國立清華大學 107 學年度碩士班考試入學試題

系所班組別：服務科學研究所 乙組（服務系統組）

考試科目（代碼）：管理資訊系統（5201）

1. Business intelligence

In 1989, Howard Dresner (later a Gartner analyst) proposed "business intelligence" as an umbrella term to describe "concepts and methods to improve business decision making by using fact-based support systems" (Wikipedia, 2018). Based on this definition, please answer the following questions.

(1) Please make the comparison of business intelligence related tasks:

    (A) business intelligence vs. competitive intelligence (5%)

    (B) business intelligence vs business analytics (5%)

(2) HealthDining (HD) is a restaurant brand and plans to launch a meal delivery service for customers in Taipei City. The value proposition of HD is to deliver happiness while you are eating. In realizing the value proposition, HD implements a business intelligence system in order to predict its customer's mood in order to recommend the best combination of items for a meal, which could be lunch or dinner to increase its customers' happiness. A customer can order the meal using the app on his/her smartphone. Once the customer logins to the app, the meal ordering system will automatically present some recommended meal choices for the customer to select from. Once the customer makes the decision and places the order, the app will inform the central kitchen to prepare for the meal and deliver the meal in a box to the customer on time.

You may figure out there is a need to develop a good delivery scheduling and routing system to guide the shipping of meal boxes from the central kitchen. Assume it is well done now. HD needs a business intelligence system to catch the moods of its customers in order to fulfill its value proposition by delivering happiness via customized meals.

The CIO of HD decided to issue 1000 free meals for a month to invite customers to join the experiment by which to formulate the learning data to training the customer's mood prediction system. Please answer the following questions which will help the CIO to develop a mood prediction system.

(A) Please specify the possible entity-relation diagram (ERD) according to the context just mentioned. (5%)

(B) Please build a mood prediction system framework, and identify one feasible machine learning model that can be built to recommend meal choice to enhance a customer's happiness while eating the meal. You are expected to present the details of data attributes and learning algorithm (10%)

2. IT-enabled service

A virtual organization (VO) is an organization in which originally detached and dissimilated entities (from employees to entire enterprises) are virtually connected via information technology to facilitate their communication and collaboration in performing the role that the VO is expected by its stakeholders.

Take an open museum as an example, in which an open museum is not a physically built venue to exhibit art works or curate activities. Instead, it coordinates many organizations which possess their unique value in a region (*e.g.,* 新竹台三線), and then demonstrate these unique values via service design to engage local residences with visitors.

For example, it could be a seasonal festival that the local celebrate its harvest of oranges at the end of the year, so that the orchard owners can collaborate with township offices, farmers organization (農會), railroad, bus transportation, restaurants, temples, schools, etc., to host the visit of tourists who are interested in experiencing the harvest season. A curation of the harvest season for the region becomes a task for the open museum. In this task, these involved stakeholders behave as functional divisions of an organization, but virtually connected via information technology to communicate and collaborate. Thus, the open museum is a virtual organization to coordinate the involved organizations and individuals for accomplishing the tasks. There are several essential issues needed to be tackled. First, the value proposition of the harvest season should be well perceived by involved collaborators and anticipated customers. Second, how to share the cost and benefit occurred among participant entities (individuals and organizations). Third, how to utilize the information technology to communicate and coordinate among stakeholders in order

to achieve the tasks.

You are not expected to tackle the issues in value proposition and the sharing of cost/benefit in this exam. You are expected to design information systems to facilitate communication and coordination tasks in order to support the collaboration of entities within a virtual organization, the open museum in this exam.

Please complete the following tasks:

(A) Please design an information system that will support the involved entities of the open museum to curate the celebration of harvest season in the townships of 新竹台三線. You may specify the events you would like to perform, and the functions needed by the system. Then, you could elaborate how these functions (operations) will be used for the harvest season celebration events you designated. (15%)

(B) Please identify the potential challenges you may face when you are going to launch this information service system to facilitate the celebration events of the harvest season for the open museum. Then, please describe how you will do to face these challenges you identified. Please make your points as concrete as possible. (10%)

3. Big Data analytics

(A) Please explain big data analytics technologies and related IT tools: (1) hardware and (2) software (20 points).

(B) Please discuss (1) technical and (2) managerial challenges of big data analytics (20 points).

(C) What kind of role and knowledge would each of the following professionals play and contribute in a business analytics team: an (1) MIS engineer (2) statistician (3) computer scientist (4) service science professional. (10 points)