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**TECHNOLOGICAL UNIVERSITY DUBLIN**  
**KEVIN STREET CAMPUS**

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BSc. (Honours) Degree in Computer Science

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(International)

**Year 4**

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SEMESTER 2 OPEN BOOK EXAMINATIONS 2020/21

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**Enterprise Systems Infrastructure & Architecture**

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Duration 3hrs

Exam script available at 2pm on 11/5/2021

Answer ALL questions.

All questions carry equal marks.

***The following is a description of a fictional organisation that is referenced in each of the three questions that follow.***

*FraxiMart* is a multinational retail enterprise that sells a range of products primarily for home and personal use.

It operates retail outlets in ten European countries. Each retail outlet sells products such as groceries (e.g. milk, vegetables, meat), household items (e.g. cleaning products, small furniture items) and clothes.

Outlets in different countries are supplied with fresh produce from local sources where possible but most non-perishable products are provided by global suppliers who manufacture their products on a large scale.

**Q.1 (a)** When analysing any Enterprise's competitive environment, Porter's *competitive forces model* is often used. Outline what these competitive forces are.

[5 Marks]

**(b)** Using what you have outlined in **part (a)** of this question, state your opinion, elaborating on your reasoning, on what the **two** most important competitive challenges that the fictional enterprise described above (*FraxiMart*) needs to address?

[10 Marks]

**(c)** In the context of *Supply Chain Management* and using what you have discussed in **part (b)** of this question, identify **two** business strategies that *FraxiMart* might employ to address those challenges and **for each of the strategies**, explain how a *Supply Chain Management System* could support *FraxiMart* to achieve the strategic goals.

[9x2 Marks]

**Q.2 (a)** *ERP* and *CRM* are two types of business systems frequently utilised within enterprise organisations. Outline, in your own words, what is meant by *ERP* and *CRM*.

[5 Marks]

**(b)** In the case of *ERP*, give your opinion on what are the *two* most important *ERP* modules/functional capabilities that *FraxiMart* could implement to help them gain a competitive advantage. In your answer, discuss how each could be used to increase either the *Efficiency* or *Effectiveness* of *FraxiMart's* business processes.

[10 Marks]

**(c)** Over the years, *FraxiMart* has utilised a number of different IT systems. It currently uses standalone call centre software in each country it operates within. It also uses direct marketing software that is currently integrated with a separate sales management system. In addition, *FraxiMart* wants to expand its online direct selling capabilities.

**(i)** From an architectural perspective, considering *integration* and *consolidation* issues/requirements, discuss, with the aid of diagrams where appropriate, how a dedicated *CRM* system could help *FraxiMart* manage its current situation more efficiently and effectively as well as provide the ability to expand its online selling capabilities.

[14 Marks]

**(ii)** State your opinion, outlining your reasoning, what are the two primary drawbacks/risks to *FraxiMart* in implementing such a *CRM* solution.

[4 Marks]

**Q.3 (a)** *Enterprise Application Integration (EAI)* often utilises an *Enterprise Service Bus (ESB)* to facilitate its goals. In your own words, briefly outline what is meant by *EAI* and *ESB*.

[5 Marks]

**(b)** *FraxiMart* operates a “Head Office” in Dublin, Ireland. From there they plan, manage and monitor the local supply of all perishable goods from their suppliers to their retail outlets within each of the individual countries. Using your knowledge of *EAI design patterns*, discuss, with the use of appropriate diagrams, how *FraxiMart* could implement an automated process to ensure competitive pricing by their suppliers.

[10 Marks]

**(c)** *FraxiMart* have developed their own logistics operation (*FraxiMart Logistics*) to transport goods from their suppliers to their retail outlets. As part of this, they are required to send shipment information to a number of different *Customs* systems depending on what country their suppliers are located in.

Using the information and headings below, describe how *FraxiMart Logistics* could implement their own in-house system/process whereby it would be relatively easy to integrate new suppliers and new *Customs* systems if they needed to ship from a new manufacturer in a country where they have not done so before. The new system/process should include the use of an *ESB*.

- ✓ *FraxiMart Logistics needs to provide data to Customs about every item that is shipped at any one time.*
- ✓ *All Customs systems provide an electronic means to exchange data. However, these mechanisms can differ, some provide web services, some provide message broker access and some require file transfer over dedicated secure links.*
- ✓ *Some Customs systems use XML with differing formats to exchange data and some use proprietary data formats.*
- ✓ *FraxiMart Logistics requires all its suppliers to supply shipment data in XML format but not necessarily in one particular format.*

Use the following headings to frame your answer.

**(i)** Integration with an existing *SCM* system

[9 Marks]

**(ii)** Data exchange with multiple *Customs* systems

[9 Marks]