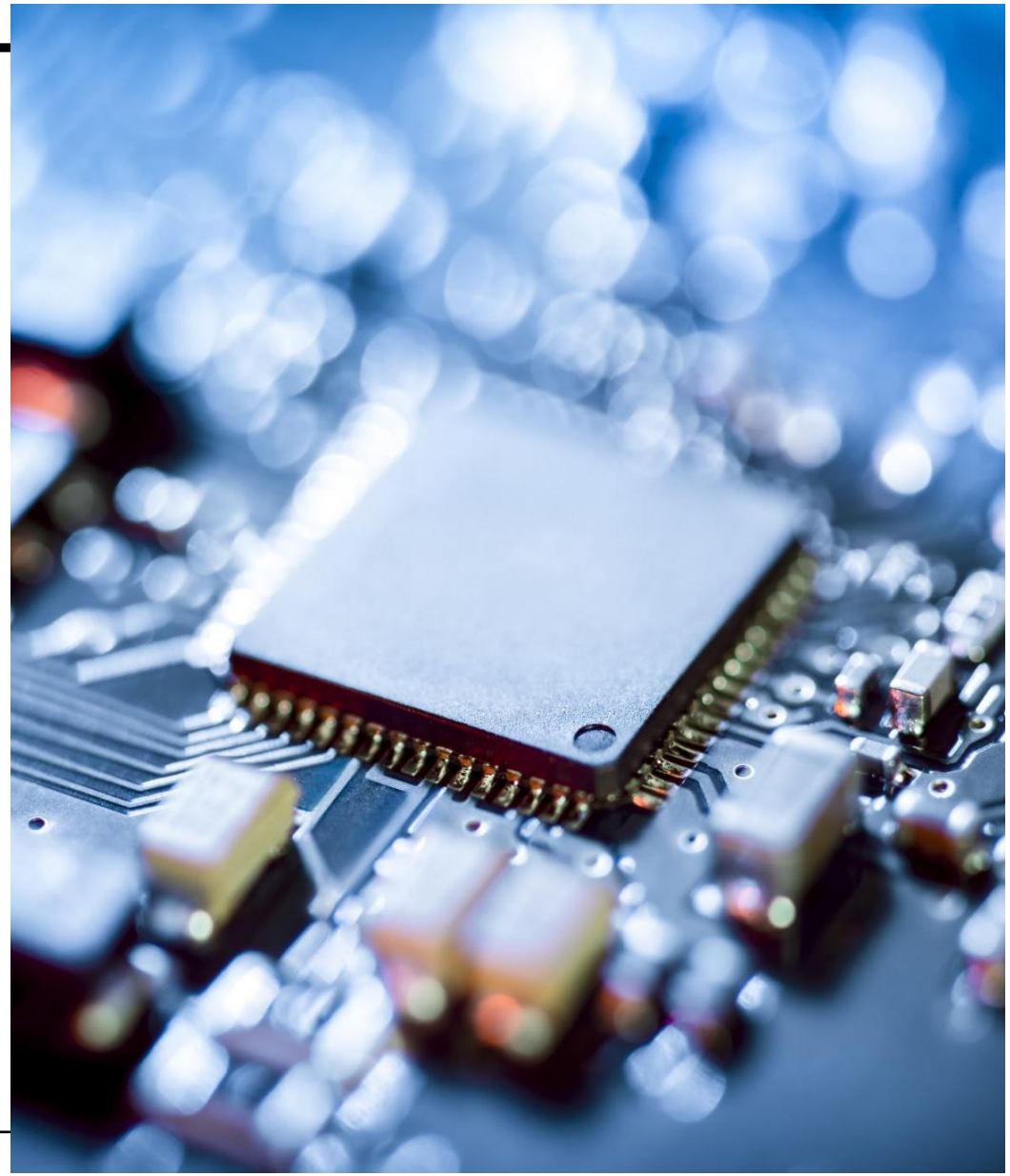
SURVIVING IN A CULTURE THAT THRIVES ON THE "NEED FOR SPEED"



Financial World of Information Technologies

Penny Collen
pennylcollen@aol.com

- Surviving in a Culture That Thrives on the “Need for Speed”

TOPICS WE WILL COVER TODAY

The demand for agility
Technology response
Life in service environment
Cloud
“as-a-Service”
Agile Development
Edge and Fog
Artificial Intelligence
The Future

WE NEED ANSWERS FASTER RESPONSES IN EVERYDAY LIFE

Voice commands

- Alexa – Tell me…. Alexa Play
- Call ….
- Text ….
- Give me directions

Edge– Latency

AI search results

ChatGPT Gemini Manus

Targeted Ads

AGILITY IS EVERYWHERE

- “We will create strategically agile systems to fulfill our purpose”
- In a fat-paced world, adaptability is key, and Blue Valley’s first strategic priority focused on building responsive systems that support students and staff in real time. From upgraded safety protocols to using data to inform student learning, the district created structures that allow flexibility, support and proactive response

TOP FIVE BUSINESS CHALLENGES IN 2024 (SOURCE:WORKBOARD)

- #5 Cultivating Robust Agility
  - Helping businesses stay competitive
  - Providing buffers to sudden jolts in the environment

UNDERSTANDING THE SPEED OF NEED

Time to Value / Business Impact – The inability to get needed IT solutions into production directly impacts the business. CEOs can purchase companies that will be strategic to the business. R&D can change IT to retool for new products, and it takes a year or more to bring a new product to market.

Self-Servicing / Shadow IT – Lines of Businesses (LOB), sick of waiting for their solutions to be implemented by IT go directly to the source. They leverage cloud-based SaaS and IaaS systems on their own, and initially work around enterprise IT. At some point, IT must take over the solution, and that actually forces the LOBs off their strategic track.

IT not a Value Driver – IT needs to drive value within an enterprise, and they must consistently prove their value. Today, IT drives costs, and their only path to value is to drive more agility.

Agility is worth more than cost savings in the long term

Quotes from David Linthicum, Cloud Analyst

LIFE WITHOUT AGILITY

- Time to Value / Business impact
  - Higher speed/higher value
- Self-servicing / Shadow IT
  - Centralize the value decisions
- Sprawl / Anarchy / Waste
  - IT becomes a hindrance

KEY CHANGES NEEDED BY FINANCE:

CONTINUOUS AGILITY

- Adding Control Points
  - Data points are key
  - Metrics are key
  - Distributing across all stakeholders
- Accountability
  - Who does what?
  - How effective is it?


Every business will be a cloud vendor in the near future
APRIL 17, 2016
0

IMPORTANCE OF SPEED IN IT SYSTEMS

Impact on Productivity

Speed in IT systems enhances productivity by allowing users to perform tasks more efficiently and effectively.

User Satisfaction

Faster IT systems lead to higher user satisfaction, as quick response times improve overall user experience.

Business Competitiveness

Increased speed in IT systems helps businesses remain competitive by meeting customer demands more effectively and quickly.

BALANCING AGILITY AND CONTROL

- Moving to Instant Feedback
  - Instant Budgeting & Forecasting
    - Information when and where needed
  - Instant Value Assessment
    - Value metrics calculated on-demand
  - Instant Cost Estimation/Forecasting
    - Making predictions based on the best data

UNDERSTANDING IT SPEED AND PERFORMANCE

Traditional Definition of IT Speed & Performance

IT speed is defined as the responsiveness and processing capabilities of information systems, impacting user experience significantly.

Performance involves how quickly tasks are completed and the overall efficiency of IT systems in providing services.

Efficiency in IT Infrastructure demands delivery of capacity as well as performance

CLOUD SIGNIFICANTLY IMPROVES SERVICES DELIVERY

Agility

- Increased velocity of innovation
- Supports faster time to market
- High elasticity
- Faster and easier migration from data center
- Faster and easier integration of new acquisitions

Cost Efficiency

- Increased overall IT efficiency
- Reduced unit cost
- Increased development productivity
- Key improvement levers
- Standardization
- Highly automated
- Simplified procedures and self service
- Increased utilization through resource sharing
- High degree of component
- re-use

Quality

- Higher resiliency and availability
- Improved maintainability of infrastructure and applications
- Consistency among applications
- Increased levels of Security as bar is raised to support Publicly hosted applications

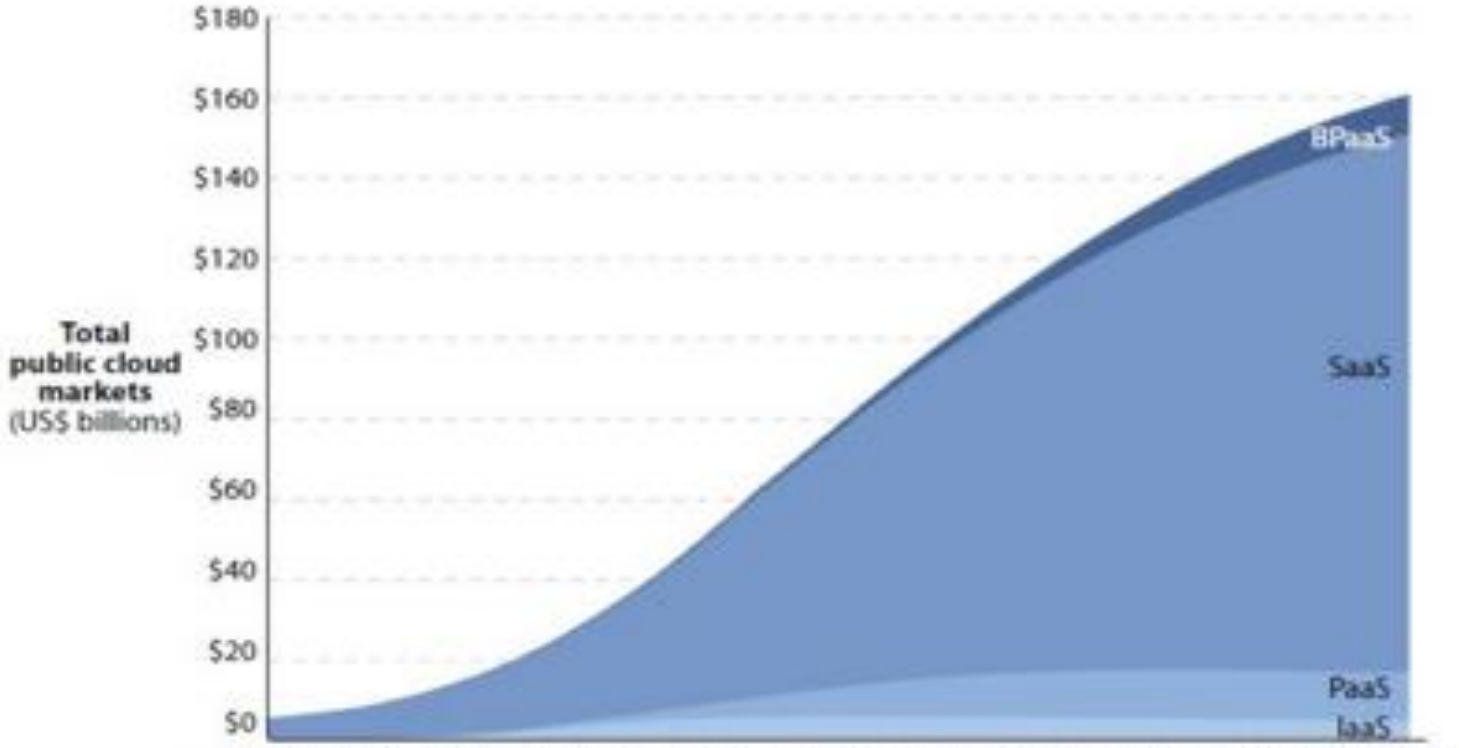
CLOUD IS THE FASTEST GROWING AREA OF IT SPEND

- 14% of IT spending will be on Cloud services (Spiceworks study)
- In 2015: IT operational spend is rising at the fastest pace in years, with 69 percent of IT organizations getting bigger operational budgets. Yet capital spending is flat and hiring is weak, Longwell, Gartner Research

GROWTH IN CLOUD MARKET

Figure 3 Forecast: Global Public Cloud Market Size, 2011 To 2020

The spreadsheet detailing this forecast is available online.



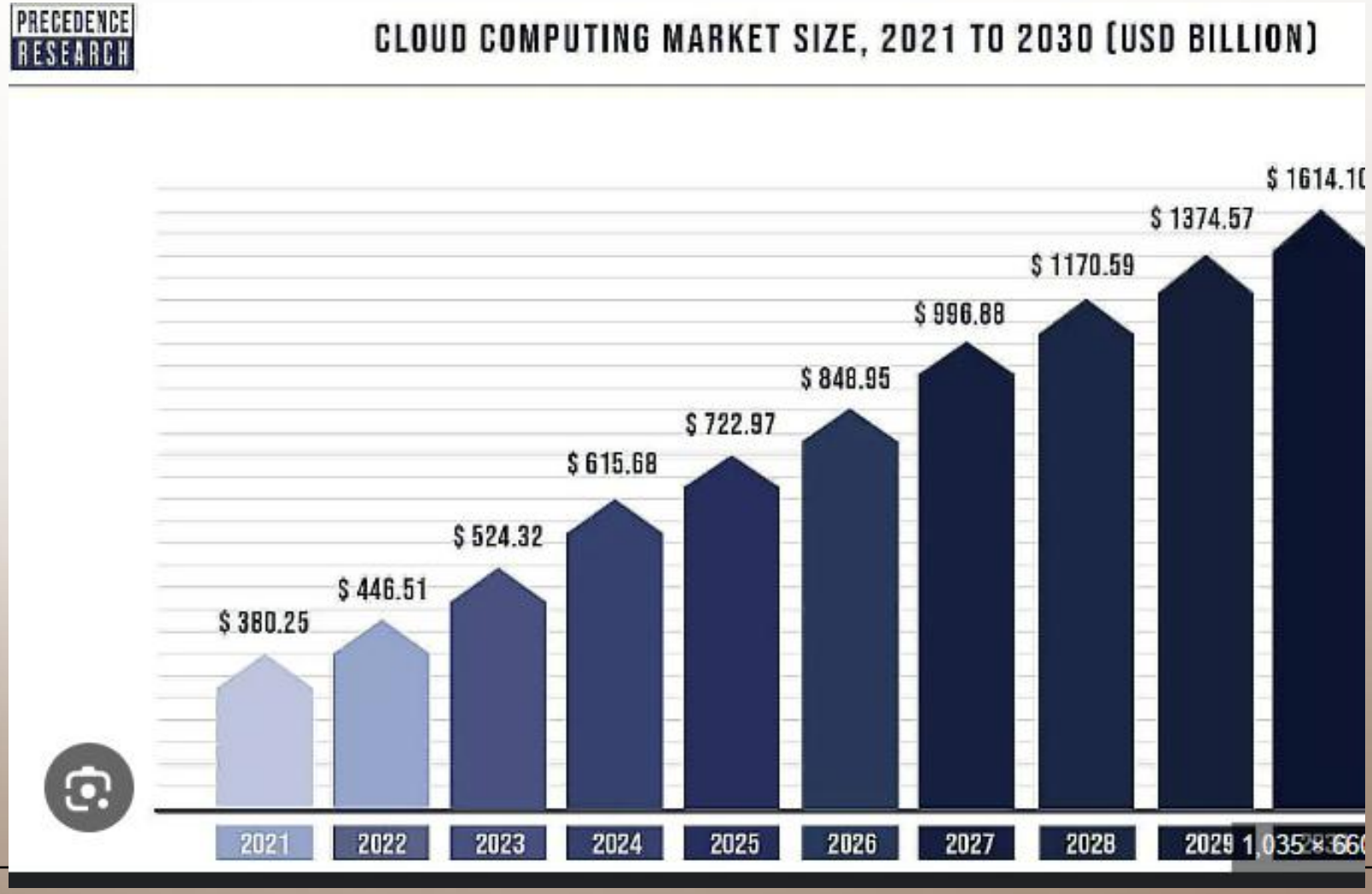
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BPaaS ($)	0.15	0.23	0.35	0.53	0.80	1.26	1.95	2.93	4.28	6.00	7.66	9.08	10.02
SaaS ($)	5.56	8.09	13.40	21.21	33.09	47.22	63.19	78.43	92.75	105.49	116.39	125.52	132.57
PaaS ($)	0.05	0.12	0.31	0.82	2.08	4.38	7.39	9.80	11.26	11.94	12.15	12.10	11.91
IaaS ($)	0.06	0.24	1.02	2.94	4.99	5.75	5.89	5.82	5.65	5.45	5.23	5.01	4.78

58161

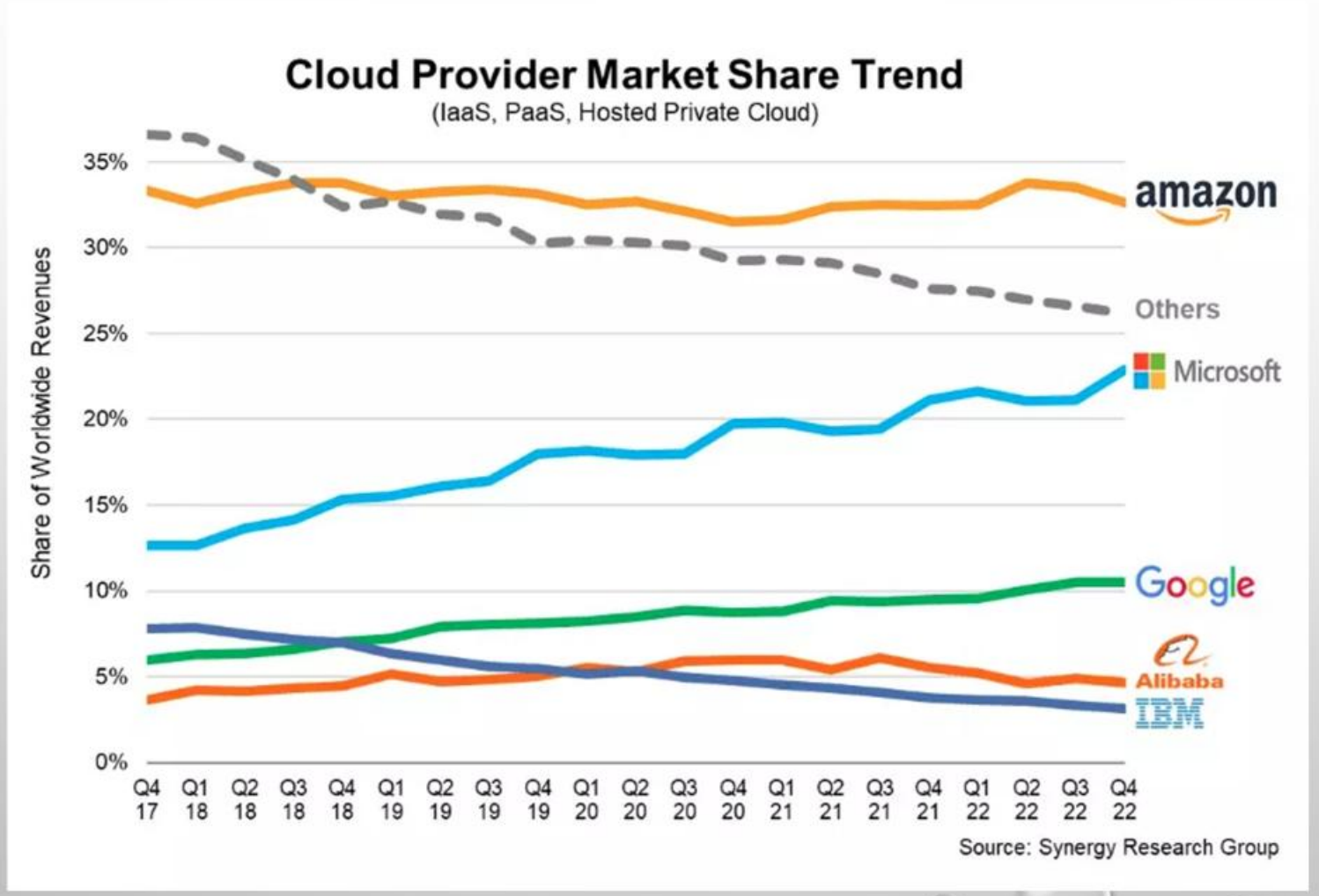
Source: Forrester Research, Inc.

REALITY CHECK!!

CLOUD MARKET 2021- 2030

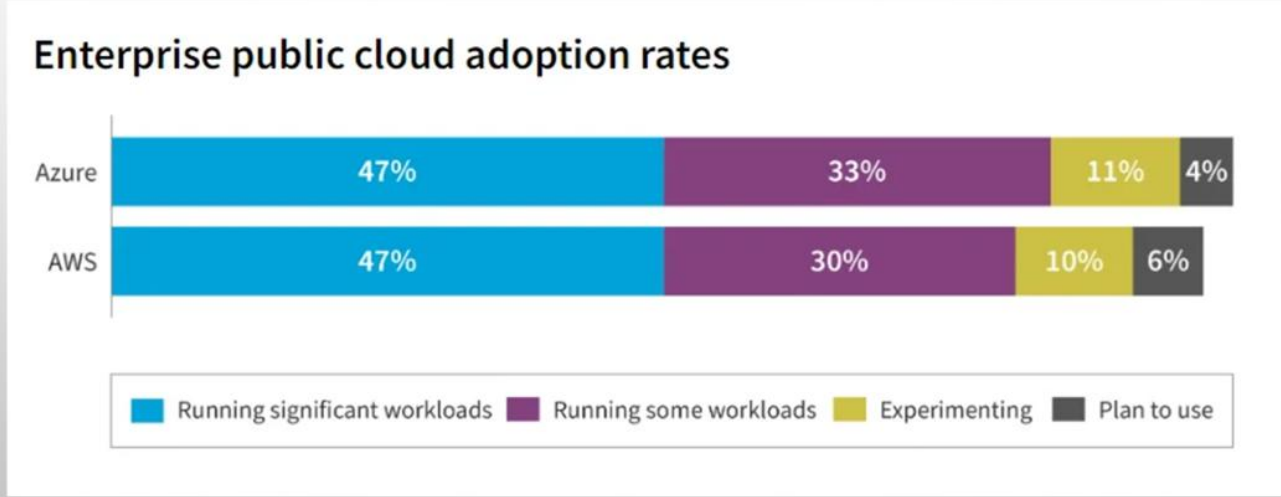


AMAZON WEB SERVICES DOMINATES WITH 34% MARKET SHARE (SOURCE: SYNERGY RESEARCH GROUP)



CLOUD IS NOW A PRIMARY RESOURCE

- HTTPS://WWW.CLOUDZERO.COM/WP-CONTENT/UPLOADS/2023/12/IMAGE-11.WEBP



ITFMA 2025 St Paul © Penny Collen 2025

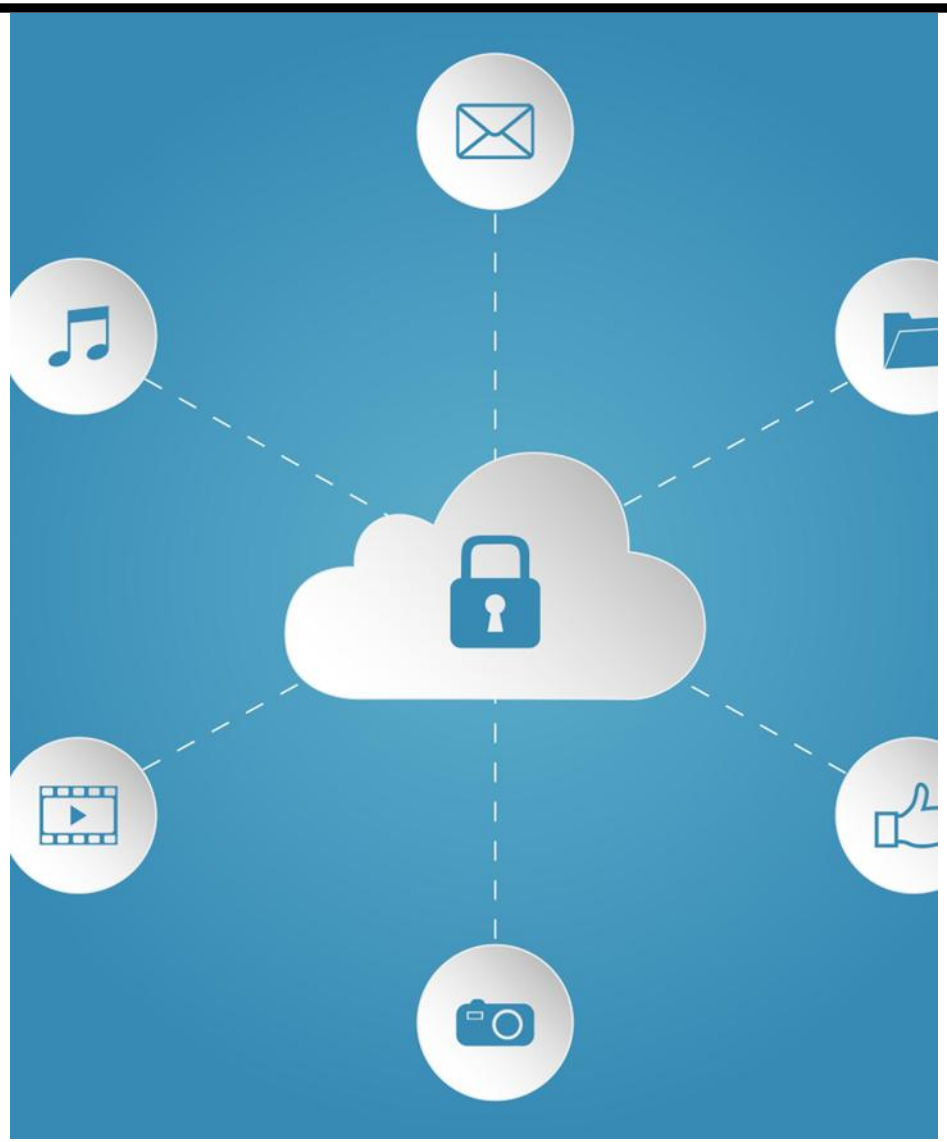
Top 7 cloud computing statistics for 2025

Top 7 cloud computing statistics for 2025

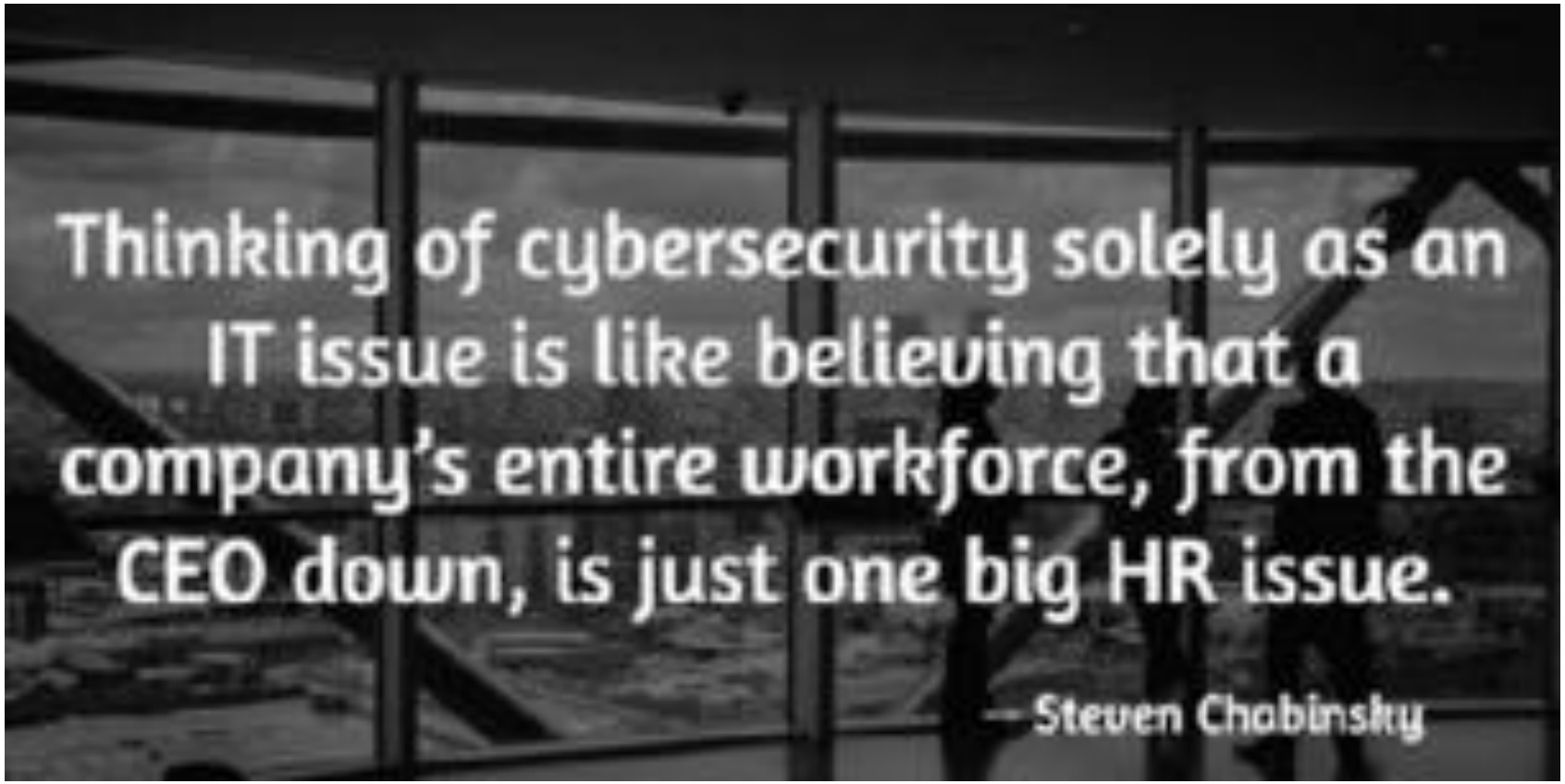
- 94% of enterprise organizations use cloud computing.
- Over 60% of all corporate data is in cloud storage.
- Global spending on cloud services will reach $1.3 trillion in 2025.
- Amazon Web Services(AWS) dominates the cloud market, with a 31% market share in 2024.
- Companies waste as much as 32% of their cloud spend.
- Over a third of cloud data breaches resulted from misconfiguration or human error.
- 83% of enterprise CIOs planned to repatriate at least some workloads in 2024.

50+ Fascinating Cloud Computing Statistics for 2025
December 23, 2024 **by Soundarya Jayaraman G2**

SECURITY IN THE CLOUD



The number one reason people say they won't use cloud is security



More budget for cybersecurity. In fact, a 15% rise in cybersecurity spending is forecast for 2025. Global expenditures on information security are expected to reach $212 billion next year, but North America continues to dominate cybersecurity spending. The continent spent $92.31 billion in 2024, and experts anticipate a CAGR of 8.51% over the next five years.

SPLUNK

NOVEMBER 25, 2024**IT and Technology Spending & Budgets for 2025: Trends & Forecasts** By Kayly Lange

BUYING THE CLOUD - BASIC TERMINOLOGY

- Self-service provisioning (IT-as-a-Broker)
  - Vendor transparency
- Pay-per-usage
- Reserved instances
- Spot market
- Capacity planning

O'REILLY'S LATEST CLOUD ADOPTION REPORT HAD SOME INTERESTING NUMBERS. CONSIDER THIS:

More than 90% of organizations use the cloud (Source: O-Reilley)

About two-thirds of respondents currently operate in a public cloud and 45% use a private cloud — versus 55% who still rely on traditionally managed on-premises systems.

48% plan to migrate at least half of their applications to the cloud in the next year; 20% intend to move all their applications to the cloud.

47% are pursuing a cloud-first strategy; 30% are already cloud-native; 37% intend to be cloud-native in about three years.

Only 5% plan on switching from the cloud to on-premises infrastructure (cloud repatriation).

Economic Advantages offered by the Cloud

SCALABILITY

What is your savings by eliminating excess capacity?

AGILITY

What will increasing client satisfaction gain?
Client Retention?

PRODUCTIVITY

What is the cost of 30 minutes of outage?
Savings from lower staff turnover?

ACCESSIBILITY

What can you gain with 24X7 access to services and data?
Workforce collaboration?

INNOVATION

What is the impact of entering the market earlier?

PROFITABILITY

How much will profits improve if you standardize your services?

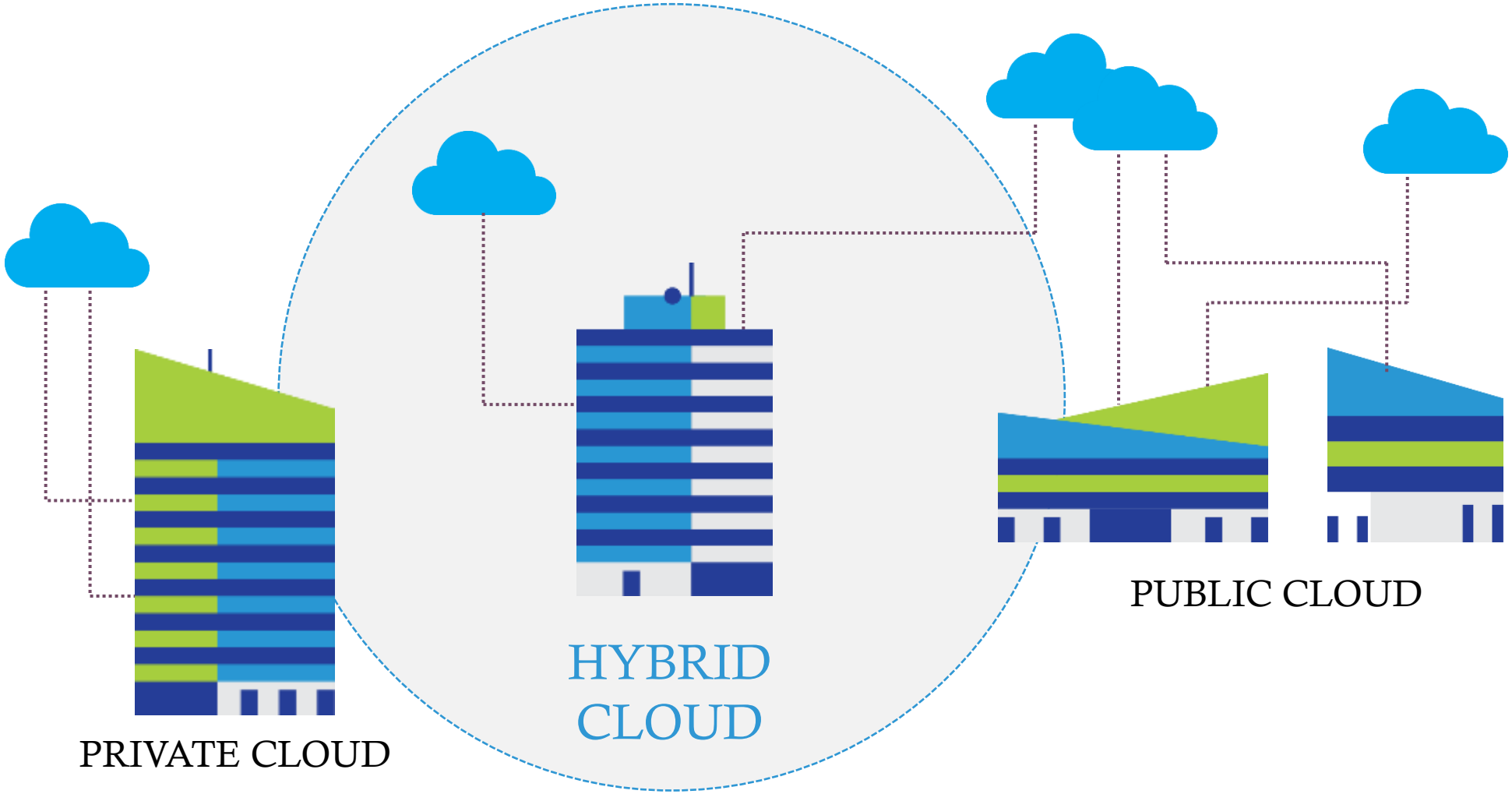
IT ISN'T ENOUGH TO CHANGE WHAT YOU MANAGE; YOU NEED TO CHANGE HOW YOU MANAGE

Hybrid IT

FINANCIAL PROS AND CONS OF CLOUD

Financial Benefits of Hybrid Cloud Computing	 Shared Resources	 Self Service	 Elastic	 Usage Based
Financial Risks of Hybrid Cloud Computing	 How do I know who's using which resources?	 How do I control IT spending with self-service IT?	 How can I track costs in an elastic IT environment?	 How do I automa chargeback for pa per-usage?

WHAT IS Hybrid Cloud?



SINGLE TENANT

MULTI TENANT

HYBRID CLOUD - 8 KEY FACTORS TO SUCCESS

1. **Cloud Strategy**
2. **Provisioning and Governance**
3. **Capacity Planning and Forecasting**
4. **Data Security, Access Management and Compliance**
5. **Network Services**
6. **Financial Controls**
7. **The CIO as an IT Services Broker**
8. **Technical Skills and Vendor Relations:**

WHY USE A COMBINATION OF SOURCES?

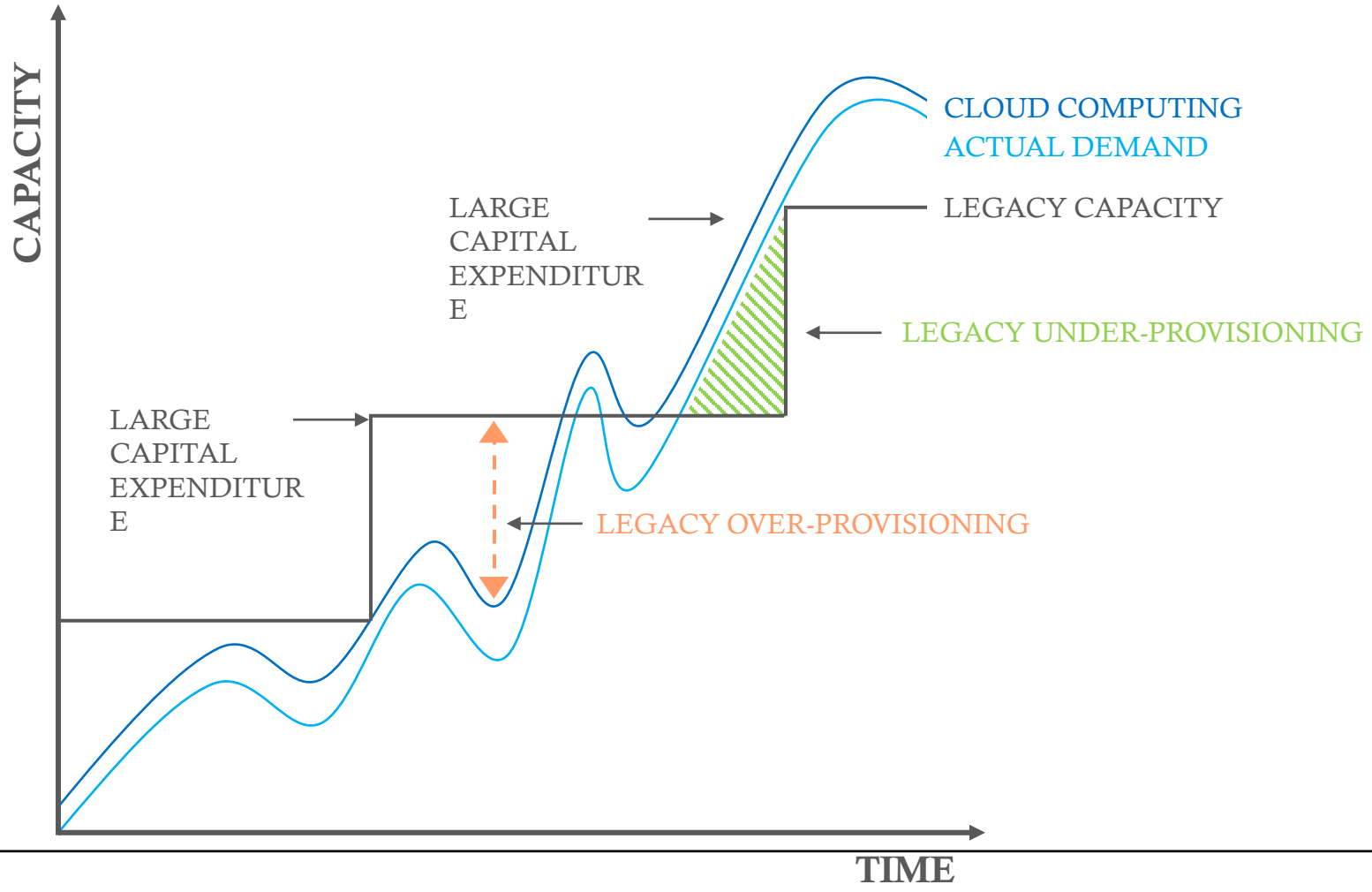
- Compliance/Regulatory requirements
- Security Concerns
- Cyclical or Seasonal Usage
- Technology Release Levels
- Optimize Cost Savings

THE PUBLIC RESOURCE OPTION

- Instant scalability
- Flexibility to meet specific business needs
- Opportunities to lower cost
- Enables phased approach to cloud adoption


GEODIS
KNOWLEDGE CENTER
Source: Supply and Demand Chain Executive
The Benefits of Cloud-Based Management to Supply Chain
By Anthony Clervi
Scalability
Immediacy
Cost containment
Efficiency
Accessibility
Onboarding
Flexibility
Optimization

ECONOMIC BENEFITS OF CLOUD



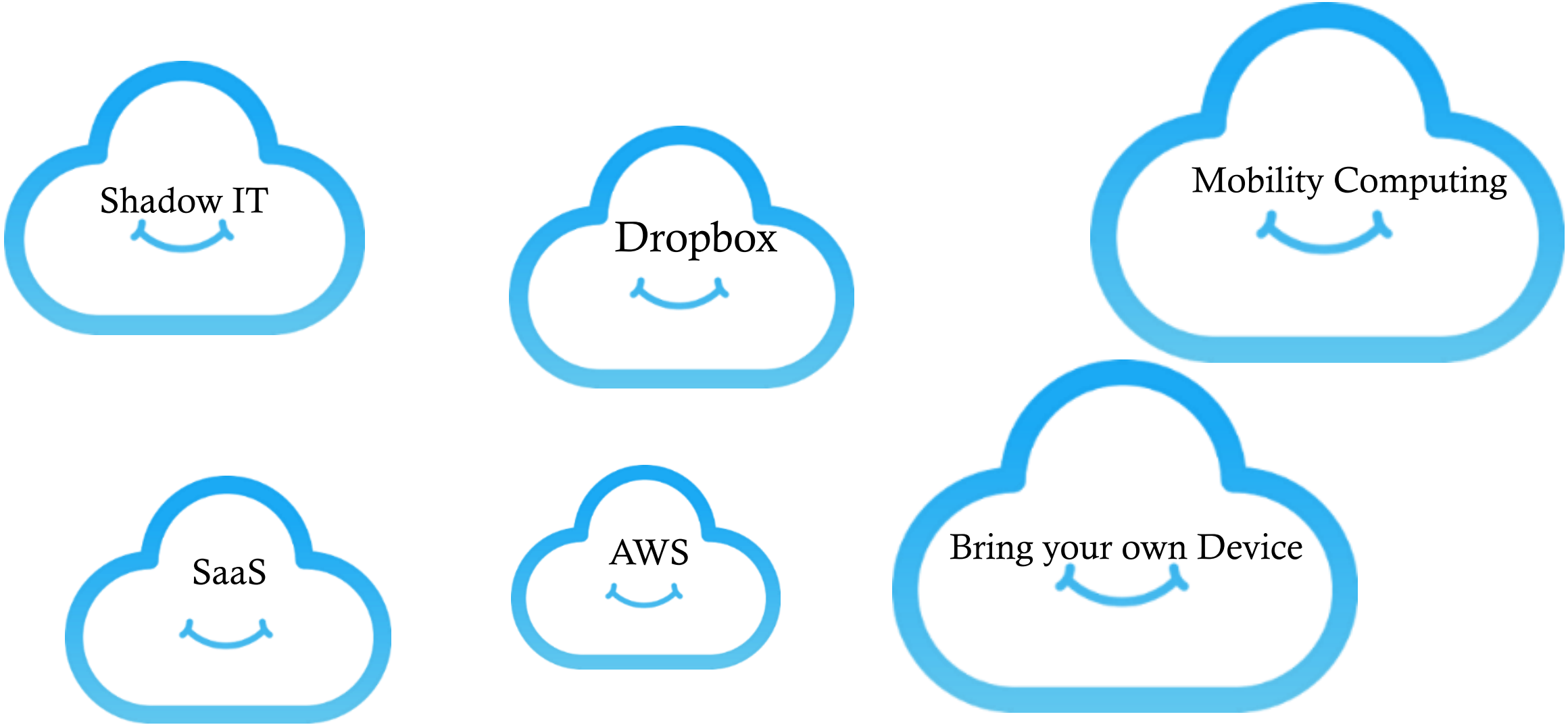
CAPEX VS. OPEX: HOW WE WORK TOGETHER TODAY & THE NEW WORLD

- CAPEX mainstay, investment based, long term expenses
- OPEX world, more short term in nature, different budgeting cycle, different management process, forecasting and cost management challenges
- CFO and CIO do capital budgeting
- Business has demands and projects it expects IT to deliver…Finance is expected to figure out funding
- The end Financial impact for most firms is neutral

WHAT IS BI-MODAL IT AND DO YOU BELIEVE IT IS THE ANSWER TO PROVIDING MORE INNOVATION?

- Gartner concept launched last year
- Different skillsets, management styles needed for cloud (vs. legacy IT)
- Form two separate organizational structures

There's no Cloud in my shop!



SHADOW IT – IT'S GOOD NEWS / BAD NEWS

"Survey on 300 IT workers and 300 line-of-business personnel at enterprises in the US, UK, Australia and New Zealand:

80 percent of both groups **admit** to **using SaaS** apps at work **without IT's approval**. [Despite the fact that many are aware that they're circumventing IT approval processes and introducing potential risks, they feel that the business value …outweighs any potential concerns.]

Source: a study conducted for McAfee by Stratecast, a unit of Frost & Sullivan

Acknowledge that your Financial Management processes are a significant asset.

Processes were developed at considerable investment of time

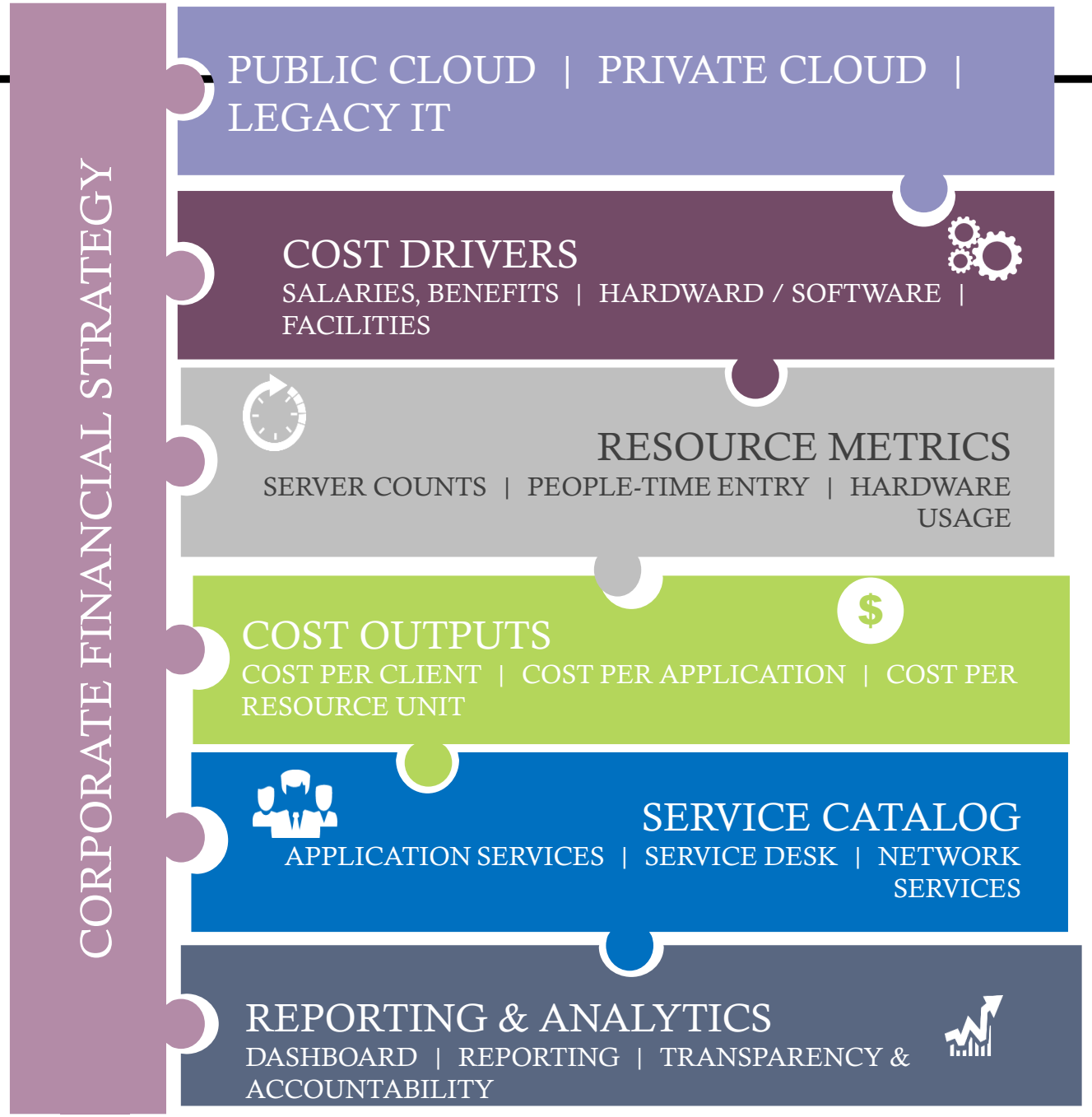
Processes operate using software which has been customized to support your corporate strategy

Processes represent intellectual capital which allows you to manage technology operations effectively

Processes offer business intelligence that drives corporate decisions for investments

WHAT WILL HAPPEN TO FINANCIAL MANAGEMENT ACTIVITIES FOR FUNDING AND FORECASTING?

THE MANY PIECES OF IT COST TRANSPARENCY



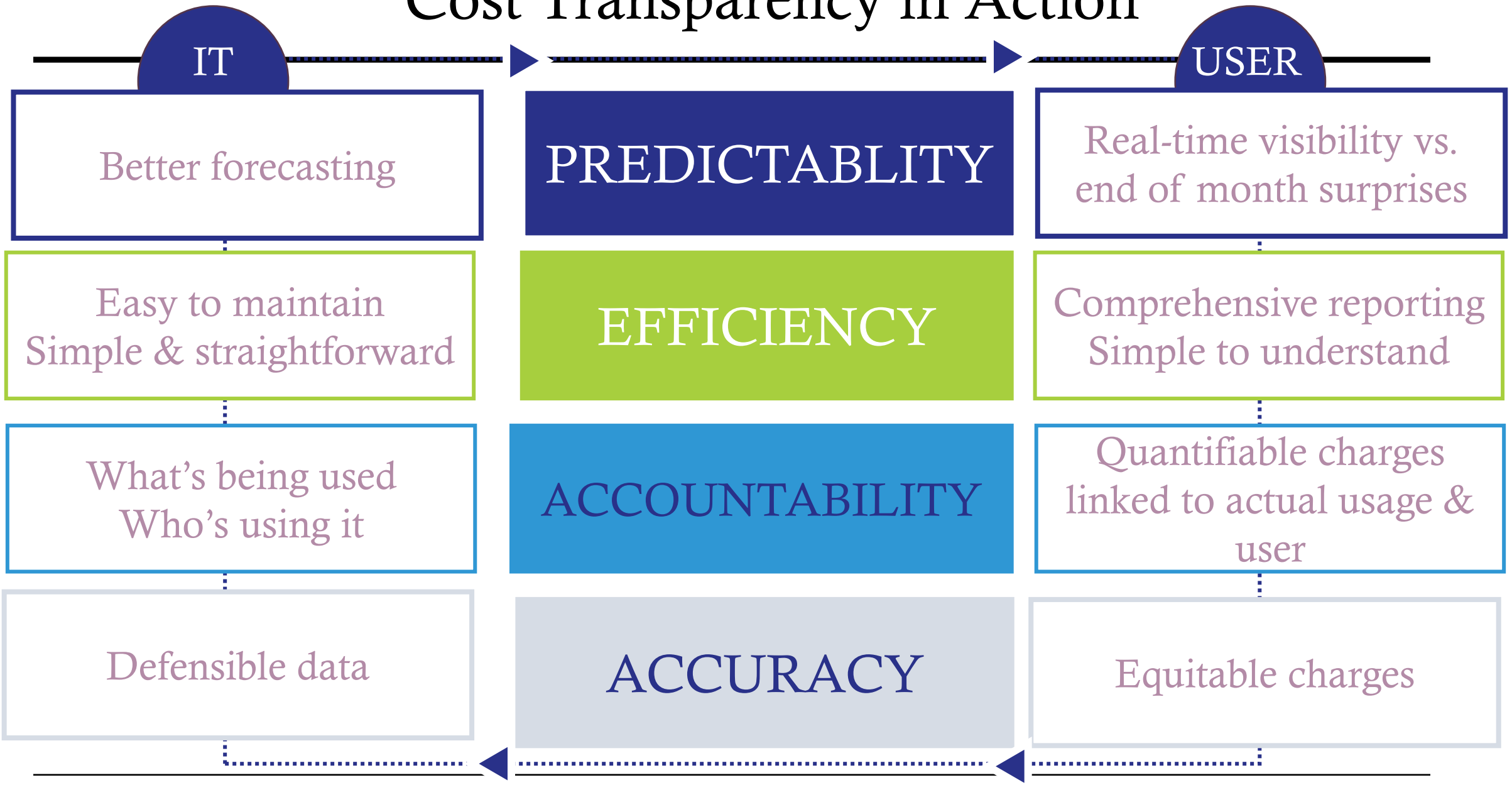
VALUE DERIVED FROM EXPOSING USAGE AND COST DATA

- Understand who consumes the resources {links IT to the business – defines who IT really works for}
- Improved Make/Buy decisions { Should you outsource an application or service}
- Improved replacement/retirement decisions {What will operations save if an application is retired?}
- Enhance technology choices {full cost – not incremental cost may look very different}
- Focus attention and resources in key areas of growth or cost {the squeakiest wheel may be a spare!}
- Expose Total Cost of Ownership – {show cost to keep the business running}

DEMAND MANAGEMENT

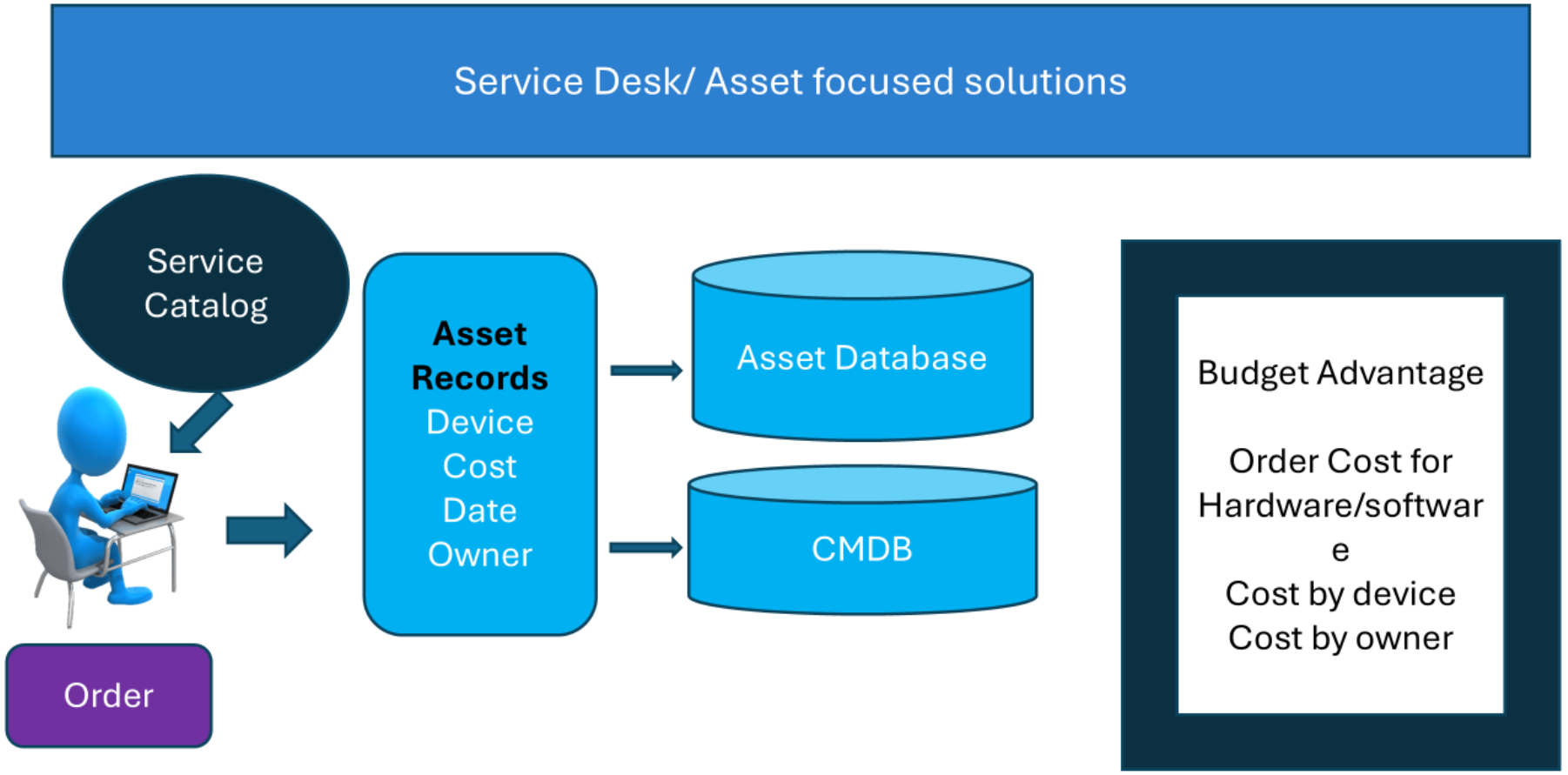
- Demand comes from the user, not IT
  - What is driving the business need?
- IT decides how to meet demand
  - How much?
  - How much will the business need in the future?
  - What is the value of dollars spent?

Cost Transparency in Action



Service Catalog

- Key communication vehicle between IT and client
- Coordinated effort with operations, development, and IT finance
- Linked with Service Agreements

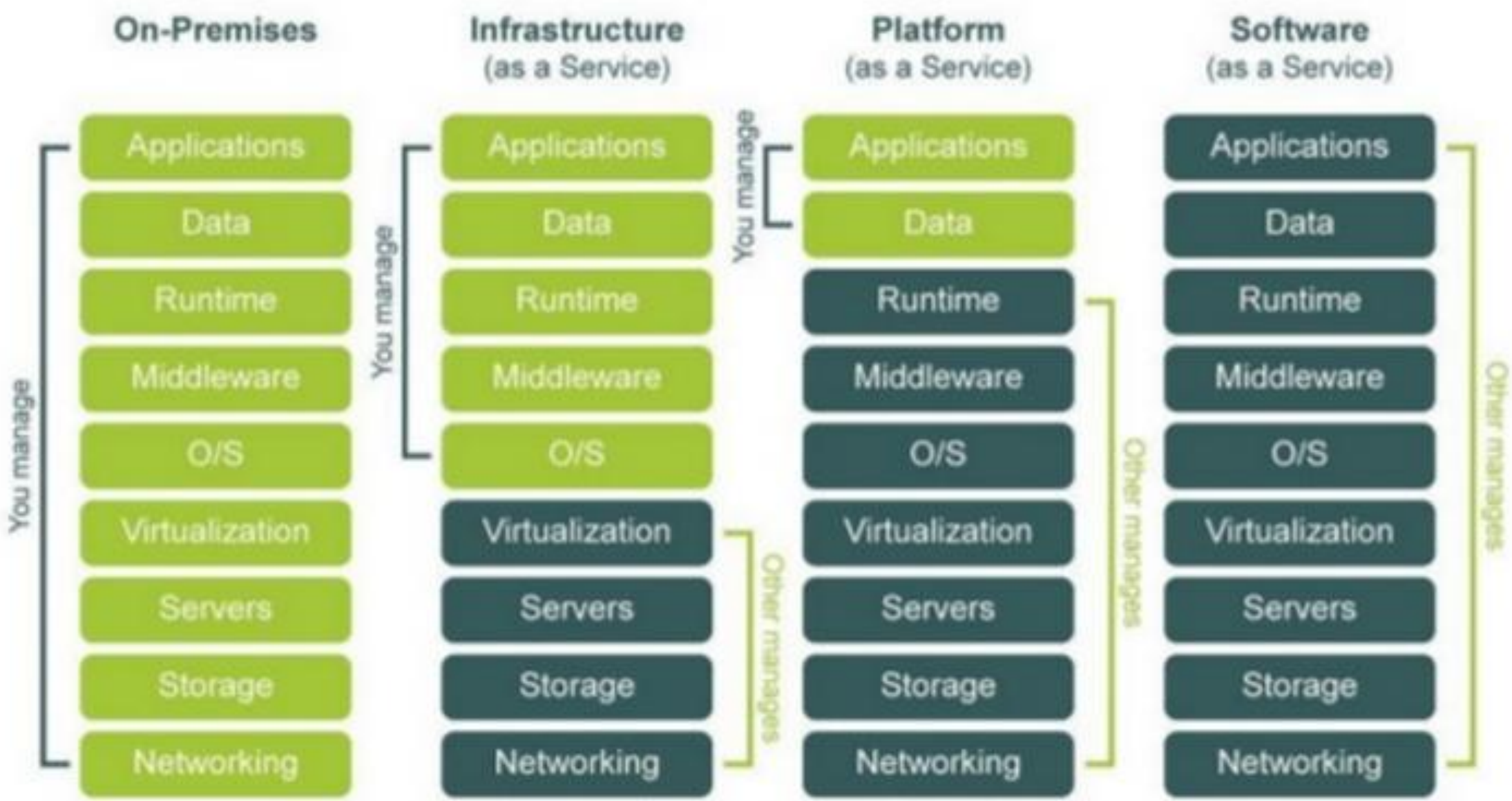

Service Desk/ Asset focused solutions
Service Catalog
Order
Asset Records
Device
Cost
Date
Owner
Asset Database
CMDB
Budget Advantage
Order Cost for Hardware/software
Cost by device
Cost by owner

IT AS A SERVICE

- ITIL is not dead/forgotten
- Aspects of running IT as a Service more important than ever
- IT adapting to the role of Broker/Agent rather than sole supplier

YOU CAN CHOOSE FROM A WORLD OF “AS A SERVICE” OPTIONS

- IaaS
- PaaS
- SaaS
- DRaaS
- DBaaS
- XaaS
- DaaS
- ITaaS
- WaaS


On-Premises
Infrastructure (as a Service)
Platform (as a Service)
Software (as a Service)
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking
You manage
Other manages

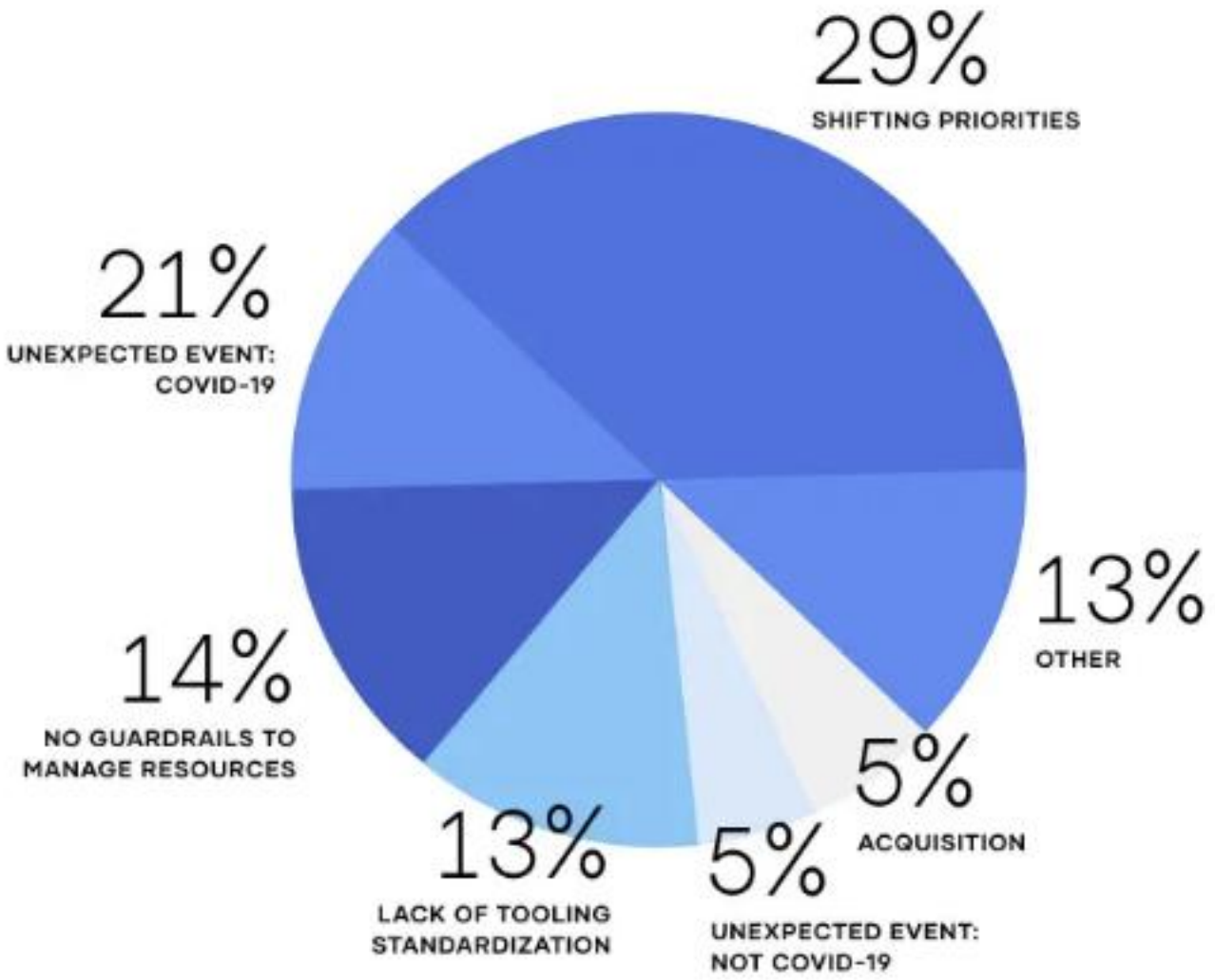
THE CULTURE SHIFT FOR IT FINANCE

DECENTRALIZED IT	CENTRALIZED IT	VIRTUALIZED IT	HYBRID IT
Pockets of Applications in business units	Mainframe shared, servers dedicated – and increasing in number	Servers and storage arrays shared by many, constantly changing	IT as a broker, Infrastructure as a Service Highly flexible Public and private clouds
Pay for what you own	If charged - pay based on: High-level allocations Asset-based counts	If charged – pay based mainly on allocations Few data collection tools or standards	Pay for what you use Usage based charging Automated data collection

IT Service Strategy

IT Financial Accountability

Factors that caused 2020 cloud overspending



Cloud Budgets Busted: Almost 40% Overspent Last Year

If you want to know what's really happening in the cloud, you have to follow the money. Here's what we learned from the 2021 HashiCorp State of Cloud Strategy Survey.

AUG 23 2021FREDRIC PAUL

Many organizations seem to be adopting the cloud on an ad hoc basis, without a complete multi-cloud strategy or toolset. That approach makes it difficult to project cloud spend, so while almost half (49%) said their 2020 cloud spending fell within their budget, 39% of respondents said their organization overspent on the cloud and another 12% of organizations spent less than projected. Somehow, the bigger the organization's cloud budget, the more likely the company was to overspend: Almost half (46%) of companies budgeting $2 million - $10 million on cloud overspent, compared to just a quarter (27%) of companies budgeting less than $100,000. Cloud spending alignment did not vary much with company size. Notably, however, some ⅔ of the overspenders said they *expected* to bust their budgets.

KNOWING WHERE TO LOOK FOR SPENDING INEFFICIENCIES

Over- and under-provisioned resources

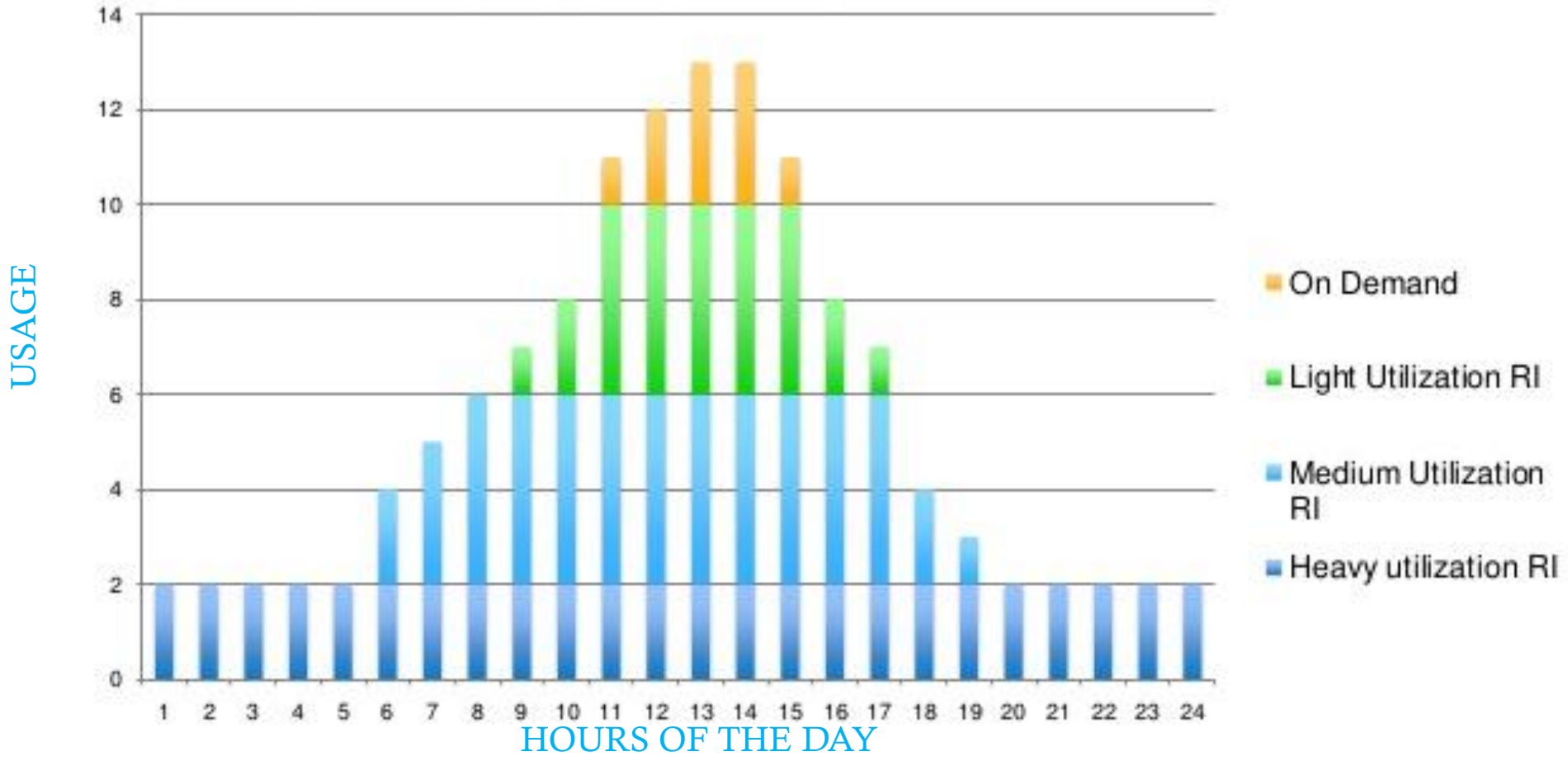
Orphan VMs (Zombies)

Runaway resources

Inappropriate pricing plan

Lack of accountability

OPTIMIZING COSTS WITH RESERVED INSTANCES



MANAGING IT IN EXCEL IS NO LONGER AN OPTION

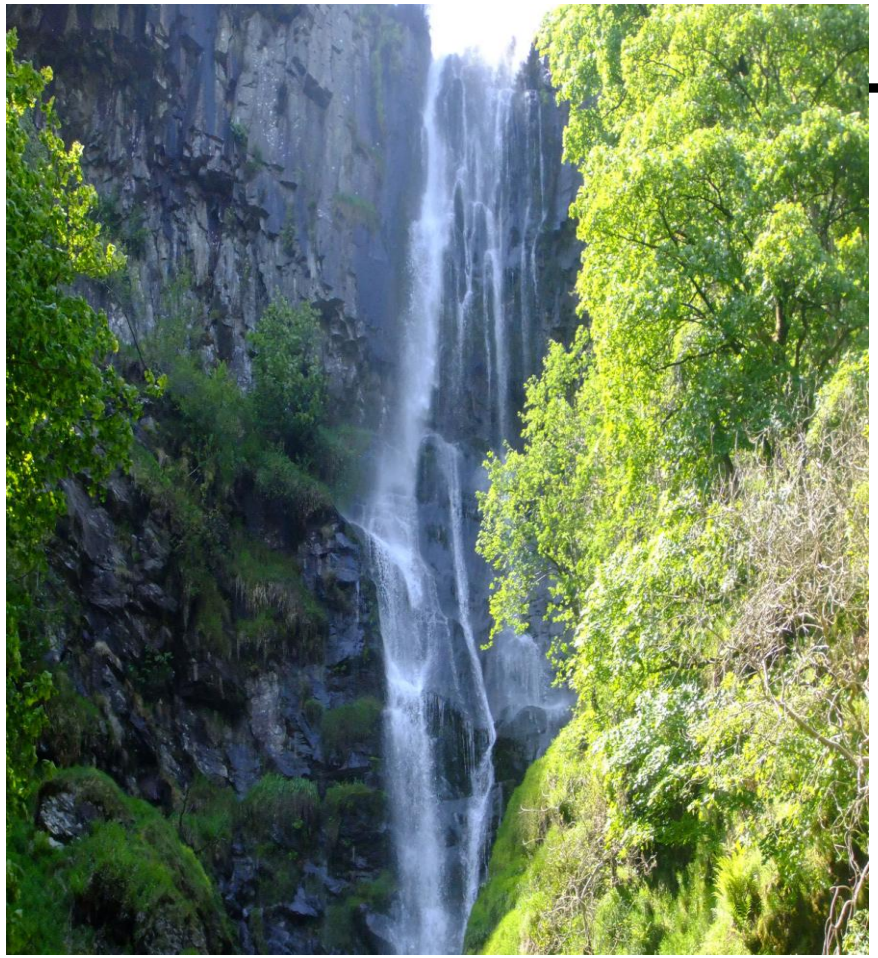
- Microsoft Excel currently supports 1,048,576 rows. If you spend more than 5 thousand dollars a month, a CSV extract of your monthly report from the cloud provider, with hourly records, will probably have over 5 million rows. Do you see the problem? Maybe you don't need the detailed report, but as you grow your environment, the additional information provided by these detailed reports becomes essential for cost management. For example, on AWS you can only get tag information on the detailed report. (Sandro Lima, Cloud Cruiser Architect)

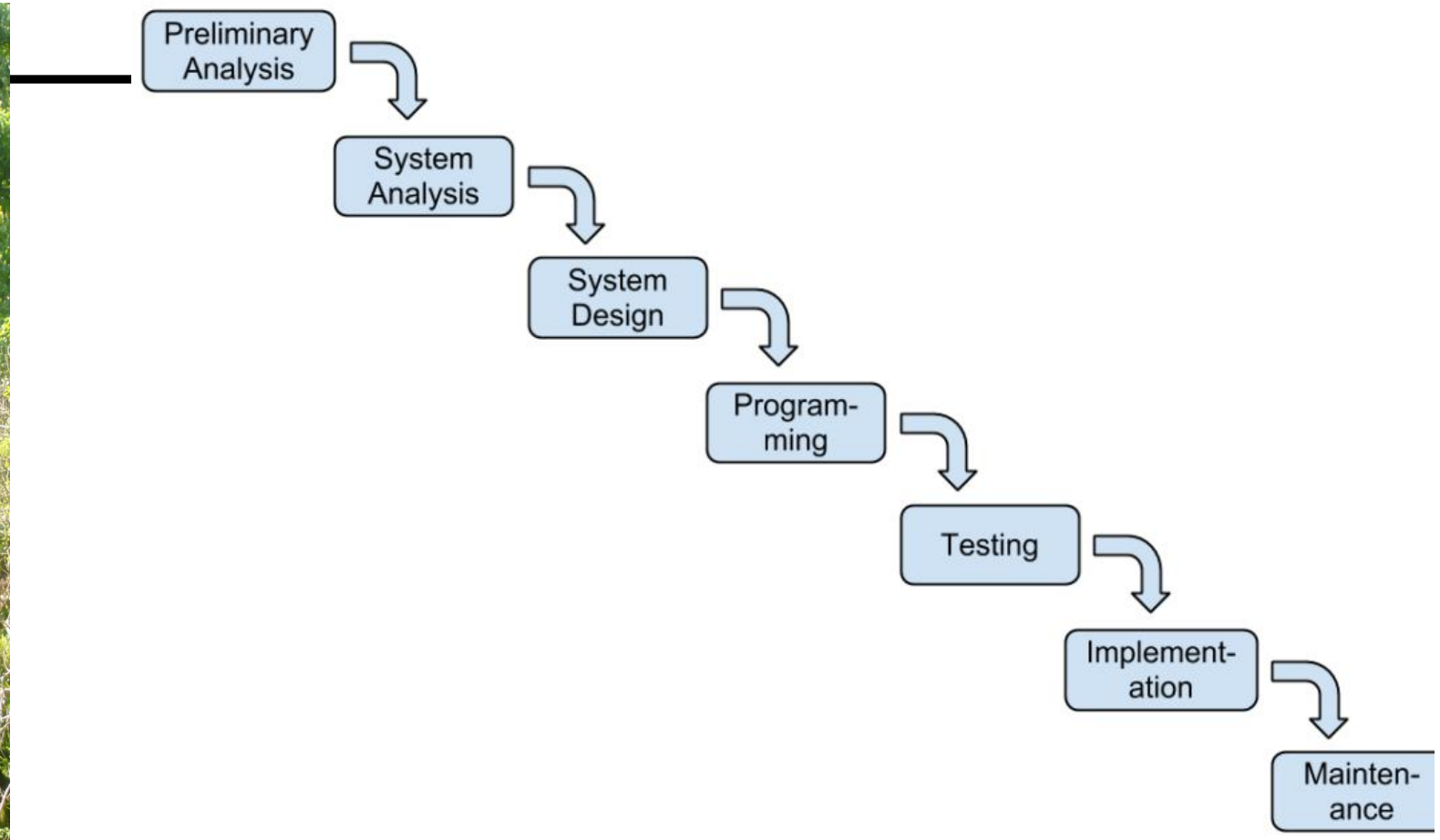
AGILE DEVELOPMENT – THE IT RESPONSE TO FASTER DELIVERY OF FUNCTIONALITY

- Need was recognized for years
- Deliver on time, within budget, and with quality.
- Driven to new levels as Saas embraced
- Functionality, budgets, and delivery dates were adjusted, often resulting in lengthy delays.
- When pushed to adhere to delivery dates, IT sometimes cut corners on quality by skipping some functionality and reducing testing. These decisions left a backlog of work required just to meet original requirements.
- The difference between writing code that works and code that is good

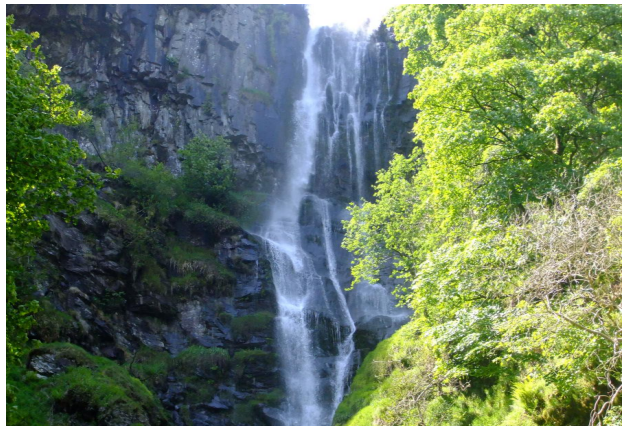
A BIT OF HISTORY

• 2016, technical debt was defined by academic and industrial experts of the topic as follows: "In software-intensive systems, technical debt is a collection of design or implementation constructs that are expedient in the short term, but set up a technical context that can make future changes more costly or impossible.
Wikipeida





WATERFALL DESIGN



- Sequential Steps form “gates” to move through
- Developers and clients agree what will be delivered
- Frequent communications, status updates, sign-offs on adjustments
- Large projects require massive requirements gathering
- Business needs may change before final work delivered

THE TERM TECH DEBT ORIGINATED WITH AGILE DEVELOPMENT PROCESSES

Agile began “officially” in 2001

A manifesto was written that documented the process

The shift to development of modules based on stories was thought to be a more creative and effective way to design code

THE LONG AND WINDING ROAD OF AGILE DEVELOPMENT

- We have to get something out to meet the deadline. We'll just fix it later

SO WHAT'S THE RESULT? CRUFT

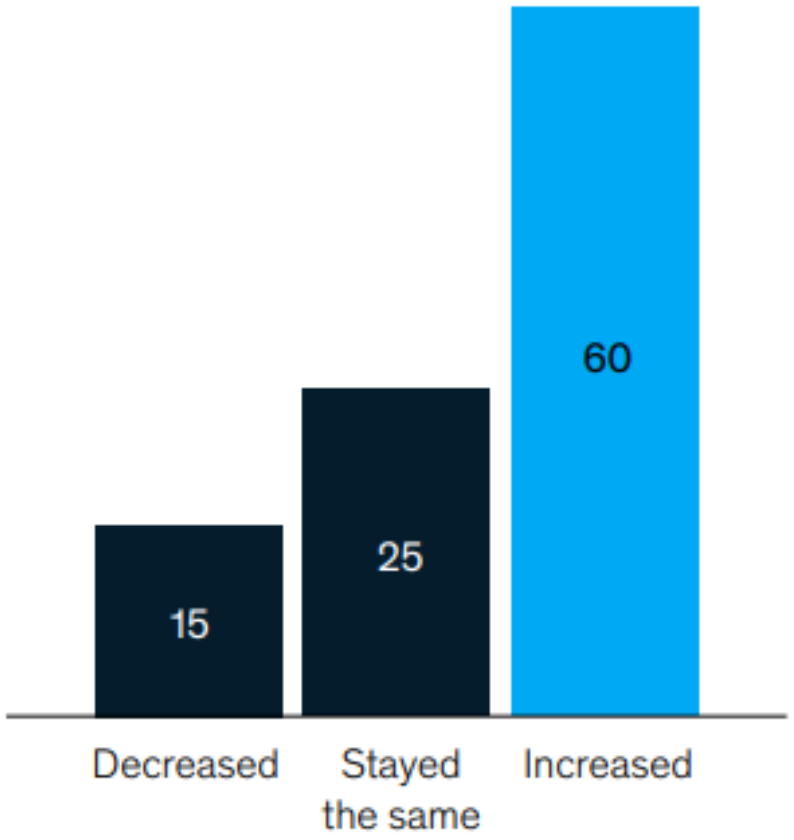
- Code Smell
- Shotgun Surgery
- Software Rot (software erosion, software decay, software entropy
- Spaghetti Code

How much tech debt can you afford?

If it is bad today, it will be more expensive to fix later

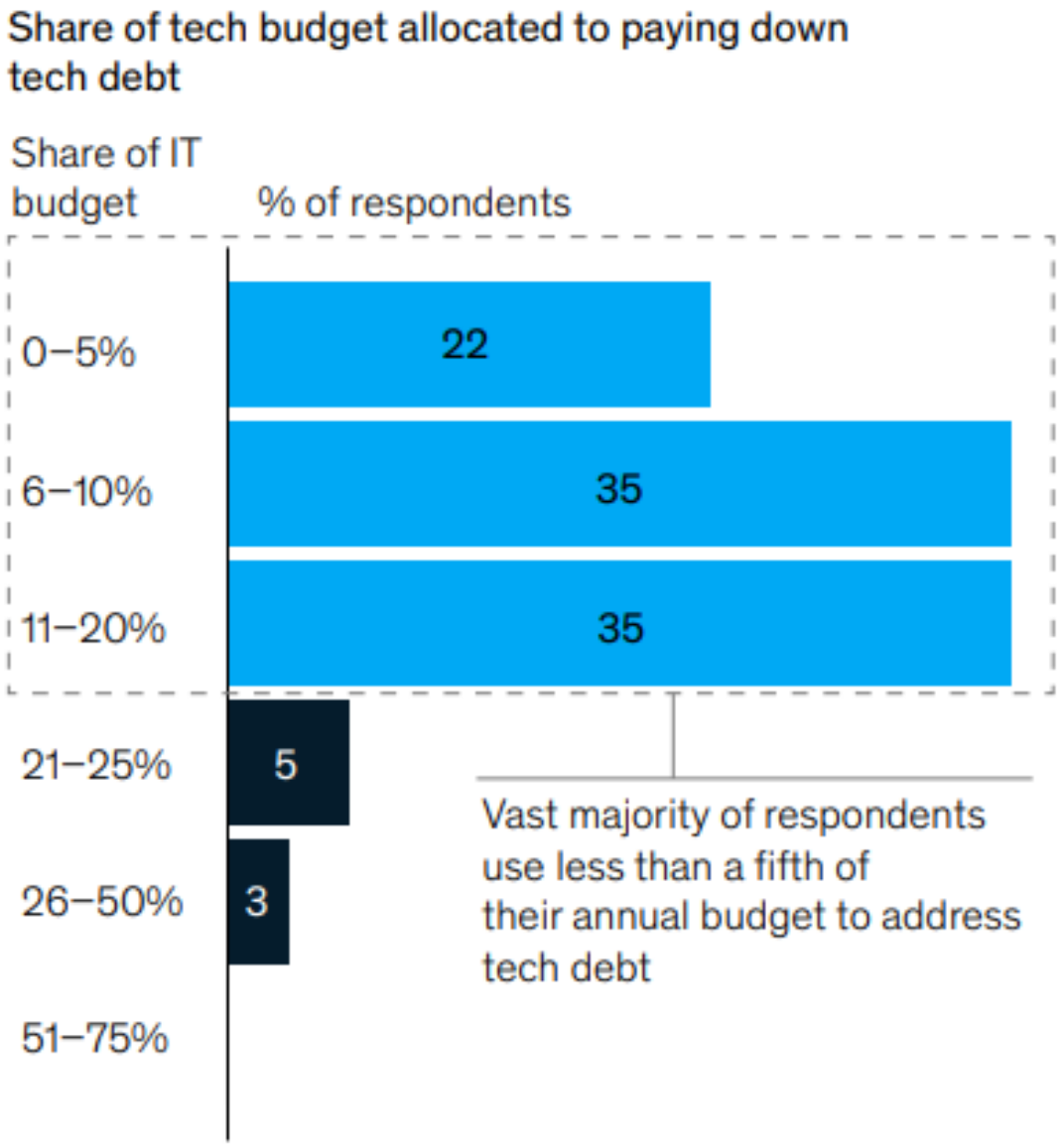
CIO estimates of spend on tech debt

Perceived change in tech debt over past 3 years
% of respondents (n = 45)

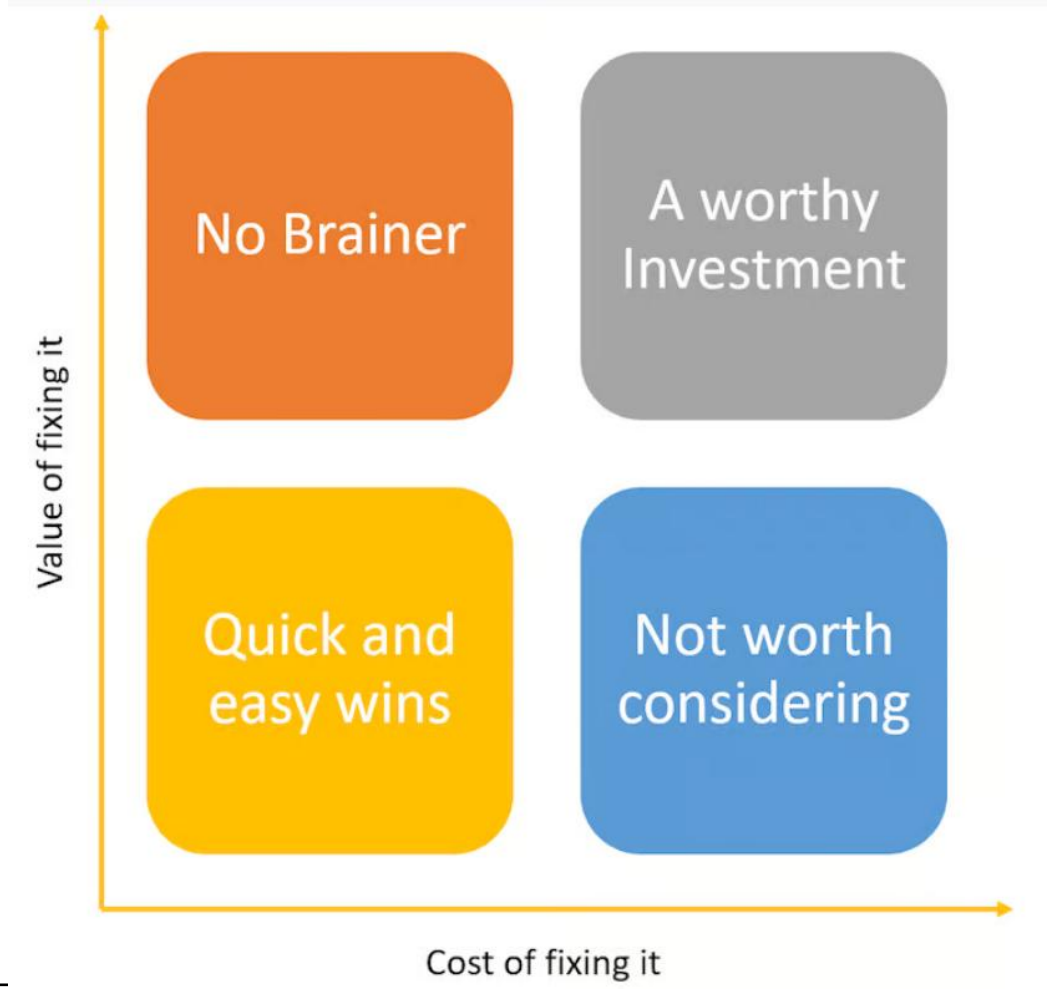


MCKINSEY DIGITAL 2020

MCKINSEY DIGITAL 2020

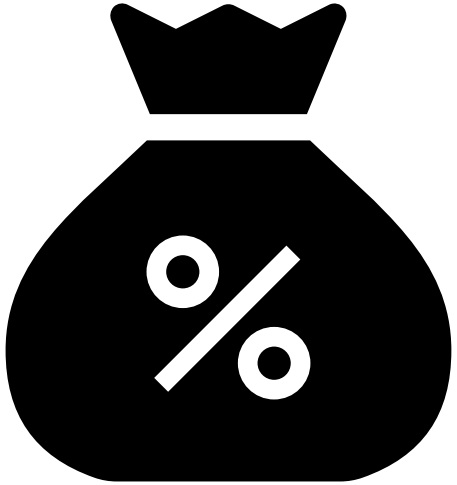


CATEGORIES RESULTING FROM AN ANALYSIS OF TECH DEBT



Source: LogRocket

CONTROLLING THE PURSE STRINGS MEANS CONTROLLING THE PROCESS



Prevention means better controls for design, documentation, implementation

- Better testing
- Peer code reviews
- Sound code procedures
- Project management tools

OPTIONS TO PAY OFF TECH DEBT

SOURCE: BC SOFTWARE

1

Waive the requirement altogether.

“Live with it”

2

Refactor the application.

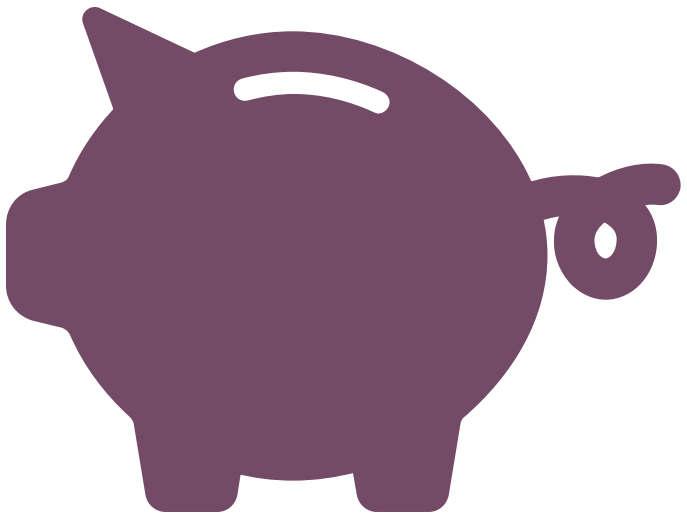
” Clean it up”

3

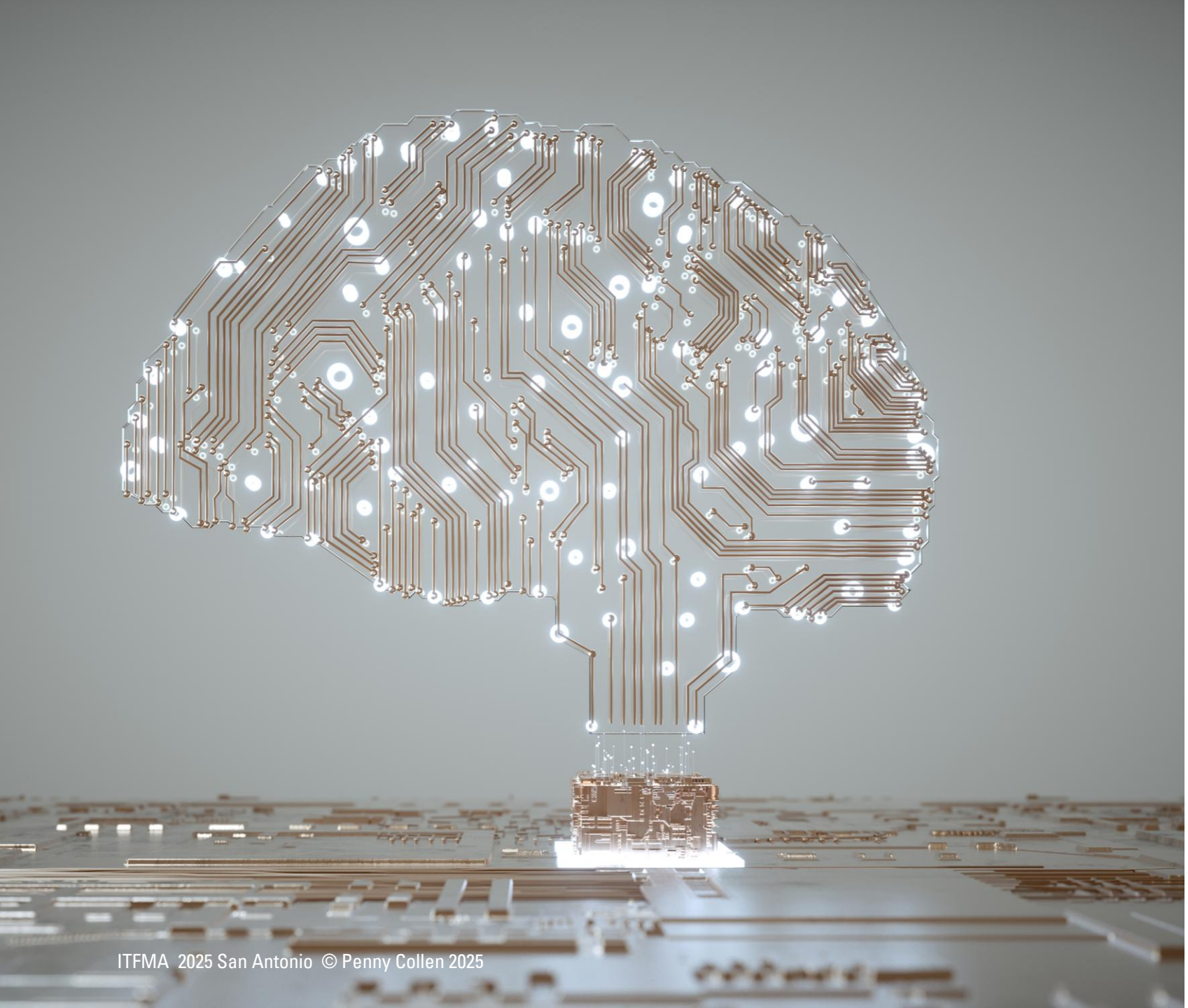
Replace the application

“Throw it out”

FINDING FUNDS FOR TECH DEBT



- Funding comes after identification and sizing of issues
- Set priorities jointly with client for cleanup/replacement
- Set aside a portion of funds annually for cleanup
- Use costing numbers (Chargeback) to support decisions
- Partner with client to develop business cases and seek funding



ARTIFICIAL INTELLIGENCE

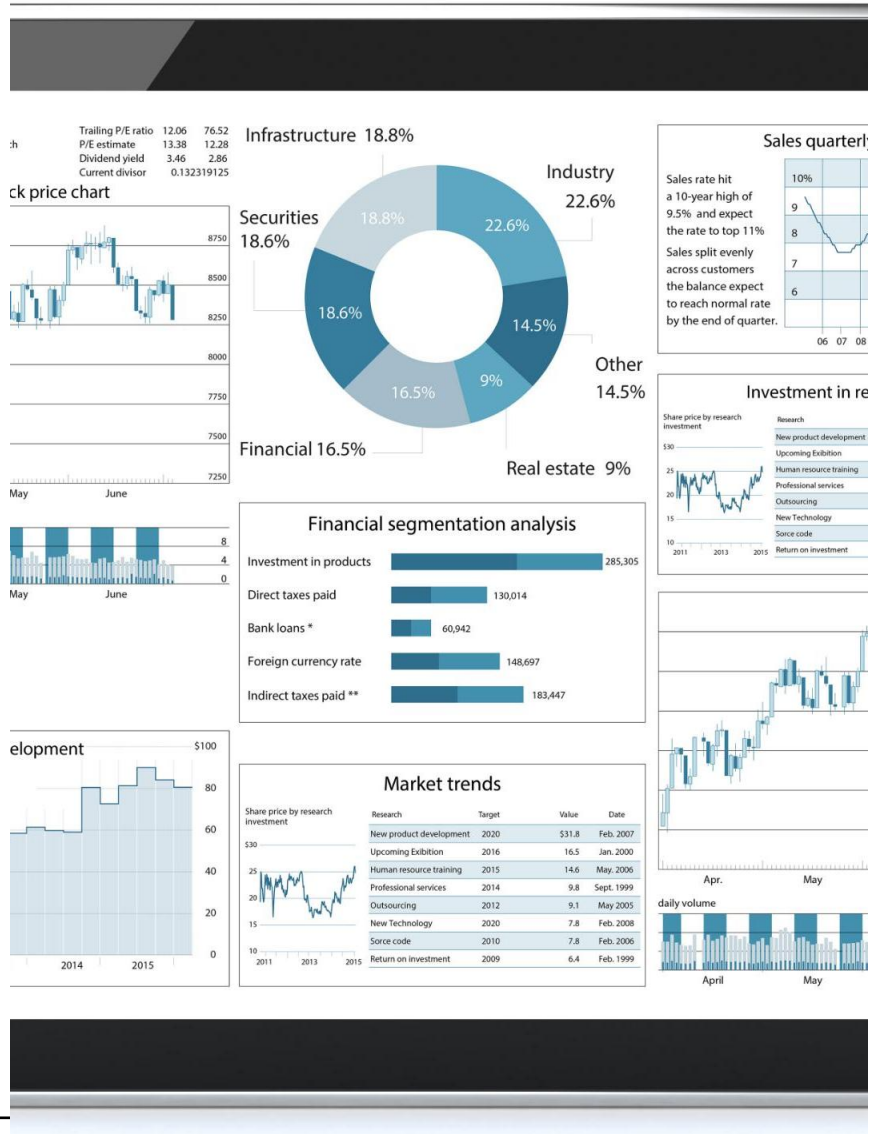
- IT'S Here!

DATA MINING AND DATA ANALYTICS

An entry phase of AI

REAL-TIME DATA ANALYTICS

- Real-time analytics tools enable organizations to process vast amounts of data instantly, facilitating immediate insights.
- Enhanced Decision-Making
- With real-time data at their fingertips, organizations can make faster and more informed decisions, improving overall efficiency.
- Market Responsiveness
- Real-time analytics improve organizations' ability to respond swiftly to market changes and emerging trends.



DATA MINING AND DATA ANALYTICS

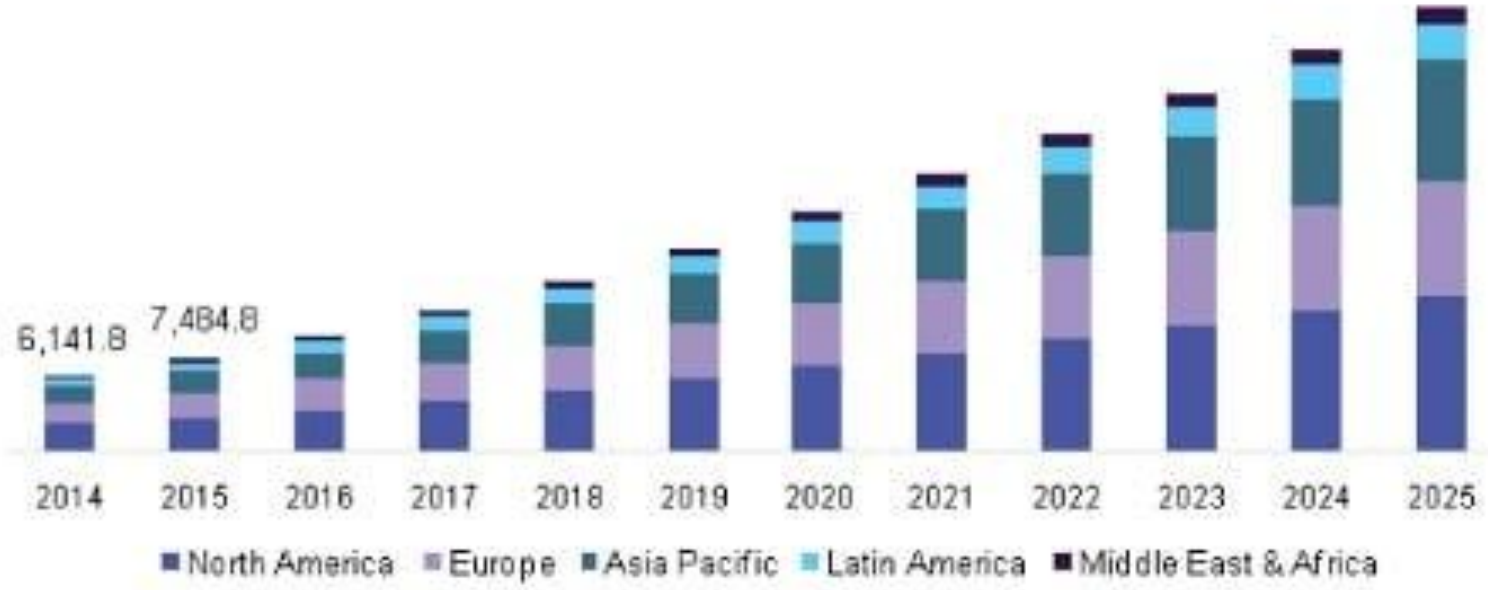
- Data Mining
  - Massive amounts of data examined for patterns and anomalies
- Data Analytics
  - Data assembled for decision making

DATA ANALYTICS AND BUSINESS INTELLIGENCE (BI)

KNOWLEDGE IS POWER, AND ORGANIZATIONS INCREASINGLY LEVERAGE THE KNOWLEDGE AT THEIR FINGERTIPS TO DELIVER BETTER RESULTS WHILE MAINTAINING COST EFFICIENCY.

A GLOBAL FOCUS ON DATA-DRIVEN DECISION-MAKING WILL CONTINUE IN 2025 AS LEADERS INCREASINGLY RELY ON ANALYTICS AND BUSINESS INTELLIGENCE (BI) TOOLS TO STAY COMPETITIVE AND GROW.

Global spending on big data and business analytics is expected to increase at a compound annual growth rate (CAGR) of 14.9% from 2024 to 2030.



HARDWARE DEMANDS TO SUPPORT AI CONTINUE TO GROW

- One estimate is that server sales will triple from 2023 to 2028 to make way for AI experimentation and innovation.
- Gartner experts expect IT software to increase 14% and IT services to experience 9.4% growth. In fact, experts at IDC project that global AI spending will surpass $200 billion in 2025.

BALANCING SPEED WITH SECURITY

Importance of Speed

Enhancing speed is essential for organizations to maintain competitiveness and improve user experiences in various services.

Need for Security

While speed is important, implementing robust security measures is crucial to protect sensitive data from threats.

Strategies for Balance

Organizations must adopt strategies that effectively balance speed with security to ensure safe and efficient operations.

IMPACTS ON SECURITY AND COMPLIANCE

Cyber threats are not just growing. They're exploding: The average number of cyberattacks per organization per week reached 1,636, a staggering 30% increase year over year.

Most of the rise in cyber threats is related to advances in AI, especially generative AI (GenAI) technologies.

These technologies gave cybercriminals tools to increase their attack sophistication, including ransomware and phishing schemes.
In response to the acceleration of cybercrime, many public regulatory bodies have created stricter laws and regulations to protect their citizens.

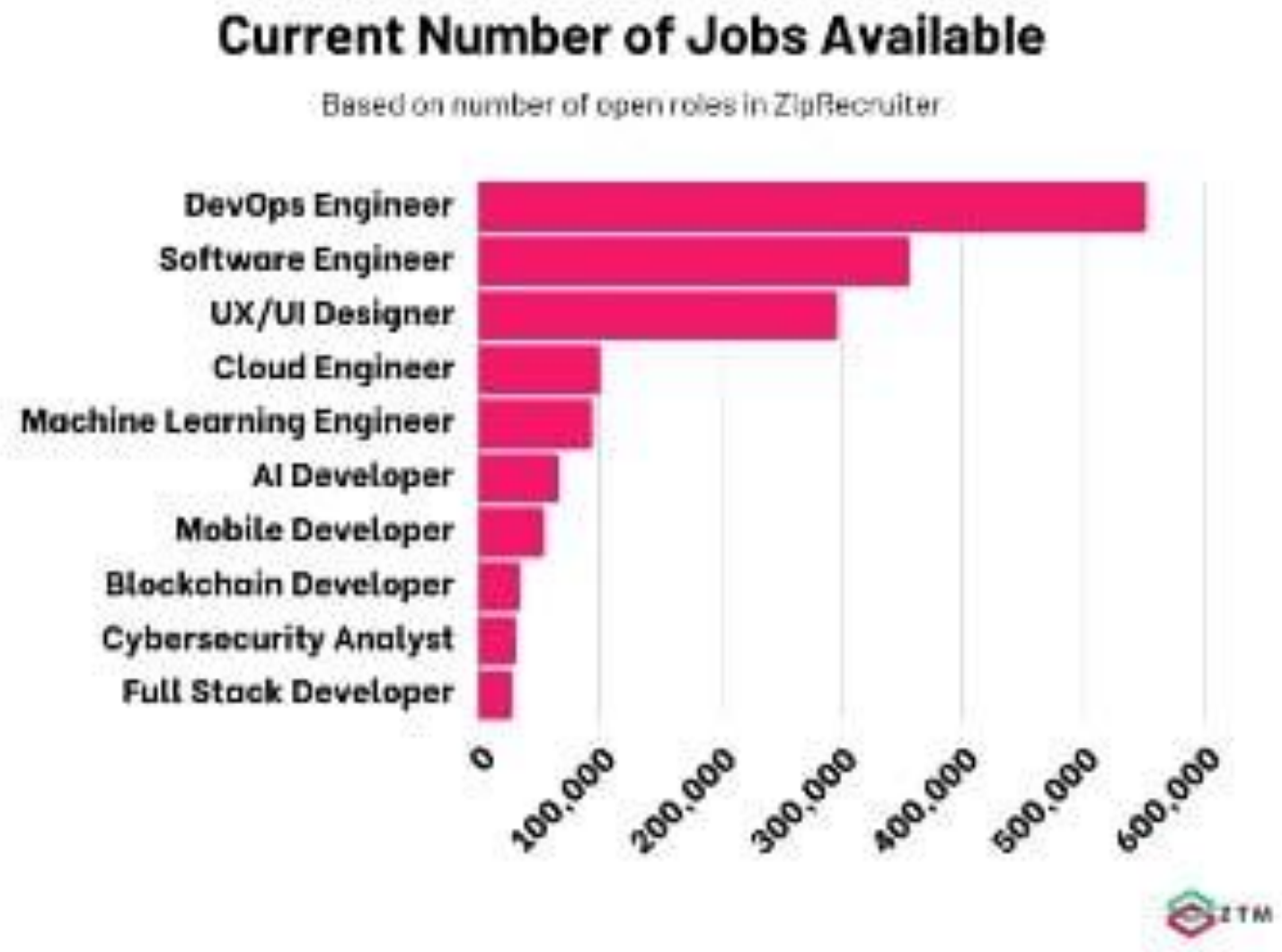
SPLUNK
NOVEMBER 25, 2024 IT AND TECHNOLOGY SPENDING TRENDS FO 2025

AI MEANS RECRUITING/LEARING NEW SKILLS

AI and ML skills growth. The rapid adoption of AI, machine learning, and cloud computing has created a significant demand for specialized skills in these areas.

Companies like Amazon and Cognizant are ramping up investments in upskilling programs to improve their workforce skills.

Amazon announced it plans to spend over $1.2 billion to upskill 300,000 workers by 2025 through offering university tuition, career coaching, and certifications. Likewise, Cognizant plans to train over 200,000 employees in digital skills by partnering with educational institutions and companies like Google


Current Number of Jobs Available
Based on number of open roles in ZipRecruiter
DevOps Engineer
Software Engineer
UX/UI Designer
Cloud Engineer
Machine Learning Engineer
AI Developer
Mobile Developer
Blockchain Developer
Cybersecurity Analyst
Full Stack Developer
0
100,000
200,000
300,000
400,000
500,000
600,000

ITFMA 2025 San Antonio © Penny Collen 2025

AND
STILL, WE
NEED
MORE
SPEED

WHAT'S AHEAD?

- Projections for life beyond Cloud

WHAT'S AHEAD?

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Edge Computing: Processing at the Source

- **Edge Computing** Bring processing to the source of data generation, such as IoT devices, autonomous vehicles, or factory sensors. Instead of relying on a distant data center, edge devices handle computations locally, enabling faster response times and reduced latency.
- Commodity trading – seconds count on major trades!
- Think latency needed for self-driving cars

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Edge Computing: Processing at the Source

- A security camera in a remote warehouse uses AI to identify suspicious activity and only sends that specific data to the main datacenter for immediate processing. So, rather than the camera burdening the network 24 hours per day by constantly transmitting all of its footage, it only sends relevant video clips. This frees up the company's network bandwidth and compute processing resources for other uses.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Advantages of Edge beyond latency :

Reduces risk of data exposure and compliance with data sovereignty. Data doe not move across borders

Reduced IT costs. With edge computing, businesses can optimize their IT expenses by processing data locally rather than in the cloud. Reduce moving data needlessly.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Timeline:

- **Experimental now (2024)**: Major players like IBM, Google, and AWS are offering quantum computing services for research.
- **Early adoption by 2030**: Industries like pharmaceuticals and finance will use quantum for niche applications.
- **Mainstream by 2035**: As hardware improves, quantum computing will complement cloud platforms for complex problem-solving.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

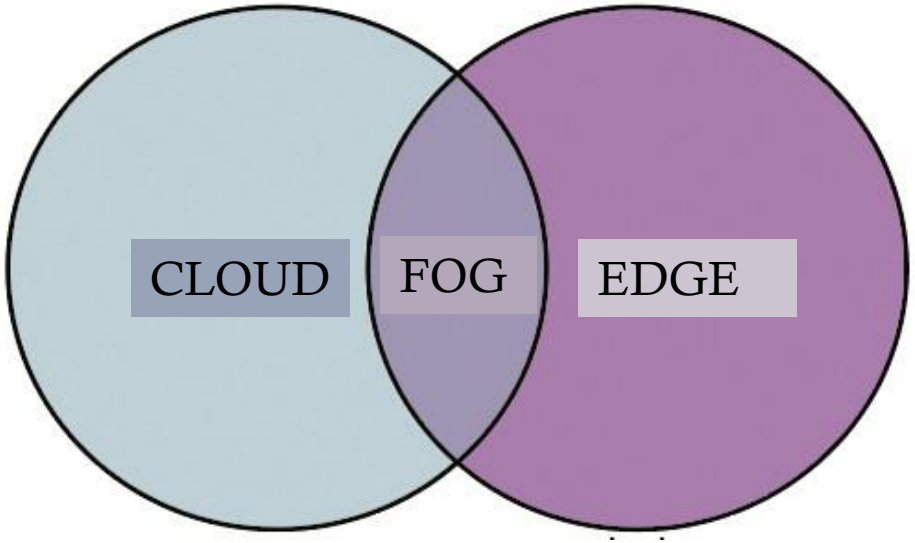
WHAT'S AHEAD?

Fog Computing: Bridging Cloud and Edge

Fog computing processes data across a distributed node network, allowing for a balance between the central cloud and local edge devices.
Handles large-scale systems like smart cities, where centralized cloud computing alone can't keep up with the volume of data generated, reduces latency

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?



Projections for life beyond Cloud

WHAT'S AHEAD?

Current Applications:
Smart grids optimize energy distribution in real-time.
Connected vehicles exchanging data to improve traffic flow.
Industrial IoT networks for predictive maintenance.

Timeline:
Emerging now (2024): Early adoption in industries requiring real-time analytics.
Mainstream by 2026: Fog computing will grow as edge devices become more ubiquitous and complex systems like smart cities and connected factories demand it.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Fog computing allows data to be temporarily stored and analyzed in a compute layer between the cloud and the edge for cases where it's not possible to process edge data due to edge equipment compute limitations. From the fog, relevant data can be sent to cloud servers for longer-term storage and future analysis and use. By not sending all of the edge device data to a central datacenter for processing, fog computing allows companies to reduce some of the load on their cloud servers, which helps to optimize IT efficiency.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Example: Smart devices to automate temperature control, ventilation, lighting, sprinklers, and fire and security alarms in all of its buildings. Rather than having these sensors constantly transmitting data to their main datacenter, the company has a server in each building's control room that manages immediate issues and only sends aggregated data to the main datacenter when network traffic and compute resources have excess capacity. This fog computing layer allows the company to maximize its IT efficiency without sacrificing performance.

It's important to note that edge computing is not reliant on fog computing. Fog computing is simply an additional option to help companies gain more speed, performance, and efficiency in certain edge computing scenarios.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

AI-Driven Computing: Intelligence Everywhere

AI-powered systems integrated across the edge and fog layers. AI will enable devices to process data locally, learn from it, and make intelligent decisions without relying on centralized infrastructure.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

- Businesses increasingly need predictive analytics and autonomous systems to operate at scale.
- AI models deployed at the edge can respond instantly, improving efficiency and reliability.

Current Applications:

- AI-powered cameras in smart cities detect unusual activity.
- Predictive maintenance in industrial settings
- Personalized retail experiences based on real-time customer behavior analysis.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Timeline:
Now (2024): AI is already integrated into cloud platforms like AWS SageMaker, and Google AI.
Mainstream by 2025: With advancements in edge AI chips for use in healthcare, logistics, and energy.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Quantum Computing: The Ultimate Problem Solver

Quantum computing goes beyond the limits of classical computing by harnessing the principles of quantum mechanics. It excels at solving problems that are computationally infeasible for traditional systems, such as complex simulations, optimization, and cryptography.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

- As cybersecurity threats evolve, quantum cryptography will provide more secure encryption methods.

Current Applications:

•Early-stage drug discovery and protein folding simulations.
•Financial institutions optimize investment portfolios.
•Climate modeling and weather forecasting.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Quantum Computing: The Ultimate Problem Solver

Timeline:

- **Experimental now (2024)**: Major players like IBM, Google, and AWS are offering quantum computing services for research.
- **Early adoption by 2030**: Industries like pharmaceuticals and finance will use quantum for niche applications.
- **Mainstream by 2035**: As hardware improves, quantum computing will complement cloud platforms for complex problem-solving.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Metacomputing: A Unified Ecosystem
Imagine a world where **cloud, edge, fog, and quantum computing work together seamlessly**.
Dynamically assigns work to the most efficient layer for processing —whether on the edge, in the fog, or in the cloud—depending on factors like latency, cost, and energy consumption.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

- Businesses need hybrid solutions that balance scalability, performance, and cost.
- Enables truly dynamic systems, such as global supply chains optimized in real-time.

Current Applications:

- Early hybrid cloud solutions combine public and private clouds.
- Multi-tier IoT systems that process data at different layers.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Timeline:

- **Emerging by 2030**: As edge, fog, and cloud computing mature, frameworks for meta computing will develop.
- **Mainstream by 2035**: Businesses will adopt fully integrated ecosystems for maximum efficiency.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Neuromorphic Computing: Mimicking the Human Brain

Neuromorphic computing uses hardware modeled after the human brain, enabling efficient, adaptive, and low-power computation. It has the potential to revolutionize robotics, AI, and IoT systems. Unlike traditional computing, neuromorphic systems excel at tasks requiring real-time learning and adaptability.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

WHAT'S AHEAD?

Current Applications:

•Early research into neuromorphic chips (e.g., Intel Loihi).

•Adaptive AI in robotics and smart devices.

Timeline:

•**Experimental now (2024)**: Neuromorphic computing is still in the research phase.

•**Mainstream by 2040**: As hardware and software ecosystems mature, it will redefine AI and IoT.

Source: What Comes After Cloud Computing? The Next Wave of Innovation in Technology...Amir Azam Dec 2024

CONCLUSION

Importance of Speed in IT

Enhancing speed in IT is crucial for improving operational efficiency and ensuring user satisfaction in today's fast-paced environment.

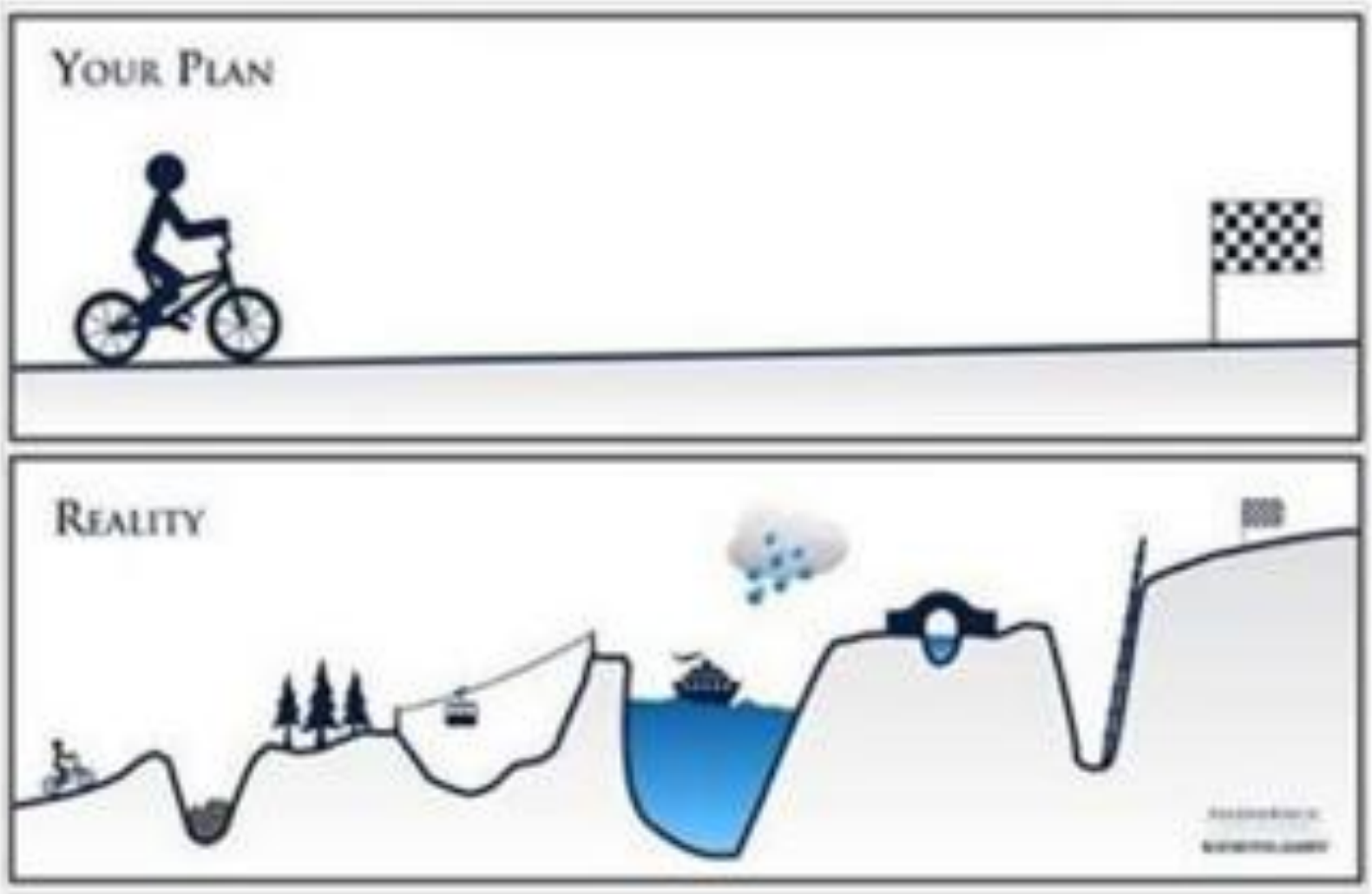
Technological Advancements

Leveraging technological advancements allows organizations to enhance their speed and adapt to changing market demands effectively.

Competitive Advantage

Organizations that address challenges swiftly can gain a competitive edge, thriving in a rapidly evolving digital landscape.

DO YOU THINK YOUR PLANNING HAS YOU READY?



THANK YOU