UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

ACADEMY FOR COMPUTER SCIENCE AND SOFTWARE ENGINEERING

MODULE **IT08X31 - SERVICES COMPUTING**

CAMPUS **APK**

SSA **XX JULY 2020**

MEMO

DATE: XX JULY 2020 **SESSION 08:30 – 10:30**

ASSESSOR(S) **PROF M COETZEE**

EXTERNAL MODERATOR **POF HS VENTER (UP**

DURATION: 3 HOURS **MARKS: 70**

NUMBER OF PAGES: 4 PAGES

INSTRUCTIONS: **Answer all the questions.**

MEMO TO BE COMPLETED

QUESTION 1

Contrast the interface definition of SOAP services with REST services (their service contracts), and comment on the effect this has on loose coupling. In your answer you should:

Focus is on complexity of WSDL file – more tightly coupled than rest

a) Define loose coupling for this context. (2)

b) Describe what the two types of service contracts contain. (5)

c) Contrast the two types of service contracts with respect to loose coupling. (6)

d) Identify which one is more loosely coupled and motivate why you say so. (2)

[15]

QUESTION 2

A SOAP web service needs to identify the consumer application that is sending a request. Provide a solution to this scenario.

Described 3rd party identification pattern and interceptor at service

a) Discuss all relevant considerations that is important to take into account. (4)

b) Describe the contents of the SOAP request. (3)

c) Give the architecture of the solution you are proposing. Use a diagram. (4)

d) Describe any software patterns that you have applied to implement the solution effectively. (4)

[15]

QUESTION 3

Software design patterns have been identified as a means of effectively defining and expressing the principles of service-oriented architecture. Describe two service design patterns as follows for a ***microservices application***:

Any two as per student

a) Give the full list of principles of service-oriented architecture (*except loose coupling*). (4)

b) Now choose **two** of these principles. ***For each principle****:*

i. Give the name of the pattern and briefly discuss how it supports the principle of service-oriented architecture for a microservices application. (5)

ii. Draw a diagram to indicate where and how you include it in the design of a microservices application. (3)

[20]

QUESTION 4

The Company Registration Service shown in Fig 1 below communicates with three other services in order to finalise the registration of a company. Throughout all communication the Company Registration Service needs to keep track of the state of the process.

Solution as per student

a) The developer of the Company Registration Service is considering to use WCF instance management to store session information across all calls to services? Do you agree with this solution? Motivate your answer. (3)

b) Comprehensively describe the best way to maintain application state for the all calls made by the Company Registration Service in the case of SOAP calls. (6)

c) How will this solution affect loose coupling? (2)

d) Comprehensively describe the best way to maintain application state for the all calls made by the Company Registration Service in the case of REST calls. (6)

e) What are the security considerations for state management in both SOAP and REST solutions? (3)

[20]

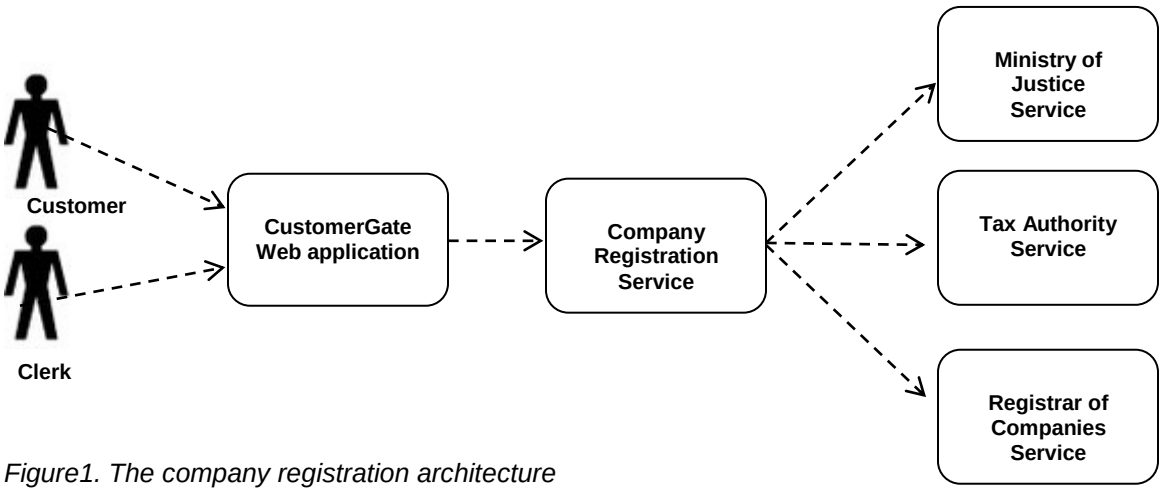

Figure1. The company registration architecture