SECR

Software Engineering Conference Russia 2018

Role of Solution Architect in a Software Project

Vladimir Ivanov

EPAM Systems

Disclaimer

Everything presented here is a product of production experience and research findings and provided as is. However, you can use it as we did.

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About me

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About me

—Vladimir Ivanov - Lead Software Engineer

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—Primary Skill: Android

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—React Native Experience > 2 year

EPAM Systems

About me

— Vladimir Ivanov - Lead Software Engineer

— Primary Skill: Android

— React Native Experience > 2 year

— Doing some Solution Architecture from time to time

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About me

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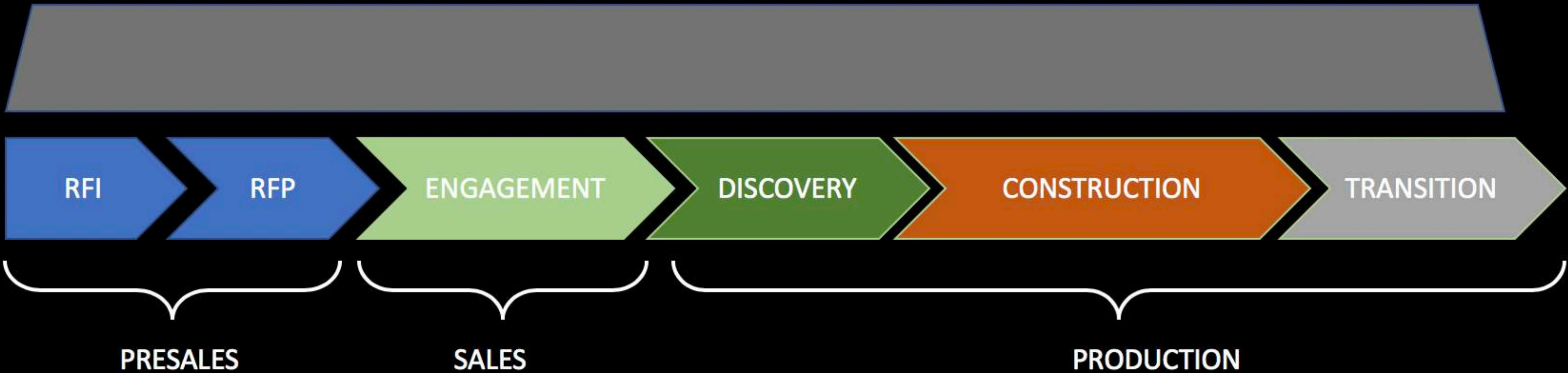
— Certified Google Cloud Architect

About me

—Vladimir Ivanov - Lead Software Engineer

—Primary Skill: Android

—React Native Experience > 2 year

—Doing some Solution Architecture from time to time

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Let's get to know each other!

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RFI

Request for information

RFI

RFI

— Answer the questions

RFI

— Answer the questions

— Contact the architects of related fields

RFI

—Answer the questions

—Contact the architects of related fields

—Perform the required research

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RFP

Request for proposal

RFP

RFP

—Understand the business value

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RFP

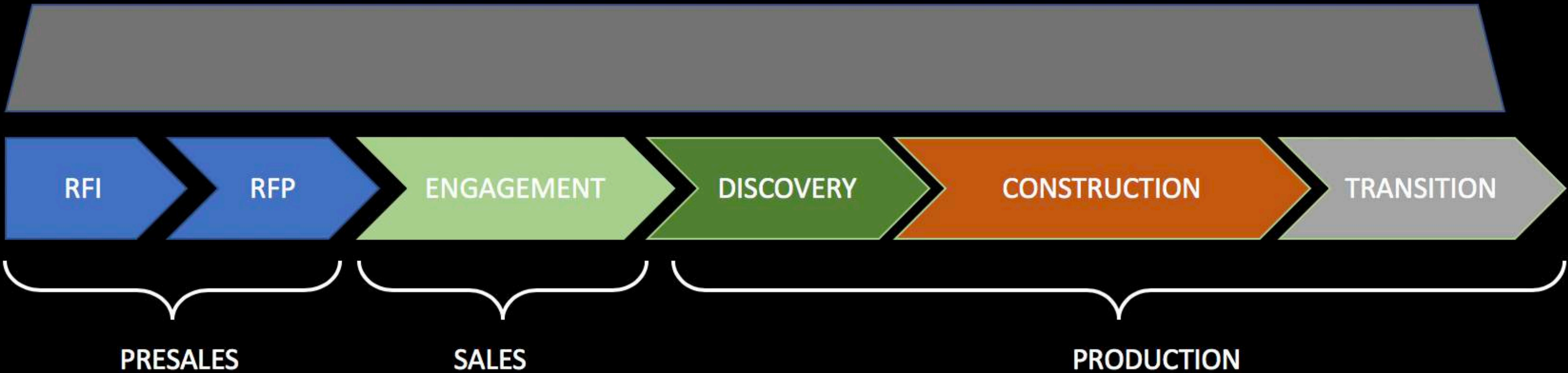—Understand the business value

—Create a solution architecture

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RFP

—Understand the business value

—Create a solution architecture

—Understand which teams are necessary to implement that solution

SOLUTION ARCHITECT

RFI	RFP	ENGAGEMENT	DISCOVERY	CONSTRUCTION	TRANSITION

PRESALES   SALES   PRODUCTION

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Discovery

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Requirements gathering

Requirements gathering

—Functional

Requirements gathering

— Functional

— Non-functional

Requirements gathering

—Functional

—Non-functional

—Constraints

Functional requirements!

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Functional requirements!

— The system should allow an administrator to login

Functional requirements!

—The system should allow an administrator to login

—The system should show the list of users

Non-functional requirements

Non-functional requirements

— The application should use TLS 1.2 for all connections involving user-data

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Non-functional requirements

— The application should use TLS 1.2 for all connections involving user-data

— The application should open the page under 0.5 second

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Non-functional requirements

— The application should use TLS 1.2 for all connections involving user-data

— The application should open the page under 0.5 second

— The application should be available 23 hours per day

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Constraints

Constraints

— The app should be deployed to customers' Azure cloud

Constraints

— The app should be deployed to customers' Azure cloud

— The app should implement 152 federal law

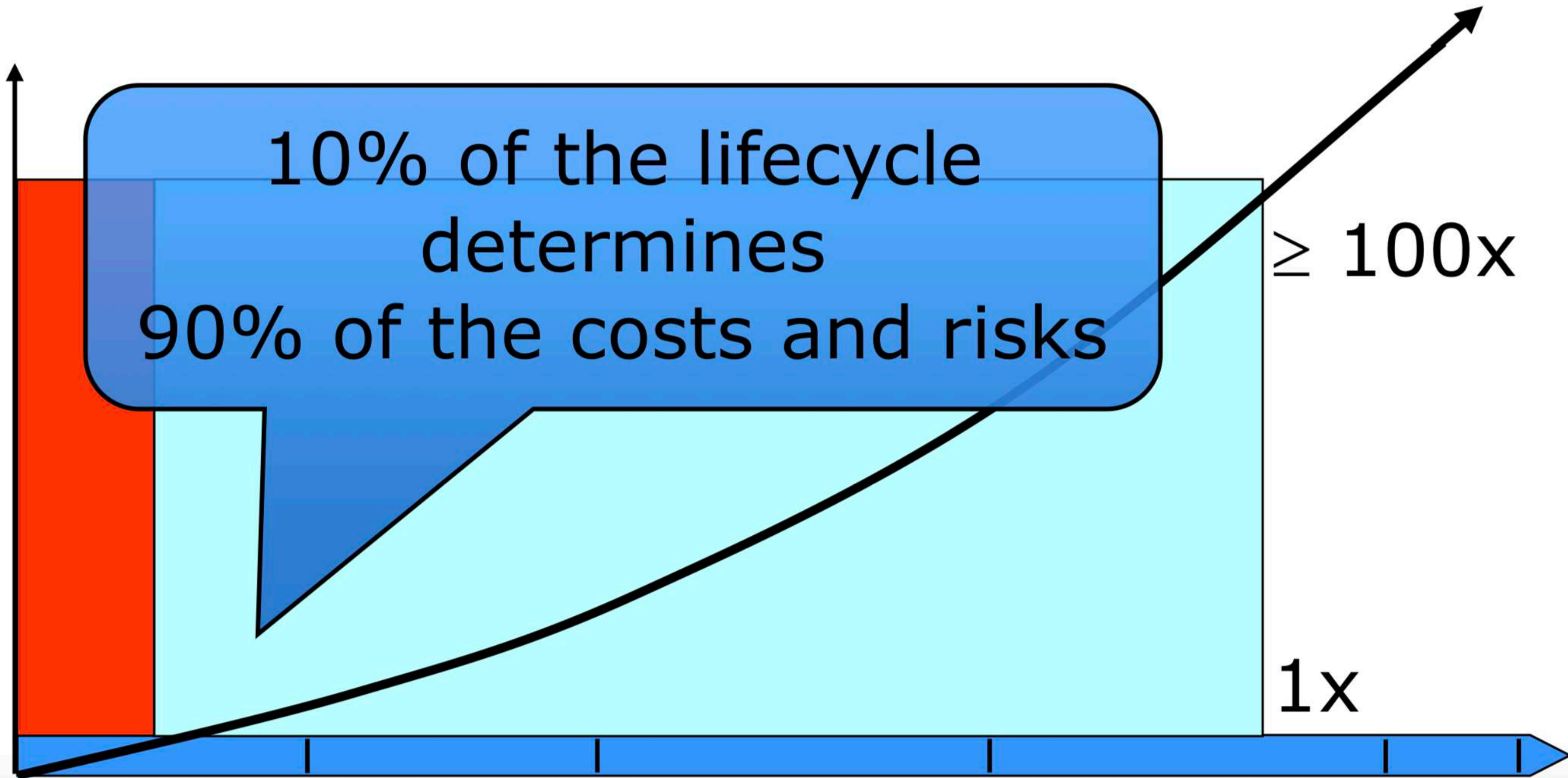# Some of them will change the architecture of the solution.

Every additional 9 of availability doubles the complexity of a target system.

Source of requirements

Source of requirements

— Stakeholders

Stakeholders are the people who have an interest in the project

Stakeholders are the people who have an interest in the project

—Customer business representatives

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—Customer business representatives

—Delivery organization business representatives

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Stakeholders are the people who have an interest in the project

—Customer business representatives

—Delivery organization business representatives

—Technical folks from both sides

Stakeholders are the people who have an interest in the project

—Customer business representatives

—Delivery organization business representatives

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—End-users

Stakeholders are the people who have an interest in the project

—Customer business representatives

—Delivery organization business representatives

—Technical folks from both sides

—End-users

—Competitors

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In order to gather requirements you need to talk to stakeholders.

The stakeholders identification is one of the main responsibilities of a Solution Architect.

What's an architecture?

The set of structures needed to reason about the system, which comprises software elements, relations among them, and properties of both. [2]

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[2] Software Architecture in Practice, 3rd Edition, Bass, Clements, Kazman, Addison-Wesley

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What the hell it means?

What the hell it means?

— Architecture is a key to the system properties, an end user is concerned about

What the hell it means?

—Architecture is a key to the system properties, an end user is concerned about

—Or product owner thinks so

What the hell it means?

— Architecture is a key to the system properties, an end user is concerned about

— Or product owner thinks so

— There are no bad or good architectures; there are ones that fit the target system properties

ASRs

Target system properties which affects architecture are unsurprisingly called architecturally significant requirements.

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How to identify ASR?

How to identify ASR?

—From requirements documents

How to identify ASR?

—From requirements documents

—By interviewing stakeholders

How to identify ASR?

— From requirements documents

— By interviewing stakeholders

— By understanding the business goals

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How to identify ASR?

—From requirements documents

—By interviewing stakeholders

—By understanding the business goals

—Utility tree!

Utility tree

Under normal load the web page is displayed within 0.5 seconds

Under normal load update of a simple entity takes < 1 seconds in 95% cases

Critical alerts are displayed in < 1 second

A message acknowledged by the system will not be lost

Sensor reading will be acknowledged in 99.99% cases

In case of system failure new instanc is up in < 30 seconds

System UI compies to EU Standards

Response time	Under heavy load (> 1000 parallel users) update of a simple entity takes < 2 seconds in 95% of cases
	Under normal load the web page is displayed within 0.5 seconds
	Under normal load update of a simple entity takes < 1 seconds in 95% cases
Latency	Critical alerts are displayed in < 1 second
Data Loss	A message acknowledged by the system will not be lost
	Sensor reading will be acknowledged in 99.99% cases
Recover time	In case of system failure new instanc is up in < 30 seconds
Compliance	System UI compies to EU Standards
	System UI complied to 508 act
	New user shall be addable in < 10 minutes by operator
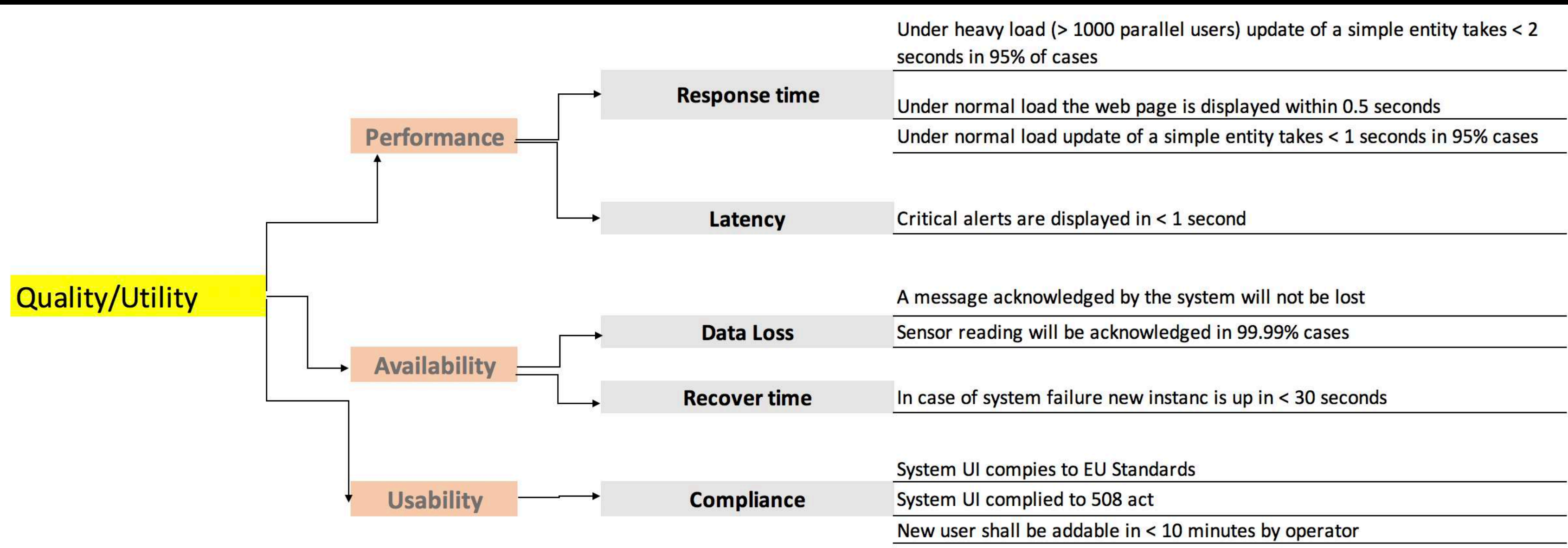
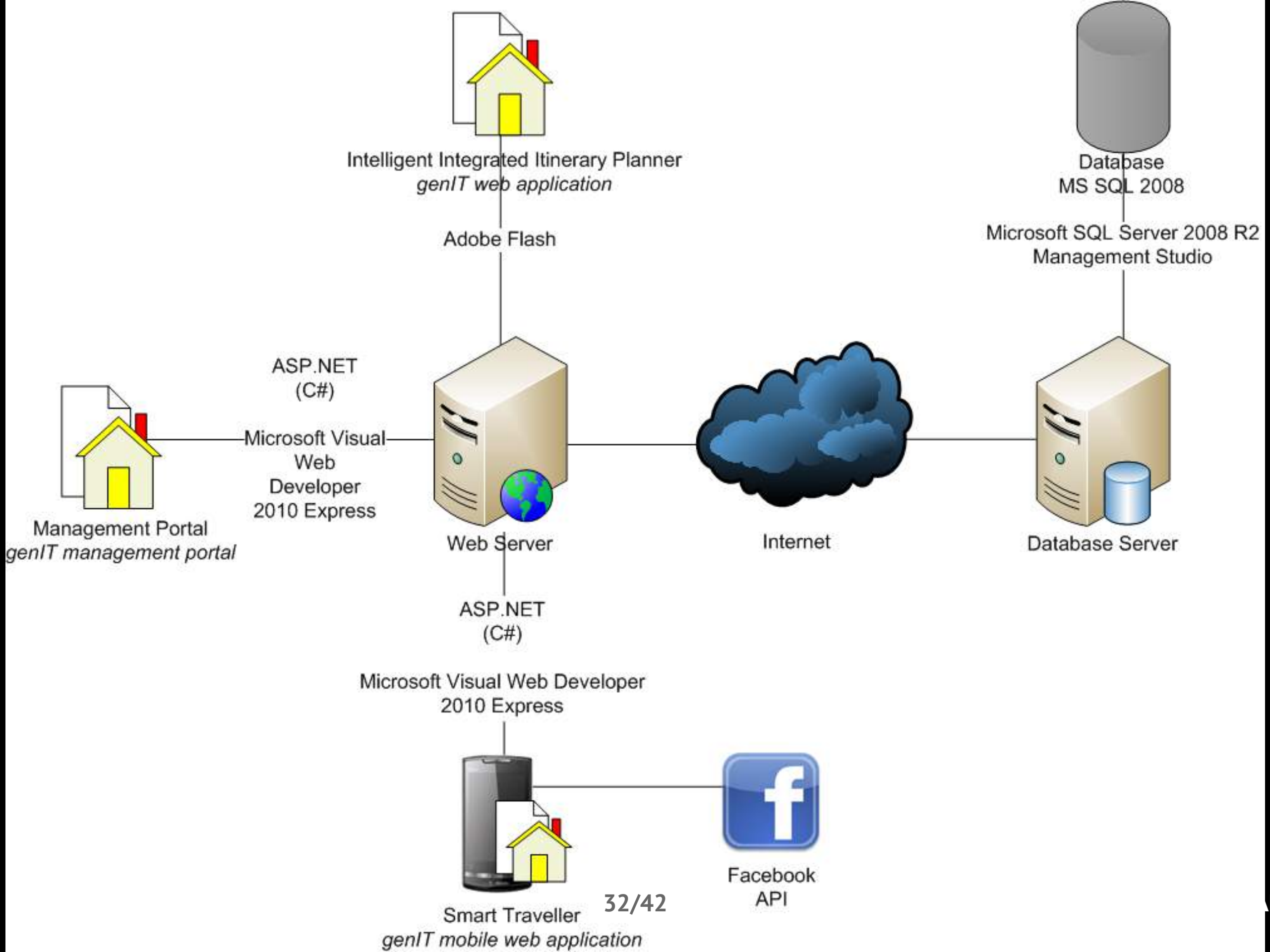# How to document architecture?

How to document architecture?

— Non-formal notations with general purpose diagramming
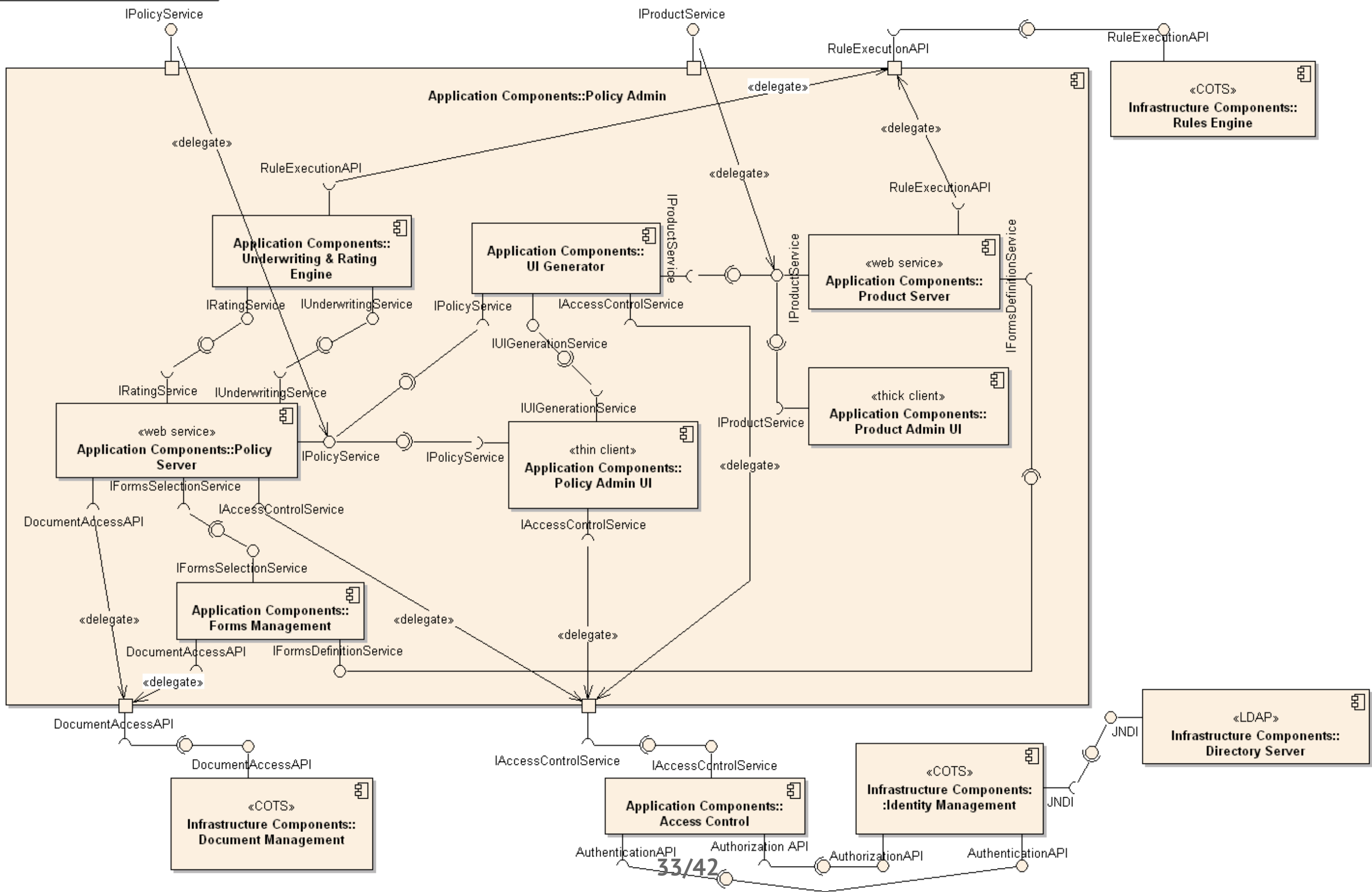
How to document architecture?

— Non-formal notations with general purpose diagramming

— Semi-formal notations with standardized notation

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How to document architecture?

— Non-formal notations with general purpose diagramming

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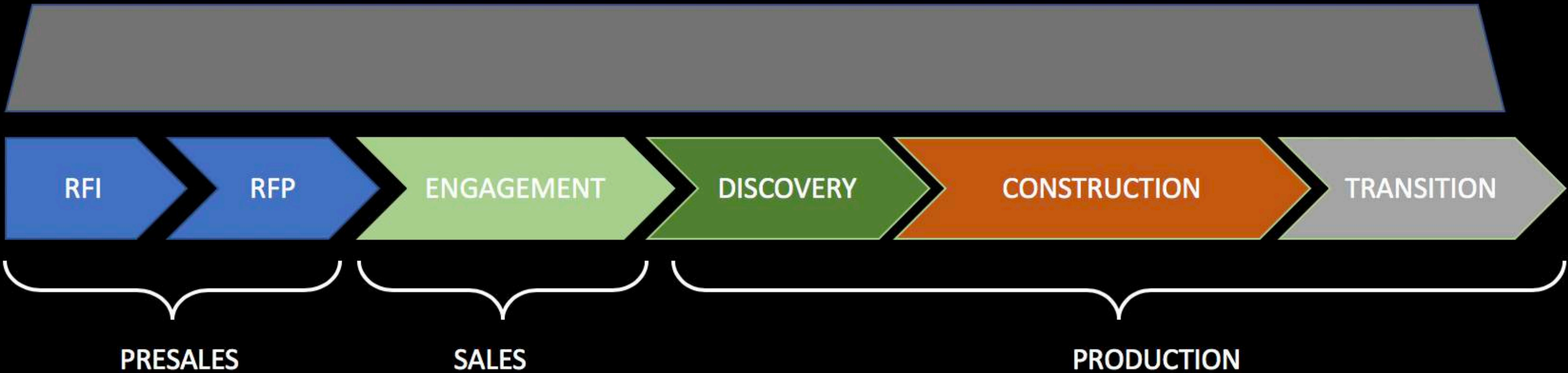
— Formal notations with precise semantics

Intelligent Integrated Itinerary Planner
genIT web application

Adobe Flash

Database
MS SQL 2008

Microsoft SQL Server 2008 R2
Management Studio

ASP.NET
(C#)

Microsoft Visual
Web
Developer
2010 Express

Management Portal
genIT management portal

Web Server

Internet

Database Server

ASP.NET
(C#)

Microsoft Visual Web Developer
2010 Express

Facebook
API

32/42

Smart Traveller
genIT mobile web application

Documenting the architecture is the third most important activity for an SA.

SOLUTION ARCHITECT

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PRESALES — SALES — PRODUCTION

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Construction

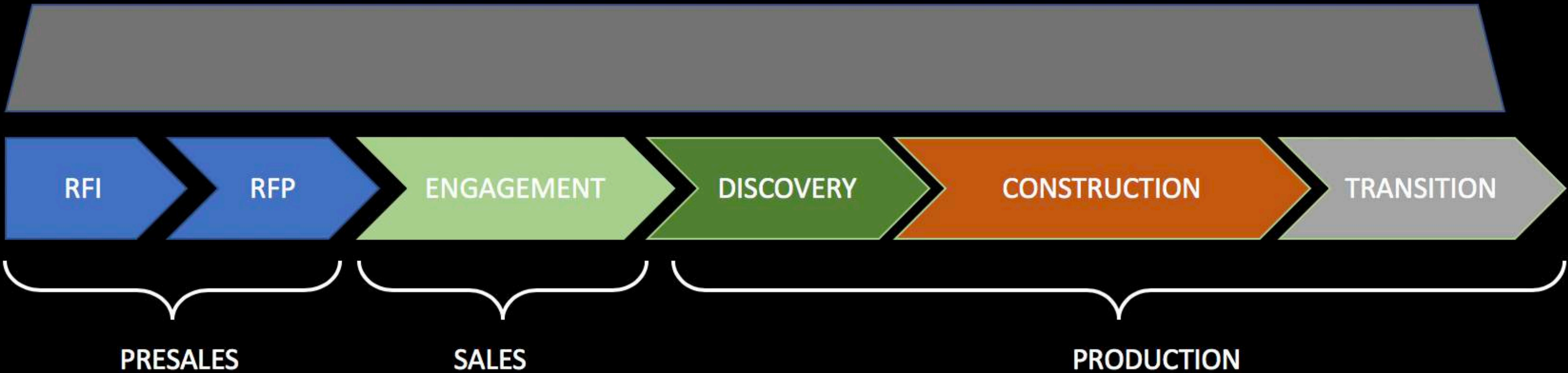# Construction

—Bootstrap the development

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Construction

— Bootstrap the development

— Define and setup quality gates

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Construction

—Bootstrap the development

—Define and setup quality gates

—Create PoCs

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Construction

— Bootstrap the development

— Define and setup quality gates

— Create PoCs

— Share knowledge

Transition

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Transition

— To production

Transition

— To production

— To other team

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So...

The person who identifies stakeholders, gathers ASRs, builds the architecture, shares it and bootstraps some of the systems components is usually called Solution Architect.

In EPAM

Solution Architect:

In EPAM

Solution Architect:

—Practical experience with 10+ projects in relevant engineering domain.

In EPAM

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— Practical experience with 10+ projects in relevant engineering domain.

— Good knowledge of architectural theory out of primary technology domain context bounds.

In EPAM

Solution Architect:

— Practical experience with 10+ projects in relevant engineering domain.

— Good knowledge of architectural theory out of primary technology domain context bounds.

— Ability to identify stakeholders and adopt communication style to particular role (effectively communicate with peer client architects and management).

Links

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Links

— Books is Software Architecture:
https://medium.com/@nvashanin/books-in-software-architecture-6ad974e524ce

Links

—Books is Software Architecture:
https://medium.com/@nvashanin/books-in-software-architecture-6ad974e524ce

—Amazon Cloud Architect Associate:
https://www.udemy.com/aws-certified-solutions-architect-associate/

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— Google Cloud Architect Professional:
https://www.coursera.org/specializations/gcp-architecture

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