce carbon footprint

ABOUT THE SPEAKER

- 20+ years of experience in IT, 16+ at Link
- Director of ICE, the coolest Tech Team on the planet!
- Areas of Expertise: Integration, Cloud and Experience Engineering
- Business-driven Solution Designer and Architect
- A keen speaker, loves to share his knowledge and make his teams thrive

https://www.linkedin.com/in/joserodriguesbpm/

LinkedIn

THE CHALLENGE

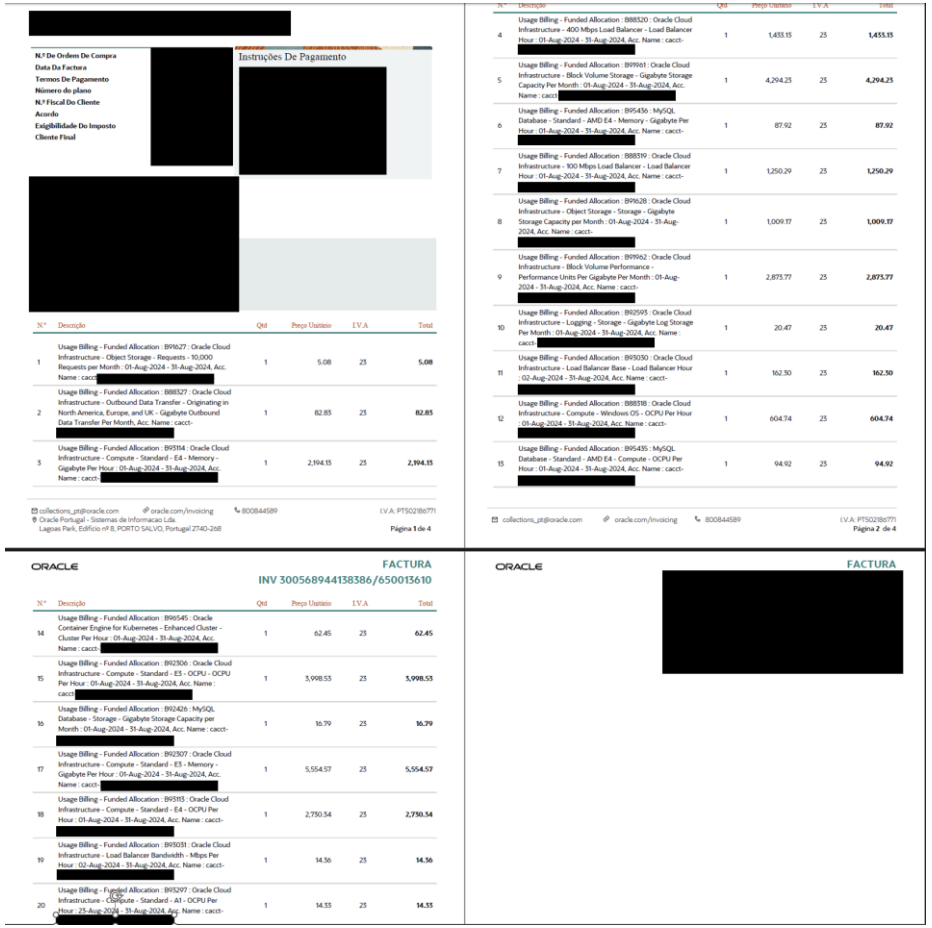
BUSINESS CHALLENGE

Who the hell knows what's inside a cloud provider invoice?

- The right answer is typically…. nobody!

- Cloud bills keep growing and growing, more recently fueled by the new/old gold rush – data.
  - It takes a lot of storage
  - It takes a lot of compute power
  - It's ever-growing: compute is ephemeral but data…. data is what we keep!
  - And then there's the magic sauce… Data transfer/Egress

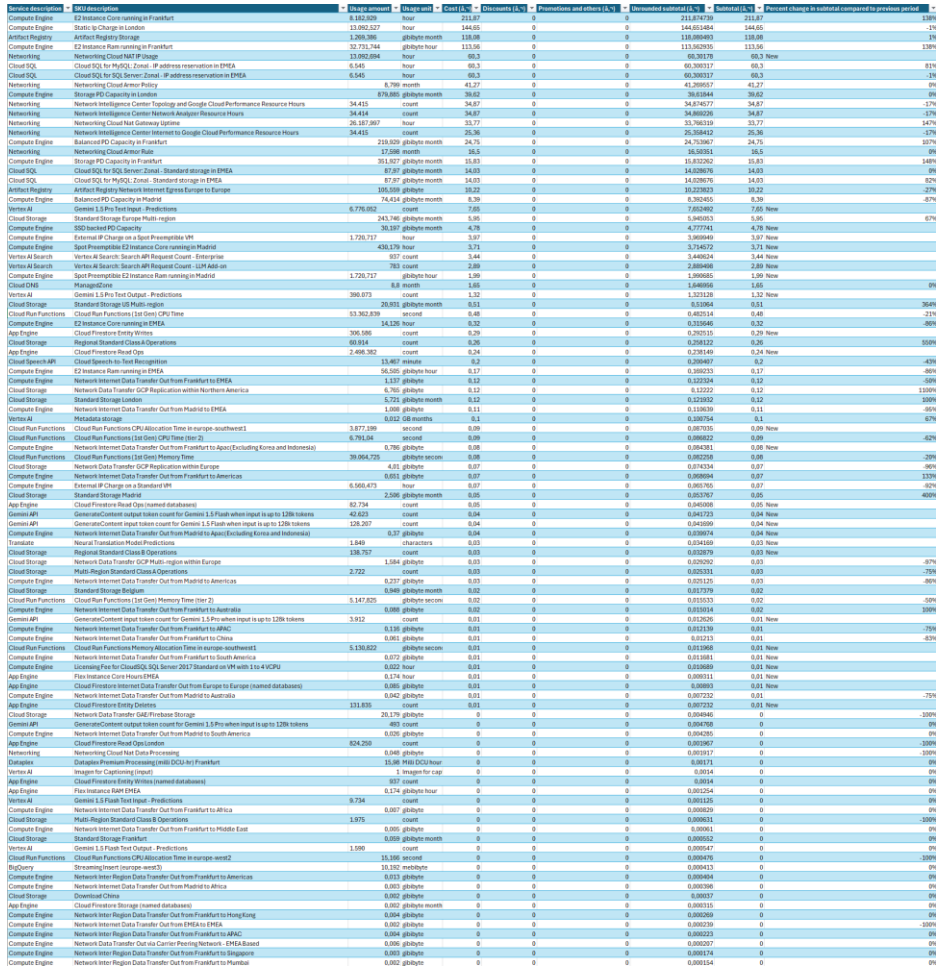
- Cloud billing models are complex, with each service having its own metrics and ways to influence the overall cost.



BUSINESS CHALLENGE

Who the hell knows what's inside a cloud provider invoice?

- Some cloud providers offer a somewhat simpler invoice structure, others offer more detail.
- But, they are typically different, and that:
  - Makes you need to understand different outputs and reports
  - Makes you deal with different names for the same thing
  - Makes it harder to automate and have a centralized approach
  - Makes it harder to manage a multi-cloud environment



Monthly Billing Report - Page 1 of ... 5

YOU CAN’T MANAGE WHAT YOU CAN’T MEASURE

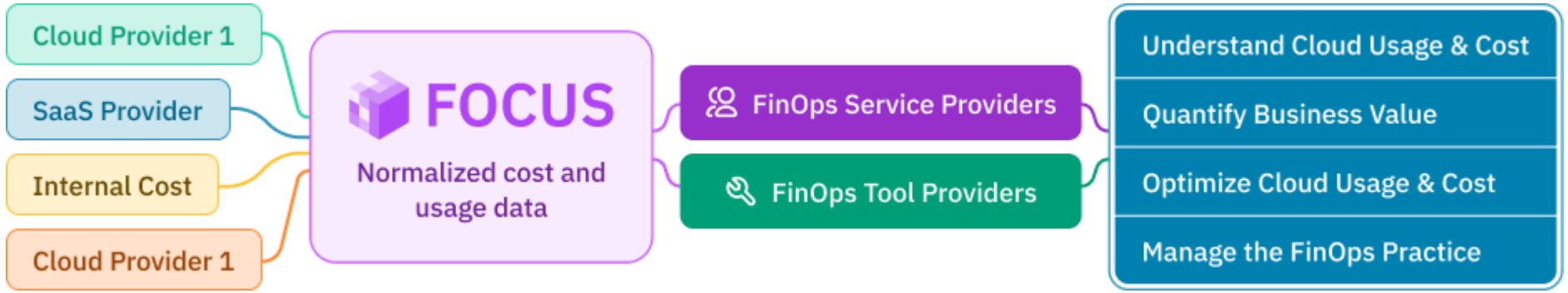
An old Adage that still holds true…

FOCUS – A FINOPS FRAMEWORK

(F)INOPS (O)PEN (C)OST & (U)SAGE (S)PECIFICATION

Open-Source project to produce FinOps-serviceable datasets.

- It’s a specification to perform typical FinOps operations:
  - cost-allocation
  - Chargeback
  - Forecasting and budgeting
- Vendor-independent, with the possibility to add SaaS providers and even On-premise costs.
- Main vendors adopting
- The secret sauce is the common data and lexicon specification: The FOCUS Datasets



FOCUS MAIN ELEMENTS

Principles

- 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

Domains & Capabilities

FinOps Foundation

Understand Cloud Usage & Cost

- Data Ingestion
- Allocation
- Reporting & Analytics
- Anomaly Management

Quantify Business Value

- Planning & Estimating
- Forecasting
- Budgeting
- Benchmarking
- Unit Economics

Optimize Cloud Usage & Cost

- Architecting for Cloud
- Rate Optimization
- Workload Optimization
- Cloud Sustainability
- Licensing & SaaS

Manage the FinOps Practice

- FinOps Practice Operations
- Cloud Policy & Governance
- FinOps Assessment
- FinOps Tools & Services
- FinOps Education & Enablement
- Invoicing & Chargeback
- Onboarding Workloads
- Intersecting Disciplines

Core Personas

- Engineering
- FinOps Practitioner
- Finance
- Leadership
- Procurement
- Product

Allied Personas

- ITAM
- ITFM
- ITSM
- Security
- Sustainability

Phases

Maturity

- Crawl
- Walk
- Run

FINOPS PRINCIPLES

Act as a North Star, guiding the FinOps pratice

Teams need to collaborate

- Finance, technology, product, and business teams work together in near real time as the cloud operates on a per-resource, per-second basis.
- Teams work together to continuously improve for efficiency and innovation.

Decisions are driven by business value of cloud

- Unit economic and value-based metrics demonstrate business impact better than aggregate spend.
- Make conscious trade-off decisions among cost, quality, and speed.
- Think of cloud as a driver of innovation.

Everyone takes ownership for their cloud usage

- Accountability of usage and cost is pushed to the edge, with engineers taking ownership of costs from architecture design to ongoing operations.
- Individual feature and product teams are empowered to manage their own usage of cloud against their budget.
- Decentralize the decision making around cost-effective architecture, resource usage, and optimization.
- Technical teams must begin to consider cost as a new efficiency metric from the beginning of the software development lifecycle.

FinOps data should be accessible and timely

- Process and share cost data as soon as it becomes available.
- Real-time visibility autonomously drives better cloud utilization.
- Fast feedback loops result in more efficient behavior.
- Consistent visibility into cloud spend is provided to all levels of the organization.
- Create, monitor, and improve real-time financial forecasting and planning.
- Trending and variance analysis helps explain why costs increased.
- Internal team benchmarking drives best practices and celebrates wins.
- Industry peer-level benchmarking assesses your company's performance.

A centralized team drives FinOps

- The central team encourages, evangelizes, and enables best practices in a shared accountability model, much like security, which has a central team yet everyone remains responsible for their portion.
- Executive buy-in for FinOps and its practices and processes is required.
- Rate, commitment, and discount optimization are centralized to take advantage of economies of scale.
- Remove the need for engineers and operations teams to think about rate negotiations, allowing them to stay focused on usage optimization of their own environments.

Take advantage of the variable cost model of the cloud.

- The variable cost model of the cloud should be viewed as an opportunity to deliver more value, not as a risk.
- Embrace just-in-time prediction, planning, and purchasing of capacity.
- Agile iterative planning is preferred over static long-term plans.
- Embrace proactive system design with continuous adjustments in cloud optimization over infrequent reactive cleanups.

FINOPS MATURITY LEVEL

- Evaluation of current level is highly recommended.
- There's an assessment tool available at: https://www.finops.org/wg/finops-assessment/

Crawl

Maturity Level Characteristics

- Very little reporting and tooling
- Measurements only provide insight into the benefits of maturing the capability
- Basic KPIs set for the measurement of success
- Basic processes and policies are defined around the capability
- Capability is understood but not followed by all the major teams within the organization
- Plans to address "low hanging fruit"

Sample goals/KPI from the FinOps Community (data.finops.org)

- Should be able to allocate at least 50%
- Resource-based commitments discount target coverage of approximately 60%
- Forecast spend to actual spend accuracy variance is 20%

Walk

Maturity Level Characteristics

- Capability is understood and followed within the organization
- Difficult edge cases are identified but decision to not address them is adopted
- Automation and/or processes cover most of the Capability requirements
- Most difficult edge cases (ones that threaten the financial well-being of the organization) are identified and effort to resolve has been estimated
- Medium to high goals/KPIs set on the measurement of success

Sample goals/KPI from the FinOps Community (data.finops.org)

- Should be able to allocate at least 80%
- Resource-based commitments discount target coverage is approximately 70%
- Forecast spend to actual spend accuracy variance is 15%

Run

Maturity Level Characteristics

- Capability is understood and followed by all teams within the organization
- Difficult edge cases are being addressed
- Very high goals/KPIs set on the measurement of success
- Automation is the preferred approach

Sample goals/KPI from the FinOps Community (data.finops.org)

- Greater than 90% of spend can be allocated
- Resource-based commitments discount target coverage is approximately 80%
- Forecast spend to actual spend accuracy variance is 12%

FINOPS DOMAINS

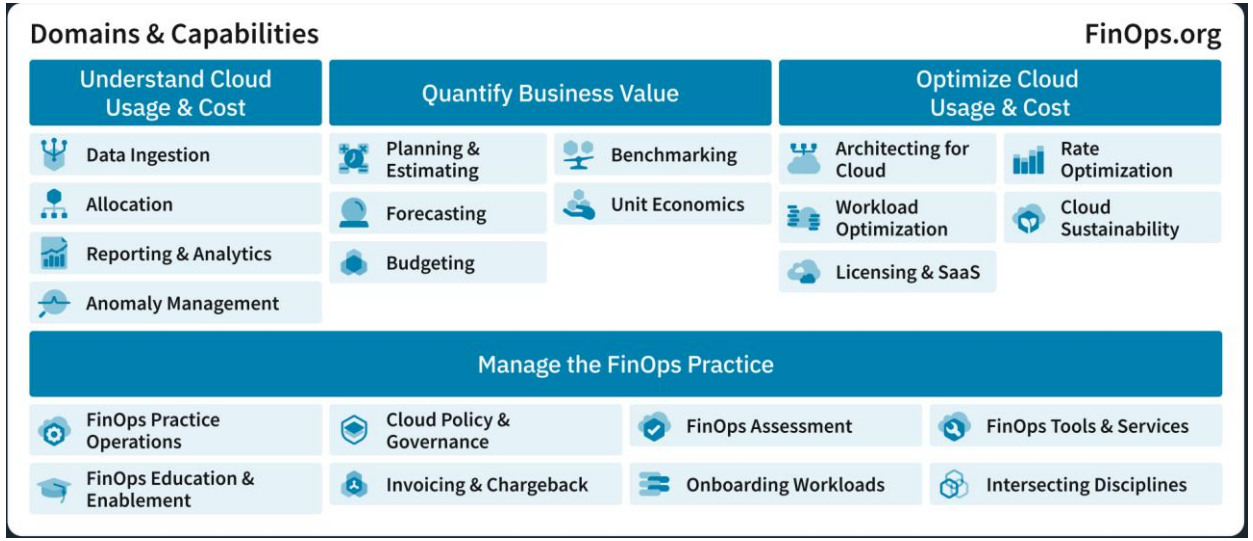
Understand Cloud Usage & Cost

The outcome of this Domain is **better understanding of an organization's use of the cloud**.

Within this Domain, organizations work to **gather all the information required to perform FinOps**.

This includes direct and imputed **cloud cost, cloud usage, observability, utilization, and sustainability data**, and other datasets required by any FinOps Domain.

Activities in this Domain also define the **organizational metadata to categorize, allocate and summarize cloud cost and usage, and define the reporting and analytics processes making** that data available for use by all FinOps Personas.

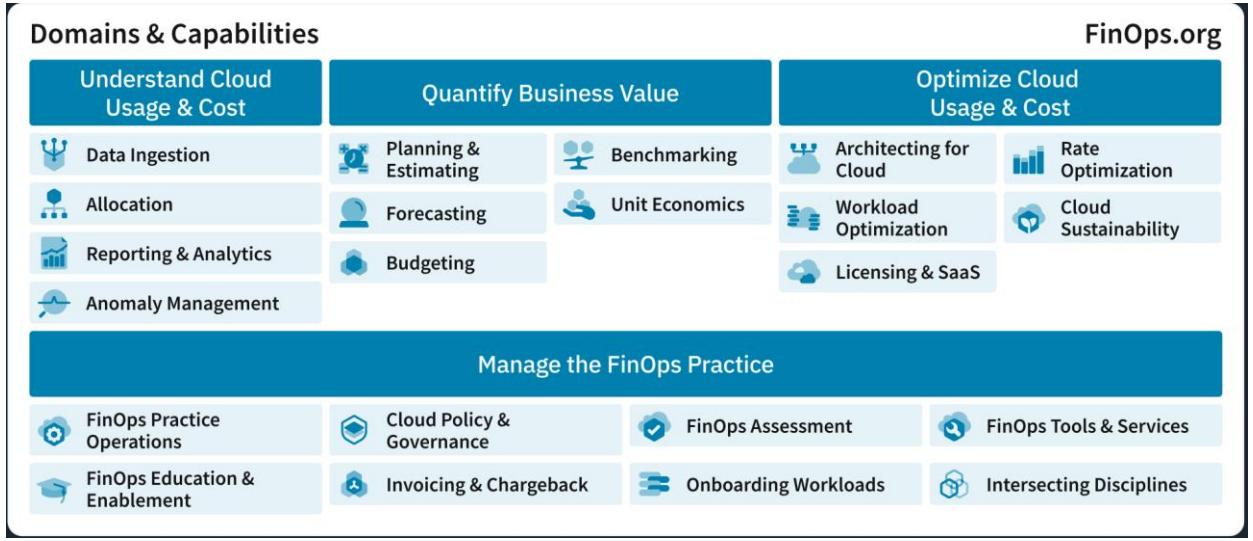


FINOPS DOMAINS

Quantify Business Value

Organizations develop Capabilities in this Domain to **connect the usage and cost data with the business value it creates**, helping ensure value is **transparent** and **within expectations**.

Within this Domain, organizations **map monetary and non-monetary cloud costs to budgets**, use **historical** information and future plans to **forecast**, **establish and measure technical and organizational KPIs**, and perform **benchmarking** across teams, business units and with other organizations.



FINOPS DOMAINS

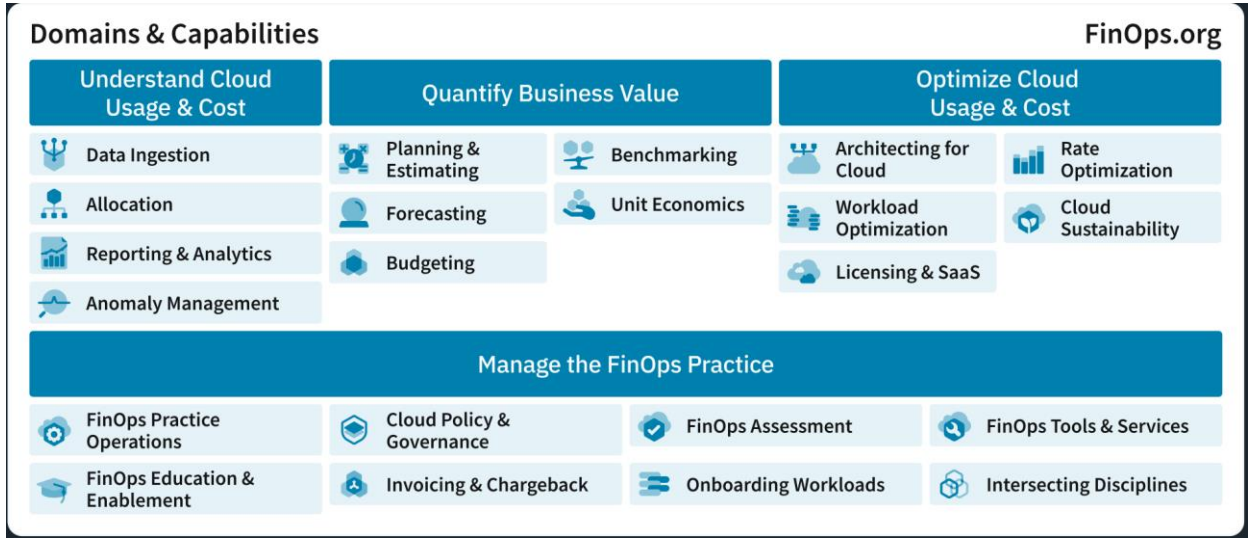
Optimize Cloud Usage & Cost

This Domain focuses on **cloud efficiency**, ensuring organizations **only use the resources when they provide value to the organization**; and that resources used are purchased **at the lowest acceptable cost and impact** to meet the organization's goals.

Organizations will **measure efficiency** in a variety of ways, including **monetary cost, carbon usage**, or more traditional IT operational efficiency measures.

Capabilities in this Domain allow the organization to **manage the types, timing and amounts of cloud resources used, and the rates** that are paid for those resources.

Capabilities here also address **architecture modernization, sustainability** considerations for FinOps teams, and the use of licensed and consumption-based SaaS products.

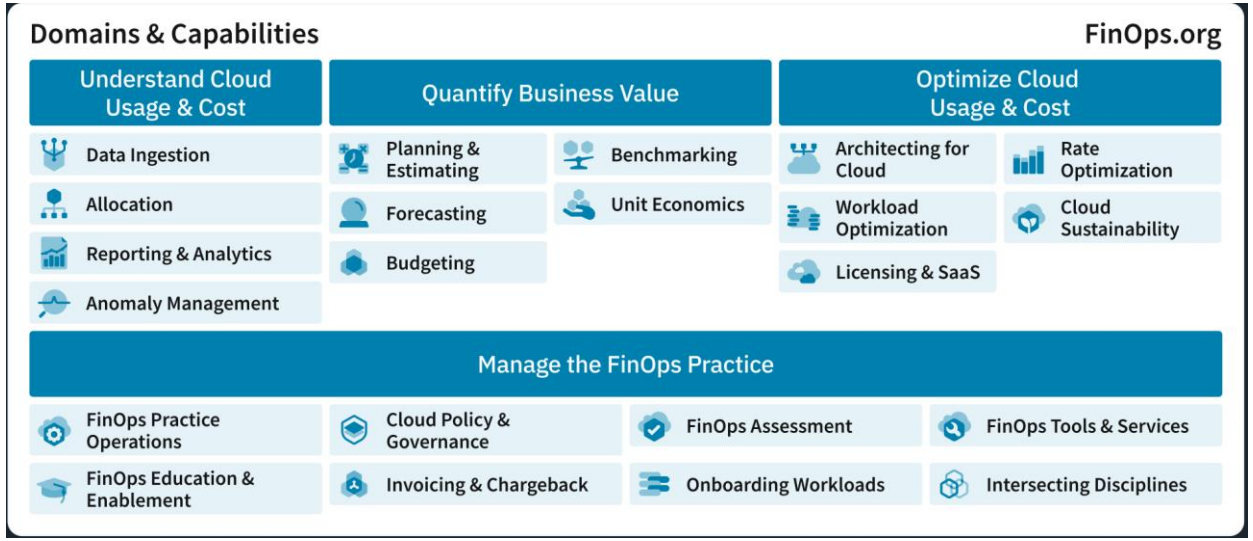


FINOPS DOMAINS

Manage the FinOps Practice

This Domain enables **continuous improvement** to change and **align the entire organization** - its people, processes and technology - **to adopt FinOps** and use cloud in ways that **create value** for the company.

Capabilities here are centered on **effective FinOps operation**, **enablement** of the whole organization, **improved interaction** with all other personas and business functions to support and represent cloud use more effectively.



FINOPS CAPABILITIES

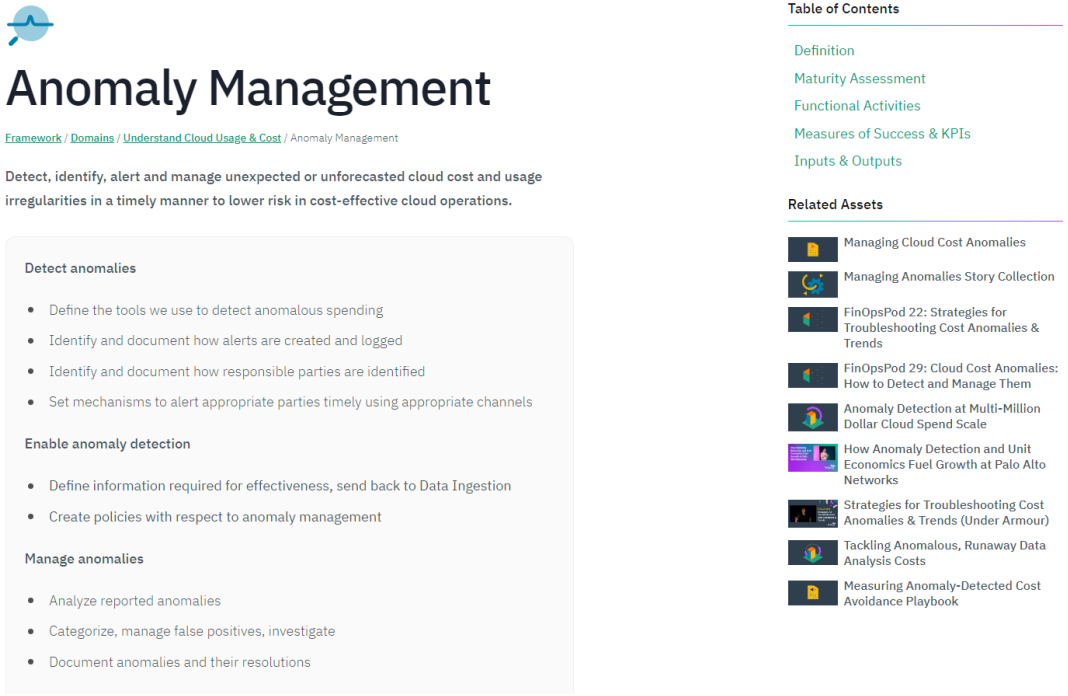
What and how-to (fast)

Each Capability is defined and explained, with a clear description of

- What is expected of it per maturity level.
- What is expected per persona involved.
- Reference KPIs and Measures of Success
- Outputs and Inputs

This allows for a very concrete and defined understanding of what is done, what needs to be done and who to involve.

It also features a set of accelerators for adoption and control of the capability



Anomaly Management

Framework / Domains / Understand Cloud Usage & Cost / Anomaly Management

Detect, identify, alert and manage unexpected or unforecasted cloud cost and usage irregularities in a timely manner to lower risk in cost-effective cloud operations.

Detect anomalies

- Define the tools we use to detect anomalous spending
- Identify and document how alerts are created and logged
- Identify and document how responsible parties are identified
- Set mechanisms to alert appropriate parties timely using appropriate channels

Enable anomaly detection

- Define information required for effectiveness, send back to Data Ingestion
- Create policies with respect to anomaly management

Manage anomalies

- Analyze reported anomalies
- Categorize, manage false positives, investigate
- Document anomalies and their resolutions

Table of Contents

Definition
Maturity Assessment
Functional Activities
Measures of Success & KPIs
Inputs & Outputs

Related Assets

Managing Cloud Cost Anomalies
Managing Anomalies Story Collection
FinOpsPod 22: Strategies for Troubleshooting Cost Anomalies & Trends
FinOpsPod 29: Cloud Cost Anomalies: How to Detect and Manage Them
Anomaly Detection at Multi-Million Dollar Cloud Spend Scale
How Anomaly Detection and Unit Economics Fuel Growth at Palo Alto Networks
Strategies for Troubleshooting Cost Anomalies & Trends (Under Armour)
Tackling Anomalous, Runaway Data Analysis Costs
Measuring Anomaly-Detected Cost Avoidance Playbook

Let's look at an example: https://www.finops.org/framework/capabilities/anomaly-management/

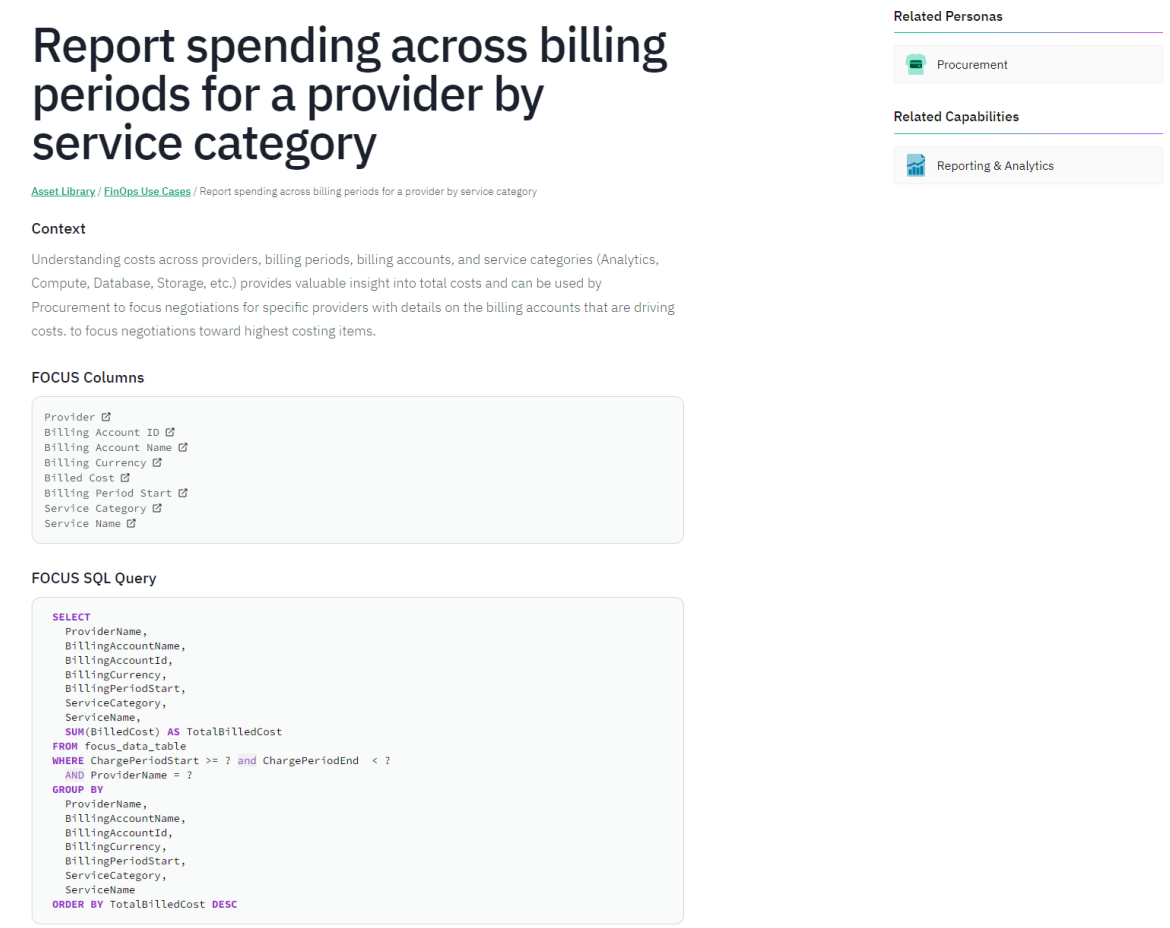
FINOPS USE CASES

Frequent “how to do” FinOps

There’s a series of typical FinOps use-cases, situations or challenges that the personas involved in FinOps may find recurrent in their work.

There are approx. 40 now available, with the number increasing regularly.

As the FOCUS dataset is standardized, a FOCUS-enabled SQL Query is also made available.



Report spending across billing periods for a provider by service category

Asset Library / FinOps Use Cases / Report spending across billing periods for a provider by service category

Context

Understanding costs across providers, billing periods, billing accounts, and service categories (Analytics, Compute, Database, Storage, etc.) provides valuable insight into total costs and can be used by Procurement to focus negotiations for specific providers with details on the billing accounts that are driving costs. to focus negotiations toward highest costing items.

FOCUS Columns

```
Provider
Billing Account ID
Billing Account Name
Billing Currency
Billed Cost
Billing Period Start
Service Category
Service Name
```

FOCUS SQL Query

```
SELECT
  ProviderName,
  BillingAccountName,
  BillingAccountId,
  BillingCurrency,
  BillingPeriodStart,
  ServiceCategory,
  ServiceName,
  SUM(BilledCost) AS TotalBilledCost
FROM focus_data_table
WHERE ChargePeriodStart >= ? and ChargePeriodEnd  < ?
  AND ProviderName = ?
GROUP BY
  ProviderName,
  BillingAccountName,
  BillingAccountId,
  BillingCurrency,
  BillingPeriodStart,
  ServiceCategory,
  ServiceName
ORDER BY TotalBilledCost DESC
```

Related Personas

Procurement

Related Capabilities

Reporting & Analytics

Let’s look at an example: https://www.finops.org/assets/use-cases/report-spending-across-billing-periods-by-service-category/

FINOPS PLAYBOOKS

Community-based how-to’s to address specific needs

Besides the actual official framework documents, the community is also invited to participate, adding ways to address everyday FinOps challenges in organizations.

These pre-made solutions are called playbooks, and there’s a ton of them available, with some fairly simple, and some others highly detailed.

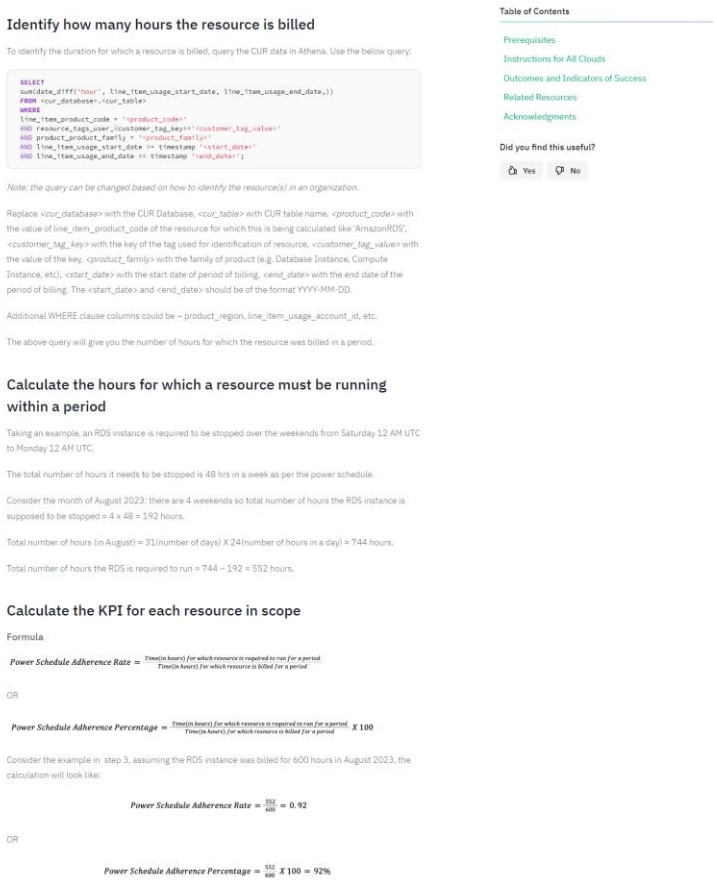


Table of Contents

Prerequisites
Instructions for All Clouds
Outcomes and Indicators of Success
Related Resources
Acknowledgments

Did you find this useful?

Yes No

Identify how many hours the resource is billed

To identify the duration for which a resource is billed, query the CUR data in Athena. Use the below query:

```
SELECT
sum(date_diff('hour', line_item_usage_start_date, line_item_usage_end_date,))
FROM <cur_database>.<cur_table>
WHERE
line_item_product_code = '<product_code>'
AND resource_tags_user_(customer_tag_key)='<customer_tag_value>'
AND product_product_family = '<product_family>'
AND line_item_usage_start_date >= timestamp '<start_date>'
AND line_item_usage_end_date >= timestamp '<end_date>';
```

Note: the query can be changed based on how to identify the resource(s) in an organization.

Replace *<cur_database>* with the CUR Database, *<cur_table>* with CUR table name, *<product_code>* with the value of line_item_product_code of the resource for which this is being calculated like ‘AmazonRDS’, *<customer_tag_key>* with the key of the tag used for identification of resource, *<customer_tag_value>* with the value of the key, *<product_family>* with the family of product (e.g. Database Instance, Compute Instance, etc), *<start_date>* with the start date of period of billing, *<end_date>* with the end date of the period of billing. The <start_date> and <end_date> should be of the format YYYY-MM-DD.

Additional WHERE clause columns could be – product_region, line_item_usage_account_id, etc.

The above query will give you the number of hours for which the resource was billed in a period.

Calculate the hours for which a resource must be running within a period

Taking an example, an RDS instance is required to be stopped over the weekends from Saturday 12 AM UTC to Monday 12 AM UTC.

The total number of hours it needs to be stopped is 48 hrs in a week as per the power schedule.

Consider the month of August 2023: there are 4 weekends so total number of hours the RDS instance is supposed to be stopped = 4 x 48 = 192 hours.

Total number of hours (in August) = 31(number of days) X 24(number of hours in a day) = 744 hours.

Total number of hours the RDS is required to run = 744 – 192 = 552 hours.

Calculate the KPI for each resource in scope

Formula

$$\textit{Power Schedule Adherence Rate} = \frac{\textit{Time(in hours) for which resource is required to run for a period}}{\textit{Time(in hours) for which resource is billed for a period}}$$

OR

$$\textit{Power Schedule Adherence Percentage} = \frac{\textit{Time(in hours) for which resource is required to run for a period}}{\textit{Time(in hours) for which resource is billed for a period}} X\ 100$$

Consider the example in step 3, assuming the RDS instance was billed for 600 hours in August 2023, the calculation will look like:

$$\textit{Power Schedule Adherence Rate} = \frac{552}{600} = 0.92$$

OR

$$\textit{Power Schedule Adherence Percentage} = \frac{552}{600} X\ 100 = 92\%$$

Let’s look at examples:

https://www.finops.org/wg/how-to-measure-power-schedule-adherence-rate-percentage/

https://www.finops.org/wg/percent-commitment-based-discount-waste-playbook/

LET'S LOOK AT A SCENARIO

A sample question from the FOCUS Analyst Certification Exam

You've been asked to optimize your organization's cloud costs.

You have a FOCUS dataset at hand and start to analyse it. You find this line which seems interesting.

Block & Fractional Block Pricing

In block pricing, a block is purchased (e.g. 1 block = 2000 hours) and in fractional block pricing, fractions of a block can be purchased (e.g. 2.2 blocks = 2200 hours).

Considering the item is a Fractional Block Pricing one, with fractional block pricing increments of 0.5, what would be the best optimization strategy to follow?

Pricing Strategy	Item Description	Charge Category	Pricing Quantity	Pricing Unit	List Unit Price	List Cost	Contracted	Contracted Cost	Billed Cost	Effective Cost	Consumed Quantity	Consumed Unit
Fractional Block Pricing	AI Tokens	Usage	1,5	1000 Tokens	1,00	1,50	0,90	1,35	1,35	1,35	1005	Tokens

a) Propose finding ways to reduce the effective cost of this item

b) Propose a way to increase the number of fractional blocks from 1.5 to 2.0

c) Propose finding ways to reduce usage slightly to avoid paying for the additional 0.5 block

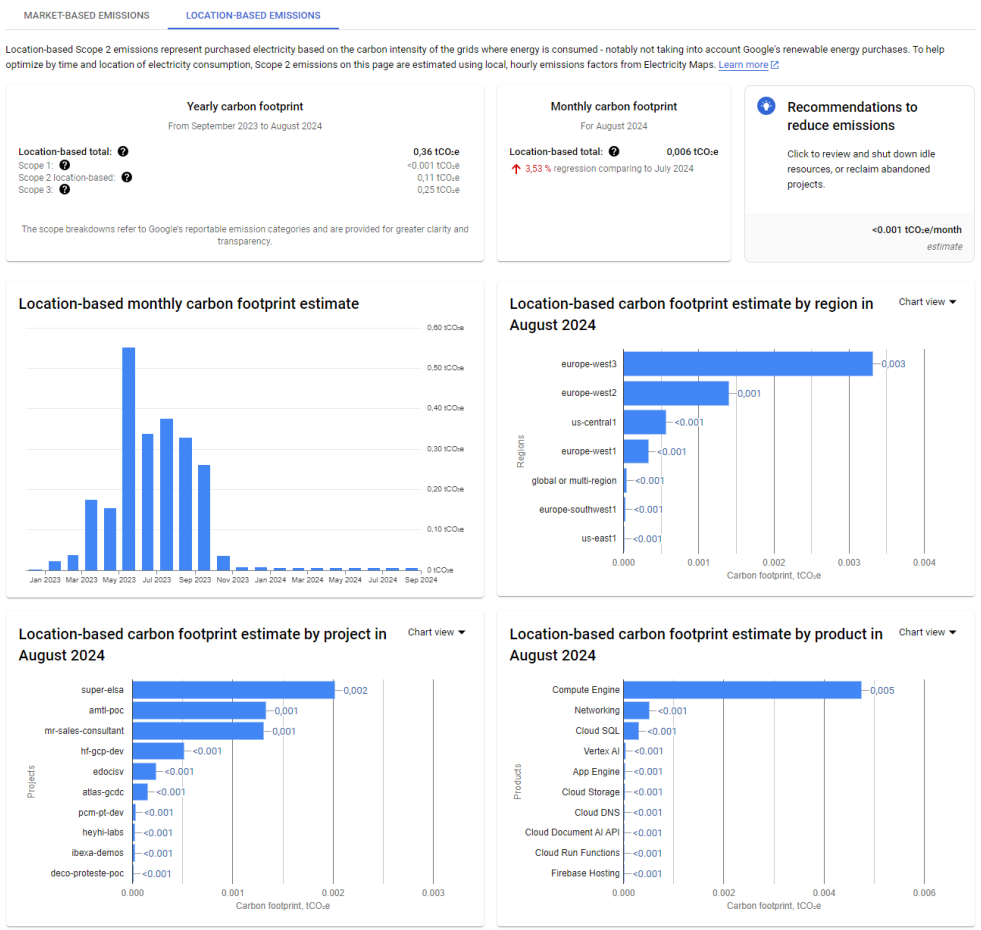
d) Propose finding ways to reduce the contracted rate for this item

CROSSING FINOPS DATA WITH CARBON FOOTPRINT

GETTING THE CARBON DATA

As provided by the cloud vendors

- All main cloud vendors are now providing carbon-related data, so that companies can measure and act upon to achieve their sustainability goals.
- Very soon, it will be mandatory to have all this data to help with the sustainability reports.
- Google: https://console.cloud.google.com/carbon
- Microsoft: https://www.microsoft.com/en-in/sustainability/emissions-impact-dashboard (has an API still in preview mode)
- AWS: https://aws.amazon.com/aws-cost-management/aws-customer-carbon-footprint-tool/
- Oracle: https://docs.oracle.com/en-us/iaas/Content/General/Tasks/carbon-analysis-viewreports.htm



It's possible to generate Carbon-Impact datasets, per service, per location and per project.

Crossing FOCUS datasets with carbon-impact datasets allows for workload carbon-impact reporting and analysis.

Link is currently working on an accelerator to have this fully integrated on a single report, with multi-cloud vendor sources.

IT'S NOT JUST NICE... IT'S ICE!

José Rodrigues

Director of ICE [Integration, Cloud and Experience]

jose.Rodrigues@linkconsulting.com

+351 969 441 364

LinkedIn