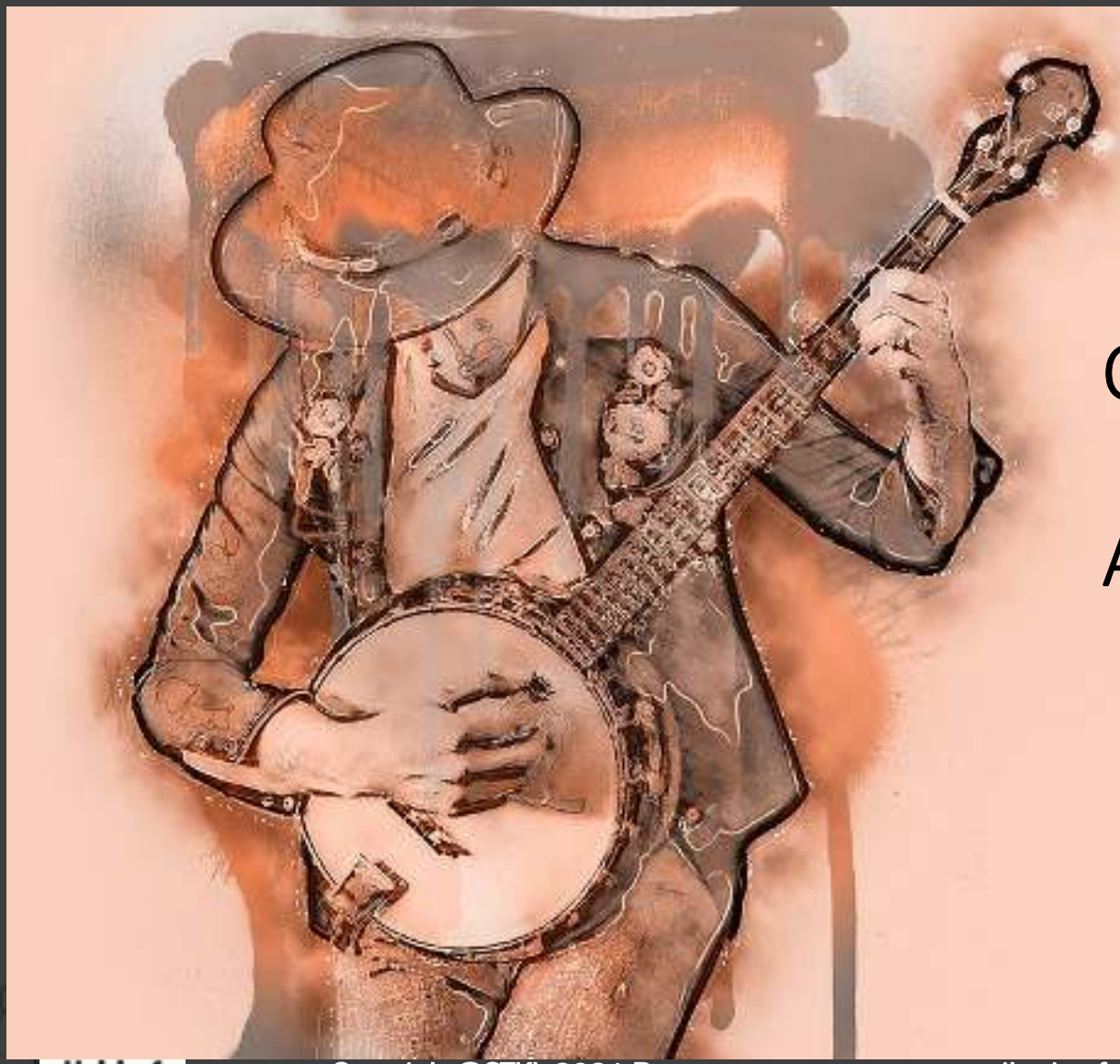


CTO's presentation:

Age of Implementation

Pini Cohen, CTO STKI

Agenda

- Intro: CTO's and Architects
- Adaptive Architecture
- Cloud CoE
- DevOps CoE
- Zero Trust

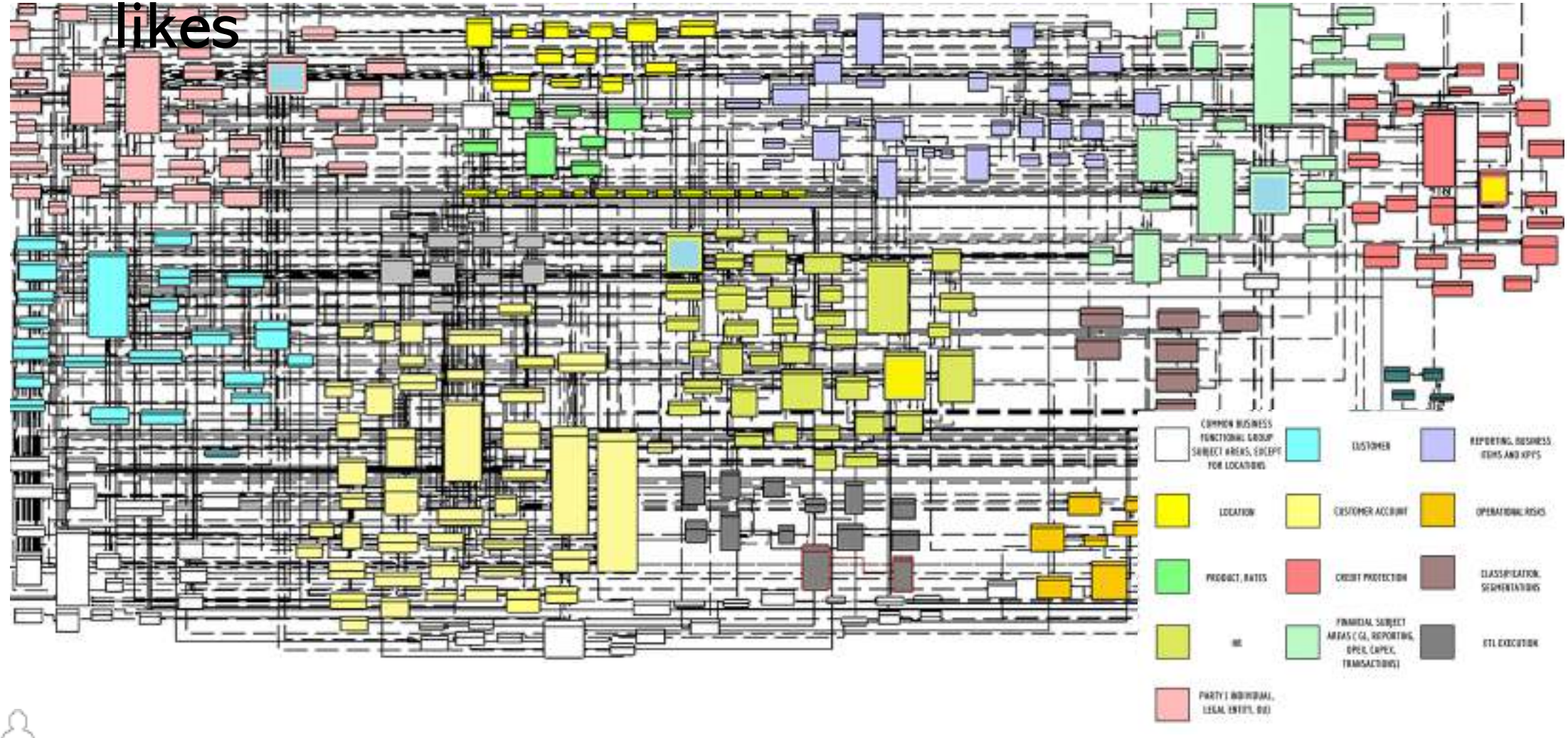
What is happening with CTO's and Architects?

- More technologies to deal with
- Technology last short time
- Customization of technology is less viable
- Dependencies in technologies is increasing

Microservices implications:

- You can do whatever you want, use database, programming language etc., as long as you get the job done and other services can depend on you.

This is how core legacy architecture looks likes



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Solution: The new architect

What is happening with CTO's & Architects ?

we are having more fun!!

Not everything is so shiny ☹

The IT talent war*

*In the holly land

Massive move of personal from Enterprise IT to High-tech

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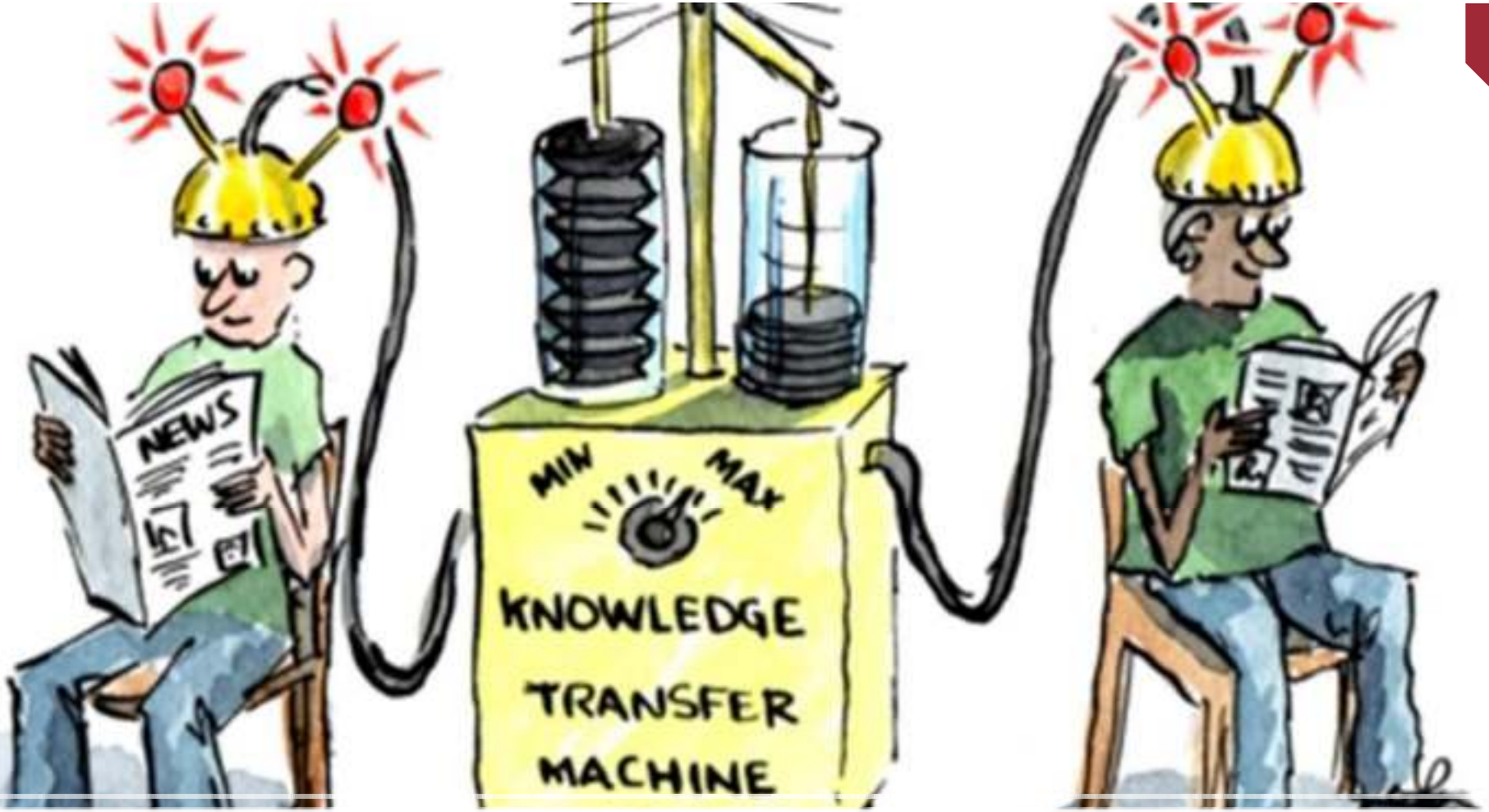

IT has little experience in Knowledge Transfer

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This will result

IT Organization

- Downtime
- IT is a barrier for the business
- Implement KM platforms in IT
- Demand for Cloud & SLA based services

IT Suppliers

- Sell products with their operations services
- High demand for staffing services (“gulglot”) but hard (impossible?) to fulfill
- Cloud & SLA based services

Adaptive Architecture

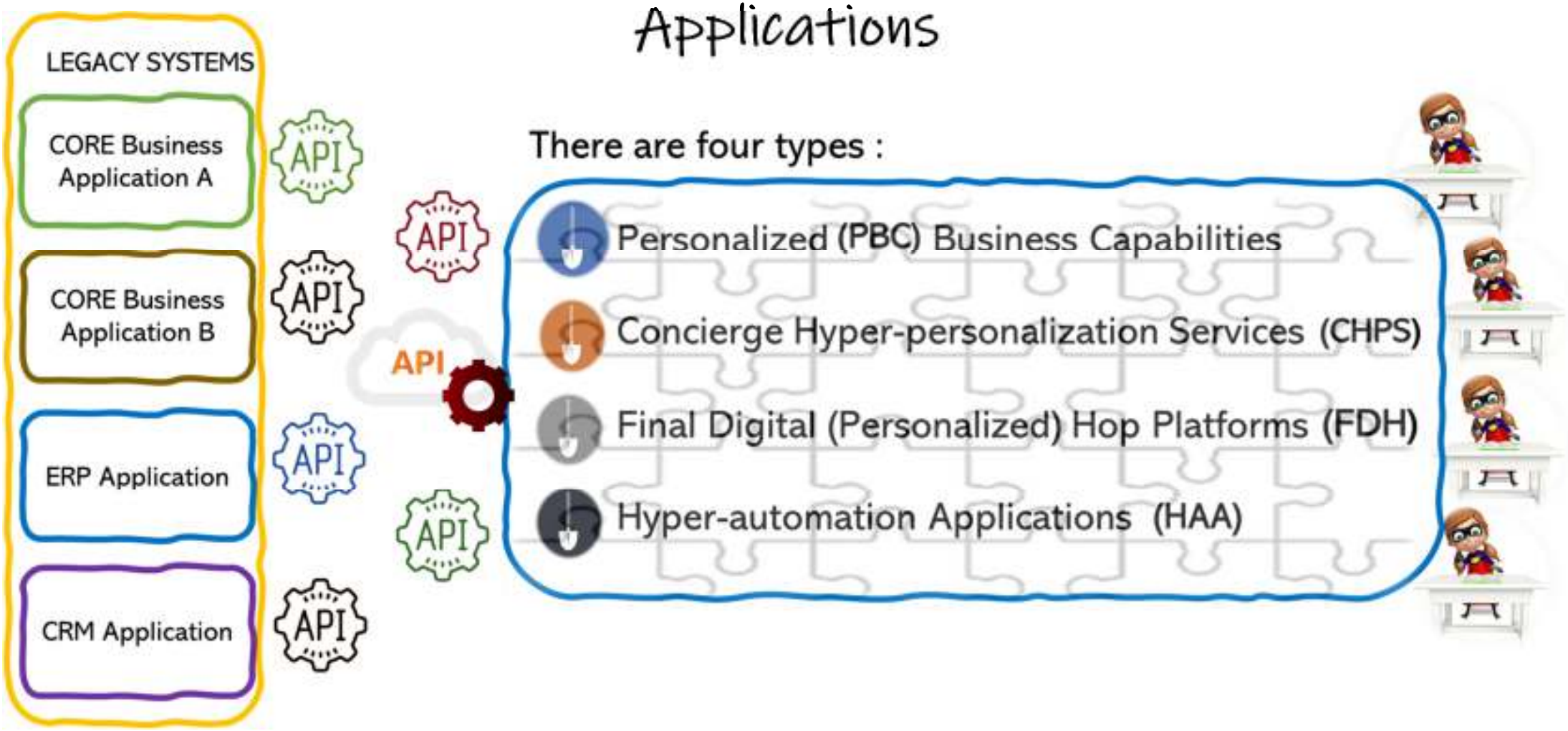
Adaptive Architecture

ADAPTIVE emerges as the top objective for the organization. Modern architecture \ Integration is the core of being Adaptive

API's are the most important indication of "what is happening" in modern application

API's and Event Driven will enable the use of Legacy system in modern business processes

Adaptive Composable Organizational Applications



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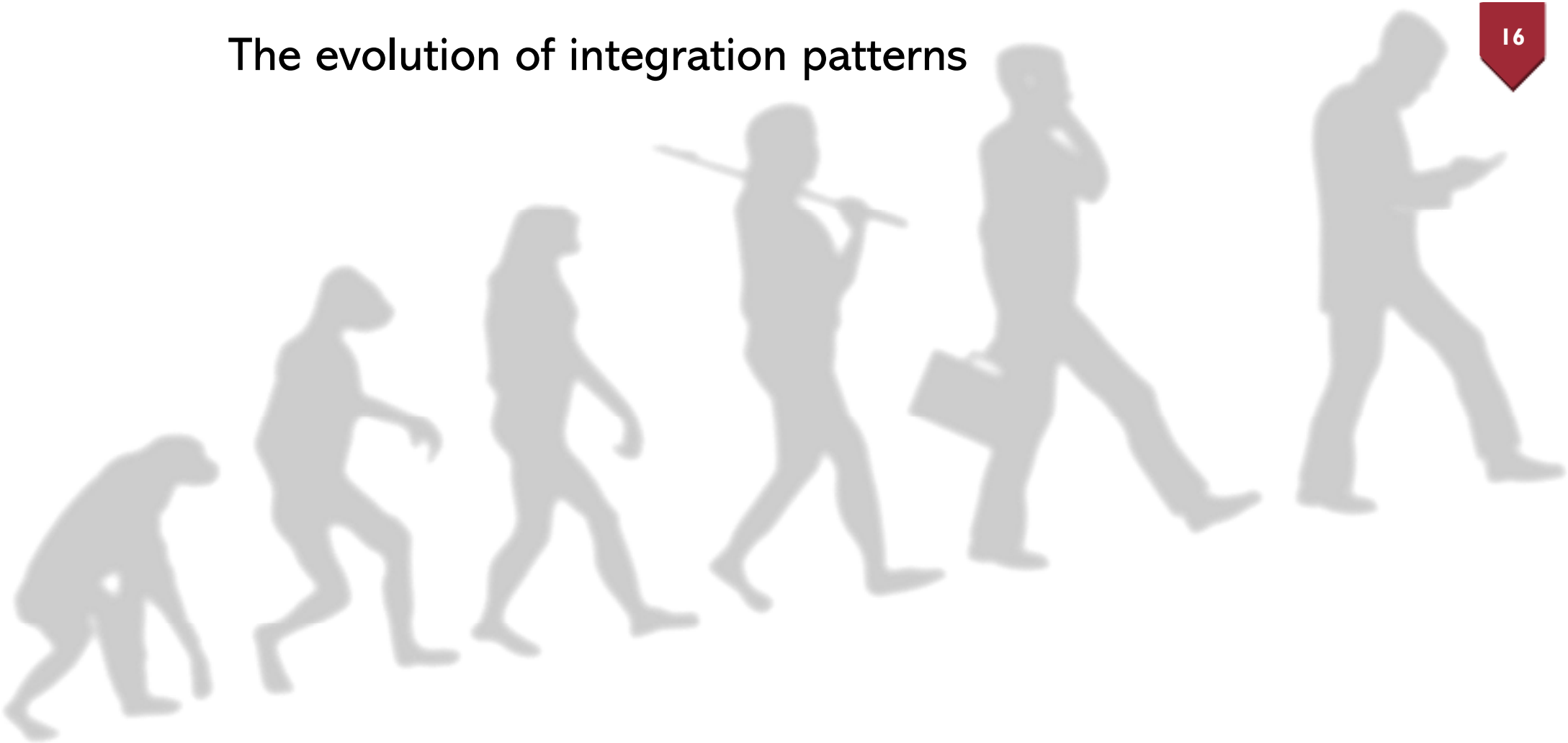
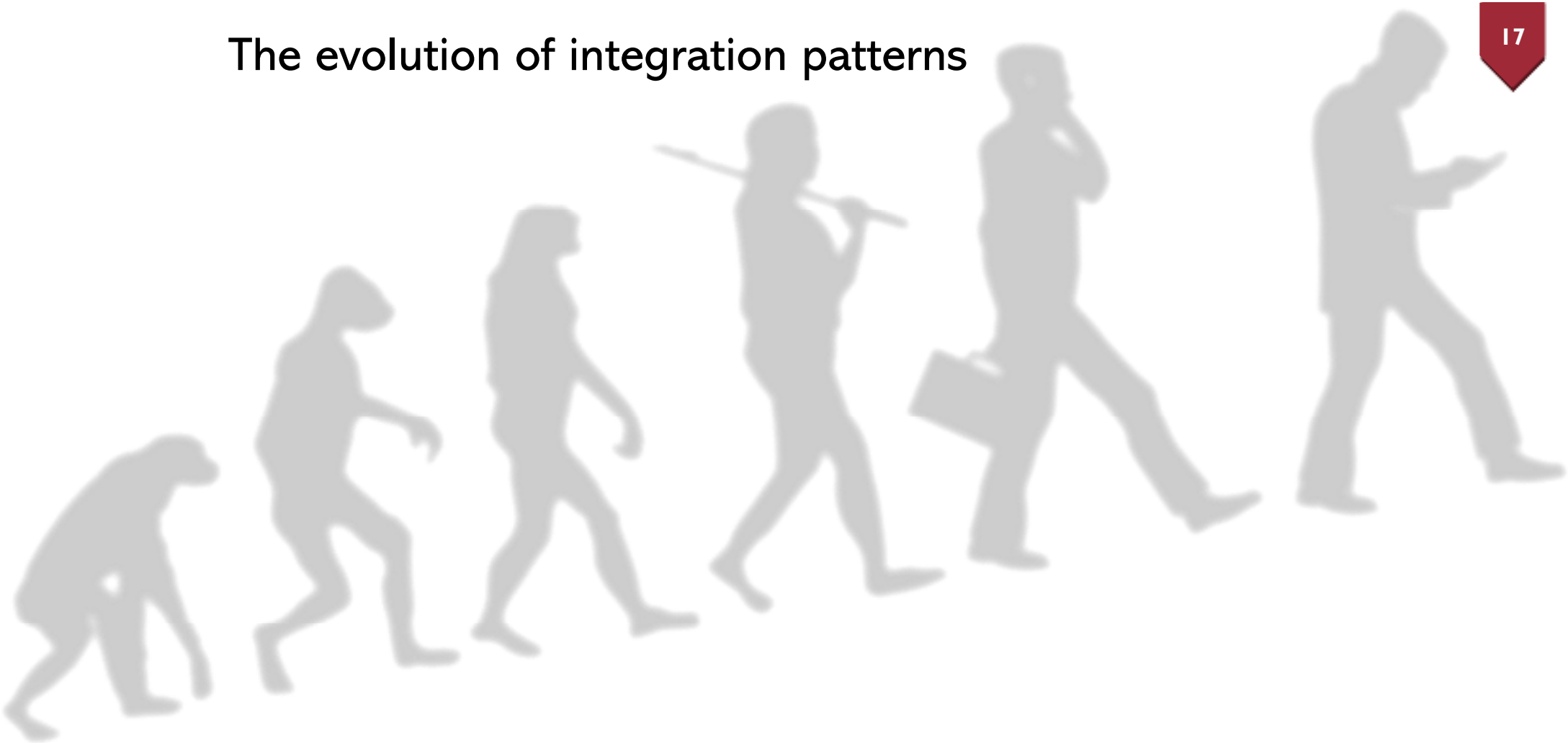
The evolution of integration patterns



Internal integration
ESB

The evolution of integration patterns



API gateway

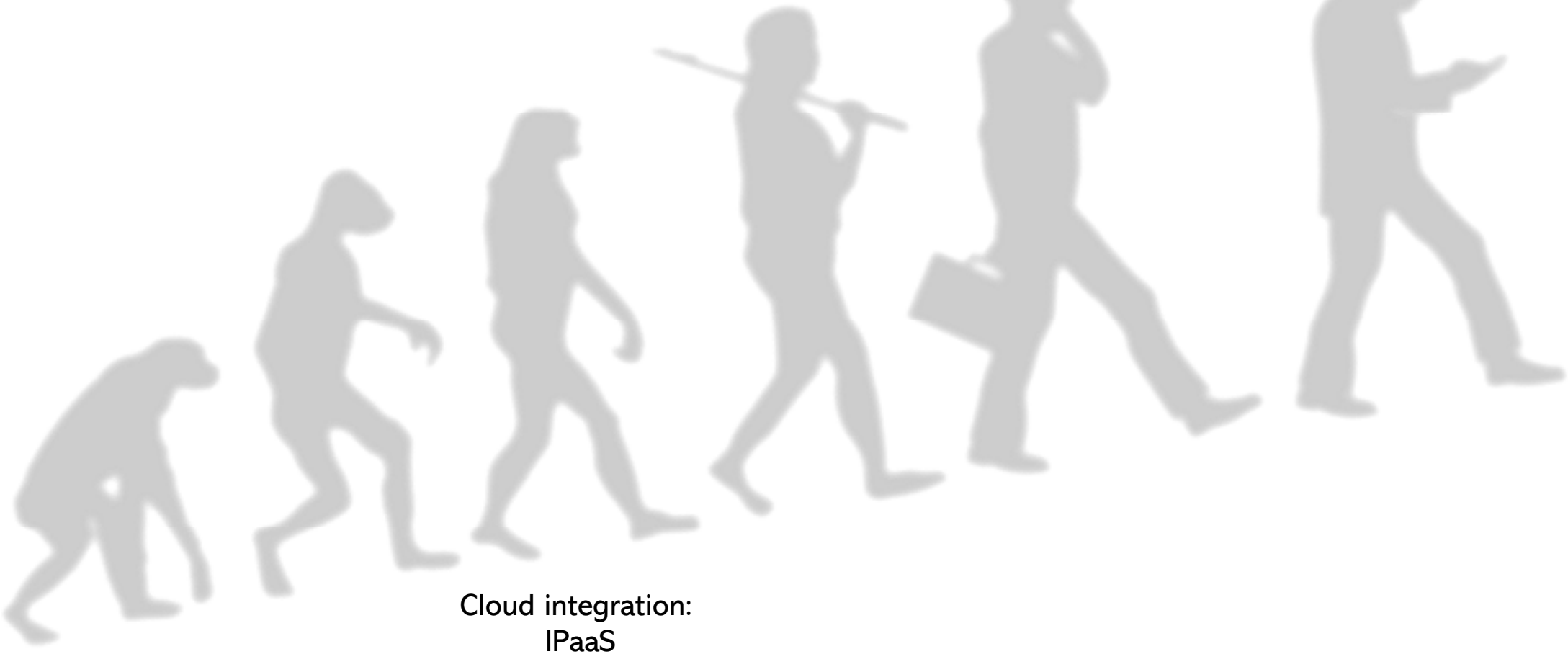
Internal integration

ESB

API Gateway

- Protocol transformation
- Scheme validation (content filters like XSD, filed limits, field format, etc.)
- **Authentication & security**
- Basic logics

The evolution of integration patterns



Cloud integration:
IPaaS

API gateway

Internal integration
ESB

IPaaS – Integration Platform as a Service

- For cloud connectivity
- Enable integration capabilities for ‘ad hoc’ or ‘citizen’ integrators”
- “I have more adaptors cloud SaaS”
- Selected products: Zapier, iConduct, Workato, Celigo, Snaplogic

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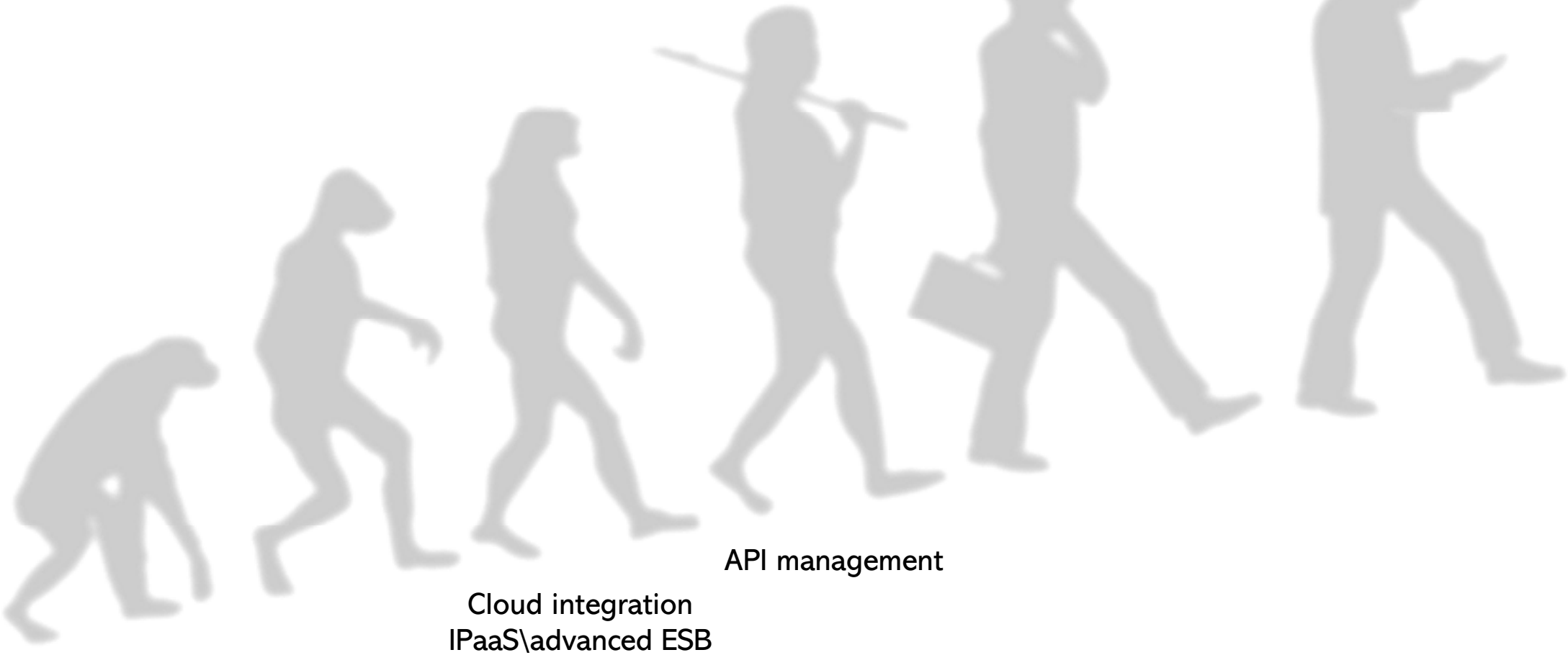
The evolution of integration patterns



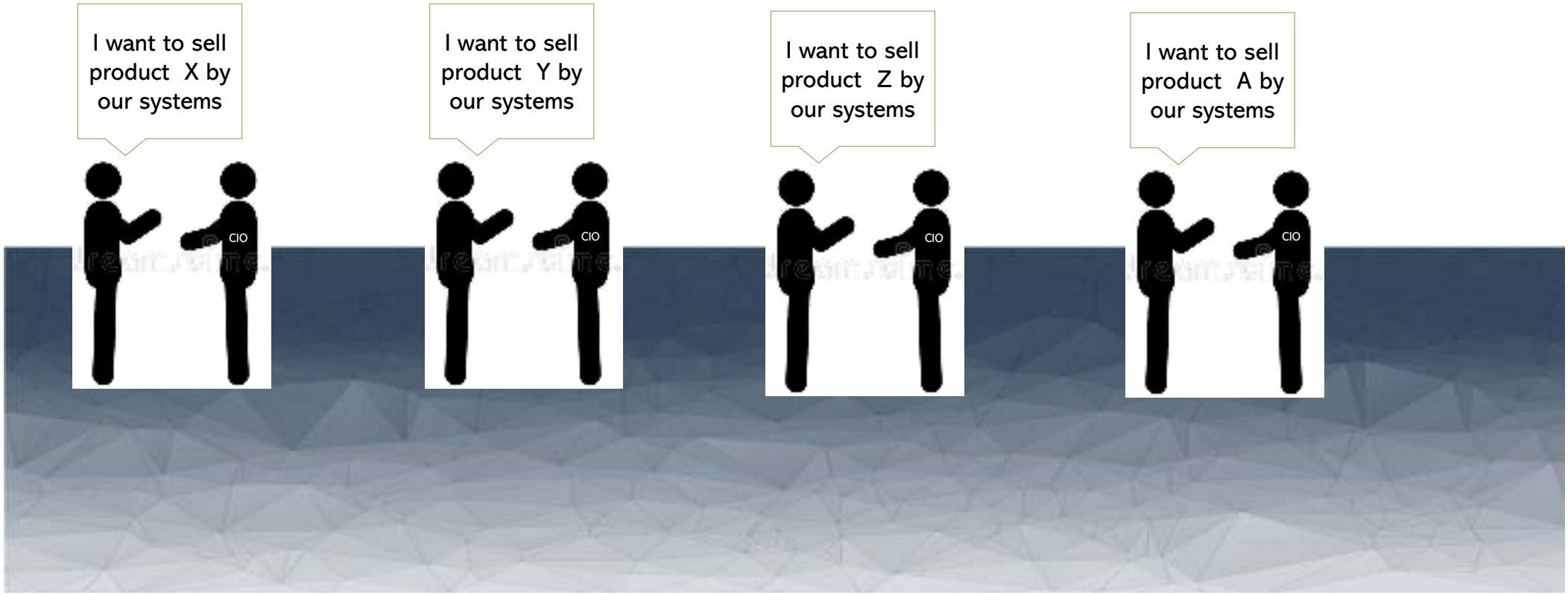
API management

Cloud integration
IPaaS\advanced ESB

External (specific API)
API gateway

Internal integration
ESB

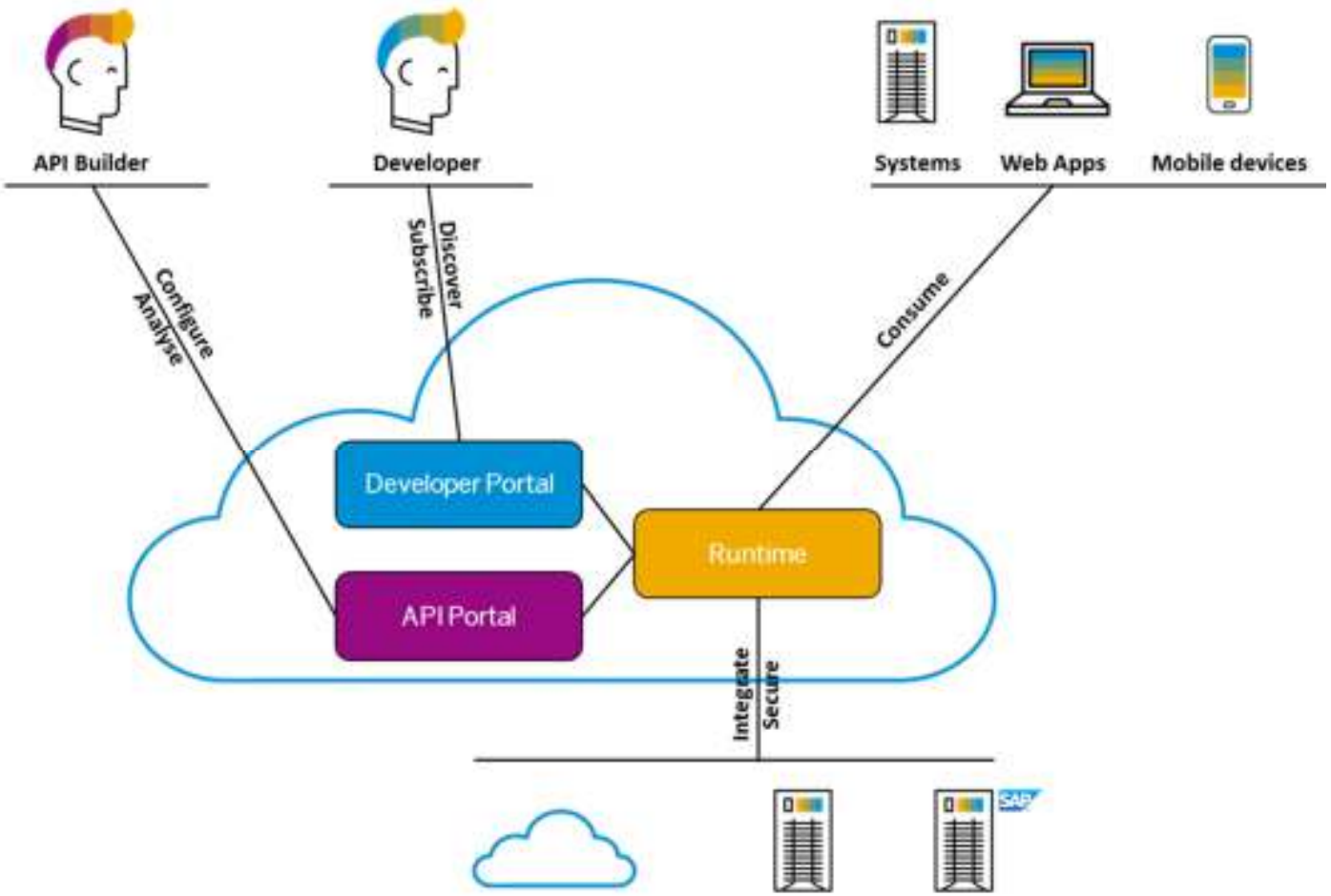
Business manager to CIO:



Business manager to CIO:

- Place new products in my catalog – dynamically
- Check stock variability in suppliers ERP
- Process payment (3rd party SW)
- Transfer money immediately to supplier
- Update delivery status and location (3rd party)
- Update buyer when product was delivered
- Update "consumer club" in both our systems and suppliers systems

API Management



BOI Open Banking Regulation

יעדי הפרויקט

- קידום היעד הפיקוחי לפתיחת שירותי המערכת הבנקאית **לתחרות והגברת הערך ללקוח**.
- **עידוד חדשנות** במערכת הבנקאית, בדומה לעולם.
- **יישום תכלית סעיף 5 בחוק** להגברת התחרות ולצמצום הריכוזיות בשוק הבנקאות בישראל, התשע"ז–2017.
- **גיבוש סטנדרט אחיד** למידע ולפעולות במערכת הבנקאית.

API Management – the hottest project in market!

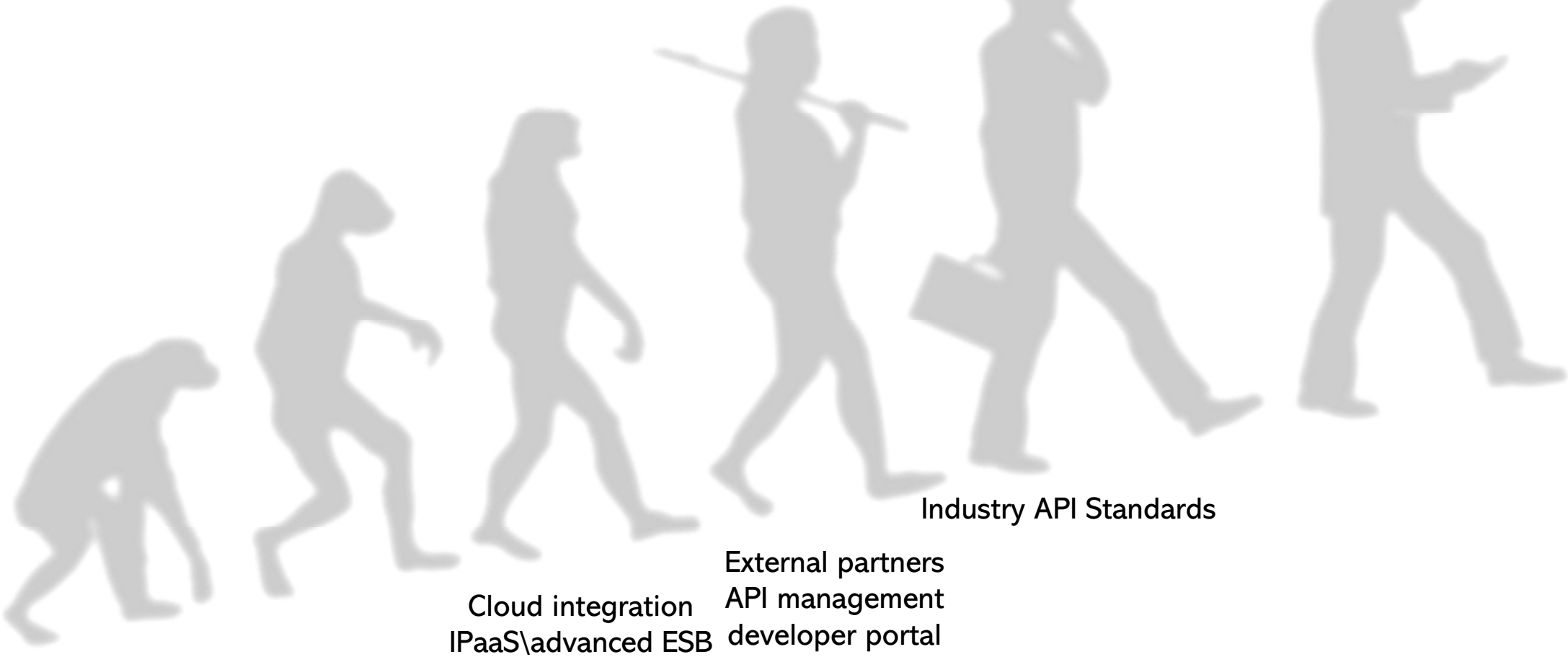
Will API management replace ESB?

It shouldn't – no oorchestration, no transformation, no adapters (tech and content), no messaging, no guarantee delivery, etc,
Still – green field organizations (enterprises and start-ups) are not using ESB at all

API management tools are replacing ESB*

* Gradually when possible

The evolution of integration patterns



Industry API Standards

External partners
API management
developer portal

Cloud integration
IPaaS\advanced ESB

External (specific API)
API gateway

Internal integration
ESB

Why API interoperability standards are critical for business agility?

"The Hongkong and Shanghai Banking Corporation Limited“ is stored in field

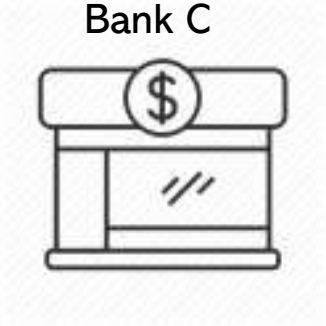
Bank A

“complete name”

Bank B

“full name”

Bank C



“full description”

Bank D

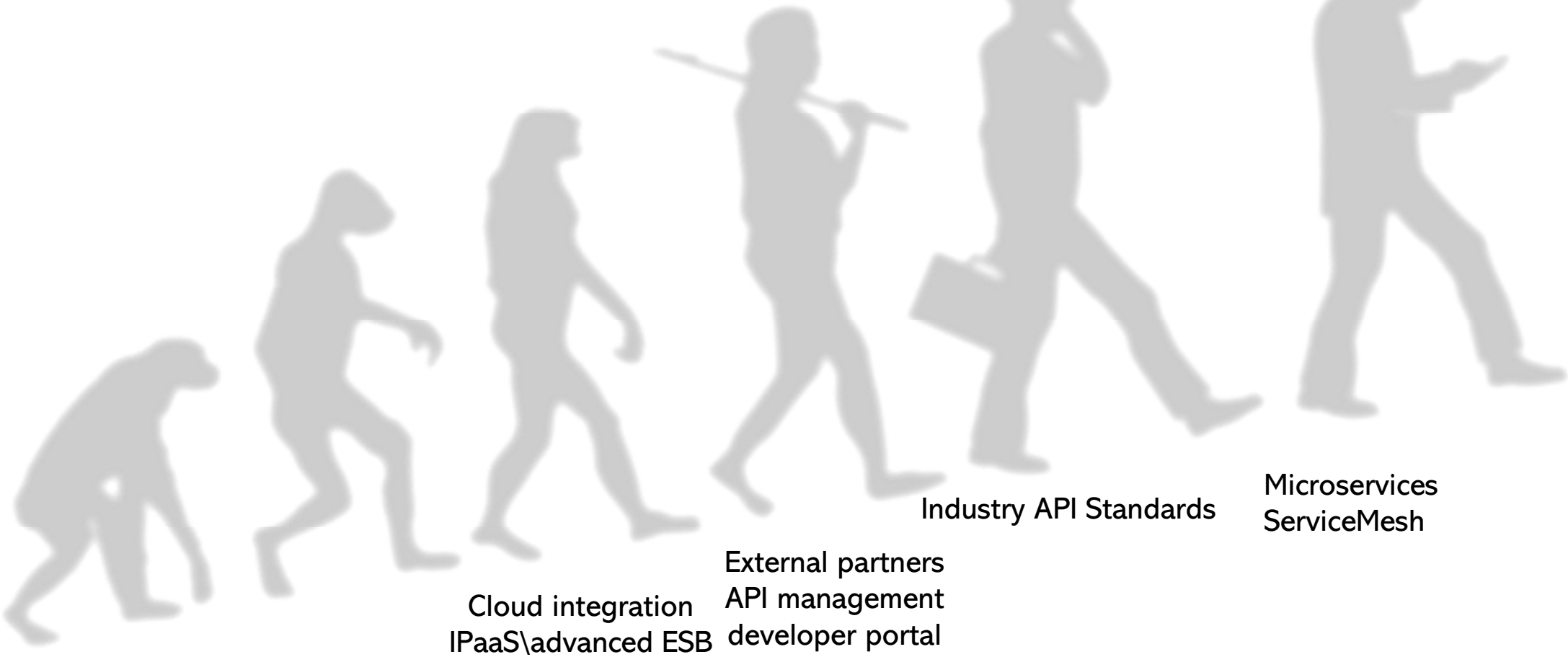
“Shem Male”

These banks can only manually co-ordinate.
This is not suitable for modern business!!

The solution: standard Open API –


```
"banks": [
        {
            "id": "hsbc",
            "short_name": "HSBC",
            "full_name": "The Hongkong and Shanghai Banking
Corporation Limited",
            "logo": "url of internet standard image",
            "website": "www.postbank.de"
        }
    ]
}
```

The evolution of integration patterns



Internal integration
ESB

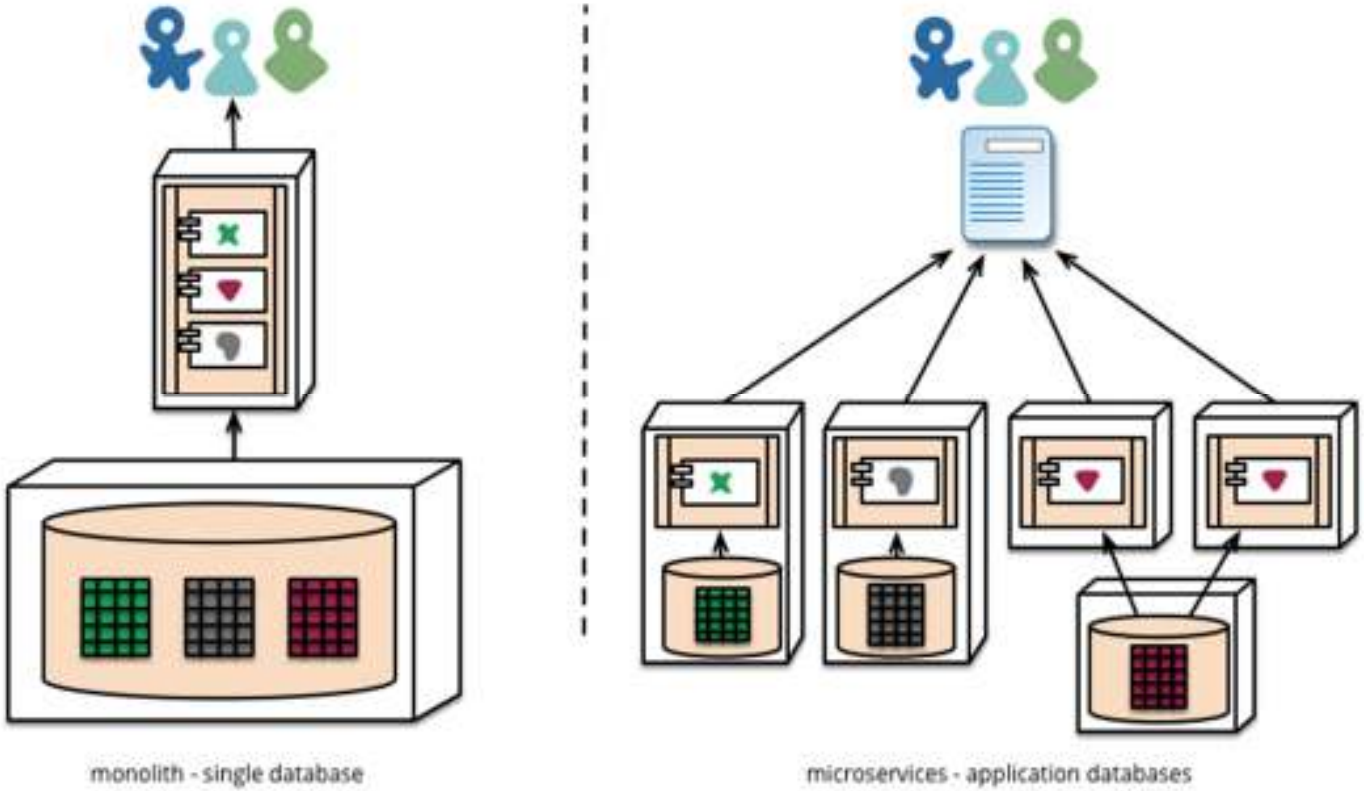
External (specific API)
API gateway

Cloud integration
IPaaS\advanced ESB

External partners
API management
developer portal

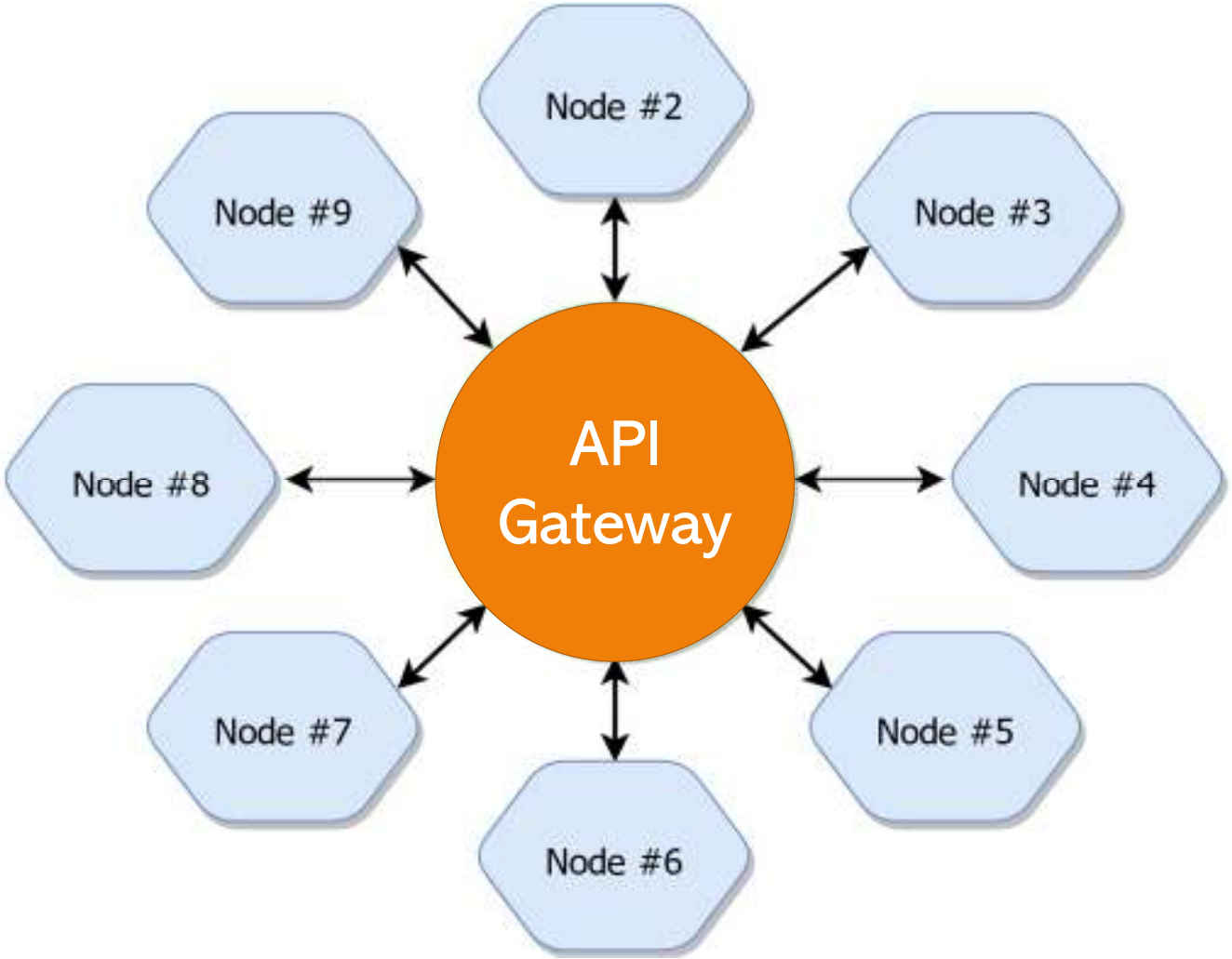
Industry API Standards

Microservices
ServiceMesh

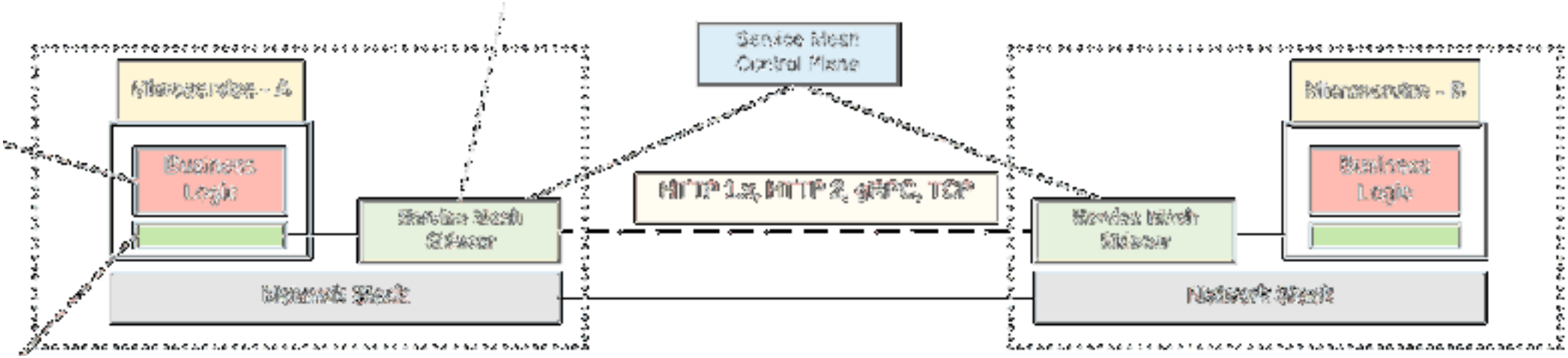


Source: http://martinfowler.com/

API gateway /ESB will not scale in microservices production environment



service mesh pattern



https://medium.com/microservices-in-practice/service-mesh-for-microservices-2953109a3c9a

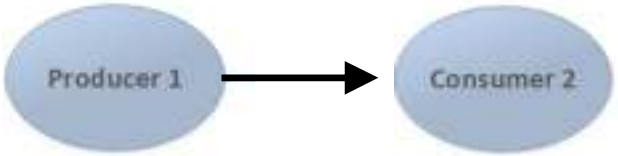
Istio

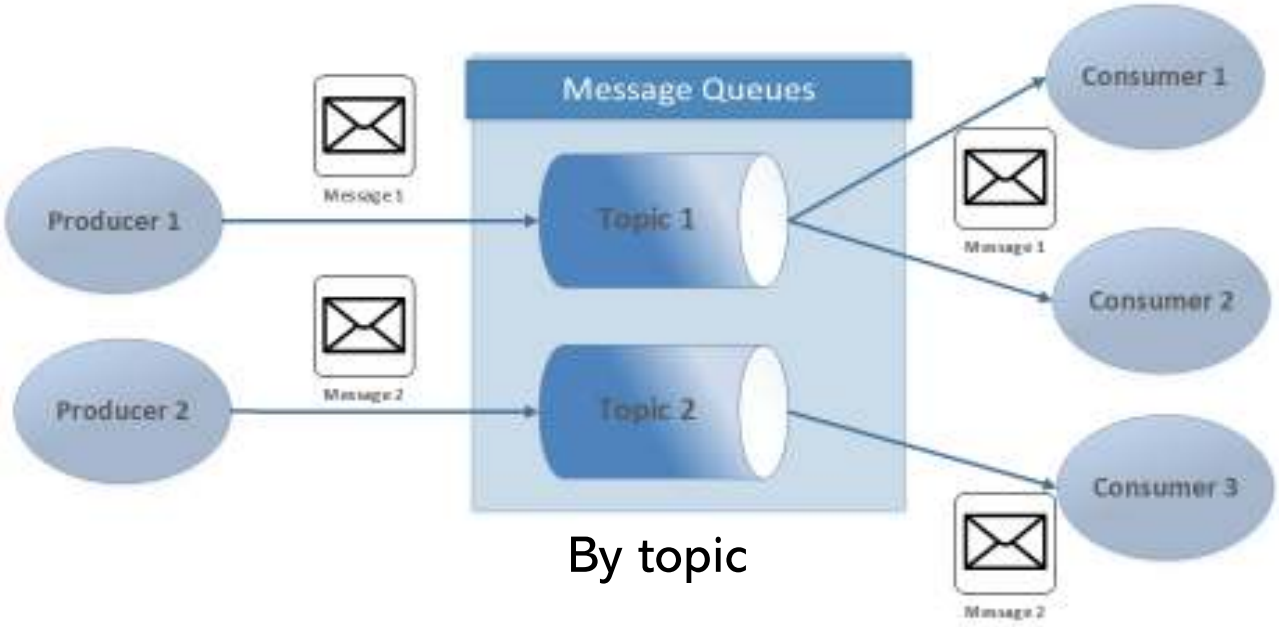
Direct (unsupervised) API calls

Advanced Integration capabilities are the key to adaptive business
API centric development & operations are a key for availability, efficiency (reuse) & security

Event Driven Architecture (EDA)

Traditional programming: direct connection





By topic

Event driven - “If you love someone set him free”

- Traditional programming:

Make_Order {

…

…

Call Order_Fulfilment (id of order).

Wait for response (ack)

- }

- EDA programming:

Make_Order {

…

…

Publish event: Order_created(id of order)

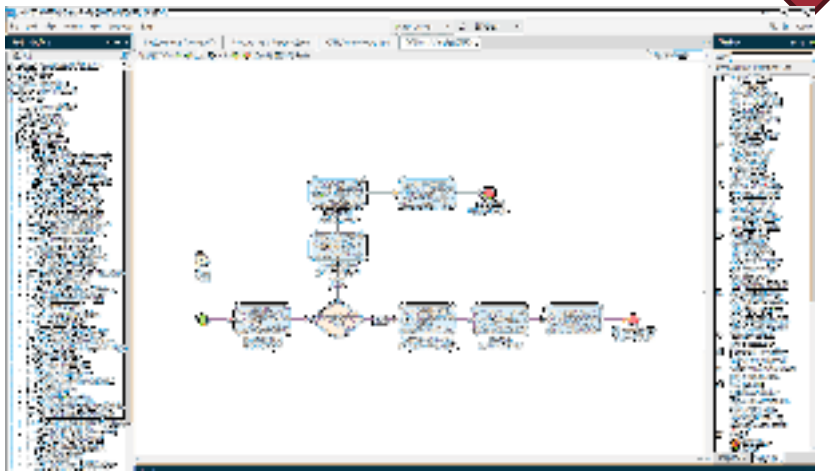
//do not wait

- }

Event driven benefits & drawbacks

- Enables adaptive business processes
- Enables work of separate teams
- Fits microservices, self contained systems, DevOps, serverless
- Basically for a-synchronous purpose
- Distributed transactions are difficult!!
- Needs to reskill architects & programmers

Low Code



"A low-code development platform (LCDP) is a software that provides a development environment used to **create application software** through **graphical user interfaces** and configuration instead of traditional hand-coded computer programming." Wikipedia

הרבה תפוקה, פחות קוד

The advantages

TTM

Fit for junior/legacy developers

Low technical debt

Good for business (application) experiments (MVP)

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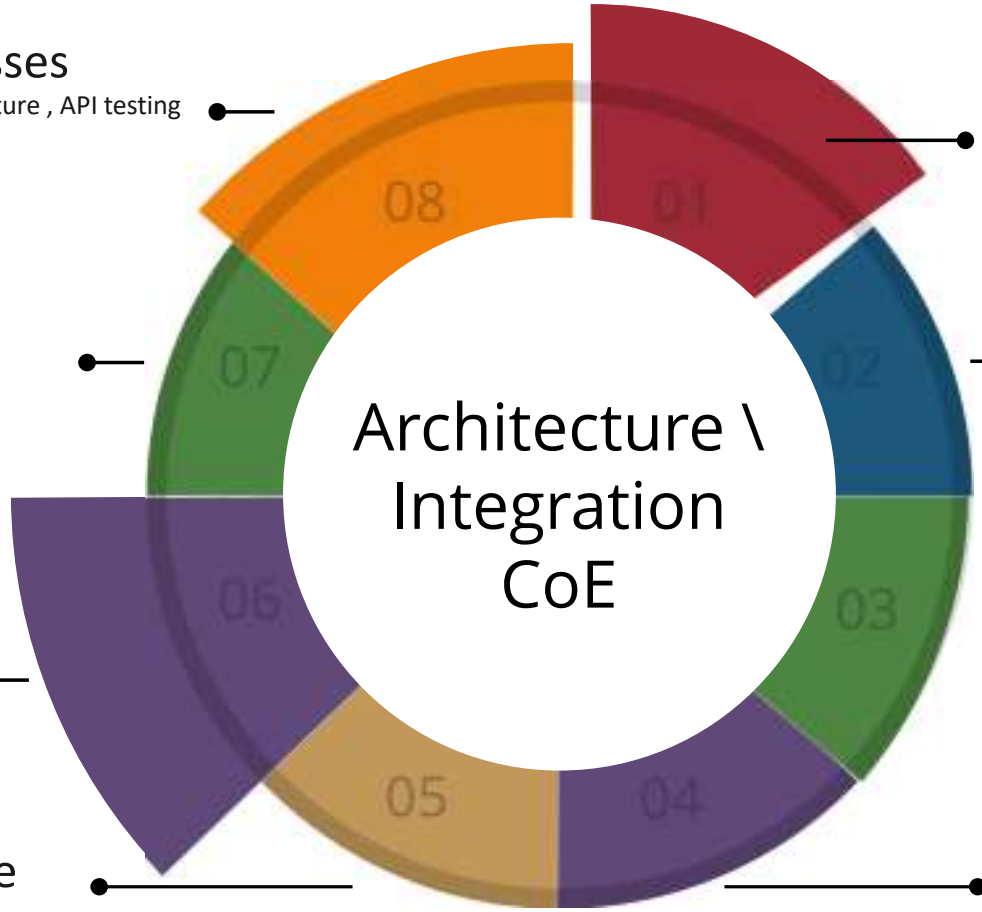
The barriers

- Prior experience- 4GL
- Politics
- Cost of entry
- Lockdown

Lesson learned from (Israeli) 4GL:

- Citizen developers should work under IT guidance/supervision:
- Security, Central Identity, Regulations, Monitoring
- Updates of infrastructure
- CAB – change advisory board
- Documentation and Architecture guidance



Processes
API first culture , API testing automation

Literacy
API Economy principals

Skills
Architect upskill for Event Driven

Standards
API standards, Identity standards, Cyber security standards

Use Cases Identification and Prioritization
Priorities in DevOps efforts and tooling

Architecture
Event Driven, API management vs. ServiceMesh , Rest vs. GraphQL

Governance
Regulations , apply standards

Tools
API management tools
IPaaS tools

Governance – be integral part of development process

Cloud CoE

There is (almost) no option since new business applications are only cloud based. Applying modern business processes without using cloud software will be very difficult and unconventional.

Reasons for moving to cloud

New business applications are only cloud based

Applying modern business processes <u>without</u> using cloud software will be very difficult and unconventional

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More reasons for moving to cloud:

- Cloud improve IT speed & agility and hence business agility
- Cloud computing enables “fail fast” (lean\MVP) business culture
- Cloud drives technology innovation which drives business innovation
- Cloud computing helps with compliance
- Cloud computing companies invest much more on cyber security than traditional IT
- Cloud computing helps with IT-Business alignment

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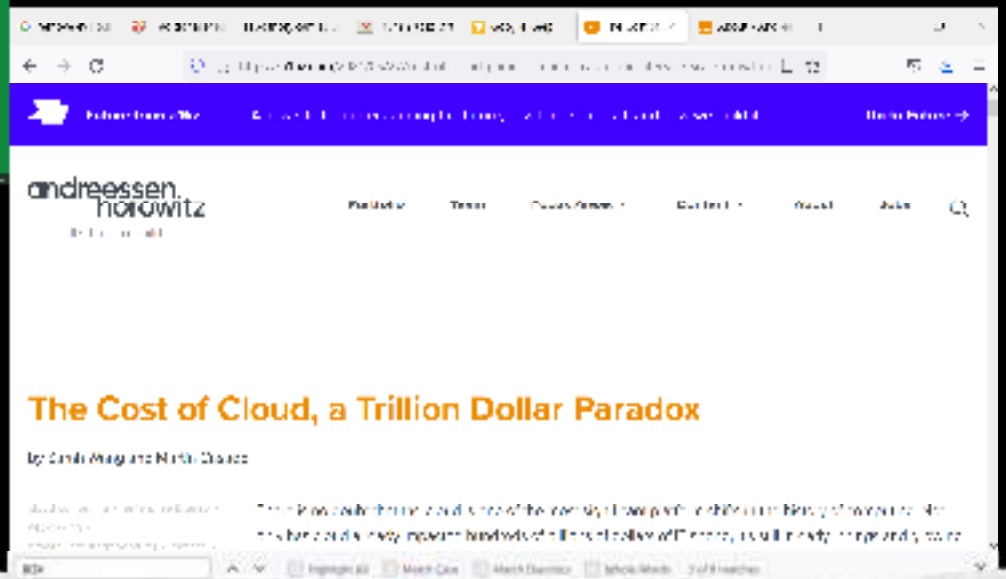
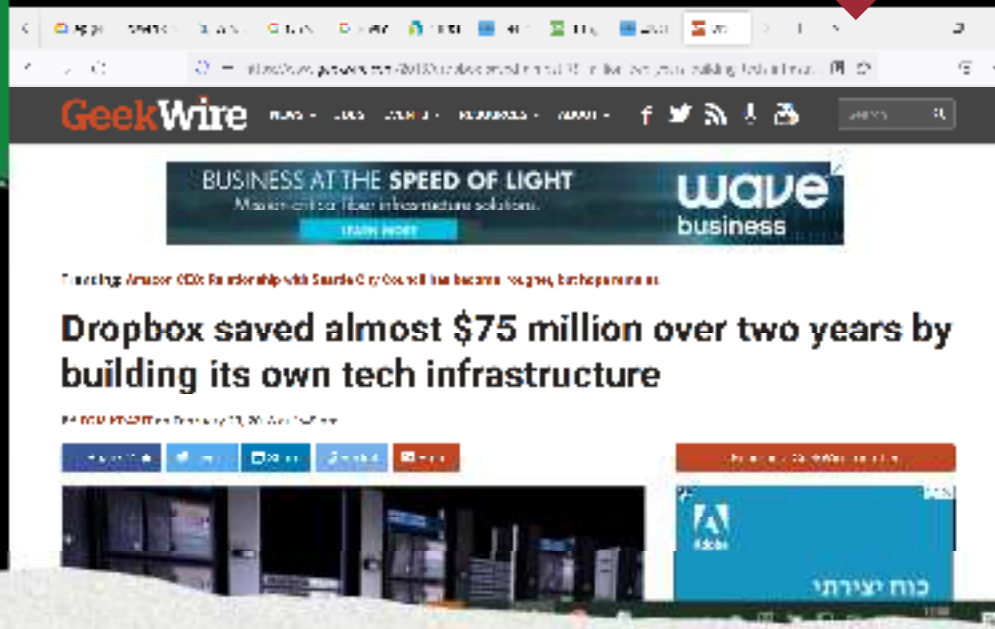
Repatriation?





Repatriation debate

Repatriation from cloud in Enterprise IT?

Cloud unexpected complexity:

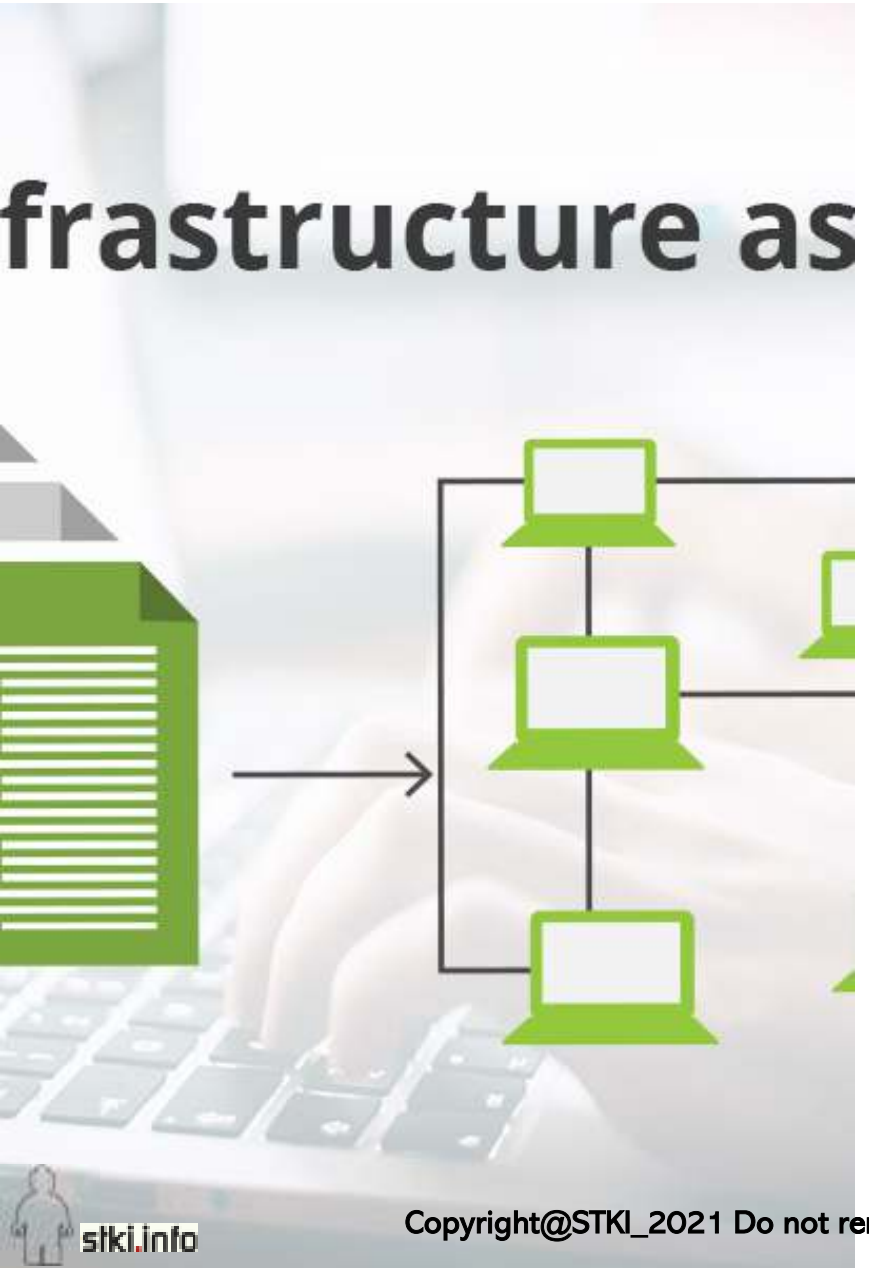
- Cloud budget planning
- Bill Shock
- Lack of flexibility in cloud contracts
- Forgotten areas in cloud SaaS deals
- In general - mistakes in the cloud are more harmful

Reduce the dominance of Windows Server and VMWARE ESX

Cloud technical team is integral part of the general teams

Fact: most resources are still spent the on-premise/traditional infrastructure

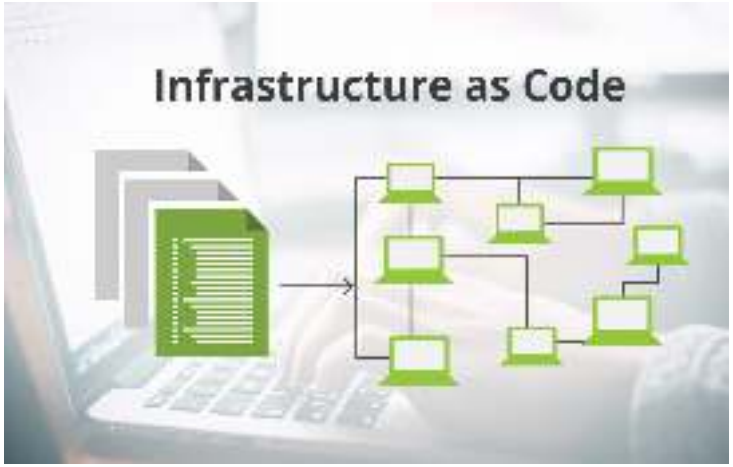
Treat on premise as cloud!!



Infrastructure as Code

- Central script\code repository (GIT) for all infra\security
- Central workflow for all infra\security

Place infrastructure as code KPI for all infra\security departments

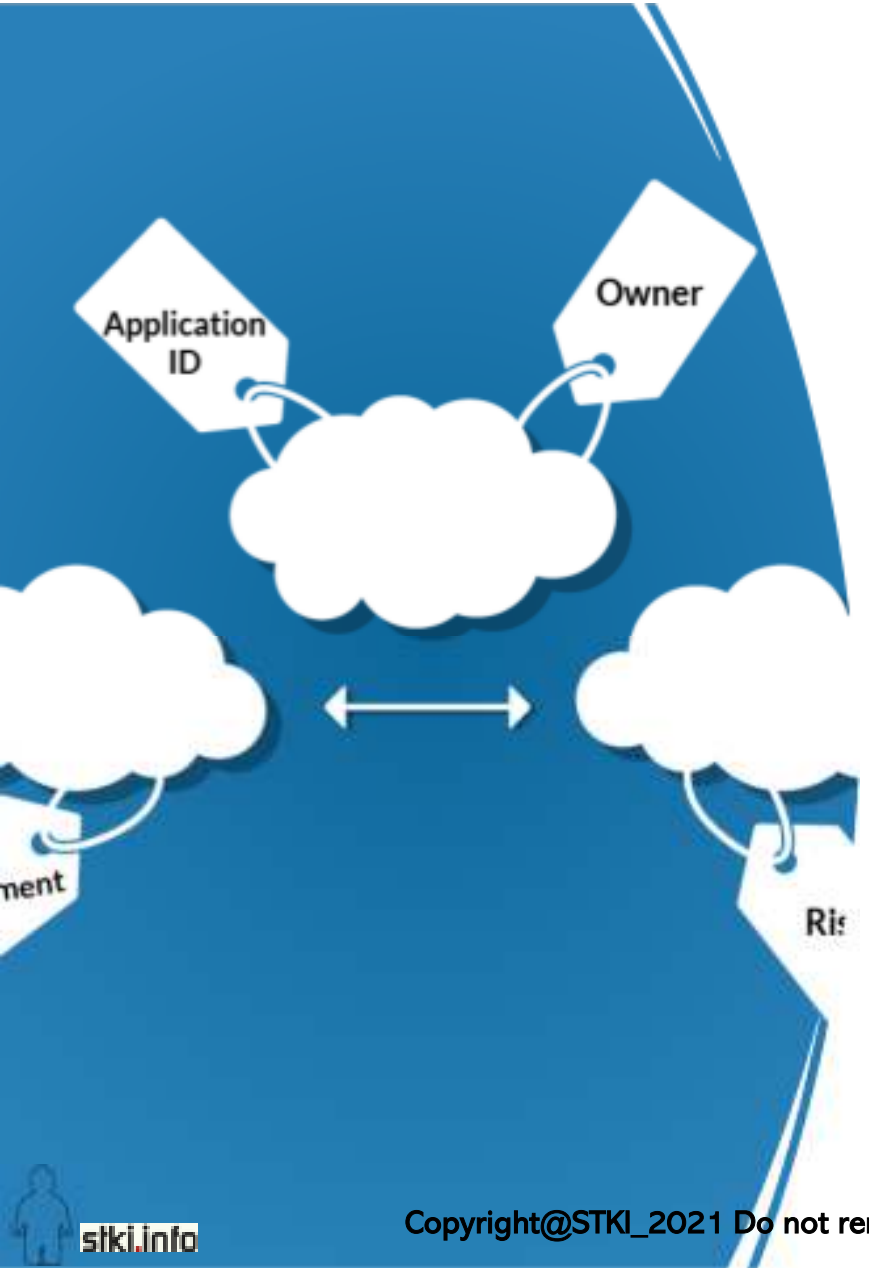


Server is running unnecessarily in traditional DC – not a big deal

Server is running unnecessarily in Cloud – very big deal $$

"Pay by the minute" is new for IT* – FINOPS is the answer

*what are "Spot Instances"?



Define and implement mandatory tags for all cloud resources in the resource group level – DO IT NOW

Cloud cost optimization tools

Build in tools:

aws

Google Cloud

Microsoft Azure

ORACLE CLOUD

Alibaba Cloud

vs

APPTIO

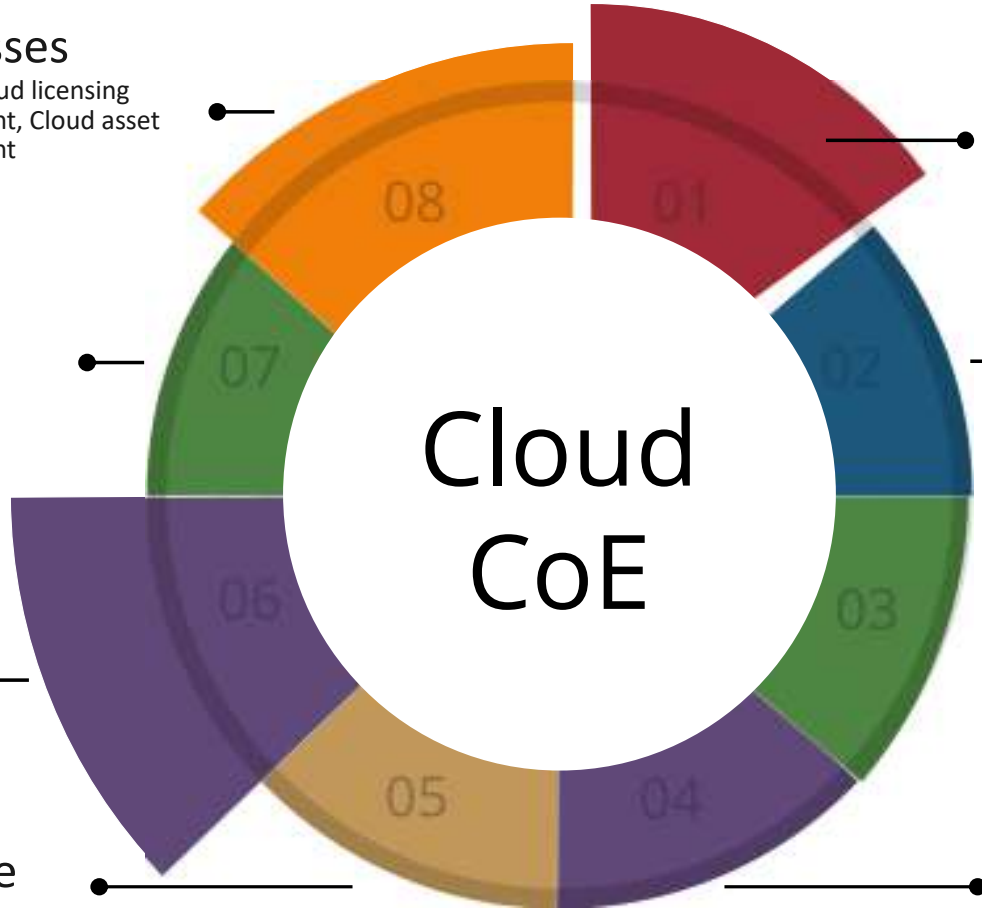
CloudCheckr

FLEXERA

turbonomic

vmware

Cloud CoE



Processes
FINOPS, cloud licensing management, Cloud asset management

Literacy
Explaining cloud business and technology implications

Skills
Cloud development, Infrastructure as code education

Standards
Example: tagging (FINOPS) standards, security standards. Identity standards

Use Cases Identification and Prioritization
Priorities in cloud migration

Architecture
Microservices, Event Driven, Serverless

Governance
Cloud related regulations

Tools
Which cloud, Cloud cost optimization tools , Cloud identity tools, cloud integration tools

CoE is an enabler, not doer itself. “One DBA team!”

DevOps CoE

Traditional deployment

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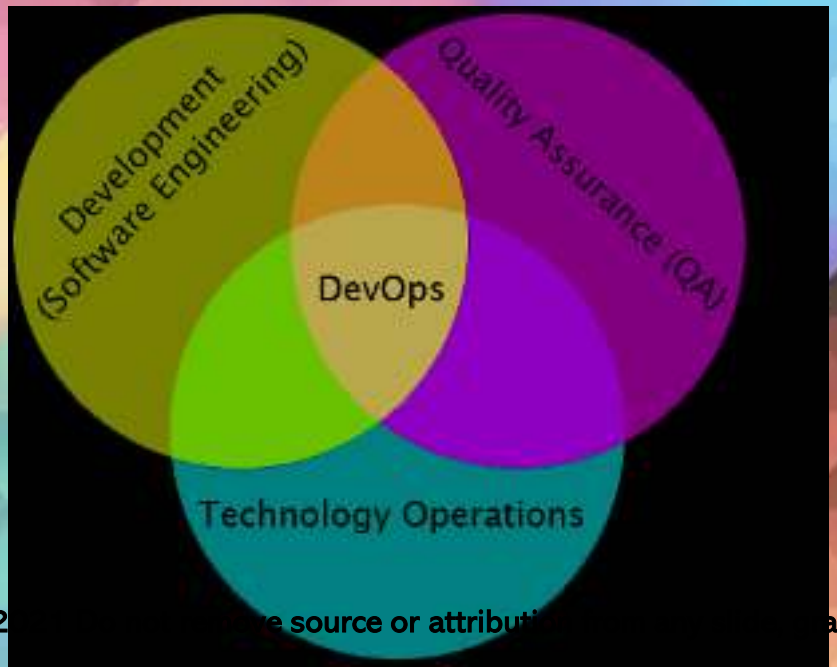
DevOps aims at:

- DevOps enables the benefits of Adaptive development to be felt at the organizational level. DevOps does this by allowing for fast and responsive, yet stable, operations that can be kept in sync with the pace of innovation coming out of the development process.

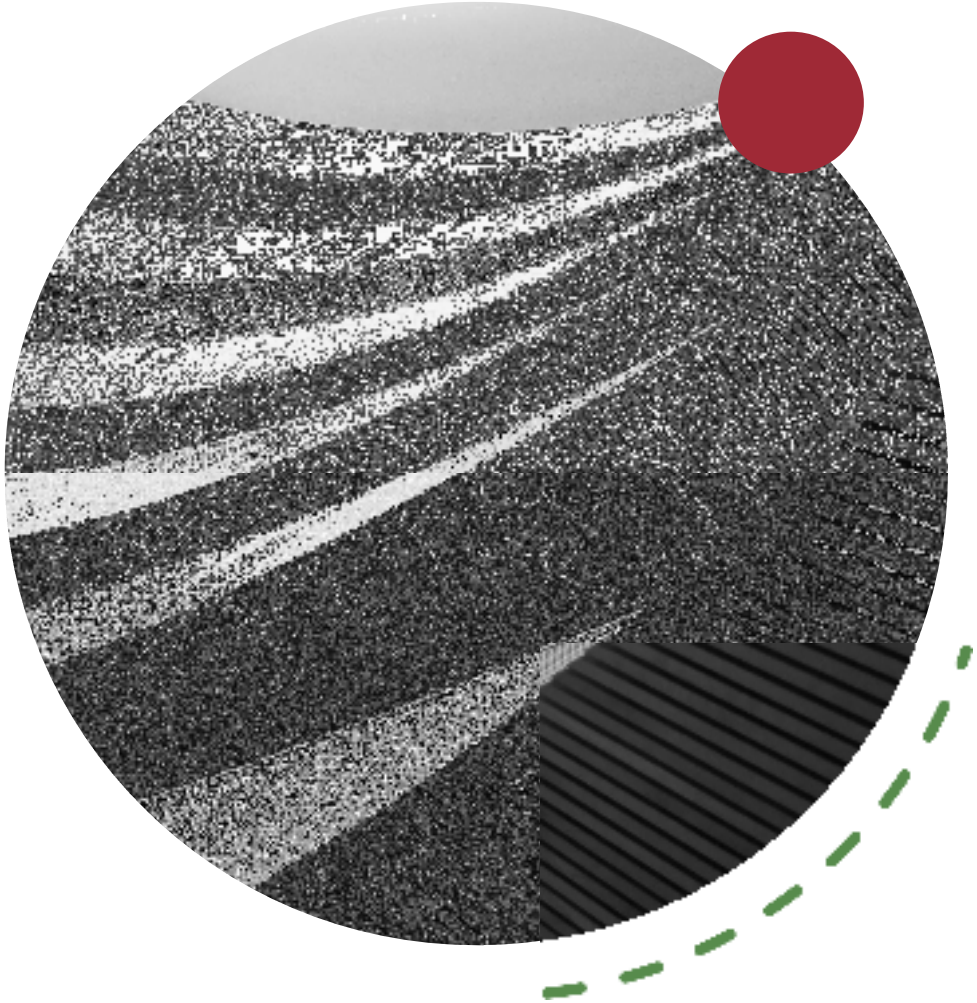


Source: http://dev2ops.org/blog/2010/2/22/what-is-DevOps.html

Source: http://www.slideshare.net/jedi4ever/devopsdays

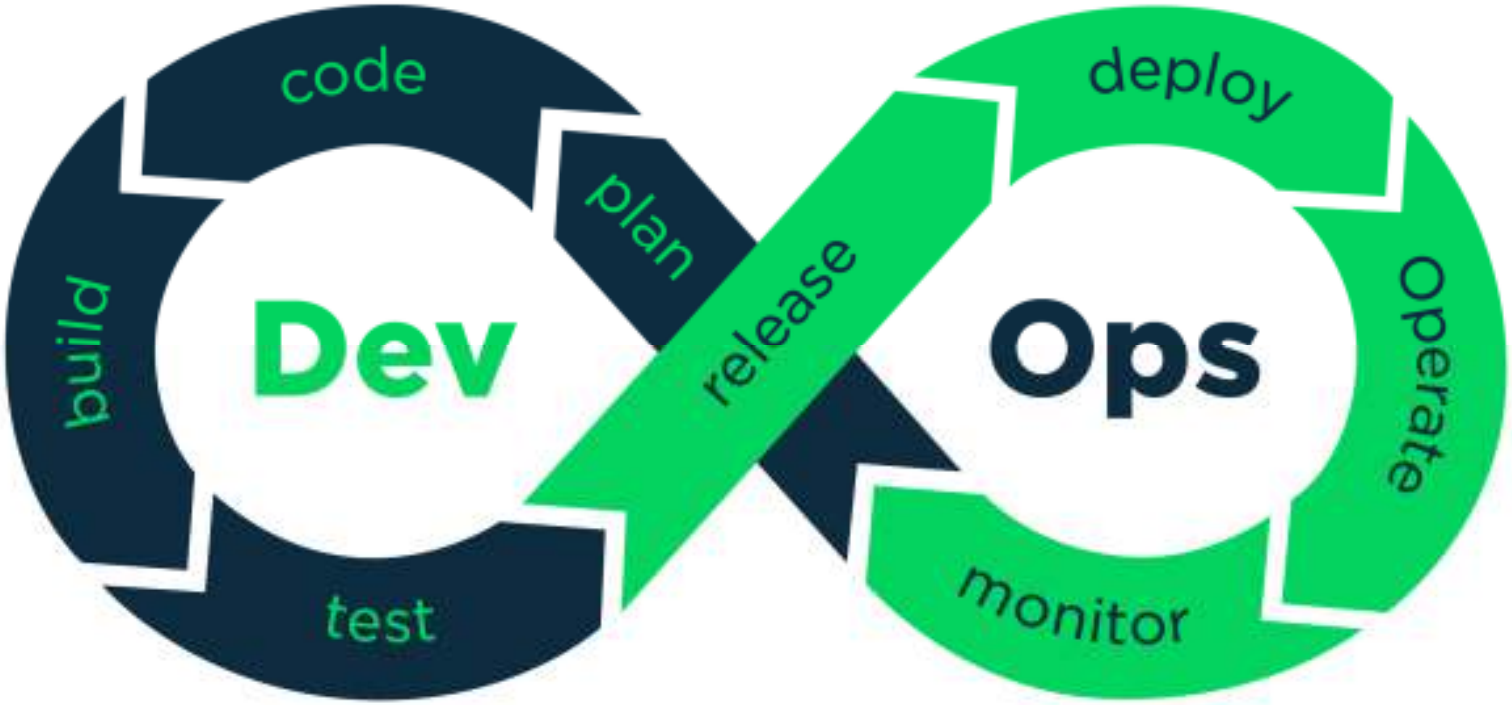
Some perspective: DevOps at Amazon

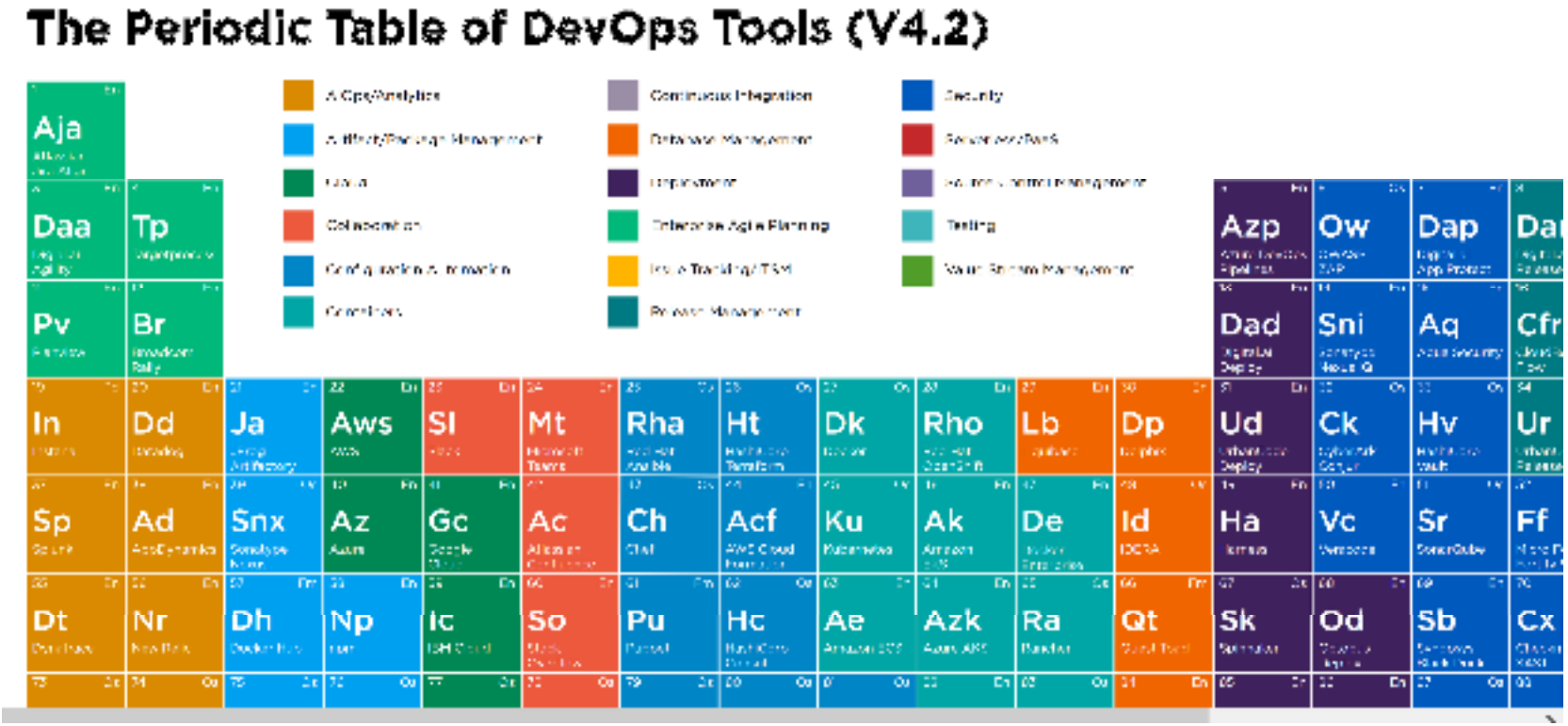
Mean	11.6 seconds : Mean time between deployments (weekday)
Max	1,079 : Max # of deployments in a single hour
Mean	10,000 : Mean # of hosts simultaneously receiving a deployment
Max	30,000 : Max # of hosts simultaneously receiving a deployment



Source: http://www.bogotobogo.com/DevOps/DevOps_Jenkins_Chef_Puppet_Graphite_Logstash.php

"Let there be DevOps"





Monitoring/Observability/AIOPS
Collaboration
Configuration Automation
Testing
Issue Trekking/ITSM
Release Management
Security
Continues Integration
Artifacts/ Package Management

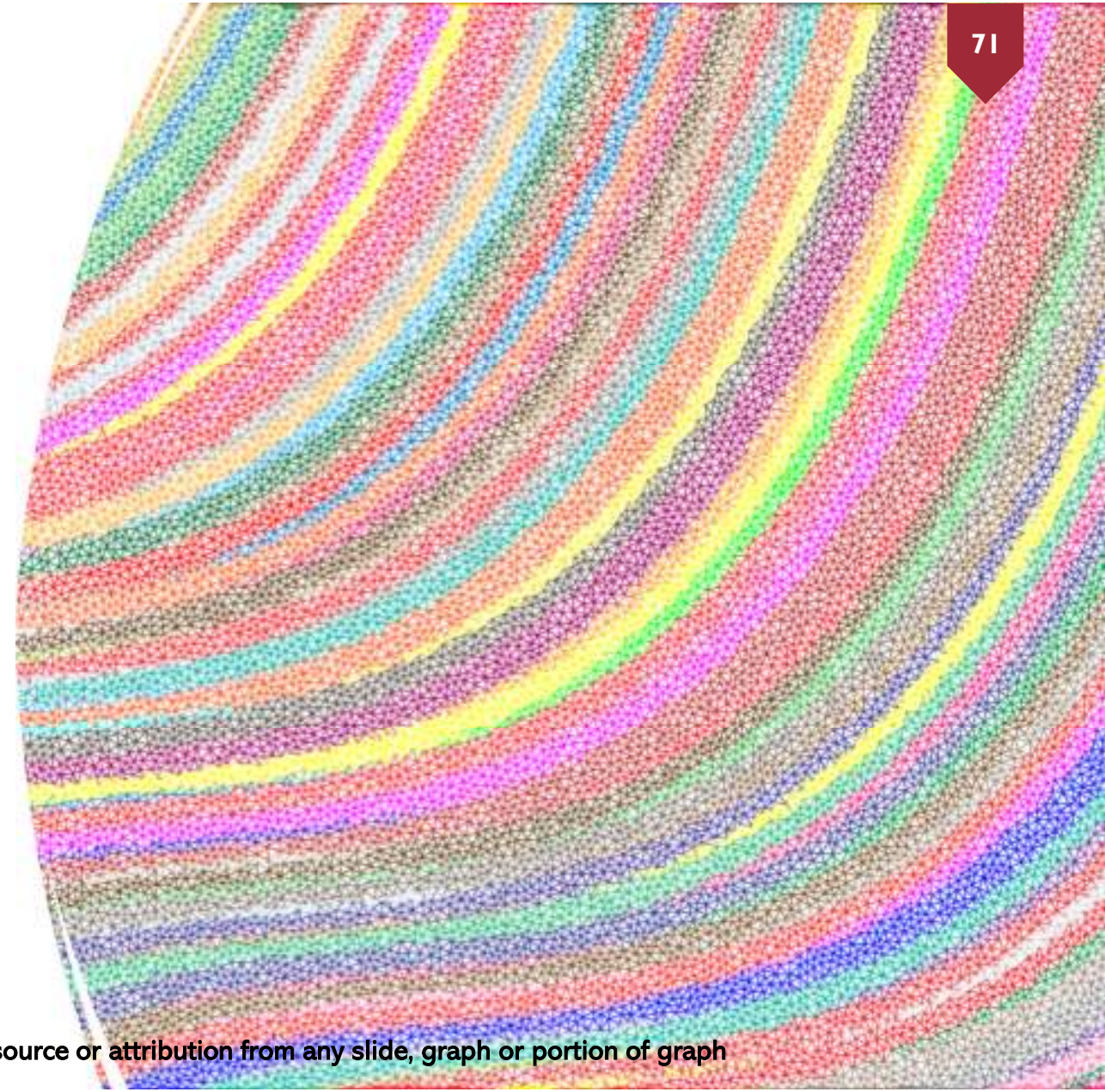
DevOps Tools

Legacy systems must be part of Value Stream mapping & DevOps

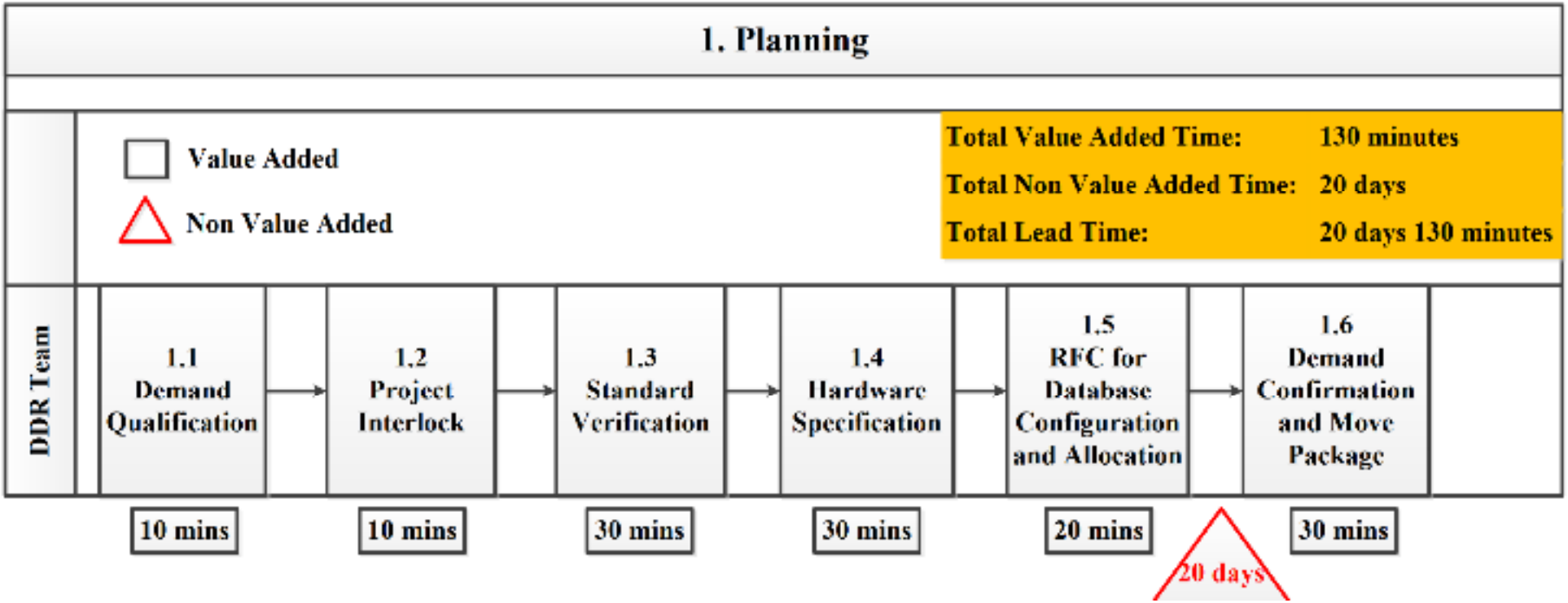
Measure until code is in production and not until value is created

Value Stream Mapping?

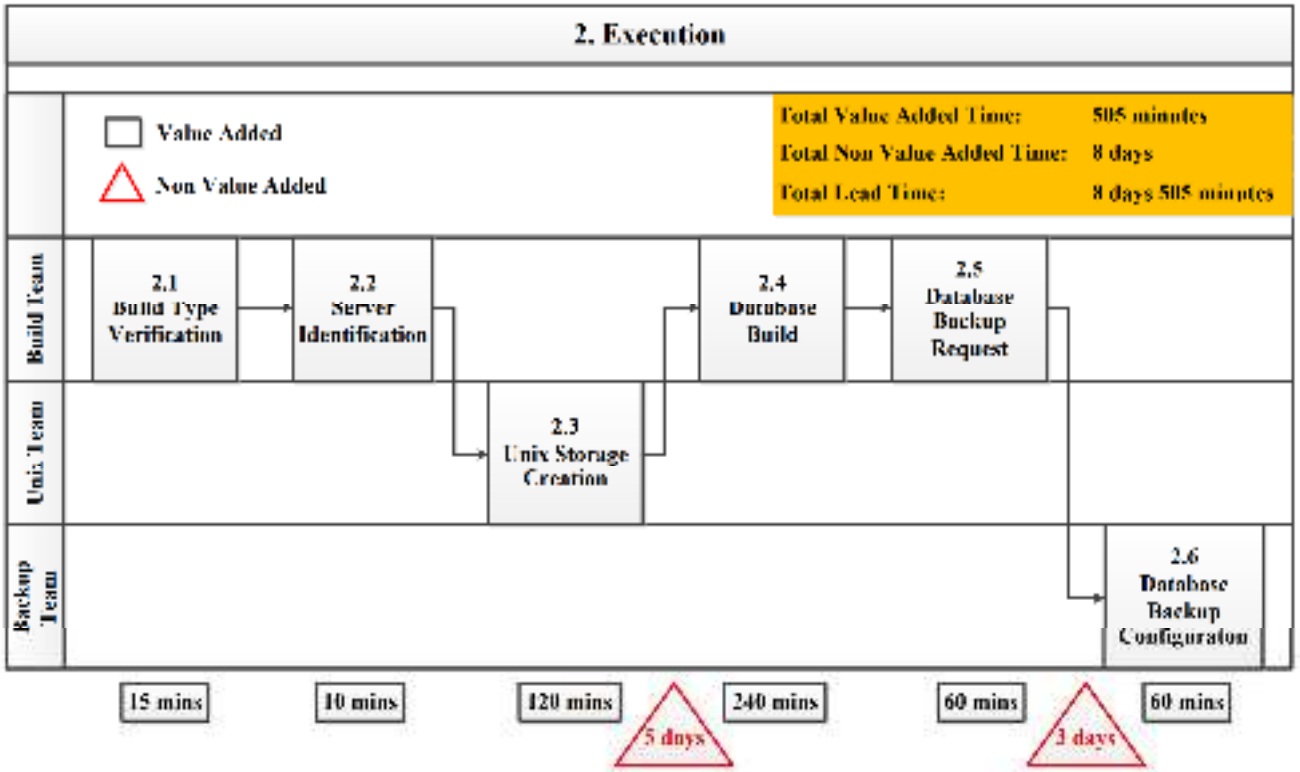
- Value stream enables you to create a detailed visualization of your workflows.
- This visualization represents how your products and services flow from supplier to customer via your company.
- Value Stream tools should get their input from ALM tools and from manual inputs



IMPROVING DATABASE PROVISIONING PROCESS TO MEET BUSINESS DEMANDS



IMPROVING DATABASE PROVISIONING PROCESS TO MEET BUSINESS DEMANDS



Value stream mapping:

Table 1. Summary of value-added and non-value-added time

Phase	Value-Added Time	Non-Value-Added Time
Planning	130 minutes	20 days
Execution	505 minutes	8 days
QA & Handover	120 minutes	3 days
Total	755 minutes (12.6 hours)	31 days

Source: https://www.scielo.br/j/jistm/a/wRTL87bgXHG6zZd8GGNNvxt/?format=pdf&lang=en

STKI: start DevOps with Value stream mapping

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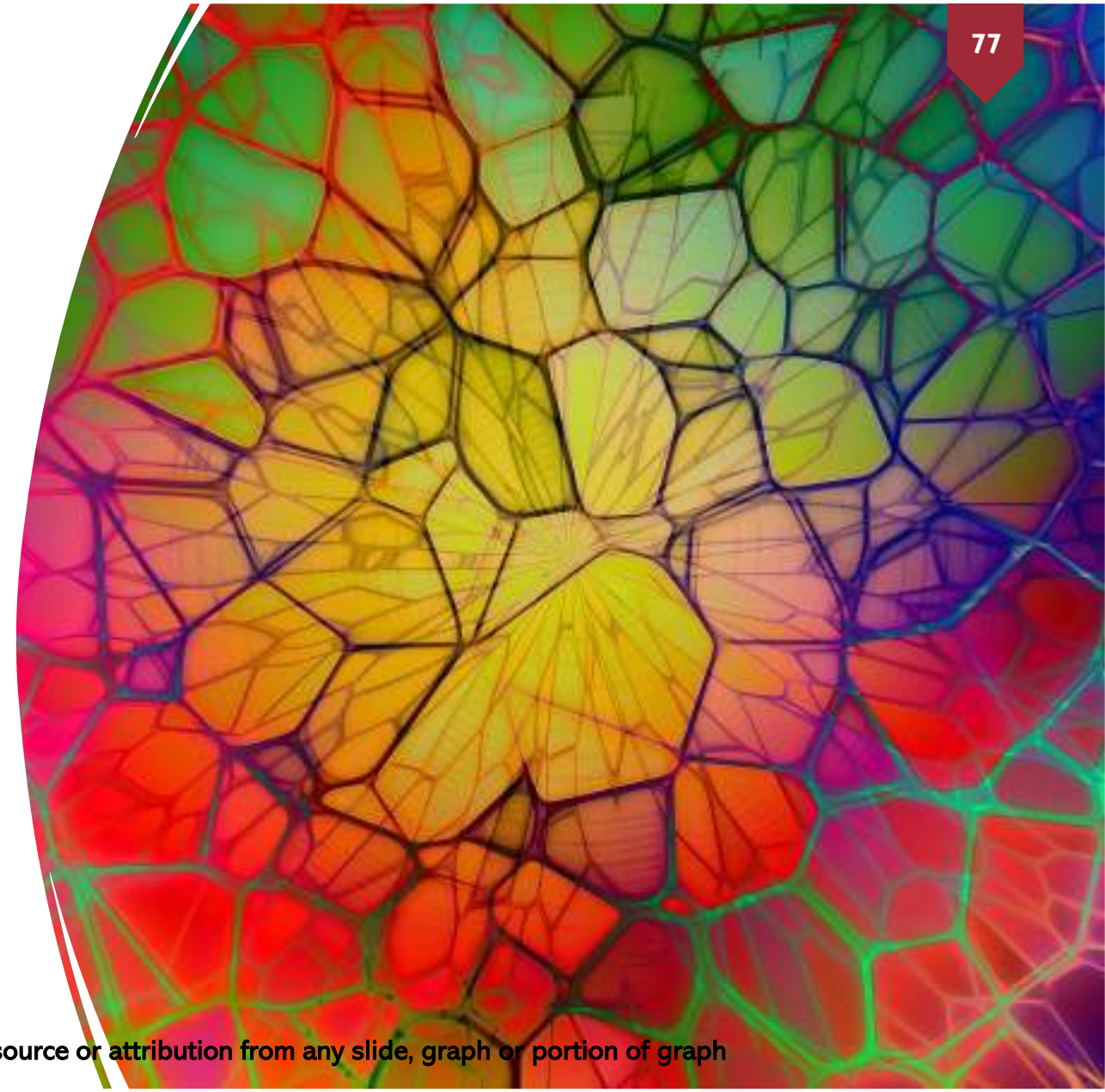
Operations team (NOC) vs. ESM (monitoring) team

SRE is what happens when you ask a software engineer to design an operations team

- SRE – Site Reliability Engineering
- Automation (code, tooling) in operations, self healing architecture
- MTTR instead of MTBF
- Error Budget
- Developers responsibility for operations



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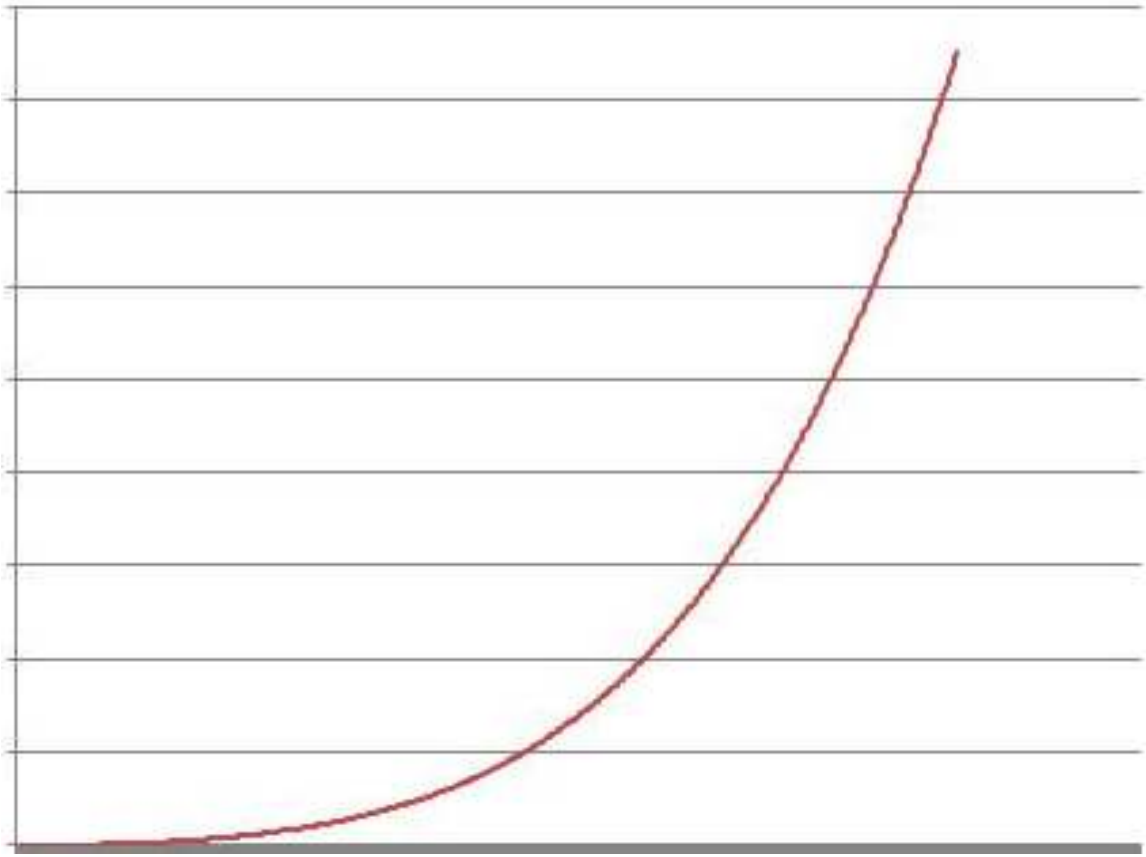
Developers are not responsible of operations

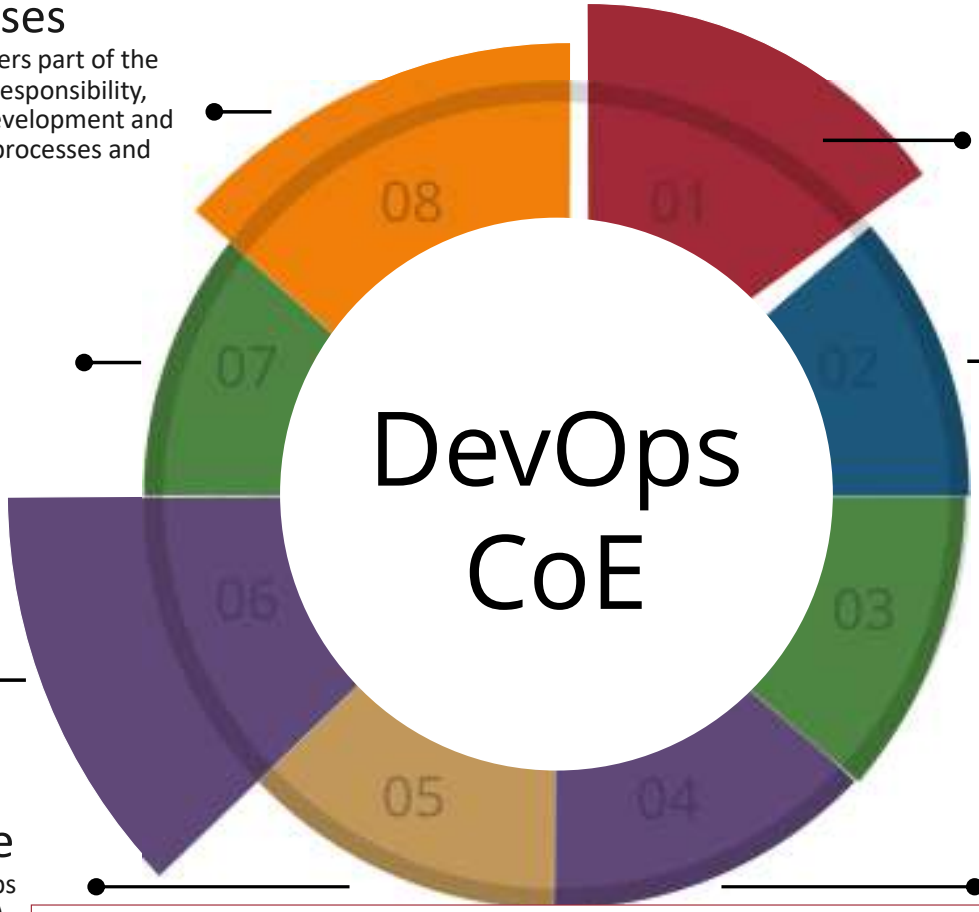
Observability: the new Monitoring

Normal behavior: Traffic--> Saturation --> Latency --> Error



Expected correlation in golden signals. What is anomaly?

DevOps CoE



Processes
Let Developers part of the operations responsibility, Unify the development and operations processes and KPI's

Literacy
Explain DevOps to business

Skills
Cloud development, Infrastructure as code education

Standards
Naming conventions for infrastructure, testing standards, Monitoring (Observability) standards

Use Cases Identification and Prioritization
Priorities in DevOps efforts and tooling

Architecture
Microservices, Monitoring (Observability) health API's

Governance
Which type of DevOps and controls (testing) for each application type

Tools
DevOps orchestrator, Integration to Source Control, Ticketing tools, DEVSECOPS tools

Cooperation between Development and Infra\Ops departments is crucial in the success of DevOps CoE

COPING WITH IT COMPLEX ENVIRONMENT

יום ד' 27.10.21

10:00

לקוחות נכבדים,

סביבות ה-IT Eenterprise, מורכבות עד סבוכות ובהם ציודים פיזיים ורכיבי תוכנה בכמויות עצומות שנמצאים בארגון שנים ארוכות.

למרות המאמצים הרבים, ארגונים רבים עדיין מתקשים לקבל תמונה מלאה על מלא רכיבים אלו, מידת השימוש בהם והקשרים ביניהם.

הקושי להגיע לתמונה מלאה גורם לפגיעה בזמינות, ביזבוז בפיתוח מחדש (חוסר reuse), פגיעה ב-compliance (כמו שימוש בתוכנה שלא נרכשה) פגיעה באבטחה (כי לא יודעים שמשתמשים ברכיבים שאינם מאובטחים מספיק), איטיות בביצוע משימות ה-IT וספציפית במשימות אינטגרציה, ועוד ועוד.

עם המעבר לארכיטקטורות מודרניות (מעבר ל-microservices וקונטיינרים) מספר רכיבי התוכנה יגדל באופן משמעותי ו"מלאות התמונה" תקטן עוד יותר והענן ההיברידי מוסיף גם הוא על מורכבות זו.

הצטרפו אלינו לשולחן עגול וירטואלי בו נדון באתגרים, בכלים והפתרונות הקיימים.

10:00-10:30	Opening **Pini Cohen**, EVP & Senior Analyst, CTO, STKI
10:30-11:00	The Modernized IT **Itay Mesholam**, Field CTO, Dell Technologies EMEA Ser
11:00-11:30	**Open discussion** • What is the level of effort needed for keeping good IT w • What are the most important information needed for • What are the tools and processes that can help? • How important is the mapping of business appl virtual IT?

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STKI Webinar:
Coping with Complex IT Environment 27.10.21

CTO's Architects, Development, Infra & Operations

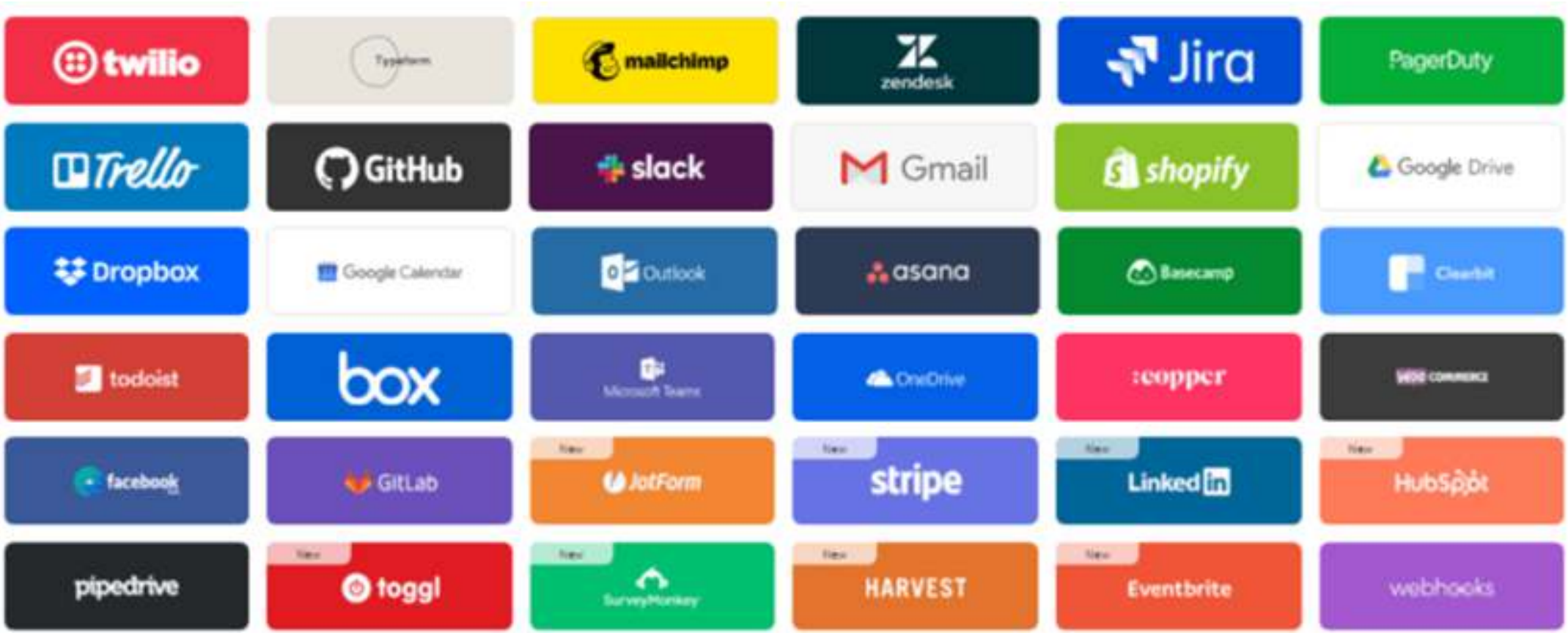
Zero Trust CoE

Zero Trust :the organization has no perimeters
“Never trust – Always verify”*

What should we verify?

- The user's identity (now)
- The device (now)
- The network (now)
- What is transferred (data, docs, web) - now
- Role-based access control (process, port, protocol) – preferably via proxy – no network access

Who is the user in many clouds?



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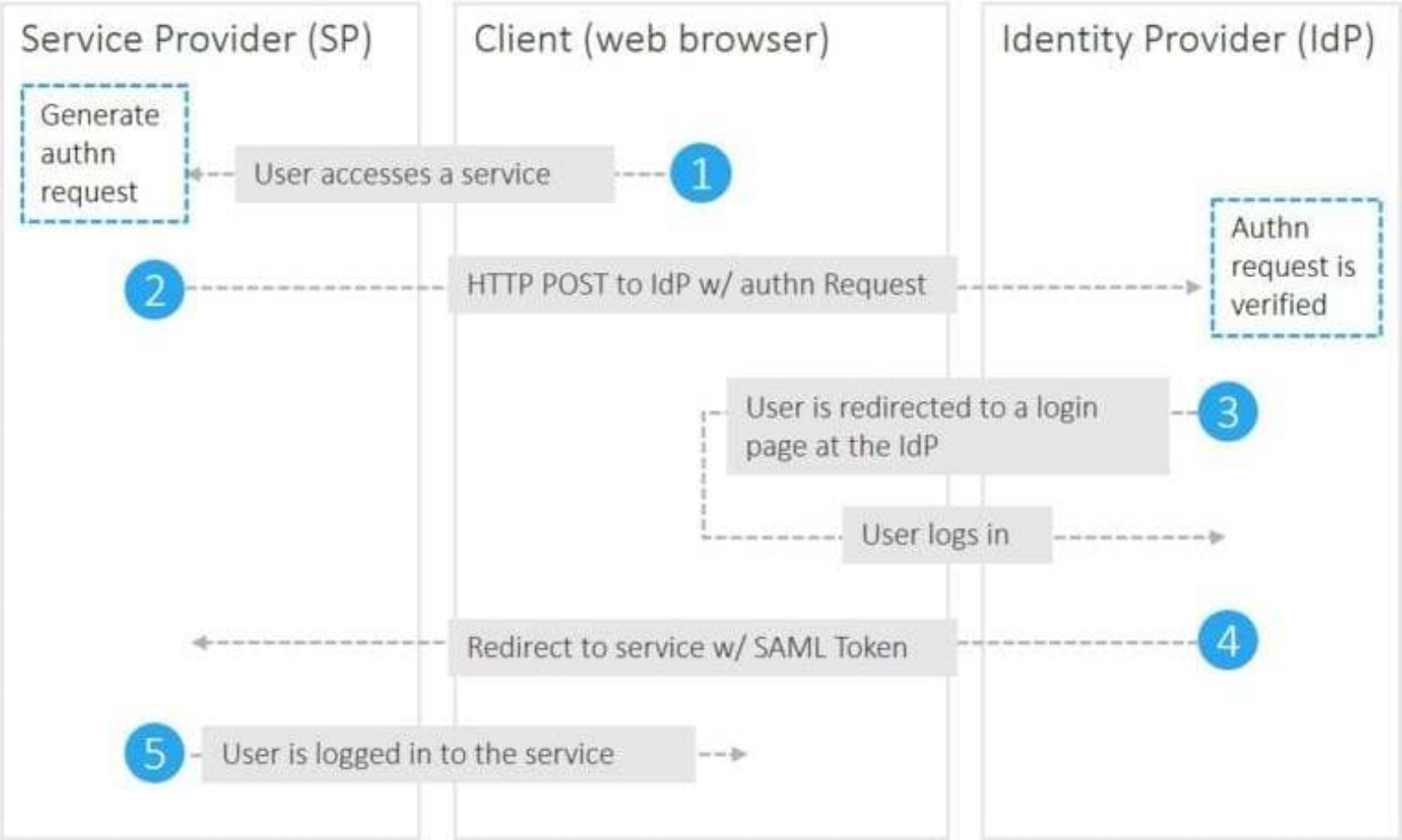
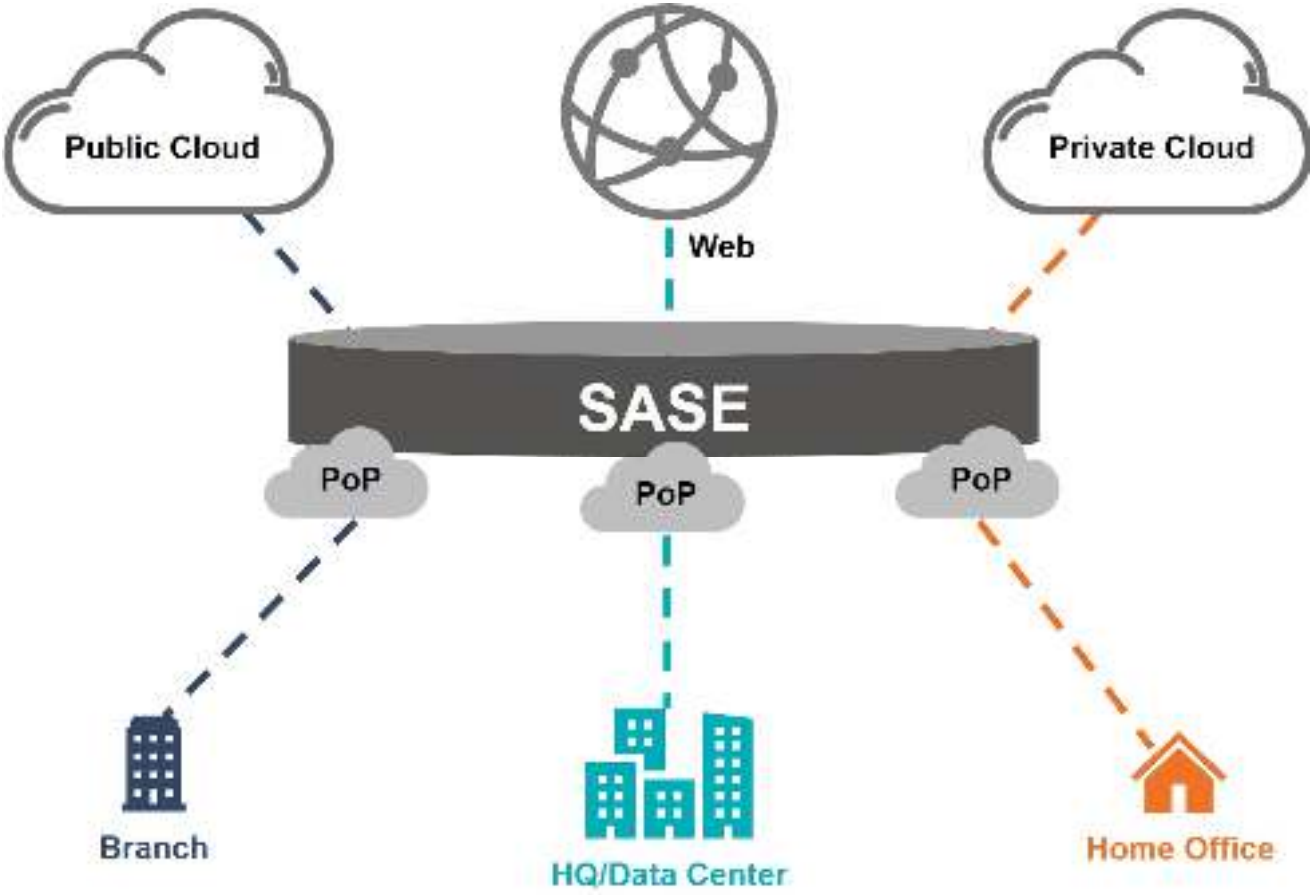
Cloud Identity Services principals



Possible solution for Zero Trust – SASE – Secure Access Service Edge



SASE capabilities

Close “employees WIFI” stay with “guest WIFI”

Close the internal network

longer term

Processes

FINOPS, cloud

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Use Cases

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Priorities in cloud migra

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Zero Trust is such a big change for Cyber Security – everybody should take a big breath

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The End:

Implement while doing fun!!

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