

國立臺灣師範大學 106 學年度碩士班招生考試試題

科目：管理學

適用系所：工業教育學系

注意：1.本試題共 3 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則依規定扣分。

1. Please explain the following terms(共 40 分):

(a) blue ocean strategy (2 分), (b) value proposition (2 分), (c) learning cycle (2 分), (d) niche market (2 分), (e) innovation (2 分), (f) globalization (2 分), (g) enabling technology (2 分), (h) technology life cycle (2 分), (i) value chain (2 分), (j) mass customization (2 分).

Please use the above mentioned terms to illustrate why Industry 4.0 is playing a daily critical role based on the following article from Forbes.com. (20 分)

Industry 4.0: Today's Most Dynamic Business Opportunity
by Reinhard Geissbauer, Jesper Vedsø, and Stefan Schrauf

Industrial revolutions are momentous events. By most reckonings, there have been only three. The first was triggered in the 1700s by the commercial steam engine and the mechanical loom. The harnessing of electricity and mass production sparked the second, around the start of the 20th century. The computer set the third in motion after World War II (see “The Man Who Made the Computer Age Possible,” by Jeffrey E. Garten).

It might seem too soon to proclaim that the fourth industrial revolution, spurred by interconnected digital technology, has begun. But Henning Kagermann, the head of the German National Academy of Science and Engineering (Acatech), did exactly that in 2011, when he used the term Industrie 4.0 to describe a proposed government-sponsored industrial initiative.

When you look closely at the rapid pace of digitization in industry today, the name doesn't seem hyperbolic at all. It is a signal of sweeping change that is rapidly transforming many companies and may catch others by surprise.

The term Industry 4.0 refers to the combination of several major innovations in digital technology, all coming to maturity right now, all poised to transform the energy and manufacturing sectors. These technologies include advanced robotics and artificial intelligence; sophisticated sensors; cloud computing; the Internet of Things;

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data capture and analytics; digital fabrication (including 3D printing); software-as-a-service and other new marketing models; smartphones and other mobile devices; platforms that use algorithms to direct motor vehicles (including navigation tools, ride-sharing apps, delivery and ride services, and autonomous vehicles); and the embedding of all these elements in an interoperable global value chain, shared by many companies from many countries.

These technologies are often thought of separately. But when they are joined together, they integrate the physical and virtual worlds. This change enables a powerful new way of organizing global operations: bringing the fungibility and speed of software to large-scale machine production. Under the Industry 4.0 model, product design and development take place in simulated laboratories and utilize digital fabrication models. The products themselves take tangible form only after most of the design and engineering problems have been worked out. The networks of machinery that have engendered industrial society become hyper-aware systems of highly flexible technology, responding rapidly not just to human commands but to their own perceptions and self-direction.

This technological infrastructure is still in its early stages of development. But it is already transforming manufacturing. Companies that embrace Industry 4.0 are beginning to track everything they produce from cradle to grave, sending out upgrades for complex products after they are sold (in the same way that software has come to be updated). These companies are learning mass customization: the ability to make products in batches of one as inexpensively as they could make a mass-produced product in the 20th century, while fully tailoring the product to the specifications of the purchaser. As the movement develops, these trends will accelerate. So will the invention of new products and services, including new ways of tackling today's most difficult problems: climate change and pollution, energy demand, the pressures of urbanization, and the problems that accompany aging populations.

The Industry 4.0 movement started in Germany, and many of that country's leading industrial companies have strong initiatives. According to the Economist, the list includes BASF, Bosch, Daimler, Deutsche Telekom, Klöckner & Co., and Trumpf. The momentum is rapidly growing elsewhere as well, particularly in the United

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States, Japan, China, the Nordic countries, and the United Kingdom. Such influential global industrial behemoths as Siemens and GE have fully embraced the approach; both companies' CEOs and senior executives have declared that it is now a core part of their identity (see "Siemens CEO Joe Kaeser on the Next Industrial Revolution," by Daniel Gross).

2. Please introduce what will your future research and career plans be if you successfully enroll in the management of technology program of the Department of Industrial Education of NTNU? (10 分)
3. 請簡述科學管理的發展歷程。(10 分)
4. 管理學的發展趨勢是什麼？如何建構新典範？(10 分)
5. 你認為正向激勵和負向激勵孰輕孰重？請分享你的看法企業如何運用正向激勵和負向激勵。(10 分)
6. 組織設計需要分析哪些因素？如何設計一個創新導向的組織？(10 分)
7. 企業應如何管理組織變革的過程？(10 分)