1. Recent developments in IT-enabled supply chain management have greatly increased the ability of firms to integrate processes, systems, and information with their business partners. In the context of IT enabled supply chain management,

   a. What is Bull-whip effect? (10%)

   b. How can you use IT to eliminate the bull-whip effect? (10%)

   c. In contrast to manufacturing sector that produces goods and results in inventory, the service sector encompasses all other industries including transportation, logistics, communication, finance, real estate, healthcare, IT consulting, and a variety of public services that usually do not have so called inventory problem. In your opinion, does bull-whip effect still exit in the service economy? Why or why not. (10%)

2. In his article, "Strategy and the Internet", Michael Porter has the following comment.

   "Many have argued that the Internet renders strategy obsolete. In reality, the opposite is true. Because the Internet tends to weaken industry profitability without providing proprietary operational advantages, it is more important than ever for companies to distinguish themselves through strategy. The winners will be those that view the Internet as a complement to, not a cannibal of traditional ways of competing."

   a. How does the Internet influence industry structure and a firm's profitability? Hint: you can use Porter's five- force analysis model to analyze the question. For example, how does the Internet change buyers' bargaining power? Suppliers' bargaining power? Rivalry? Barriers to entry? Threats of substitute products/services? You can use examples to elaborate your points. (10%)

   b. Do you agree with Porter's statement? Briefly justify your position, using specific company examples where possible. (10%)

3. In traditional corporate information systems, a company may have its dedicated internal users. Thus, the system development life cycle starts with acquiring these users' requirements through interview, process modeling, system analysis and design, and then implementation and deployment.

In your undergraduate education, you may be trained to conduct system analysis and design for a specific application for a business process. However, due to the prevalence of internet applications, many business services are accessible directly by end customers, which could be a variety of people with various technical skill levels and operational preferences, and different expectations on service products and processes. This practice challenges the traditional system analysis and design approach for corporate internal users to fulfill the needs of external end users. Especially, when the internet application moves toward so called Web 2.0, a variety of services provided to service potential users' needs face high difficulties to engage users' inputs to design service information systems. Therefore, we can see many Web 2.0 sites end up to be sluggish flows with small popularity. In considering the opportunities to enhance the effectiveness of system development for internet-based e-service, such as Web 2.0 innovative services, please answer the following two questions.

a. Please evaluate the suitability of the existing methodologies in system development for internet-based e-services. (10%)

b. Please propose your methods to enhance the system development process for Web 2.0 types of services. (10%)

4. By virtue of the advanced information technology, many potential architectures and services, such as SaaS and cloud computing have been proposed, and some operational services are available. You can gain some background information from the attached references. For example, Trend Micro has adopted cloud computing for timely virus detection and content security services. Now, assume that you are the CIO of a large service company, e.g., an international financial service company, what would you do by facing these emerging technologies which may affect your strategic competition in serving the growing population of internet end customers. Take the cloud computing service as an example, what could you do with this emerging technology?

a. Please analyze the pros and cons in adopting cloud computing service to perform your major corporate information services, such as ERP, SCM, and BI. (10%)

   b. As a CIO, please redefine and justify the role of the information service department once the cloud computing technology is adopted. (10%)

   c. Please design a new service to enhance your international financial service business based on the newly adopted cloud computing technology. (10%)

References:

1. **SaaS** (extracted from en.wikipedia.org)

"Software as a Service" (SaaS) is a model of software deployment where an application is licensed for use as a service provided to customers on demand. On demand licensing and use alleviates the customer's burden of equipping a device with every application. It also reduces traditional End User License Agreement (EULA) software maintenance, ongoing operation patches, and patch support complexity in an organization.

The key characteristics of SaaS software include:

- network-based access to, and management of, commercially available software

- activities that are managed from central locations rather than at each customer's site, enabling customers to access applications remotely via the Web.

- application delivery that typically is closer to a one-to-many model (single instance, multi-tenant architecture) than to a one-to-one model, including architecture, pricing, partnering, and management characteristics.

- centralized feature updating, which obviates the need for downloadable patches and upgrades.

- SaaS is often used in a larger network of communicating software - either as part of a mashup or as a plugin to a platform as a service. Service oriented architecture is naturally more complex than traditional models of software deployment.

2. **Cloud computing** (extracted from en.wikipedia.org)

Cloud computing refers to the use of Internet ("cloud") based computer technology for a variety of services. It is a style of computing in which

dynamically scalable and often virtualised resources are provided as a service over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure "in the cloud" that supports them. The concept incorporates software as a service (SaaS), Web 2.0 and other recent, well-known technology trends, in which the common theme is reliance on the Internet for satisfying the computing needs of the users. Often-quoted examples are Salesforce.comand Google Apps which provide common business applications online that are accessed from a web browser, while the software and data are stored on the servers.

The *cloud* is a metaphor for the Internet, based on how it is depicted in computer network diagrams, and is an abstraction for the complex infrastructure it conceals.

The majority of cloud computing infrastructure as of 2009 consists of reliable services delivered through data centers and built on servers with different levels of virtualization technologies. The services are accessible anywhere in the world, with *The Cloud* appearing as a single point of access for all the computing needs of consumers. Commercial offerings need to meet the quality of service requirements of customers and typically offer service level agreements. Open standards and open source software are also critical to the growth of cloud computing.

Amazon.com played a key role in the development of cloud computing by modernizing their data centres after the dot-com bubble and, having found that the new cloud architecture resulted in significant internal efficiency improvements, providing access to their systems by way of Amazon Web Services in 2002 on a utility computing basis.

2007 saw increased activity, with Google, IBM, and a number of universities embarking on a large scale *cloud computing* research project, around the time the term started gaining popularity in the mainstream press. It was a hot topic by mid-2008 and numerous cloud computing events had been scheduled.

In August 2008, Gartner Research observed that "organizations are switching from company-owned hardware and software assets to per-use service-based models" and that the "projected shift to cloud computing will result in dramatic growth in IT products in some areas and in significant reductions in other areas."