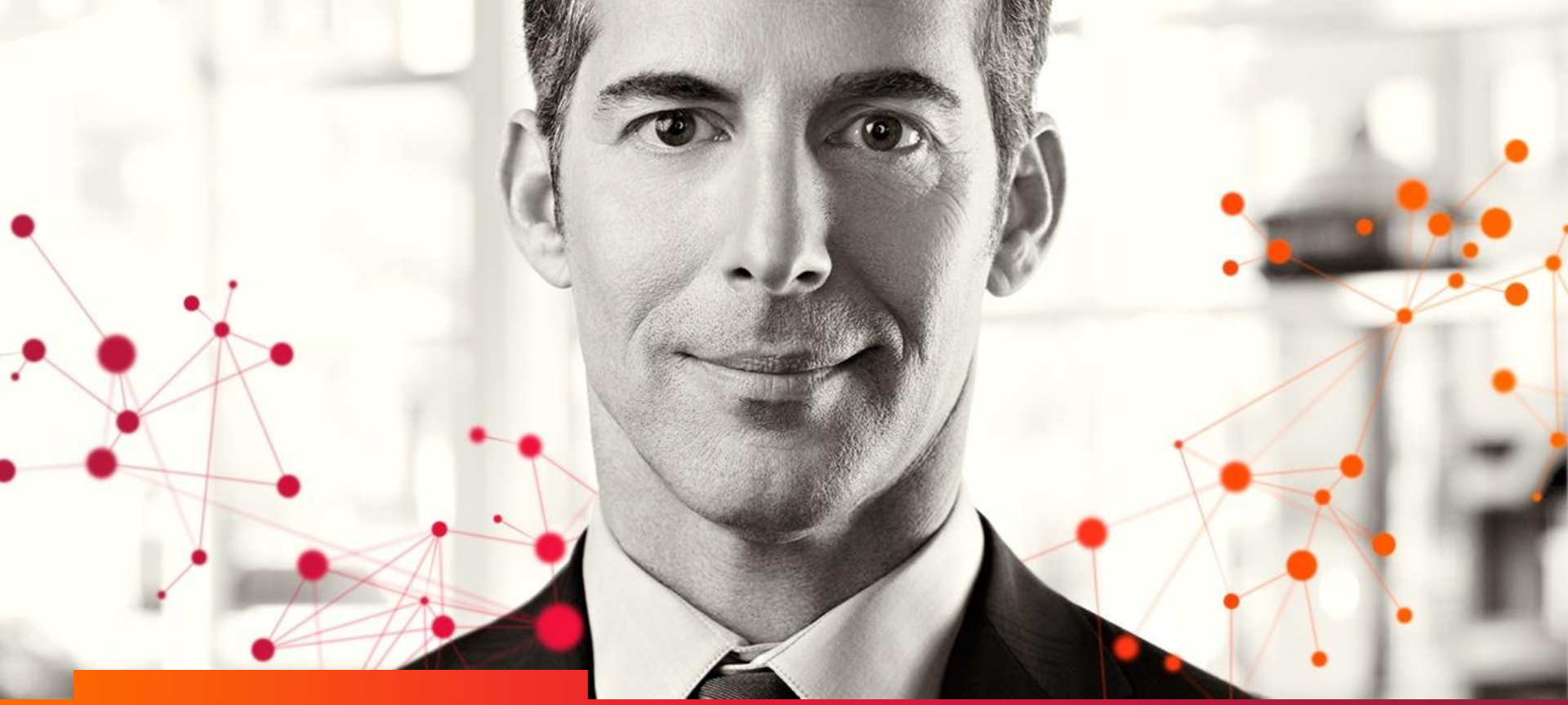

# An introduction API testing with SoapUI

Vincent Vonk
12-06-2018



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# Agenda for the next 50 minutes

- What is SoapUI?
- ~~What are Web APIs?~~
- Why test on API level?
- What can SoapUI do?
- Types of Web APIs
- Short explanation about SOAP
- Why is SoapUI currently so popular?
- SoapUI best practices
- Mini SoapUI workshop
- The end/time for questions




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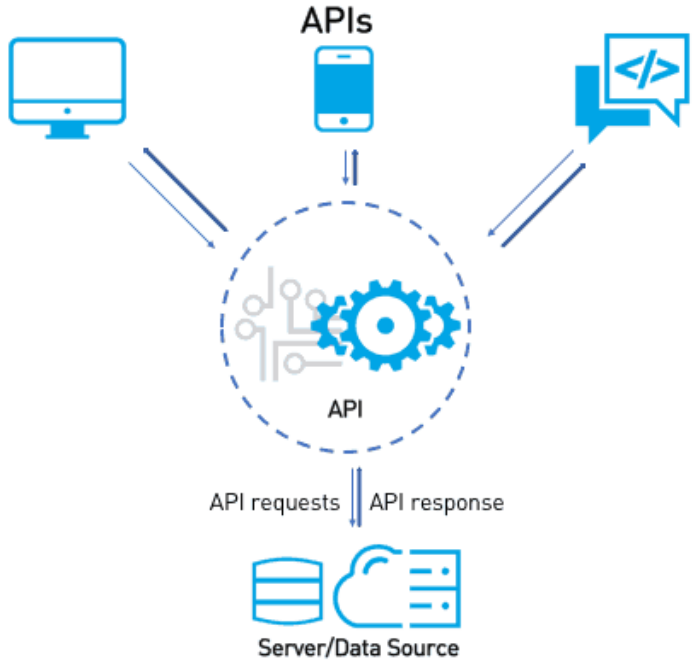
# What is SoapUI?

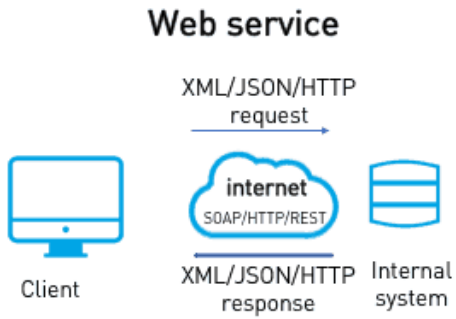
- SoapUI is a free and open source cross-platform functional testing tool
- SoapUI allows you to easily and rapidly create and execute automated functional, regression, compliance/security, and load tests for Web APIs
- SoapUI can be used out of the box for the two most used Web APIs types

# What are Web Application Programming Interfaces?

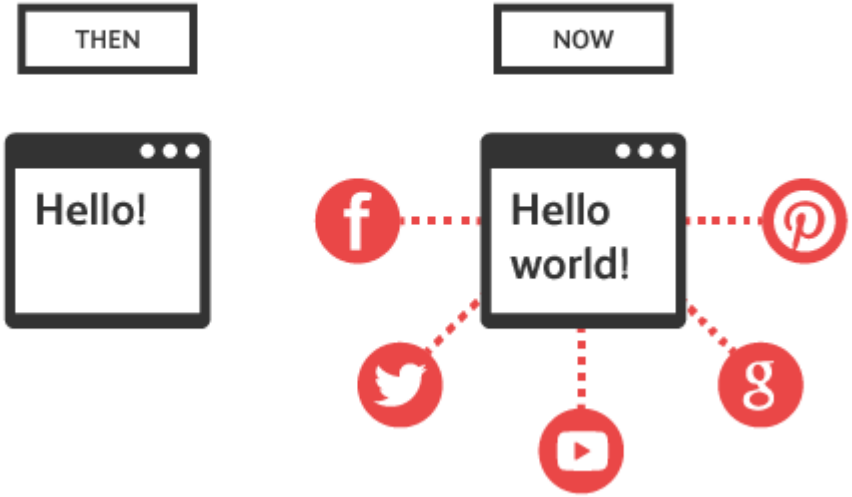
- An **interface to** a **software component** that can be **invoked** at a distance **over a** communications **network using standards based technologies**

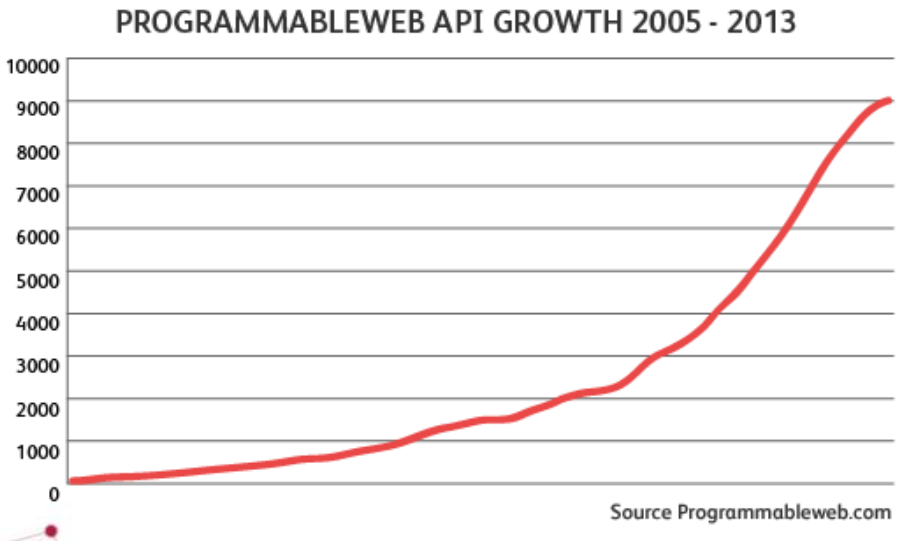
- Web APIs ≈ Web Services in this presentation

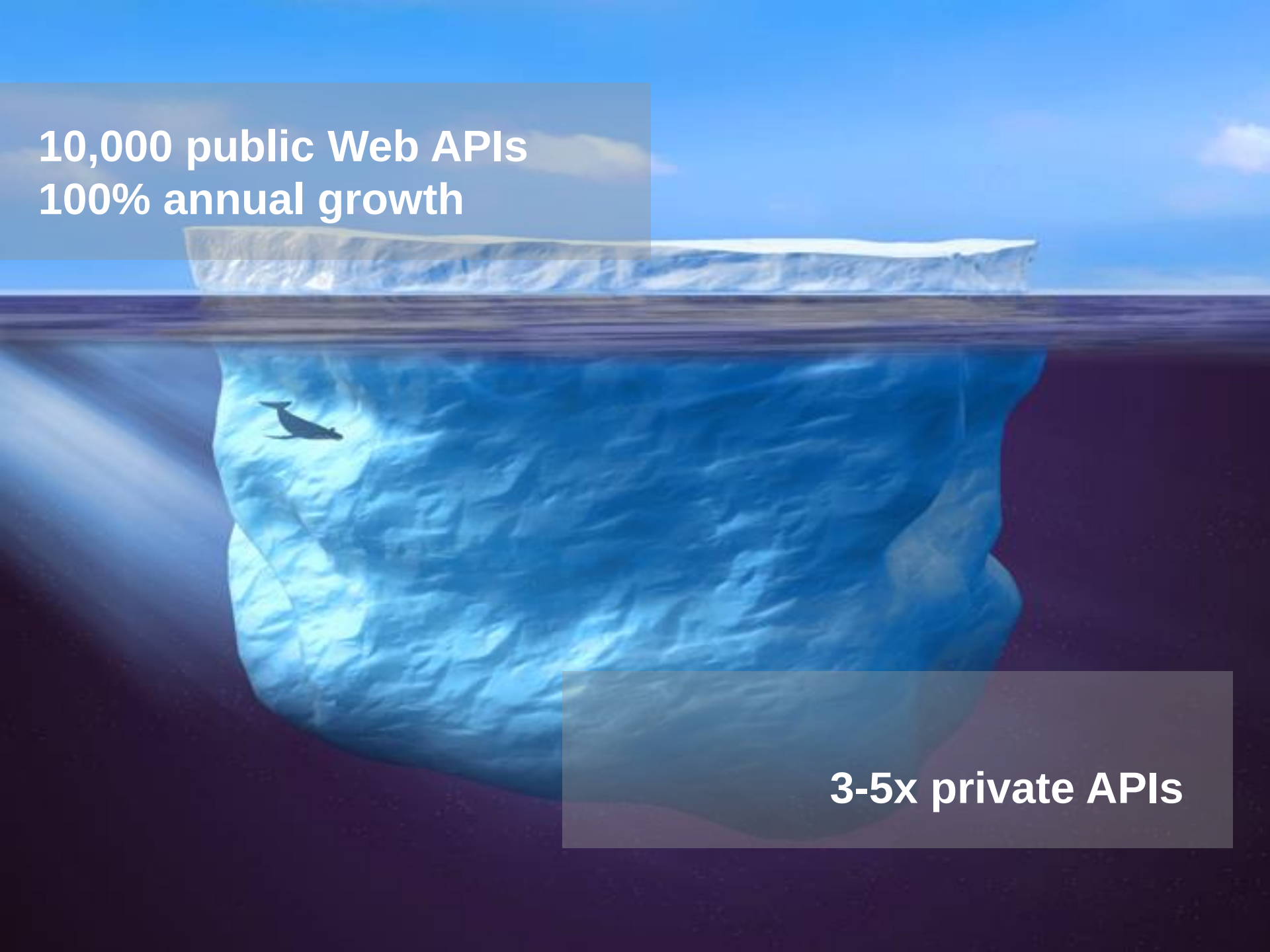


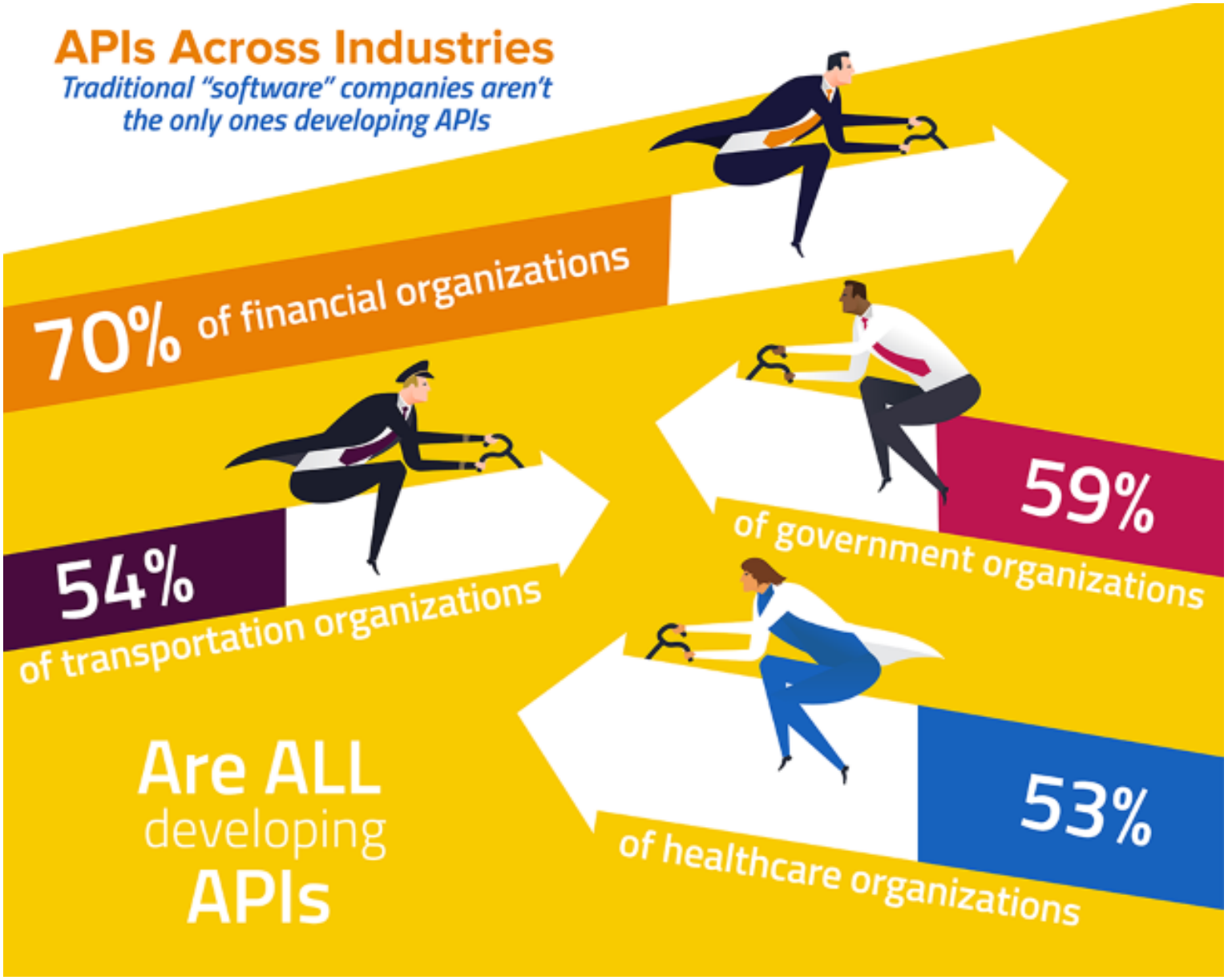



# Popularity Web APIs




10,000 public Web APIs
100% annual growth
3-5x private APIs


APIs Across Industries
Traditional "software" companies aren't the only ones developing APIs
70% of financial organizations
59% of government organizations
54% of transportation organizations
53% of healthcare organizations
Are ALL developing APIs

# Web API testing example

Your Application
Provides a GUI for users to
Enter data and
internally generate XML
and call a Web API

XML
Generated
by your
system
internally

WEB
API

Takes the input
XML,
processes it
and sends a
return XML
message



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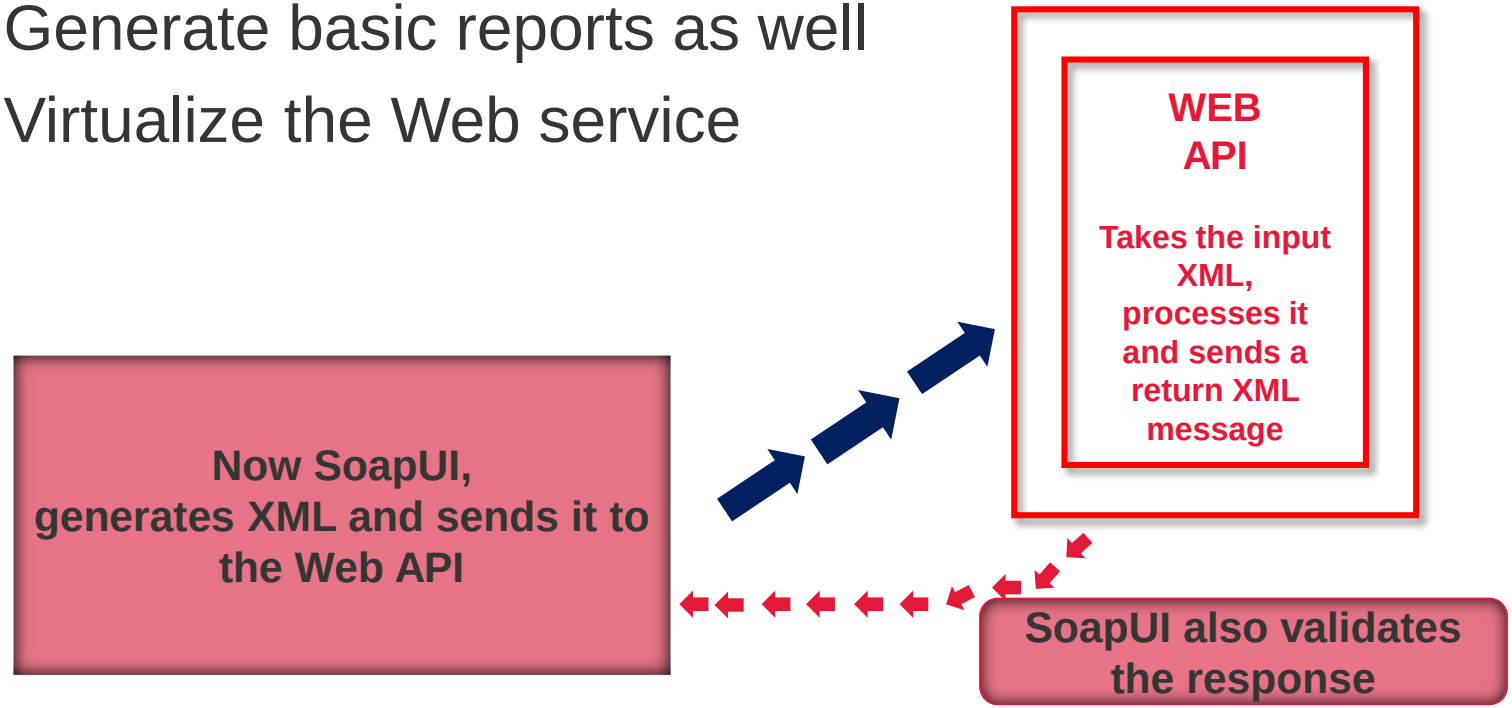
# What can SoapUI do?

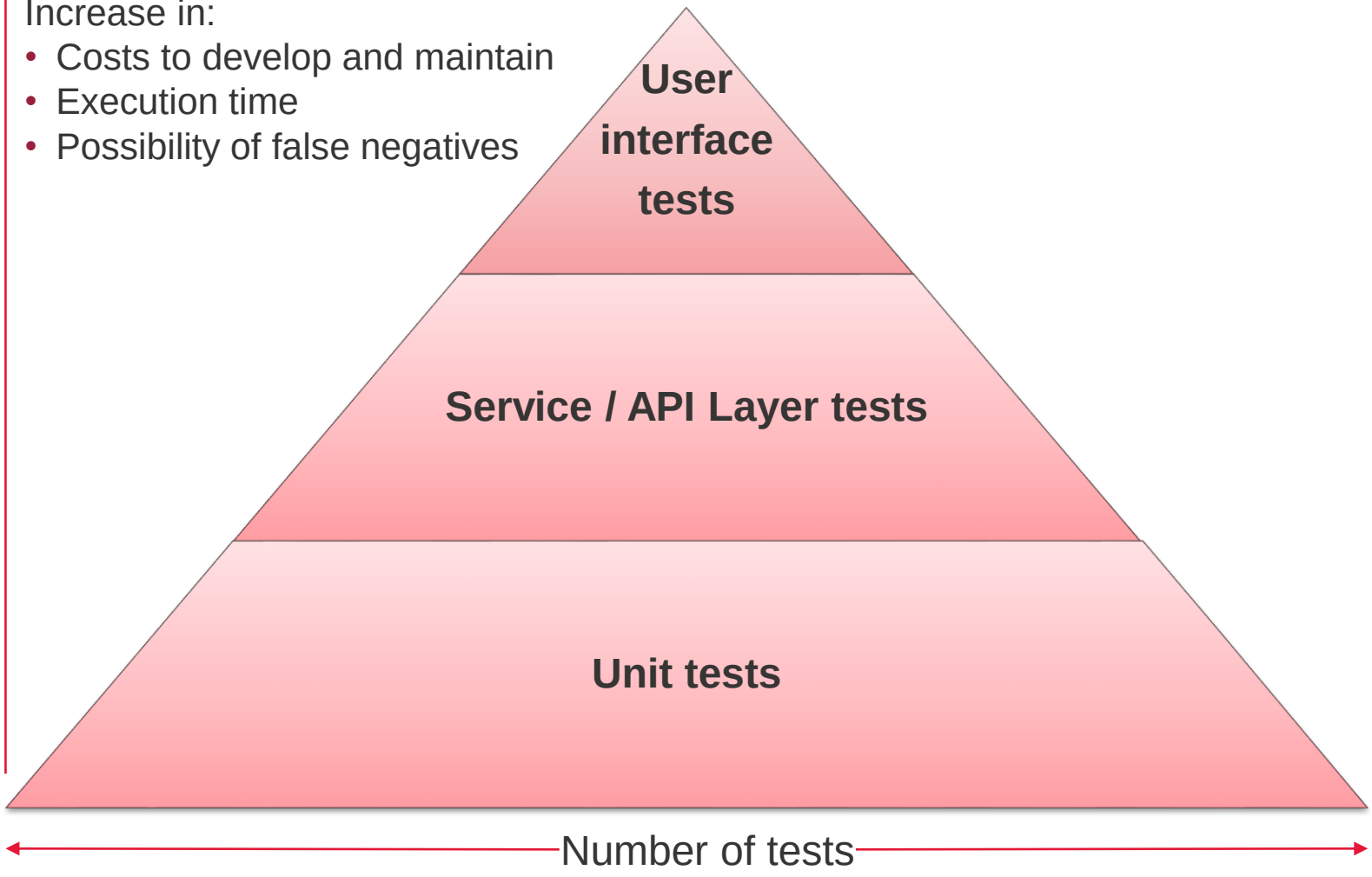
- Generate request on behalf of our input data and send it to Web API engine
- Receive data coming from Web API and validate data
- Automate the above (and also put in to load / security tests)
- Generate basic reports as well
- Virtualize the Web service



# Why test on Web API level?

Increase in:

- Costs to develop and maintain
- Execution time
- Possibility of false negatives




Mike Cohen's Testing Pyramid

# Types of Web APIs

**SOAP**

→Conventional (2000)
→Heavy
→Enterprise applications
→XML - XML
→Service based

**REST**

→New Technology (2000)
→Light Weighted
→Internet applications
→HTTP – HTML, XML, JSON
→Resource based





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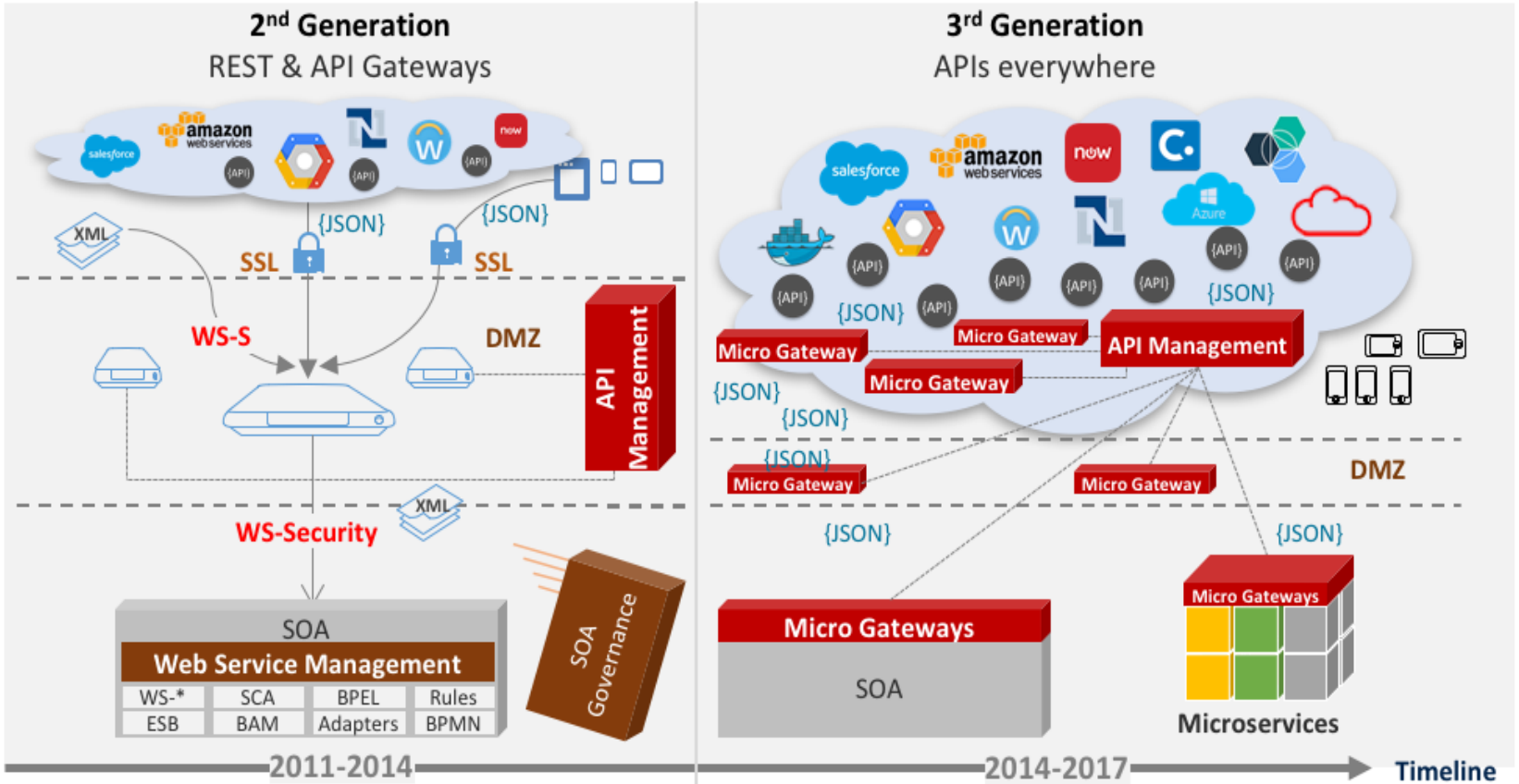
# Current Web API landscape




- Big push for cloud in large enterprises
- Data becoming federated
- RESTful APIs taking over SOAP services
- Early days of microservice architectures

- Second wave of cloud
- Data fully federated
- All about APIs
- Microservice architectures go mainstream



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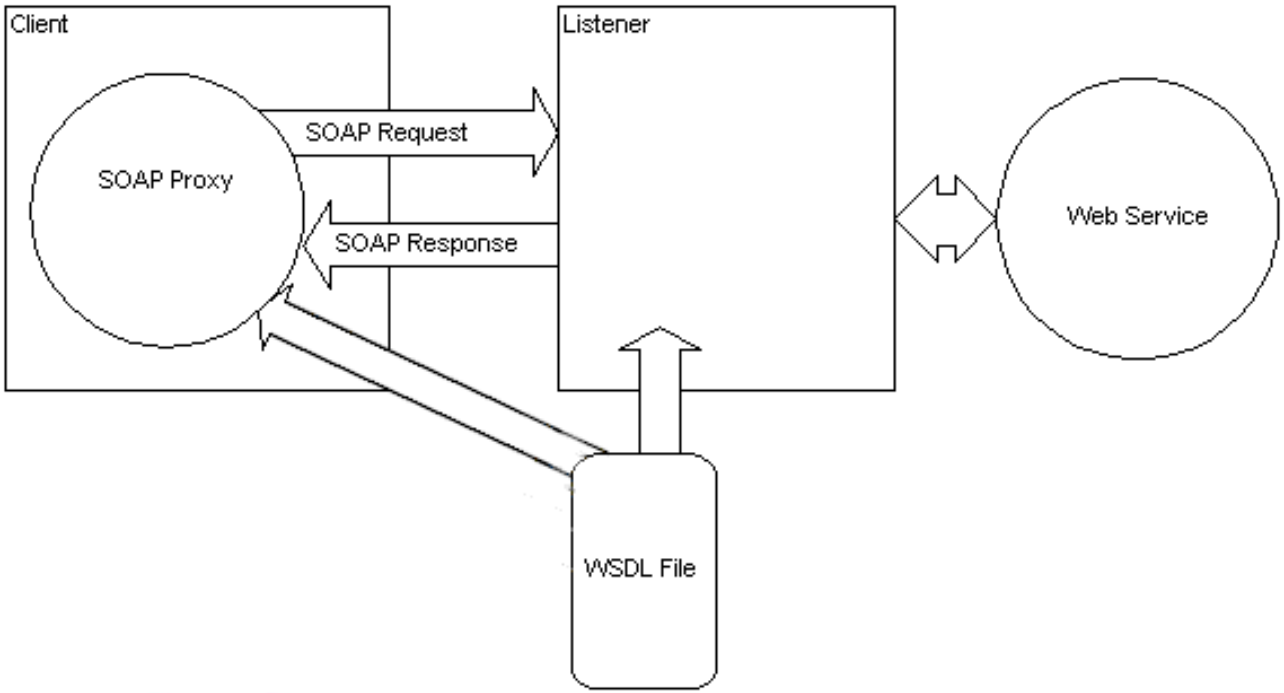
# SOAP

Simple Object Access Protocol

1. Use WSDL for description
2. SOAP is approach of protocols and standards
3. Works with operations



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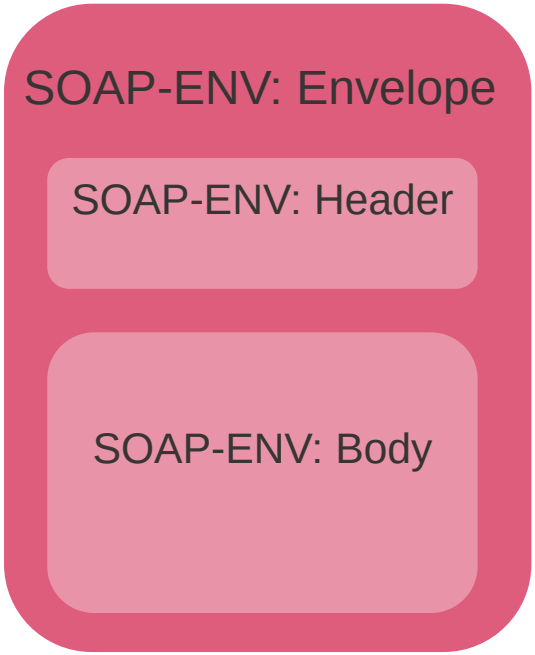
# SOAP Message

SOAP request example:

```
<soapenv:Envelope>
      <soapenv:Header/>
      <soapenv:Body>
            <tem:Add>
               <tem:intA>3</tem:intA>
               <tem:intB>5</tem:intB>
            </tem:Add>
      </soapenv:Body>
</soapenv:Envelope>
```




A SOAP message is an ordinary XML document containing the following elements:

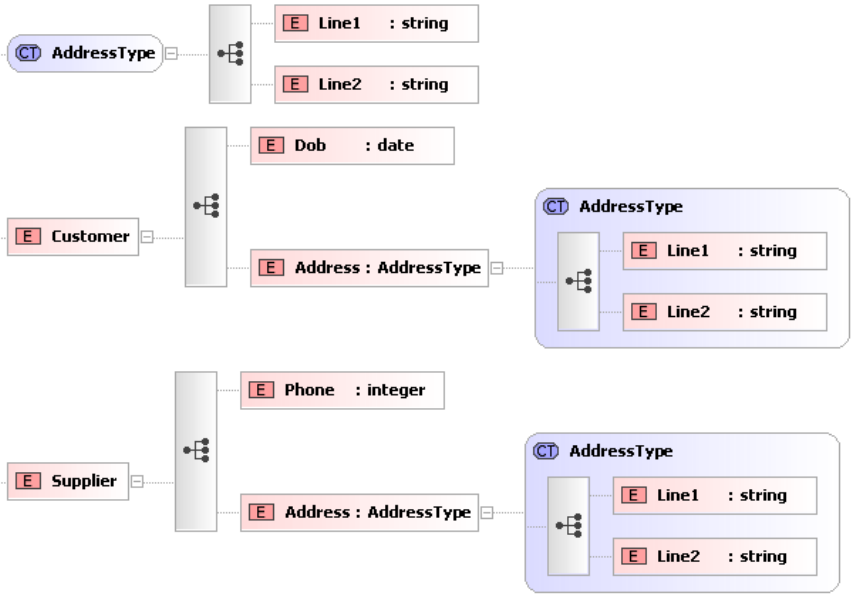
- An Envelope element that identifies the XML document as a SOAP message
- A Header element that contains header information
- A Body element that contains call and response information

# XML Schema

- XML Schema, fully called: W3C XML Schema Definition Language (XSD), is a language for describing the structure of XML-documents.

- In this language, schemas can be made for example, XML documents. By which those documents can be specified and validated formally, for example by XML validators.

* An XML document can be correct in respect of the overall XML standard, but nevertheless not valid with respect to a given XML schema.



# WSDL (Web Service Definition Language)

- When we start working on a Web API, we don't have an idea on:
  - What is the format of input that the Web API takes
  - What is the format of output XML generated by the Web API
  - What are the different services and operations that are exposed by the Web API

For SOAP all this information is mentioned in a XML formatted document called WSDL

We need this WSDL file for testing SOAP Web APIs



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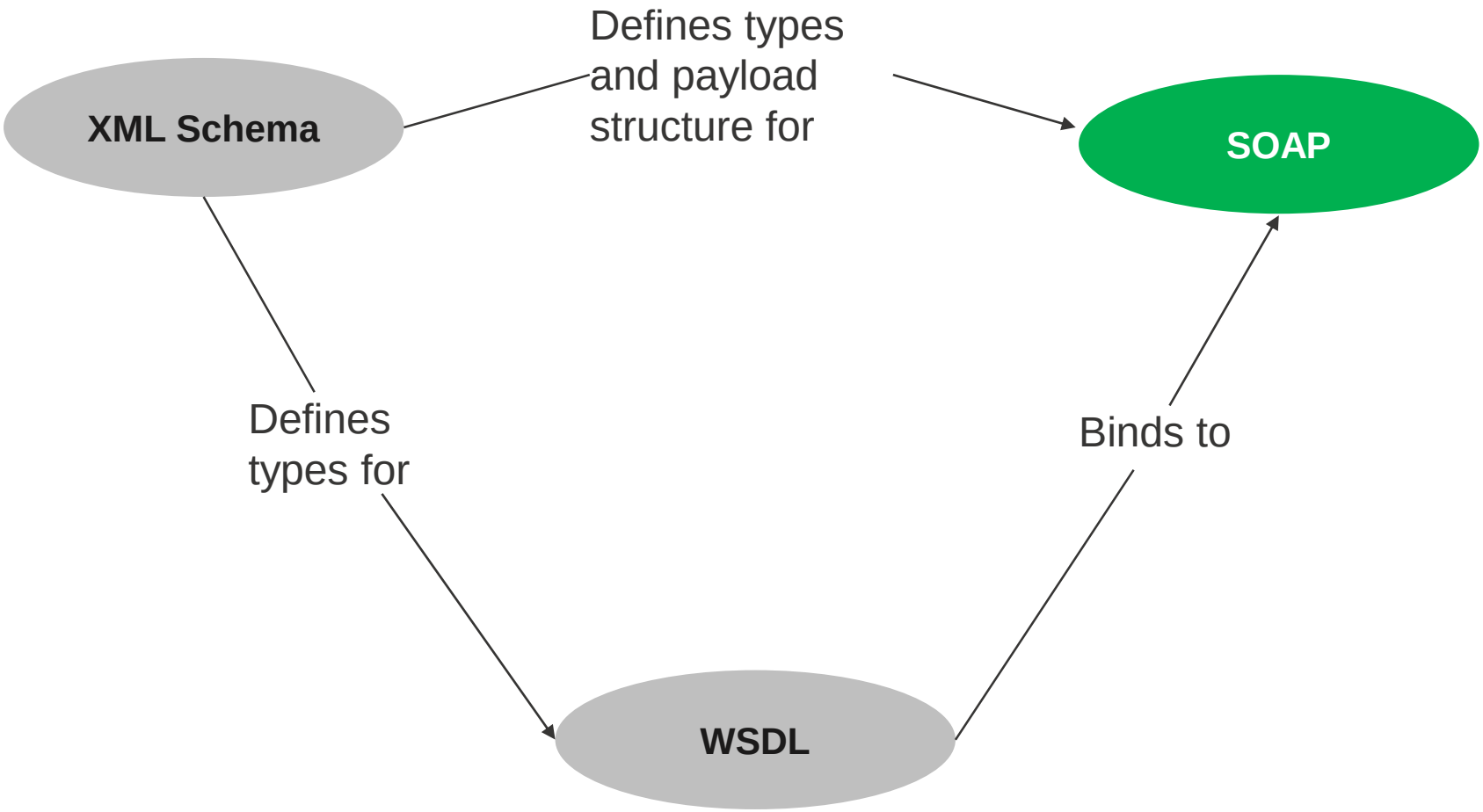
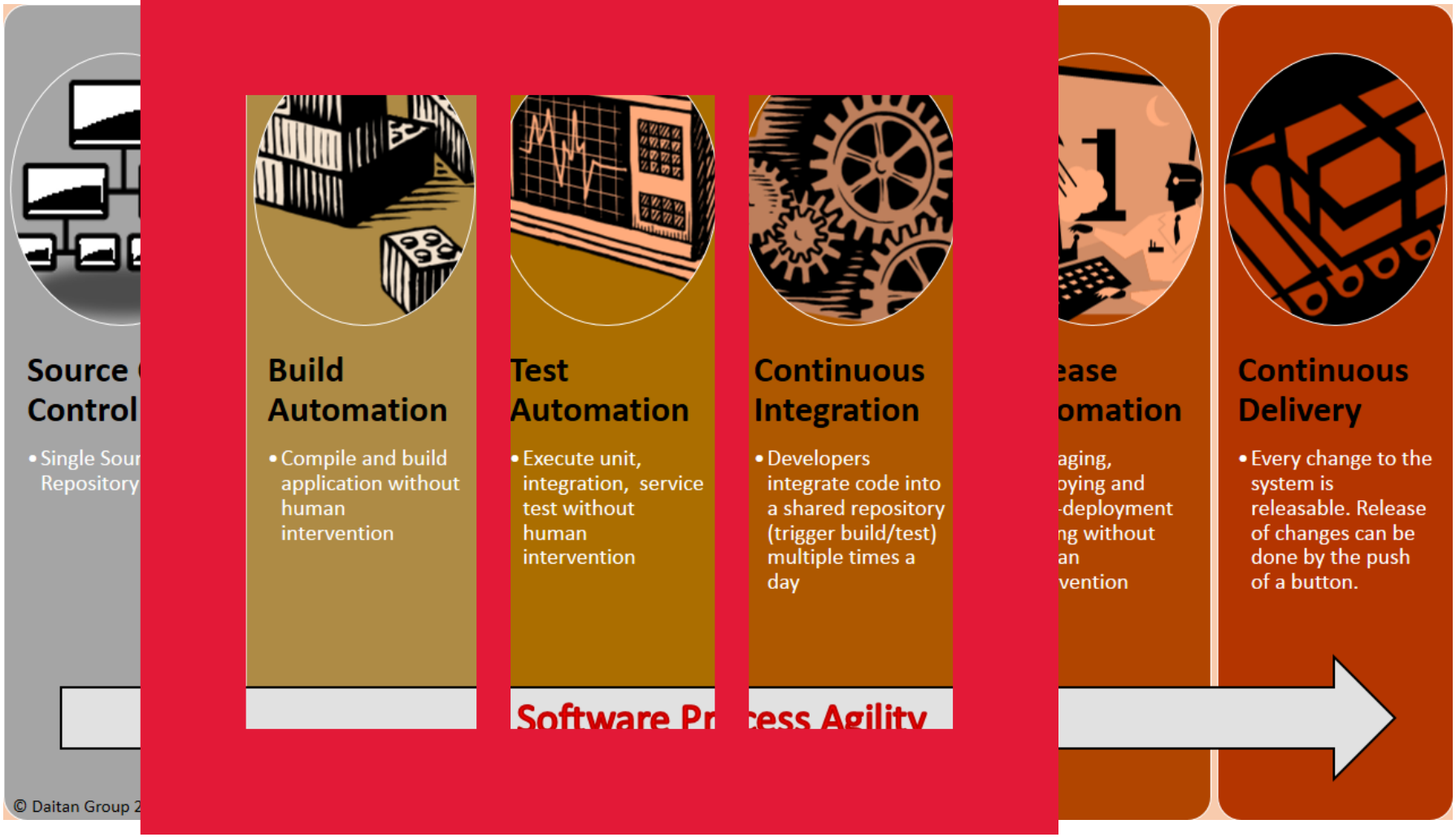
# XML schema relation



# SoapUI Features

- Functional Testing
- Service Simulation
- Security Testing
- Load Testing
- Technology Support
- Automation
- Analytics
- Recording
- Ecosystem

# Why is SoapUI currently so popular?



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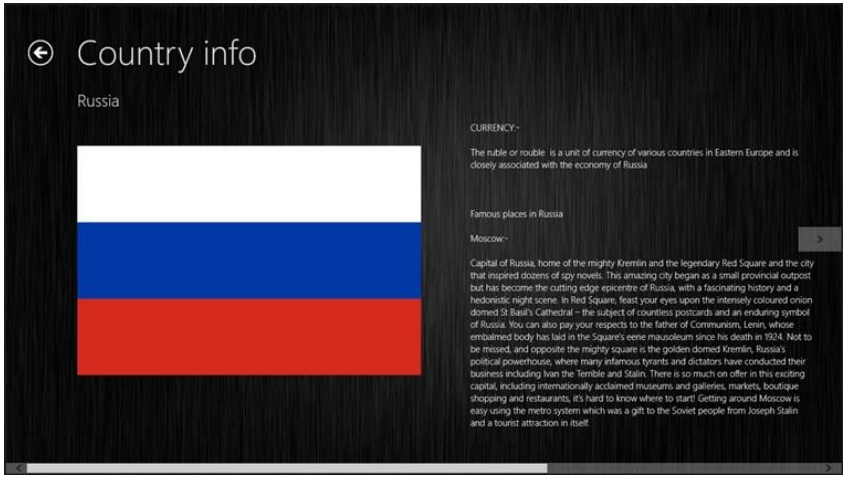
# SoapUI best practices

- First and foremost, start testing for the basic functionality before you start automating (the basic request-response is working)
- Group the test cases (in test suites) by test level/type or functionality/scenarios
- To maximize test coverage, create test cases for all possible Web API input combinations
- Test for failure and invalid parameters for how it handles unforeseen problems and loads making sure the API fails gracefully
- Add stress to the system through a series of Web API load tests
- Move the test data input and expected result outside of SoapUI
- Use Web API virtualization wisely
- Automate whatever you can (and good assertions are essential)

# Mini Workshop testing SOAP based Web API's using SoapUI

OR





# End

SoapUI by SMARTBEAR

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