VPM's
DR VN BRIMS, Thane
Programme: PGDM (2016-18)
PGDM Trimester III Examination April 2018

Subject	**Management Information system**		
Roll No.		**Marks**	**60 Marks**
Total No. of Questions	**7**	**Duration**	**3 Hours**
Total No. of printed pages	**3**	**Date**	**12.04.2018**

Note: -

1. **Q1 is compulsory and solve any FOUR from the remaining SIX questions.**
2. **Write every answer on a new page.**

Q1) 20 Marks (Compulsory)

Case Study

What's the Buzz on Smart Grids?

The existing electricity infrastructure in the United States is outdated and inefficient. Energy companies provide power to consumers, but the grid provides no information about how the consumers are using that energy, making it difficult to develop more efficient approaches to distribution. Also, the current electricity grid offers few ways to handle power provided by alternative energy sources, which are critical components of most efforts to go "green." Enter the smart grid.

A smart grid delivers electricity from suppliers to consumers using digital technology to save energy, reduce costs, and increase reliability and transparency. The smart grid enables information to flow back and forth between electric power providers and individual households to allow both consumers and energy companies to make more intelligent decisions regarding energy consumption and production. Information from smart grids would show utilities when to raise prices when demand is high and lower them when demand lessens.

Smart grids would also help consumer's program high-use electrical appliances like heating and air conditioning systems to reduce consumption during times of peak usage. If implemented nationwide, proponents believe, smart grids would lead to a 5 to 15 percent decrease in energy consumption. Electricity grids are sized to meet the maximum electricity need, so a drop in peak demand would enable utilities to operate with fewer expensive power plants, thereby lowering costs and pollution.

Another advantage of smart grids is their ability to detect sources of power outages more quickly and precisely at the individual household level. With such precise information, utilities will be able to respond to service problems more rapidly and efficiently.

Managing the information flowing in these smart grids requires technology: networks and switches for power management; sensor and monitoring devices to track energy usage and distribution trends; systems to provide energy suppliers and consumers with usage data; communications systems to relay data along the entire energy supply system; and systems linked to programmable appliances to run them when energy is least costly.

If consumers had in-home displays showing how much energy they are consuming at any moment and the price of that energy, they are more likely to curb their consumption to cut costs. Home thermostats and appliances could adjust on their own automatically, depending on the cost of power, and even obtain that power from non-traditional sources, such as a neighbour's rooftop solar panel.

Instead of power flowing from a small number of power plants, the smart grid will make it possible to have a distributed energy system. Electricity will flow from homes and businesses into the grid, and they will use power from local and faraway sources. Besides increasing energy efficiency, converting to smart grids along with other related energy initiatives could create up to 370,000 jobs.

That's why pioneering smart grid projects such as Smart Grid City in Boulder, Colorado, are attracting attention. Smart Grid City represents collaboration by Xcel Energy Inc. and residents of Boulder to test the viability of smart grids on a smaller scale. Participants can check their power consumption levels and costs online, and will soon be able to program home appliances over the Web. Customers access this information and set goals and guidelines for their home's energy usage through a Web portal. They also have the option of allowing Xcel to remotely adjust their thermostats during periods of high demand.

Smart Grid City is also attempting to turn homes into "miniature power plants" using solar-powered battery packs that "TiVo electricity," or stash it away to use at a later time. This serves as backup power for homes using the packs, but Xcel can also tap into that power during times of peak energy consumption to lessen the overall energy load. Xcel will be able to remotely adjust thermostats and

water heaters and will have much better information about the power consumption of their consumers.

Bud Peterson, chancellor of the University of Colorado at Boulder, and his wife Val have worked with Xcel to turn their home into the prototype residence for the Smart Grid City project. Their house was supplied with a six-kilowatt photovoltaic system on two roofs, four thermostats controlled via the Web, a plug-in hybrid electric vehicle (PHEV) Ford Escape, and other high-tech, smart grid-compatible features. Xcel employees are able to monitor periods of high power consumption and how much energy the Petersons' Escape is using on the road.

A digital dashboard in the Petersons' house display power usage information in dozens of different ways—live household consumption and production, stored backup power, and carbon emission reductions translated into gallons of gasoline and acres of trees saved each year. The dashboard also allows the Petersons to program their home thermostats to adjust the temperature by room, time of day, and season. Since the project began in the spring of 2008, the Petersons have been able to reduce their electricity use by one-third.

Xcel is not alone. Hundreds of technology companies and almost every major electric utility company see smart grids as the wave of the future. Heightening interest is $3.4 billion in federal economic recovery money for smart grid technology.

Duke Energy spent $35 million on smart grid initiatives, installing 80,000 smart meters as part of a pilot project in Charlotte, North Carolina, to provide business and residential customers with up-to-the minute information on their energy use, as well as data on how much their appliances cost to operate. This helps them save money by curbing usage during peak times when rates are high or by replacing inefficient appliances.

Although residential customers' monthly electric bills will be $3.24 higher, the company says this amount will be more than offset by energy savings. Google has developed a free Web service called Power Meter for tracking energy use online in houses or businesses as power is consumed. It expects other companies to build the devices that will supply data to Power Meter.

There are a number of challenges facing the efforts to implement smart grids. Changing the infrastructure of our electricity grids is a daunting task. Two-way meters that allow information to flow both to and from homes need to be installed at any home or building that uses electric power–in other words, essentially everywhere.

Another challenge is creating an intuitive end-user interface. Some Smart Grid City participants reported that the dashboard they used to manage their appliances was too confusing and high-tech. The smart grid won't be cheap, with estimated costs running as high as $75 billion. Meters run $250 to $500 each when they are accompanied by new utility billing system. Who is going to pay the bill? Is the average consumer willing to pay the upfront costs for a smart grid system and then respond appropriately to price signals? Will consumers and utility companies get the promised payback if they buy into smart grid technology? Might "smart meters" be too intrusive? Would consumers really want to entrust energy companies with regulating the energy usage inside their homes? Would a highly computerized grid increase the risk of cyber attacks?

Marcel Hawiger, an attorney for The Utility Reform Network, a San Francisco consumer advocacy group, favours expanding existing air conditioner-cycling programs, where utilities are able to control air conditioners so they take turns coming on and off, thereby reducing demands on the electric system. He believes air conditioner controllers, which control temperature settings and compressors to reduce overall energy costs, provide much of the benefit of smart meters at a fraction of their cost. Consumer advocates have vowed to fight smart grids if they boost rates for customers who are unable or unwilling to use Web portals and allow energy companies to control aspects of their appliances.

Energy companies stand to lose money as individuals conserve more electricity, creating a disincentive for them to cooperate with conservation efforts like smart grids. Patience will be critical as energy companies and local communities work to set up new technologies and pricing plans.

1. **<u>CASE STUDY QUESTIONS</u>: -**
   How do smart grids differ from the current electricity infrastructure in the United States?
2. What management, organization, and technology issues should be considered when developing a smart grid?
3. What challenge to the development of smart grids do you think is most likely to hamper their development?

4. What other areas of our infrastructure could benefit from “smart” technologies? Describe one example not listed in the case.
5. Would you like your home and your community to be part of a smart grid? Why or why not? Explain.

Attempt Any FOUR from the Remaining SIX Questions

Q2) Any two from (a) or (b) or (c) ———— (5x2) = 10 Marks

a) How are information systems transforming business and what is their relationship to globalization?
b) Which features of organizations do managers need to know about to build and use information systems successfully? What is the impact of information systems on organizations?
c) What are the challenges posed by strategic information systems and how should they be addressed?

Q3) Any two from (a) or (b) or (c) ———— (5x2) = 10 Marks

a) What ethical, social, and political issues are raised by information systems?
b) How have information systems affected everyday life?
c) Explain IT Infrastructure and Its Components.

Q4) Any two from (a) or (b) or (c) ———— (5x2) = 10 Marks

a) Describe Challenges of Managing IT Infrastructure and Management Solutions.
b) Explain the problems of managing data resources in a traditional file environment and how are they solved by a database management system
c) Why are information policy, data administration, and data quality assurance essential for managing the firm’s data resources?

Q5) Any two from (a) or (b) or (c) ———— (5x2) = 10 Marks

a) Why are information systems vulnerable to destruction, error, and abuse?
b) Which are the most important tools and technologies for safeguarding information resources?
c) Explain the challenges posed by enterprise applications.

Q6) Any two from (a) or (b) or (c) ———— (5x2) = 10 Marks

a) Explain the unique features of e-commerce, digital markets, and digital goods.
b) Explain the role of knowledge management and knowledge management programs in business.
c) How do information systems support the activities of managers and management decision making?

Q7) Any two from (a) or (b) or (c) ———— (5x2) = 10 Marks

a) How does building new system produce organizational change?
b) Explain the objectives of project management and why is it so essential in developing information systems?
c) Explain the major objectives to use information systems in businesses today.