University of the Sunshine Coast
Queensland, Australia

ICT705 Data & Systems Integration

USC Semester 1, 2020

Mid-Semester Examination

School of Business

Examination Duration: 120 minutes

Reading Time: 10 minutes

Exam Conditions:

Reading Time: Students are permitted to write on the examination paper

This is an open book exam.

Notes are permitted

Any calculator

English dictionary

Instructions to Students:

This is an individual assessment; all submissions will go through **SafeAssign**.

Answer all questions in in this document in the space provided following the question.

The value of each question is as shown.

Save document in Microsoft Word format (no other formats will be accepted) with your name and student number included in the filename.

Upload exam to Blackboard

Submit to Task 1 Mid-Semester Exam no later than **1:30pm 30th March 2020**

Questions (Total 40 Marks)

Answer all questions in this section in the space provided below the questions. Please note space is not indicative of the length of answer required.

- **[8 marks total]** In your own words (approx. 200 words) demonstrate your understanding of Enterprise Information Management data domains. In your answer, provide examples.

Answer Q1:

There are five data domains in enterprise information management:

- Metadata
- Master data
- Operational data
- Unstructured data
- Analytical data

Meta data: it is data that provide information about data that is stored in database and features of data assets of a corporation. It is basically data about data.

It can also classify metadata into two subcategories:

Business metadata: this includes business models and their rules.

Technical metadata: it gives basic structure of database, data warehouse, IT applications, etc.

Example: student_name, date_of_birth, subjects etc in student database.

Master data: it is data about business entities, nouns that defines a business **for example:** customer, product, supplier, accounts etc. It is necessary that this data is highly accurate because it is used as part of operational data, instructed data and analytical data, if this data is not accurate it will generate errors in data queries. It is also important that this data is consistent, complete, relevant, timeliness and trusted.

Operational data: data that is generated by transitions from a business this means it is transitional data from a business transition. This data is highly structured and is

use within the departments or LOB. It used master data for example customer and product information is used to make an order.

Examples: sales order, billing data, invoices etc.

Unstructured data: it is non transitional data such as files. It is also knwn as content.

Analytical data: when operational data is transformed to address specific requirements of decision support system. Data is analysed and transformed to better understand it so that business decisions can be made.

- **[12 marks total]** In your own words (approx. 300 words), compare and contrast the Enterprise Information Architecture Reference Architecture (EIA RA) levels of abstraction. In your answer, provide examples.

Answer Q2:

there are three layers of abstraction: conceptual level, logical level and physical level.

Conceptual layer: it gives us Architecture Overview Diagram. Major task in this level is to identify capabilities that are required by system and are necessary.

Common capabilities off system are as follows:

- User interface to be used for the system, this gives presentation services. It defines what type user experience will be provided.
- Identifying operation systems that is line of business(LOB), define all the business process so that workflow and data needed can be defined accurately.
- Process and workflow between different system operations this defines process services
- Adaptation, adapting new and changing business environment.
- Using five data domain, this brings foundation for information sharing and is called foundational information capabilities.
- Enterprise information integration : defining data sementics, unified views.
- Information security: protecting unauthorised users to access database.

Logical level: this level has two parts

- Logical View: this is derived from AOD(Architecture overview diagram) that is generated in conceptual level. It is a high level view of system components of an organisation. It has all infrastructure components, IT landscapes, and general system.

- Component model: it defines relationship between components such as functions, responsibilities and interfaces. Results of this model are component relationship diagram, component description, component interface diagram.

Physical level: this level gives operational model. software mapping is done here,integration patterns,operational patterns are defined here.software interoperational details are also defined.

- **[8 marks]** A business has approached you about choosing a Service Oriented Architecture (SOA). In your own words, write how would you determine if this business should choose a SOA and why. (approx. 200 words)

Answer Q3:

A system should not choose SOA when it has homogeneous IT environment that is there are not much changes and variation taking place in the system. If the business process remain consistent then business should not chose SOA.

If a business need real time data and its real time performance is important then SOA is not beneficial

If there is strong coupling in the methods then there is no need of SOA.

If the system is never changing then there is no need of SOA.

If all these factors are applicable on a business then SOA should not be done because it can cause performance and reliability issues, many interactions can cause performance issues.

- **[6 marks]** In your own words (approx. 150 – 200 words), compare and contrast Service Orchestration and Service Choreography. In your answer describe why a system might choose to incorporate both approaches

Answer Q4:

Service Orchestration: A single centralized orchestrator invokes and coordinates the

interaction among different services. This means different services will communicate with a dedicated services which will provide information for the queries and this composite service interacts with all other services in the system. All services have a single end point that is composite service.it is a centralized approach. The orchestrator invokes and combine services.

Service choreography: it is a decentralized approach, it does not have a single dedicated composite service. All services can send and receive messages from other services. Every service has two or more end points.it has decentralizd service composition.

- **[6 marks total]** Examine the following SOAP XML based Message Envelope. In your own words, describe the functions and purpose of the various elements (approx. 150-200 words)

```
POST /InStock HTTP/1.1
Host: www.example.org
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn

<?xml version="1.0"?>
<soap:Envelope
        xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
        soap:encodingStyle="http://www.w3.org/2003/05/soap-encoding">

        <soap:Body xmlns:m="http://www.example.org/stock">
                <m:GetStockPrice>
                        <m:StockName>IBM</m:StockName>
                </m:GetStockPrice>
        </soap:Body>
</soap:Envelope>
```

Answer Q5:

Answer: soap element is not a root element of SOAP message. Xmlns:soap name space defines that it is an soap envelop and it always has a fixed value

SOAP body contain actual message SOAP message intended for the ultimate endpoint of the message.

END OF EXAMINATION