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WEEK 3 – From Smart Buildings to Smart Cities

Smart City

A smart city is an urban development vision to integrate multiple information and communication technology (ICT) solutions in a secure fashion to manage a city's assets – the city's assets include, but not limited to, local departments information systems, schools, libraries, transportation systems, hospitals, power plants, water supply networks, waste management, law enforcement, and other community services. The goal of building a smart city is to improve quality of life by using technology to improve the efficiency of services and meet residents' needs. ICT allows city officials to interact directly with the community and the city infrastructure and to monitor what is happening in the city, how the city is evolving, and how to enable a better quality of life. Through the use of sensors integrated with real-time monitoring systems, data are collected from citizens and devices - then processed and analysed. The information and knowledge gathered are keys to tackling inefficiency.

Wikipedia. *Smart City*. [online] < https://en.wikipedia.org/wiki/Smart_city > [accessed at 18 June 2016]

Building Information Modelling (BIM)

Building information modelling (BIM) is a process involving the generation and management of digital representations of physical and functional characteristics of places. Building information models (BIMs) are files (often but not always in proprietary formats and containing proprietary data) which can be exchanged or networked to support decision-making about a place. Current BIM software is used by individuals, businesses and government agencies who plan, design, construct, operate and maintain diverse physical infrastructures, such as water, wastewater, electricity, gas, refuse and communication utilities, roads, bridges and ports, houses, apartments, schools and shops, offices, factories, warehouses and prisons.

Wikipedia. *Building Information Modelling*. [online]
< https://en.wikipedia.org/wiki/Building_information_modeling > [accessed at 18 June 2016]

Virtualization

In computing, virtualization refers to the act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, operating systems, storage devices, and computer network resources.

Virtualization began in the 1960s, as a method of logically dividing the system resources provided by mainframe computers between different applications. Since then, the meaning of the term has broadened

Wikipedia. *Virtualization*. [online] < <https://en.wikipedia.org/wiki/Virtualization> > [accessed at 18 June 2016]

Stock and Flow

Economics, business, accounting, and related fields often distinguish between quantities that are stocks and those that are flows. These differ in their units of measurement. A stock variable is measured at one specific time, and represents a quantity existing at that point in time (say, December 31, 2004), which may have accumulated in the past. A flow variable is measured over an interval of time. Therefore, a flow would be measured per unit of time (say a year). Flow is roughly analogous to rate or speed in this sense.

For example, U.S. nominal gross domestic product refers to a total number of dollars spent over a time period, such as a year. Therefore, it is a flow variable, and has units of dollars/year. In contrast, the U.S. nominal capital stock is the total value, in dollars, of equipment, buildings, inventories, and other real assets in the U.S. economy, and has units of dollars. The diagram provides an intuitive illustration of how the stock of capital currently available is increased by the flow of new investment and depleted by the flow of depreciation.

Wikipedia. *Stock and Flow*. [online]
< https://en.wikipedia.org/wiki/Stock_and_flow > [accessed at 18 June 2016]