Cloud Finance Onboarding (CFO)

CLOUD FINANCE ONBOARDING (CFO): MODULE 3

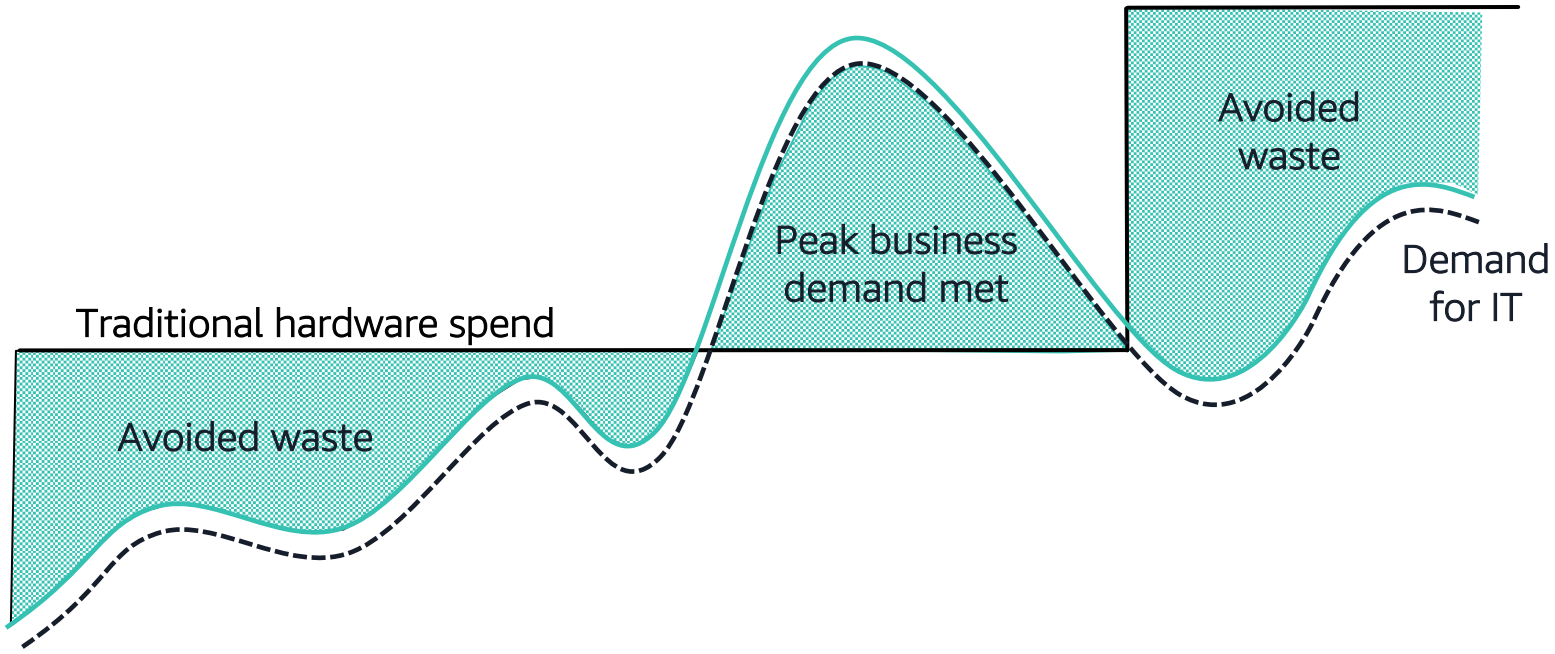
Cloud Financial Predictability

AGENDA

1. Forecasts and Budgets
2. Cloud Costs Forecasts (Predict)
3. Cloud Costs Budgets (Track)
4. Closing the Loop (Control)
5. Improving Cloud Financial Predictability

Forecasts and Budgets

Predictability is more important now than ever …



As we move from on-prem where we needed a high-level forecast to provision IT resources for the next 3-year cycle, and where overprovisioning was an accepted tenet; now in the cloud we need more accurate forecasts (e.g. per workload) to constantly track the variable cost from on-demand provisioning of IT resources, and where the objective is now to maximise efficiency and mitigate waste.

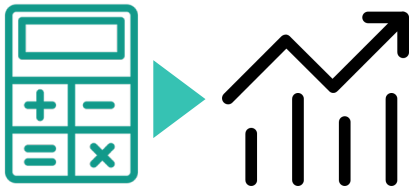
Forecasts and budgets are key to financial predictability in the cloud

Allowing cloud consumers to achieve the following

- Set expectations / goals with finance, business, and technology stakeholders
- Track cloud behaviour on a granular level (cost centre, service, team)
- Provide timely reporting to drive awareness and corrective action

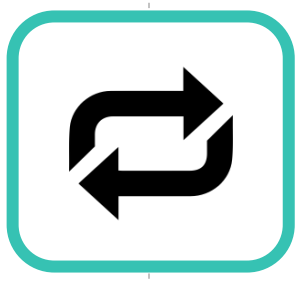
Predict with forecasts; track with budgets; then control and repeat

Forecasts

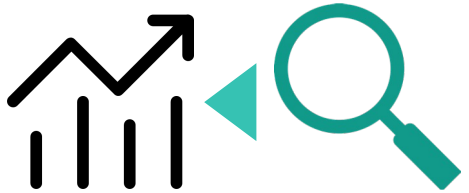


Estimate of future cost outcomes to set expectations with all stakeholders

- ✓ Based on historical data and/or business drivers
- ✓ Strategic; helps to inform financial plan
- ✓ Dynamic; frequently adjusted due to changing assumptions and environment



Budgets



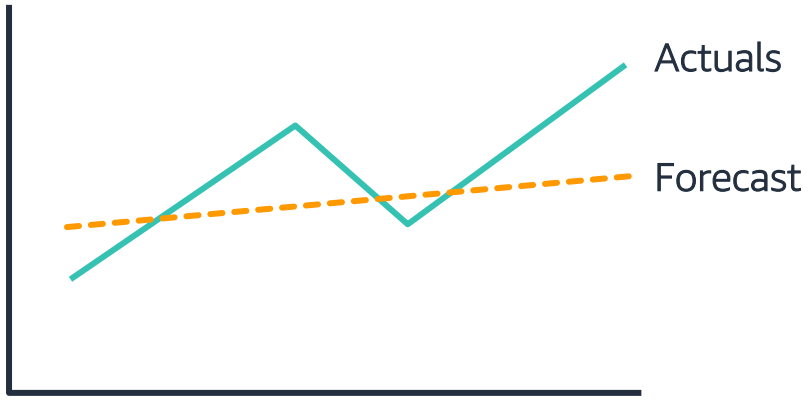
Evaluation of forecasts to track behaviour and drive awareness and corrective action

- ✓ Based on forecasts
- ✓ Tactical; helps to track short-term targets
- ✓ Static; tracks forecast as-is (until forecast needs to be changed)

Cloud Costs Forecasts (Predict)

There are largely two ways for predicting cloud cost …

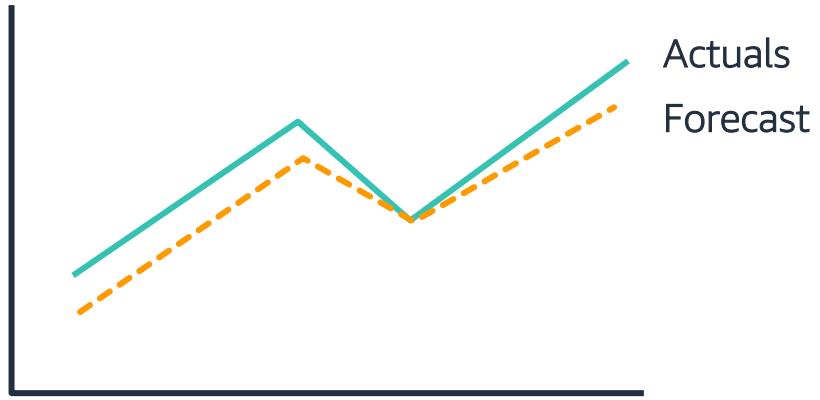
Trend-based (top-down)



Forward-looking extrapolation of historic time-series data

- ✓ Simple / Highly automated
- ✓ Improved accuracy when using ML models
- ✓ Only for existing workloads
- ! Requires historical data
- ! Does not factor in business or environmental changes

Driver-based (bottom-up)



Manual calculation based on business and demand drivers

- ✓ Provides highest accuracy
- ✓ Takes into account business or environmental changes
- ✓ Best for new workloads
- ! Labour-intensive option
- ! Requires manual updates as architecture changes
- ! Requires finding highly correlated (to spend) drivers

… and various methods to execute the trend-based way

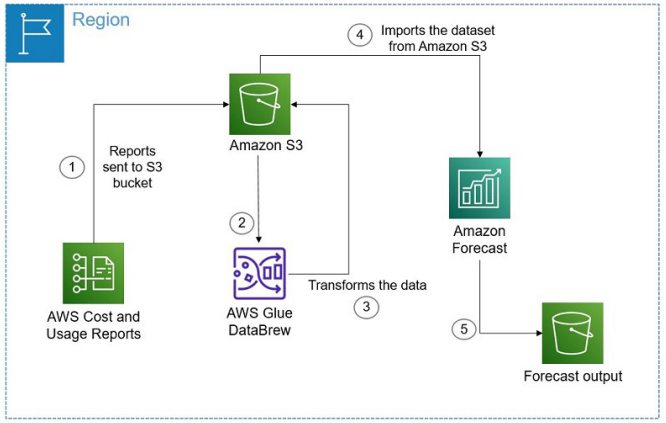
Manual Process

- ✓ Calculated based on observed CMGR*
- ✓ Easiest method (using Spreadsheet)
- ✓ Ideal to get a relatively quick ‘rough order of magnitude’ value to use as a starting point for a budget

Standard Models
(AWS Cost Explorer)

- ✓ Off-the-shelf ML- and rules-based models
- ✓ AWS Cost Explorer (native feature)
  - ✓ Forecast costs and usage
  - ✓ 80% prediction interval

Custom ML Models
(Amazon Forecast)



- ✓ Customised Machine Learning models
- ✓ Most accurate forecasting, but increased complexity
- ✓ Custom solutions using the Cost and Usage Report (CUR) with Amazon Forecast and AWS Glue DataBrew

* Compound Monthly Growth Rate

Building a driver based forecast

Identify business and demand drivers

New product launches
- Born in the cloud products
- Migrations from on-premises

New environments
- Dev, test, CI/CD
- Pre-sales/demo
- Pre-prod, prod

Increased product demand
- New users
- Growth of existing users
- Capacity expansion

Changes to existing products
- New features and capabilities
- Re-factoring, re-architecture and modernization

Business related
- Commercial seasonality
- Regional, and global expansion
- Disaster recovery
- M&A
- Divestiture

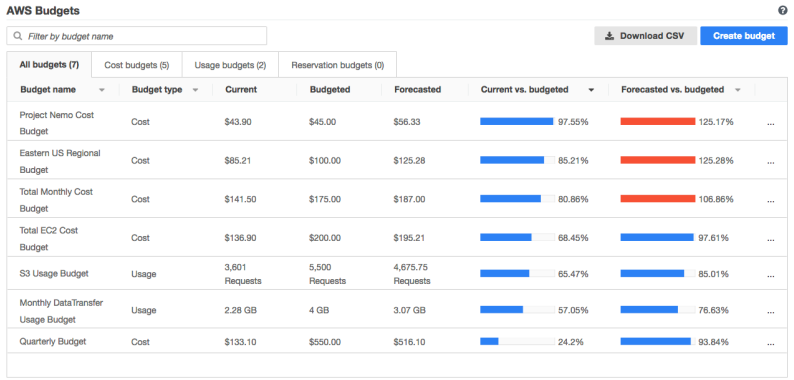
Calculate or Identify cost

aws pricing calculator	Estimate the cost for your architecture solution.
aws migration evaluator Formerly TSO Logic	Build a data-driven business case for additional workload migrations to AWS
Leverage Unit Metric approach	Forecasting highly variable spend components
Leverage Partner solutions	AWS Cloud Spend by Anaplan (driver-based forecasting) https://bit.ly/33Y6ebw

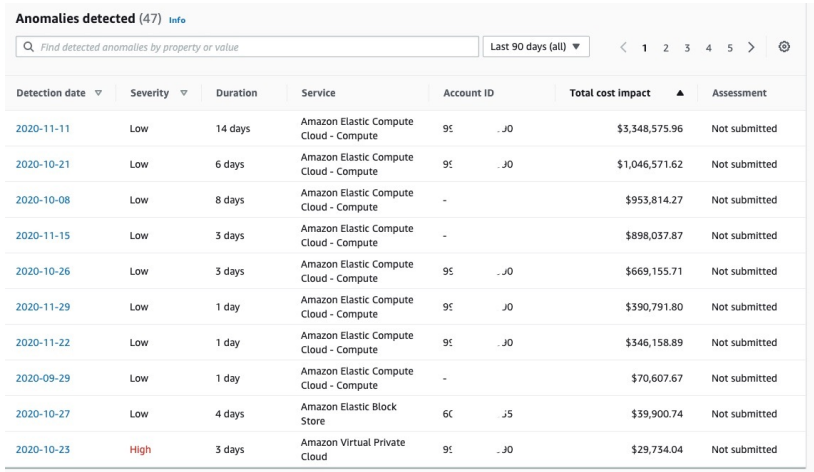
Cloud Costs Budgets (Track)

There are largely two ways for tracking budgets …

AWS Budgets



AWS Cost Anomaly Detection



Custom defined budgets with automatic tracking, alerting and action triggering

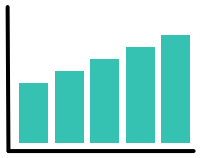
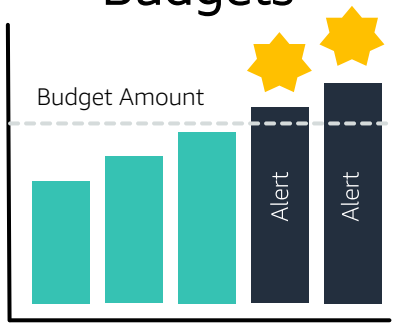
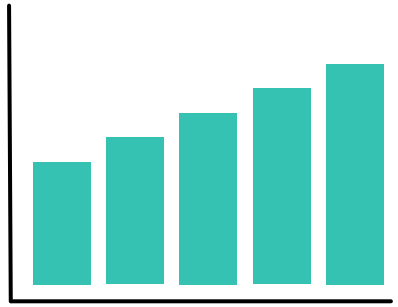
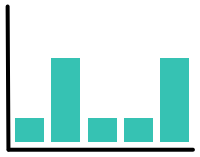
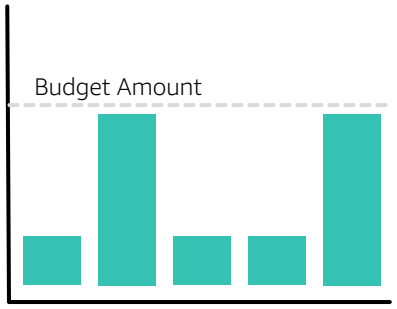
- ✓ Alerts based on usage/cost, actual/forecast, RI/SP utilisation/coverage
- ✓ Manually input thresholds per budget (up to 5 each)
- ✓ Tracking on multiple dimensions (via filters)
- ✓ Free service

Trainable ML-based detection of spend anomalies with RCA alerting

- ✓ Alerts based on ML-estimated thresholds (including RCA)
- ✓ Thresholds automatically adjusted daily for organic growth and seasonal trends
- ✓ Tracking on multiple dimensions (via spend segments)
- ✓ Customer can provide feedback on alerts to increase model accuracy

… which can be used as complementary services

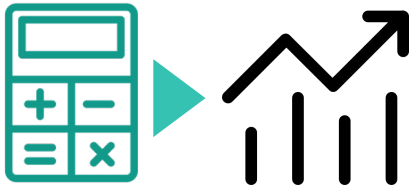
Leverage both AWS Budgets and AWS Cost Anomaly Detection to avoid surprises across different scenarios

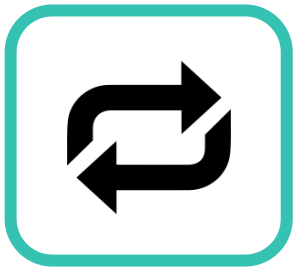
Scenarios	AWS Budgets	AWS Cost Anomaly Detection	Potential Root Cause
Steady / Expected Growth 			✓ Increase in user base ✓ Increase in usage by existing user base ✓ Savings Plans low coverage
Sudden / Abnormal Spikes 			✓ Ad-hoc infrastructure spin-up ✓ Accumulated EBS snapshots ✓ Seasonal promotions

Closing the Loop (Control)

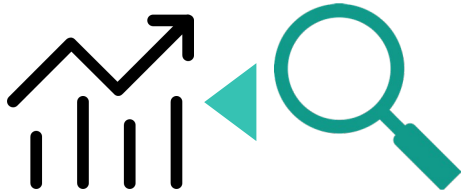
Closing the Loop to Control Variances

Forecasts





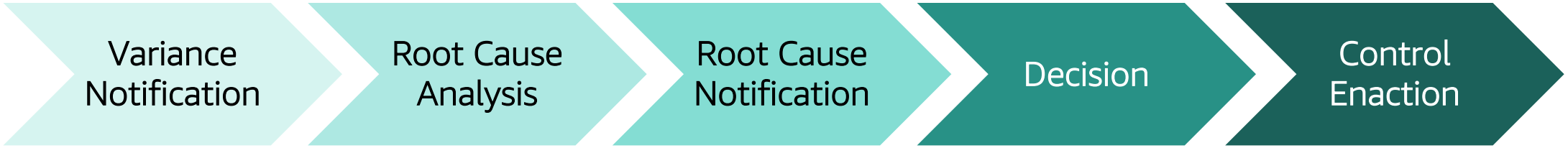
Budgets



Standard Operating Procedure

Corrective Action
(via controls)

Following a Standard Operating Procedure …



Variance Notification	Root Cause Analysis	Root Cause Notification	Decision	Control Enaction
Which stakeholders need to be notified of a cloud cost variance?	Which stakeholders (or groups) need to perform the RCA? What is the SLA for determining root cause?	Which stakeholders need to be notified of the root cause?	Can we justify the variance?; OR Do we need to fix the problem to avoid it from recurring? Who is going to sign-off on this decision?	What is the fix plan? What is the timeline to deliver the fix plan? Who is going to implement the corrective actions?

Preferably, you should leverage existing incident management processes and tools

… to implement corrective action via controls

Less Invasive Controls

- Shutdown or terminate resources left running by mistake
- Modify oversized resources
- Shutdown unused test, dev or non-production environments
- Purchase 1 year, No Upfront Reserved Instances or Compute Savings Plans
- Move fault-tolerant workloads to Amazon EC2 Spot Instances

More Invasive Controls

- Impose short-term resource provisioning moratorium
- Re-design or re-architect for cost
- Aggressive Reserved Instance or Savings Plans purchase
- Implement cloud controls
- Re-adjust forecasts
- Pre-consume future budget

Best Practices (1/2)

Cross-functional Collaboration

- ✓ Establish a steering committee (FinOps)
- ✓ Run a bi-weekly cadence between Finance and Engineering/Product for cross-functional knowledge sharing, variance analysis, forecasts adjustments, and overall business alignment
- ✓ Visibility and timely reporting into how much all teams are currently spending, is crucial

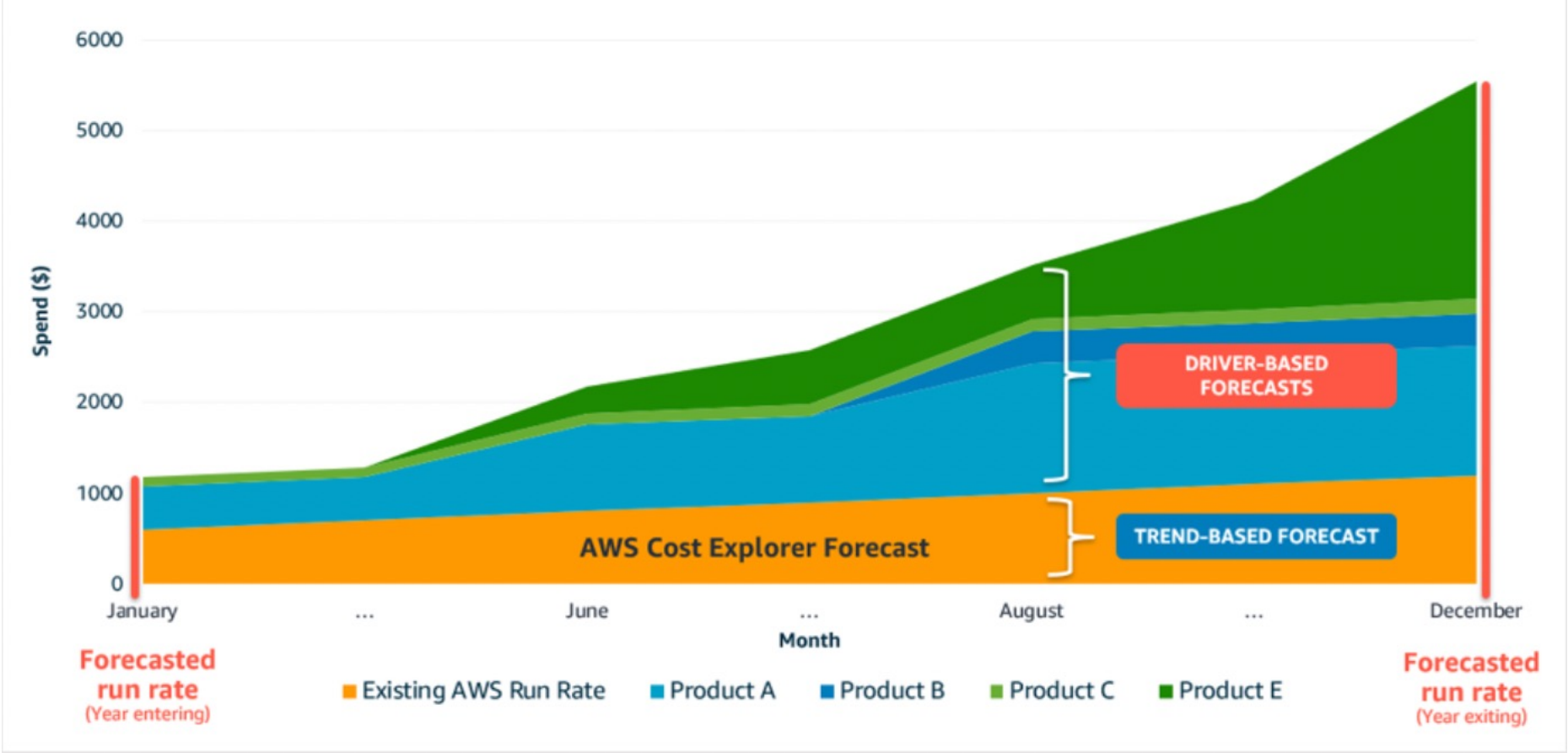
Governance and Accountability

- ✓ Product owners are responsible for their team's forecasts, and must justify root cause for any variance, as well as document mitigation steps
- ✓ Their engineering leads are accountable for the underlying cost
- ✓ Advanced practices include checkbox incentives, gamification of success, as well as cost optimization stories backlog management

Combined Forecast Modelling

- ✓ Acknowledge the power of each type of forecasting, and use them in tandem to build an accurate forecast
- ✓ Start with trend-based forecast of well-known workloads with historical data
- ✓ Stack on top driver-based forecasts of new workloads and/or features, including their corresponding launch dates

Best Practices (2/2)



Improving Cloud Financial Predictability

Where to start

Customer's degree of maturity

- ✓ Start with trend-based forecasting (Manual Process and/or Standard Models)
- ✓ Enable cost monitoring with AWS Budgets, based on total cost
- ✓ Activate AWS Cost Anomaly Detection, based on total cost
- ✓ Hold ad-hoc Budget tracking alignment meetings (based on notifications)

- ✓ Build a driver-based forecasting for a new workload; expand to more
- ✓ Enable cost monitoring with AWS Budgets, based on a per workload/team cost (via filters)
- ✓ Activate AWS Cost Anomaly Detection, based on per workload/team cost (via spend segments)
- ✓ Establish regular cadence for Budget tracking alignment meetings

- ✓ Implement a custom ML-based forecasting model to improve accuracy
- ✓ Automate responses using AWS Budgets Actions (IAM, SCP and/or EC2/RDS instance)
- ✓ Achieve higher degree of automation (Slack notifications, SNS-based triggers)

Who is responsible for what (personas)

Finance Persona

- ✓ Evaluate trend-based forecasts for existing workloads (Spreadsheets, AWS Cost Explorer, Custom ML Models)
- ✓ Develop driver-based forecasts for new workloads (AWS Pricing Calculator, Spreadsheets)
- ✓ Track budgets on a defined regular cadence
- ✓ Modify forecasts based on changing assumptions and environment

FinOps Persona

- ✓ Define (and refine) budgets on AWS Budgets for each team/workload
- ✓ Enable Finance and Tech stakeholders by setting automated notifications at specific cost thresholds for each budget
- ✓ Ensure alignment between Finance and Tech to clarify variances, as well as define next steps when budget alerts are triggered (justify or fix variance; modify forecast or recommend cost optimisation initiative)

Tech Persona

- ✓ Provide input into development of driver-based forecasts for new workloads
- ✓ Provide feedback on usage-based budget variances
- ✓ Implement advanced custom ML forecasting models

Best practices and their impacts on *Forecast accuracy (KPI)*

Best practice	Increase in cloud spend forecast accuracy*
Regular trend- and driver-based forecasting with detailed variance analysis	35%
Audit findings are actioned consistently and systematically	40%
80% or more of cloud spend is managed centrally	45%
Cloud training is conducted consistently and systematically	40%

*Compared to accuracy of respondents not using or suboptimally using the practices (e.g., infrequently, to a lesser degree).

Source: Cloud Services Study, The Hackett Group, 2022

Thank you