

MASTER OF BUSINESS ADMINISTRATION

Innovation



Contact details:
Regenesys Business School
Tel: +27 (11) 669-5000
Fax: +27 (11) 669-5001
E-mail: info@regenesys.co.za
www.regenesys.co.za

This study guide highlights key focus areas for you as a student. Because the field of study in question is so vast, it is critical that you consult additional literature.

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1. WELCOME TO REGENESYS

*“Have a vision. Think big. Dream, persevere, and your vision will become a reality.
Awaken your potential, knowing that everything you need is within you.”
Dr. Marko Saravanja*

At Regenesys we help individuals and organisations achieve their personal and organisational goals by enhancing their management and leadership potential. Our learning programmes are designed to transform and inspire your mind, heart and soul, helping you to develop the knowledge, skills, positive values, attitudes and behaviours required for success.

Having educated more than 100,000 students based in highly reputable local and international corporations across more than 160 countries since the inception of Regenesys in 1998, we are now one of the fastest-growing institutions of management and leadership development in the world. Our ISO 9001:2008 accreditation bears testimony to our quality management systems meeting international standards. We are also accredited with the Council on Higher Education.

At Regenesys you will be taught by business experts, entrepreneurs and academics who are inspired by their passion for human development. You will be at a place where business and government leaders meet, network, share their experience and develop business relationships.

We encourage holistic leadership development by fostering multiple intelligences at an intellectual, physical, emotional, and spiritual level. We promote the development of rational intelligence (IQ) by honing your critical and analytical abilities so that you become a better problem-solver and innovative thinker. We will foster your spiritual intelligence (SQ) as a purpose- and value-driven individual who can rise above adversity, take difficult decisions and make a difference. We will help you develop your emotional intelligence (EQ) so that you can significantly improve your relationships and resolve conflict effectively. You will have the opportunity to hone your financial acumen through the personal finance education available on campus. And, because studying often adds pressure to an already stressful life, we will also help you develop physical intelligence (PQ) by learning how to manage stress and lead a healthier lifestyle.

We will help you awaken your potential and to realise that everything you need to succeed is within you. And we will be with you every step of the way.

Areas of Expertise



2. TEACHING AND LEARNING METHODOLOGY

Regenesys uses an interactive teaching and learning methodology that encourages self-reflection and promotes independent and critical thinking. Key to our approach is an understanding of adult learning principles, which recognise the maturity and experience of participants, and the way that adult students need to learn.

At the core of this is the integration of new knowledge and skills into existing knowledge structures, as well as the importance of seeing the relevance of all learning via immediate application in the workplace. Practical exercises are used to create a simulated management experience to ensure that you can apply the conceptual knowledge and practical skills you learn in your work environment. These activities may include scenario analysis, self-reflection, problem solving, making presentations and planning tasks.

Our courses are developed to cover all essential aspects of your training comprehensively in a user-friendly and interactive format. Our subject matter experts have extensive experience in management education, training and development.

2.1 PRINCIPLES FOR RESPONSIBLE MANAGEMENT EDUCATION

Regenesys upholds the UN Global Compact's Principles for Responsible Management Education:

- **Purpose:** We will develop the capabilities of students to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy.
- **Values:** We will incorporate into our academic activities and curricula the values of global social responsibility as portrayed in international initiatives such as the United Nations Global Compact.
- **Method:** We will create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership.
- **Research:** We will engage in conceptual and empirical research that advances our understanding about the role, dynamics, and impact of corporations in the creation of sustainable social, environmental and economic value.
- **Partnership:** We will interact with managers of business corporations to extend our knowledge of their challenges in meeting social and environmental responsibilities and to explore jointly effective approaches to meeting these challenges.
- **Dialogue:** We will facilitate and support dialogue and debate among educators, students, business, government, consumers, media, civil society organisations and other interested groups and stakeholders on critical issues related to global social responsibility and sustainability.

(PRME, 2014:1)

The Ten Principles

The UN Global Compact, in its 10 principles, asks organisations to:

- Support and respect the protection of internationally proclaimed human rights;
- Ensure they are not complicit in human rights abuses;
- Uphold workers' freedom of association and the effective recognition of the right to collective bargaining;
- Eliminate all forms of forced and compulsory labour;
- Abolish child labour;
- Eliminate discrimination in respect of employment and occupation;
- Support a precautionary approach to environmental challenges;
- Undertake initiatives to promote greater environmental responsibility;
- Encourage the development and diffusion of environmentally friendly technology; and
- Work against corruption in all its forms, including extortion and bribery.

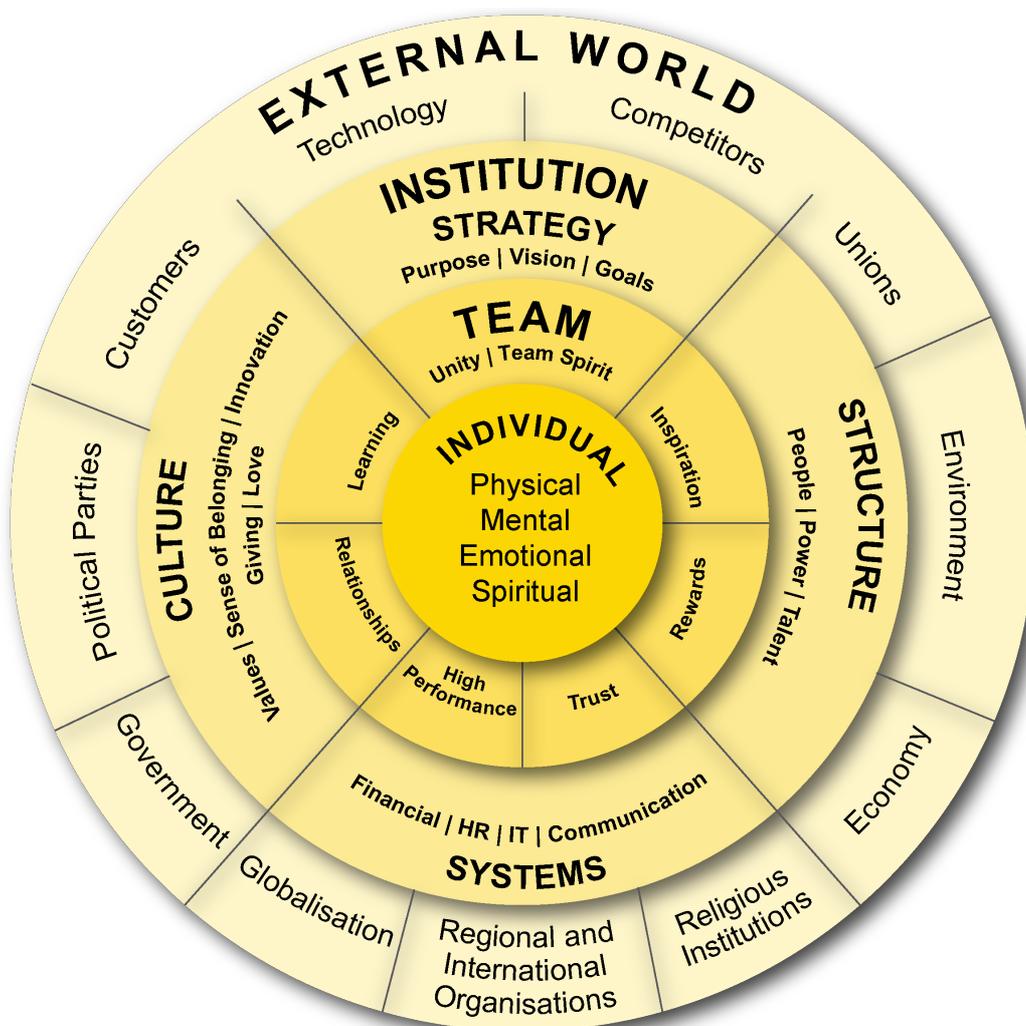
(United Nations, nd)

These principles provide a foundation for doing business responsibly and sustainably, and – exercised in a culture of integrity – set the stage for long-term success (UN, nd).

2.2 REGENESYS' INTEGRATED LEADERSHIP AND MANAGEMENT MODEL

This course draws on the Regenesys Integrated Leadership and Management Model, which demonstrates how the external environment, the levels of an organisation, the team and the components of an individual are interrelated in a dynamic and systemic way. The success of an individual depends on his or her self-awareness, knowledge, and ability to manage these interdependent forces, stakeholders and processes.

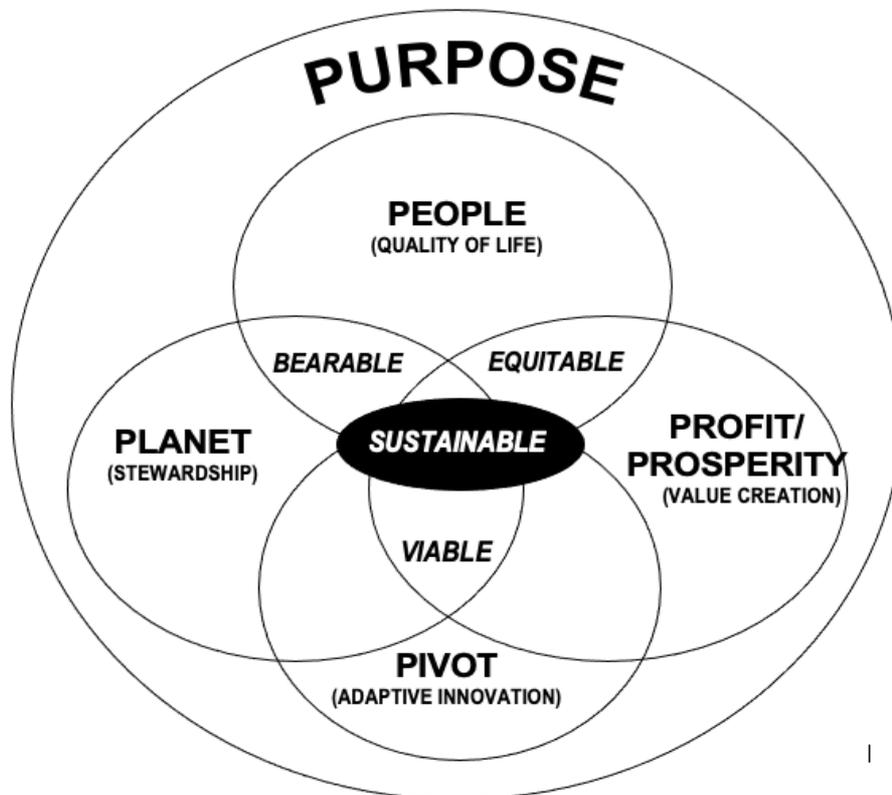
The degree of *synergy* and *alignment* between the goals and objectives of the organisation, the team and the individual determines the success or failure of an organisation. It is, therefore, imperative that each organisation ensures that team and individual goals and objectives are aligned with the *organisation's strategies* (vision, mission, goals and objectives, etc); *structure* (organogram, decision-making structure, etc); *systems* (HR, finance, communication, administration, information, etc); *culture* (values, level of openness, democracy, caring, etc). An effective work environment should be characterised by the alignment of organisational systems, strategies, structures and culture, and by people who operate synergistically.



Regenesys' Integrated Leadership and Management Model

2.3 THE QUINTUPLE BOTTOM LINE

While Regenesys' Integrated Leadership and Management Model demonstrates the interconnected-ness of the individual with organisational layers and the broader environment, the quintuple bottom line draws attention to the interrelationships between the actualisation of organisational purpose, and people, planet, and prosperity, given the organisation's ability to pivot.



THE QUINTUPLE BOTTOM LINE

Let's unpack each element, and look at why it matters:

- **Purpose** – the reason the organisation exists.
- **People** – how the organisation affects quality of life for all its stakeholders, direct and indirect.
- **Planet** – refers to the level of environmental responsibility the organisation exercises.
- **Profit, prosperity** – the value the organisation creates in pursuit of its objectives.
- **Pivot** – the organisation's ability and capacity to rethink how and what it does to adapt to circumstances (Zinaty, 2020).

Then, in the zones that overlap:

- Is your organisation's influence on people and planet **bearable** for all affected?
- Is the value created by your operation shared in an **equitable** way?
- Is the organisation's balance between consumption and prosperity **viable**?

Once the answer to all three questions is yes, the organisation should be sustainable.

As you start to apply the concepts you learn from this course in your work, think about the effect of your action on all stakeholders – the people your organisation serves, your colleagues, your suppliers, your clients, your neighbours, and the public at large. What are the ethical implications of what you do, and intend to do in future? How will you ensure that your strategies and activities are sustainable in the quintuple-bottom-line sense?

In other words, how is achieving the organisation's **purpose** going to affect **people**, the **planet** and its **profit** or **prosperity** requirements? All are inextricably linked. And much depends on the organisation's ability to **pivot**.

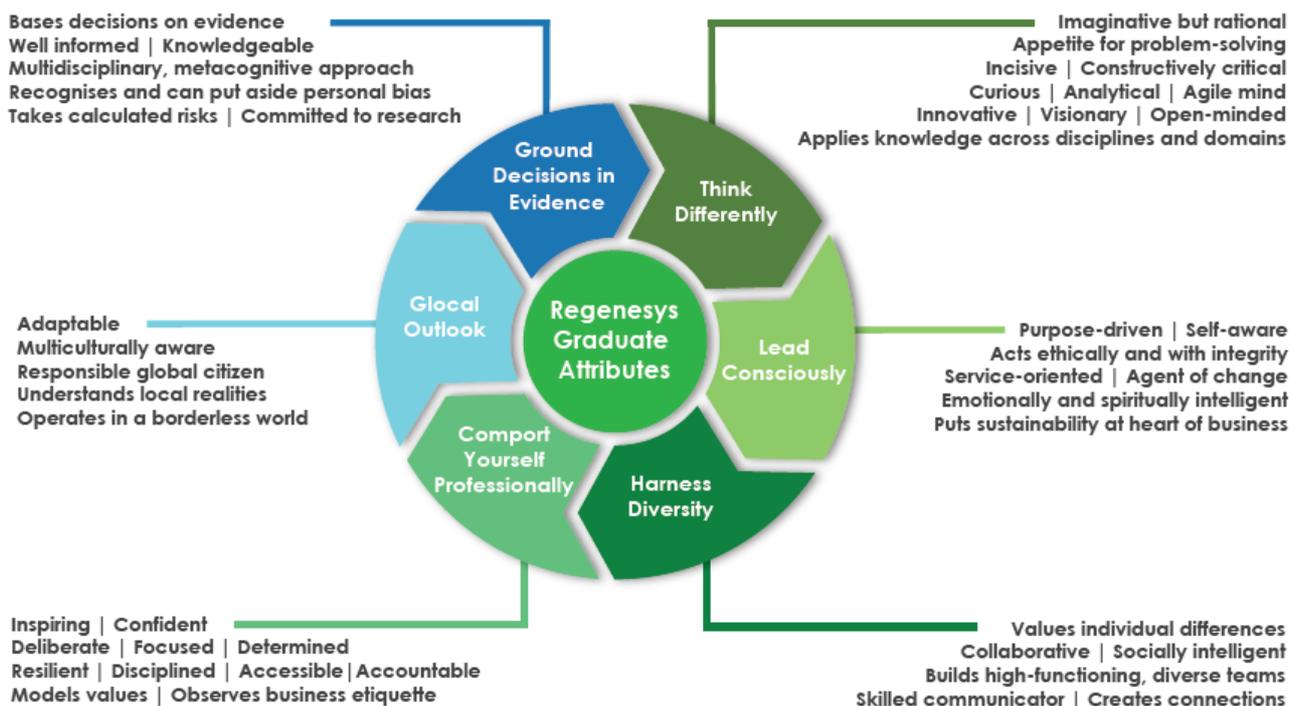


As a student in the business management field, **you** have the capacity to bring about **real change**. As much as businesses are shaped by their environment, their actions influence the environment. **You** can contribute to sustainable change by managing responsibly.

2.4 DEVELOPING REGENESYS GRADUATE ATTRIBUTES

Getting a qualification is not enough, on its own, to prepare you to traverse the rapidly changing world of work, where industry 4.0 and 5.0 are rendering many professions obsolete. We will work with you throughout your studies to help you develop these critical attributes to navigate the new world order, along with the skills and knowledge you need to excel in any environment.

REGENESYS GRADUATE ATTRIBUTES



Think differently



To think differently, you must be intellectually curious, analytical, open-minded though constructively critical, with the mental agility to think across disciplines, contexts and domains to solve complex problems and find innovative ways to do things. Be imaginative but rational. We will systematically help you cultivate higher-order thinking – the kind of thinking that recognises and makes sense of patterns others miss, and that facilitates unique linkages and solutions.

Ground decisions in evidence



Both well-informed and knowledgeable, you must be committed to sound research, taking a multidisciplinary and metacognitive approach to problem-solving, and able to recognise and put aside personal bias, basing decisions on evidence. This will prepare you to take calculated risks.

Lead consciously



This ties back to the overarching P in the quintuple bottom line: purpose. Purpose-driven, you put sustainability at the heart of your organisation. Emotionally and spiritually intelligent, you should be self-aware, understand the interconnectedness of all things, and act ethically and with integrity. As an ideal graduate, you will be a service-oriented agent of change.

Harness diversity



You appreciate the value of individual differences. Socially intelligent, collaborative and a skilled communicator, you should be able to facilitate connections to build, empower and manage high-functioning teams with diverse skills and personalities, and support them in assuming responsibilities.

Professional comportment



With a confident and inspiring aura, you are utterly professional, yet accessible. Deliberate, determined, disciplined, and focused. You will model your values, and hold yourself accountable. You will have the resilience and grit to keep going in the face of adversity.

Have a glocal outlook



Your glocal outlook underpins your ability to operate and compete ethically and profitably as a responsible global citizen in a borderless world. Your multicultural awareness and wide-ranging interest in current affairs enables you to recognise and respond to local cultures and needs without losing sight of the global picture.

As you work through your course, keep an eye out for each of these icons. They will signal which of the attributes you are developing as you work through your study tasks.

Are you ready to start work on what it takes to be a Regenesys graduate?

The next few sections contain practical information that will help you do just that.

3. KEY TO ICONS

	Workbook		Rate your skills
	Prescribed resources		References
	Interesting reading		Articles
	Case study		Discussion forum
	Example		Calculations
	Quote		Definitions and glossary
	Note important information		In a nutshell – important summary
	Self-reflection activity to complete		Task to complete/formative assessment
	Course evaluation		Digital assessment
	Assignment		Group assignment
	Workplace assessment		Exam
	Web link		Video clip
	Audio		Presentation
	Livestream/webinar		Folder/portfolio of evidence
	Choice		Appendix
	Downloadable item		Upload here

4. STUDY MATERIAL

Your material includes:

- This study guide;
- Prescribed reading and viewing;
- Digital assessments at the end of each section of your course; and
- An individual assignment.

These resources provide a **starting point** for your studies. You are expected to make good use of your textbooks, the additional resources provided via online links, and wider reading that you, as a higher education student, will source yourself.

5. PRESCRIBED RESOURCES

Various resources are prescribed to help you complete this course.

5.1 BOOKS

The following textbook is **prescribed** and should be used to complete the course:

- Trott, P. (2021). *Innovation management and new product development* (7th ed.). Pearson Education.



Please ensure that you order or download your textbooks before you start the course.

5.2 ARTICLES

- Anthony, S., Cobban, P., Nair, R., & Pinchaud, N. (2019). Breaking down the barriers to innovation. *Harvard Business Review*, November-December, <https://hbr.org/2019/11/breaking-down-the-barriers-to-innovation> (accessed 23 November 2021).
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5.3 MULTIMEDIA

- Apple Explained. (2018, November 26). *Is Apple still innovative?* [Video]. YouTube. <https://www.youtube.com/watch?v=U5Yx2p2ZguU> (accessed 24 November 2021).
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- Ionology. (2016, December 16). *The 5 secrets of data driven decision making* [Video.] YouTube. <https://www.youtube.com/watch?v=dCK6e8EDVNQ> (accessed 24 November 2021).
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5.4 ACCESSING JOURNAL ARTICLES AND OTHER ONLINE LINKS

Most course links should open directly when you click on them, provided your browser is open and connected to the net. However, to access **Emerald** and **Ebsco** articles, you must be logged in to the student portal, and have the relevant database open.

- Click on Tools, Resources, Library, and then on Ebsco or Emerald (whichever you need):

The screenshot shows the Regenesys student portal interface. The top navigation bar includes the Regenesys logo and the tagline "Awakening Potential". Below the navigation bar, a breadcrumb trail reads: Home ► Select Course ► Miscellaneous ► Welcome ► Getting Started ► Using your digital course. The main content area is divided into two columns. The left column is a navigation menu with categories such as Chapter contents, Getting started, Courses, Tools, Events, Calendar, Resources, Library, Open access journals, Around the net, Useful sites, News sites, Consultancy research, Resource centre manual, Textbooks, Academic guides, Assignment submission, Examinations, Multimedia, Archive search, Academic record, Who's who, Contact details, Policies and procedures, Report site faults, and Course search. The "Library" category is expanded, and "EbscoHost" and "Emerald" are circled in red. The right column displays the "Using your digital course" page, which features a "Recommended resources" section. This section includes a "Learning Outcomes" box with a list of skills to be developed, a "Let's warm up:" section with checkboxes, and a "Recommended resources" link circled in red. Below this, there are two bullet points providing instructions on how to use the resources.

... and then click on the article link in the study guide.

If this does not work (it can depend on what browser you are using), cut and paste the URL (the www address) into your browser and click to access the link. Use Chrome, Firefox or Safari as your browser – not Internet Explorer, which is no longer supported by all applications. Check that you have copied the whole URL, and have not left out part after a hyphen. There should not be any spaces in the URL – the whole thing should be on one line.

Please report any broken links – or any other problems encountered on your educational journey that we can solve – to mdt@regenesys.co.za so we can fix them for you.



Links to additional media that may prompt discussion and help you complete this course will be saved in Around the Net, a couple of clicks down from the Ebsco and Emerald database links in the portal library. Visit the site regularly to see what's new.

5.5 ADDITIONAL SOURCES TO CONSULT

As a higher education student, you are responsible for sourcing additional information that will assist you in completing this course successfully. Here are sources you can consult to obtain additional information on the topics to be discussed in this course. You will find more on the portal.

EbscoHost and Emerald	These online databases contain journal articles, e-books and multimedia relevant to your studies. Registered Regenesys students in good standing can access them through the student portal.
NetMBA	MBA constructs and discussion. http://www.netmba.com/
MindTools	Ideas, constructs, management models and commentary. http://www.mindtools.com/
ProvenModels	Provides management models – generalisations of business situations that, when applied in context, can be powerful tools for solving business problems. http://www.provenmodels.com/
12manage.com	More models, principles and global commentary. http://www.12manage.com/
The Free Management Library	Comprehensive overviews of strategic planning. http://managementhelp.org/strategicplanning/index.htm
TED	TED (Technology, Entertainment and Design) is a nonprofit organisation spreading transformative ideas in science, business and global issues, among other topics. TED's website will take you to the ground-breaking TED Talks, and to TEDx, a programme that helps communities, organisations and individuals to create local TED-like experiences. https://www.ted.com/about/our-organization



A word of caution – not all information available on the internet is necessarily of a high academic standard. Always compare the information you find with that in reputable sources, such as articles published in accredited journals.

6. INTRODUCTION TO THIS COURSE

The purpose of this course is to guide you through the innovation process by giving you both theoretical and practical experience of how to create, drive and sustain innovation in an organisation. Innovation is important not only for the success of a business but for our economy and for future generations.

You will be guided through using various processes, frameworks and practical examples. Note that innovation management has challenges and risks – with it come uncertainty, costs, and the management of processes across the organisation and in the external environment. Further, we address the challenges of innovation by paying attention to the systemic forces of strategy, structure, culture and systems.

At the end of this course, you will have a holistic view of how innovation is vital to the success of an organisation.

6.1 LEARNING OUTCOMES

On completing this course, you should be able to:

- Reflect critically on the importance of innovation for organisations, and analyse the critical factors for innovation success;
- Assess innovation management models, tools, frameworks and processes;
- Critically evaluate different methods for generating ideas and managing uncertainty in the innovation process;
- Exploit strategic alliances and networks to create innovative ways of doing business;
- Compare and contrast innovation with research and development;
- Critically evaluate the innovative approaches used in product and service development;
- Assess the value of integrating issues related to ethics and corporate social investment within innovation; and
- Demonstrate the importance of management information systems in innovation.



The number of notional learning hours set out in the table under each section heading provides guidance on how long to spend studying each section of this course. Set yourself a schedule to ensure that you spend a suitable period of time on each section, complete the assignment, and give yourself enough time to prepare for the examination.

6.2 GETTING TO KNOW INNOVATION

Timeframe	Minimum of 40 hours
Learning outcome	<ul style="list-style-type: none"> • Reflect critically on the importance of innovation for organisations, and analyse the critical factors for innovation success.
Prescribed book	<ul style="list-style-type: none"> • Chapter 1 in Trott, P. (2021). <i>Innovation management and new product development</i> (7th ed.). Pearson Education.
Prescribed articles	<ul style="list-style-type: none"> • Mourkogiannis, N. (2007). Using purpose to drive innovation. <i>Ivey Business Journal</i>, July-August. http://iveybusinessjournal.com/publication/using-purpose-to-drive-innovation/ (accessed 24 November 2021). • Puranam P. (2015, June 9). Elon Musk, frugal engineer. <i>Knowledge INSEAD blog</i>. https://knowledge.insead.edu/blog/insead-blog/elon-musk-frugal-engineer-4085 (accessed 24 November 2021). • <i>Paul Shepherd</i>. (2015, November 14). Case study: successful innovation – how Ikea innovates. https://paulshepherd.co/successful-innovation-case-study/ (accessed 24 November 2021). • Sandefur, T. (nd). Innovation. <i>Library of Economics and Liberty</i>. http://www.econlib.org/library/Enc/Innovation.html (accessed 24 November 2021). • Satell, G. (2017, June 21). The 4 types of innovation and the problems they solve. <i>Harvard Business Review</i>, June. https://hbr.org/2017/06/the-4-types-of-innovation-and-the-problems-they-solve (search EbscoHost on the student portal if this link does not take you directly to the article) (accessed 24 November 2021). • Schirtzinger, A. (2016, March 15). The top 10 innovation killers and how to neutralize them. <i>Sales Force</i>. http://answers.salesforce.com/blog/2016/03/innovation-killers.html (accessed 24 November 2021).
Prescribed multimedia	<ul style="list-style-type: none"> • AsapSCIENCE. (2016, October 26). <i>The 71 most amazing innovations of all time</i> [Video]. YouTube. https://www.youtube.com/watch?v=l16TJU4SVA (accessed 24 November 2021). • TEDx. (2017, June 29). <i>MOOCs: knowledge at your fingertips</i>. [Video.] YouTube. https://www.youtube.com/watch?v=MnFg7cGYFrk (accessed 24 November 2021). • QUT IFB101. (2015, February 12). <i>Diffusion of innovations</i> [Video.] YouTube. https://www.youtube.com/watch?v=kxVeLITEgtU (accessed 24 November 2021).
Section overview	<p>This section introduces the concept of innovation. You will discover the characteristics, types and purpose of innovation in an organisation. Further, you will understand the advantages and disadvantages of innovation, and should emerge with a broad yet comprehensive understanding of the value that innovation can bring an organisation.</p>

6.2.1 What is Innovation?

Many authors argue that innovation, as a management topic, has not reached its full stature. Many surveys on how companies innovate show that while there is a distinct need to innovate, there is widespread dissatisfaction with how innovation is carried out (Trías de Bes and Kotler, 2011:1).

Further, innovation has been mainly associated with technological innovation (such as research and development), with less emphasis on innovation in business models, processes, marketing, and other functions of the organisation (*ibid*).

There are competing views on innovation, for example, inside out versus outside in. Consider these excerpts:

“ The traditional view of creativity is that it is unstructured and doesn't follow rules or patterns. That you need to think 'outside the box' to be truly original and innovative. That you should start with a problem and then brainstorm ideas without restraint until you find a solution. That you should go wild making analogies to things that have nothing to do with your products, services, or processes. That straying as far afield as possible will help you come up with a breakthrough idea. We believe just the opposite ... better and quicker innovation happens when you work inside your familiar world.

(Boyd & Goldenberg, 2013:2)

We're drowning in a sea of technological crap [*sic*], because every product that is released to the market is a result of multiple compromises based on decisions by the product manager, the engineering manager, the marketing manager, the sales manager and everyone else who has skin in the game as they prepare the offering to meet what they think are the target customer's needs. The reason Jobs and Ive [Apple design guru] get it right is because they design sexy products with elegant and simple interfaces – for themselves. Then they count on their hip gaggle of early adopters to see it the same way. Once the snowball starts rolling, it's all momentum from there.

(Alain Breillatt, director of product management, Nielsen Company, in Gallo, 2011:126)



Innovations that changed the world:

- AsapSCIENCE. (2016, October 26). *The 71 most amazing innovations of all time* [Video]. YouTube. <https://www.youtube.com/watch?v=l16TJUp4SVA> (accessed 24 November 2021).

These two excerpts demonstrate inside-out approaches, which run counter to the traditional outside-in thinking of market researchers and customer-centric product development managers. Gallo (2011:127) argues that “transformational breakthroughs are rarely the result of focus groups”. He cites Steve Jobs’s iTunes store, the iPhone, and the iPad – none of which customers asked for and yet customers cannot imagine living without them now. This is not to say that successful innovators do not keep their ears to the ground; it merely suggests that context plays a big role in how innovation takes place.

What seems clear is that the highest ratings for innovation are given to business ingenuity in “products, customer experience, business models, and processes”. Whether “technology forms part of innovation is irrelevant” (Trías de Bes and Kotler, 2011:2). This suggests a much wider view of innovation – one that considers all aspects of the organisation, including supply chains and other strategic alliances.

Innovation economics is a school of thought that repositions where the value of economic growth lies. Innovation economics “reformulates the traditional model of economic growth so that knowledge, technology, entrepreneurship, and innovation are positioned at the centre of the model rather than seen as independent forces that are largely unaffected by policy” (Robles, 2009).

Innovation economics has two core premises:

1. The central goal of economic policy is to encourage higher productivity and greater innovation.
2. Markets relying on price signals alone will not always be as effective as smart public-private partnerships in spurring higher productivity and greater innovation

(Robles, 2009).

If we consider that the main drivers of “economic growth are productive efficiency and adaptive efficiency” then the focus of innovation economics is different from other schools of thought. For example, neoclassical economics is “the study of how societies use scarce resources to produce valuable commodities and distribute them among different people,” whereas the focus in innovation economics is “the study of how societies create new forms of production, products, and business models to expand wealth and quality of life” (Robles, 2009).



- Innovation is still a developing management topic.
- Innovation is not limited to products (goods and services) – it also includes processes.
- There are competing ideas on how to innovate successfully (eg inside out and outside in).
- Innovation takes place across all functions of the organisation and extends to supply chains and strategic alliances.
- Innovation economics is a new school of thought that holds innovation as a principle.

Given the many competing perspectives, it is useful to start by considering a range of definitions of innovation to draw out similarities and differences.



Innovation is “invention plus exploitation”. It is “the embodiment, combination, or synthesis of knowledge in original, relevant, and valued new products, processes, or services”.

(Harvard Business Essentials, 2003:2)

Innovation is a “growth engine and has been found to be a predictor of business success ... in the age of networked knowledge, the competitive advantage of a firm lies in its ability to capitalise on innovation ... the implementation of a new significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations ... innovation is a collaborative and ongoing effort which draws on the combined knowledge and insights of the individuals working in various functional departments both within and outside the firm”.

(Wong, 2013)

“**Innovation** should also be understood as developing an innovative culture within the company, which is what will enable it to produce and bring out onto the market a steady stream of smaller, incremental innovations. That’s when, as paradoxical as it might seem, radical innovation eventually appears ... a company that hasn’t developed the innovative habit can hardly expect to perform well when it comes to extraordinary innovations.”

(Trías de Bes and Kotler, 2011:4)

Innovation is “a new way of doing things that results in positive change. It makes life better. Innovation increases productivity, and productivity increases the possibility of higher income, higher profits, new jobs, new products, and a prosperous economy.”

(Gallo, 2011)

Innovation is “not a single action but a total process of interrelated subprocesses. It is not just the conception of a new idea, nor the invention of a new device, nor the development of a new market. The process is all these things acting in an integrated fashion.”

(Myers and Marquis in Trott, 2021:15)

Innovation is the “management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product or manufacturing process or equipment.”

(Trott, 2021:15)

Several of the definitions imply that the innovation process is best represented as:

**Theoretical conception (idea) + technical invention + commercial exploitation
= Innovation**

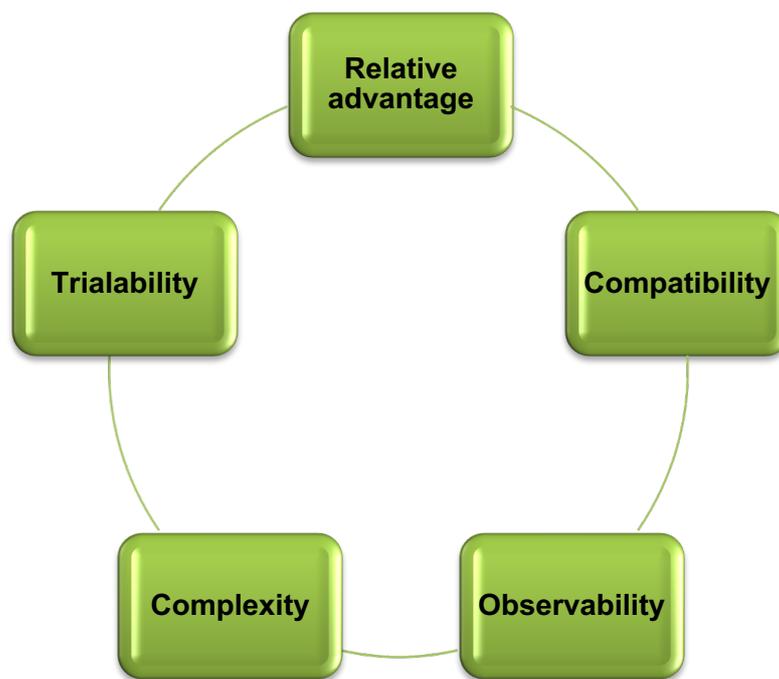
As Trott (2021:15) points out, innovation is the result of intelligent thoughts or ideas converted into an invention and then exploited commercially. An idea in itself is not an innovation, and neither is an invention.

Wong (2013) argues strongly for management involvement, particularly as innovation in organisational processes is likely to change the established course of work and is likely to disrupt current business operations. Innovation is inherently costly and risky. It can be unpredictable, and therefore management involvement is a prerequisite to successful innovation.

6.2.2 Characteristics of Innovation

Innovation is a complex process and one that is determined by people's acceptance and adoption of an innovation. It is important to note that people do not simply accept an innovation, but rather make a conscious decision to adopt it. Five core characteristics influence whether an innovation is adopted (Rogers, 2003). See **Figure 1**.

FIGURE 1: CHARACTERISTICS OF THE DIFFUSION OF INNOVATION



(Adapted from Rogers, 2003)

Relative advantage is “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers, 2003:229).

Compatibility is “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (Rogers, 2003:15).

Observability is “the degree to which the results of an innovation are visible to others” (Rogers, 2003:16)

Complexity is “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers, 2003:15).

Trialability is “the degree to which an innovation may be experimented with on a limited basis” (Rogers, 2003:16).



Do you know how innovations spread? Watch this:

- QUT IFB101. (2015, February 12). *Diffusion of innovations* [Video.] YouTube. <https://www.youtube.com/watch?v=kxVeLITEgtU> (accessed 24 November 2021).

Understanding the characteristics of innovation will allow you to consider how innovation is adopted in the context of a larger social system, rather than just as an individual process. This will guide you in launching an innovation.

6.2.3 Types of innovation

Here we highlight types of innovation before considering potential levers of innovation:

- Generic typologies of innovation;
- Incremental versus radical innovation; and
- Frugal innovation.

Generic typologies of innovation

Table 1 provides examples of the types of innovation found across organisations.

TABLE 1: TYPOLOGY OF INNOVATIONS

Types of innovation	Examples
Product (good or service) innovation	The development of a new good or service: <ul style="list-style-type: none"> • New product – the iPhone • New service – internet-based taxi service
Organisational innovation	<ul style="list-style-type: none"> • An internet-based, employee self-service human resource management system • The establishment of a new division that diversifies the organisation
Process innovation	The development of a new manufacturing process, eg Pilkington's float glass process
Management innovation	A new quality management system
Production innovation	Use of robotics
Commercial or marketing innovation	Big data analytics and integrated social media marketing
Supply chain	Net environmental impact and green strategies

(Trott, 2021:17)

Innovation does not occur in isolation. It results in change and possibly further innovations taking place elsewhere in the organisation that are driven by individuals and team. For example, the digital cameras produced by Kodak and Fuji resulted in substantial internal organisational changes (ie to manufacturing, marketing, and sales processes) which ultimately affected the product and drove innovation principles throughout the organisation.



- Product innovations are usually followed closely by process innovations.
- A change in one part of the system has ramifications for other parts of the system. Therefore innovation cannot be seen in isolation.

Incremental versus radical innovation

Incremental innovation exploits existing technologies. This is either through:

- A **reconfiguration** of the existing technology, possibly for some other purpose (GPS technology applied to vehicle navigation systems); or
- An **improvement** of the existing technology (vehicle navigation system to include traffic reports).

A **radical innovation** is something new to the world – it marks a departure from existing business models and technologies. Other names include “breakthrough”, “discontinuous innovation” and “disruptive innovation”. This type of innovation may completely disrupt an organisation's business model, and the technologies it applies and may even disrupt an entire industry approach. In some cases, radical innovation can create an entirely new market.



“Consider the recent emergence of MOOCs – massive open online courses aimed at unlimited participation in education with open access via the web. Innovations in information and communication technologies are creating innovative ways in which to deliver education. The consequence of this is new markets for traditional ‘brick and mortar’ education institutions. Rather than being faced with 30 students in a lecture hall, professors are broadcasting to thousands of students across the globe.

“Unfortunately, the MOOC revolution failed to live up to its ambitions due to the expense of maintaining such an operation and low completion rates. However, by shifting their focus to become the ‘Uber of Education’ they have managed to transform their original business model to target student employability through education.”

(Watters, 2015)



See how you can learn from the world’s most prestigious universities for free:

- TEDx. (2017, June 29). *MOOCs: knowledge at your fingertips*. [Video.] YouTube. <https://www.youtube.com/watch?v=MnFg7cGYFrk> (accessed 24 November 2021).

Trott (2012:212) makes it clear that radical and incremental innovations have very different competitive consequences, and he distinguishes them as follows:



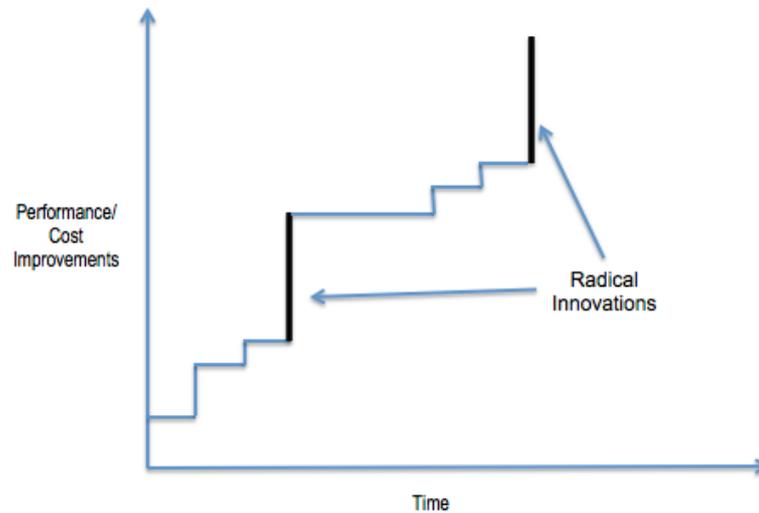
- **Internal dimension:** “An incremental innovation will build upon existing knowledge and resources within the firm leading to the enhancement of its competencies. Whereas a radical innovation will require completely new knowledge and/or resources and could, therefore, destroy many of the existing competencies.”
- **External dimension:** “It differentiates the innovation based on the technological changes and the impact upon the market competitiveness. An incremental innovation will involve modest technological changes and the existing products in the market will remain competitive. A radical innovation will instead involve large technological advancements, rendering the existing products uncompetitive and eventually obsolete.”

(Trott, 2021:232)

Existing organisations may remain competitive if the innovations are incremental, since they can keep using existing knowledge and processes (ie their core competencies) to compete. But new market entrants will have a greater advantage if the innovation is radical, because new entrants do not need prior knowledge and are not constrained by established processes. Nor are new entrants trapped by the managerial mind-sets that are often inherent in existing organisations. Radical innovations clearly open the door to new entrants – they can level the playing field (Trott, 2021:232).

Incremental and radical innovations often go hand in hand. Periods of incremental innovations are punctuated by a radical innovation, as shown in **Figure 2**.

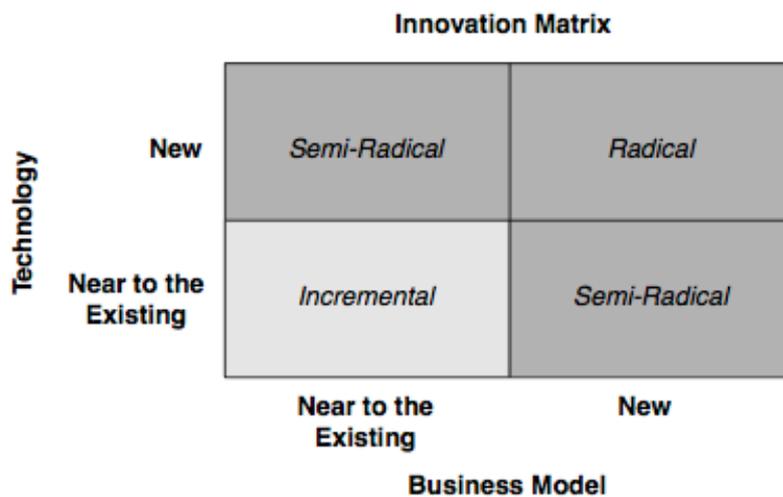
FIGURE 2: INDUSTRY TIMELINE FOR RADICAL AND INCREMENTAL INNOVATION



(Harvard Business Essentials, 2003:4)

Some organisations extend the above to include semiradical innovation, which is a new technology in a near-to-the-existing business model, or a near-to-the-existing technology in a new business model. See **Figure 3**.

FIGURE 3: AN INNOVATION FRAMEWORK



(Davila, Epstein & Shelton, 2013:39)

Understanding the level of innovation is vital – how an organisation innovates has implications for its business model and technologies, and for its competitive stance.

Frugal innovation

We live in an age of austerity, emerging economies, and cost-conscious and eco-aware consumers. These all demand affordable, sustainable and high-quality products – a seemingly impossible combination. While some organisations see this as unattainable, others have responded with a new mind-set that considers these constraints as a growth opportunity. The emergence of this as a strategy has been labelled “frugal innovation”.



Frugal innovation is “the ability to generate considerably more business and social value while significantly reducing the use of scarce resources. It is about solving – and even transcending – the paradox of doing more with less.”

(Radjou & Prabhu, 2013)

Puranam (2015) identifies six principles for ensuring frugal innovation, particularly in India, where the majority are poor. Such products should:

- Be robust;
- Be portable;
- Be examples of “leapfrogging technology”;
- Drive costs down with mega-scale production;
- Leverage existing service systems; and
- Ditch unnecessary product features, enabling manufacturers to serve low-income mass markets.



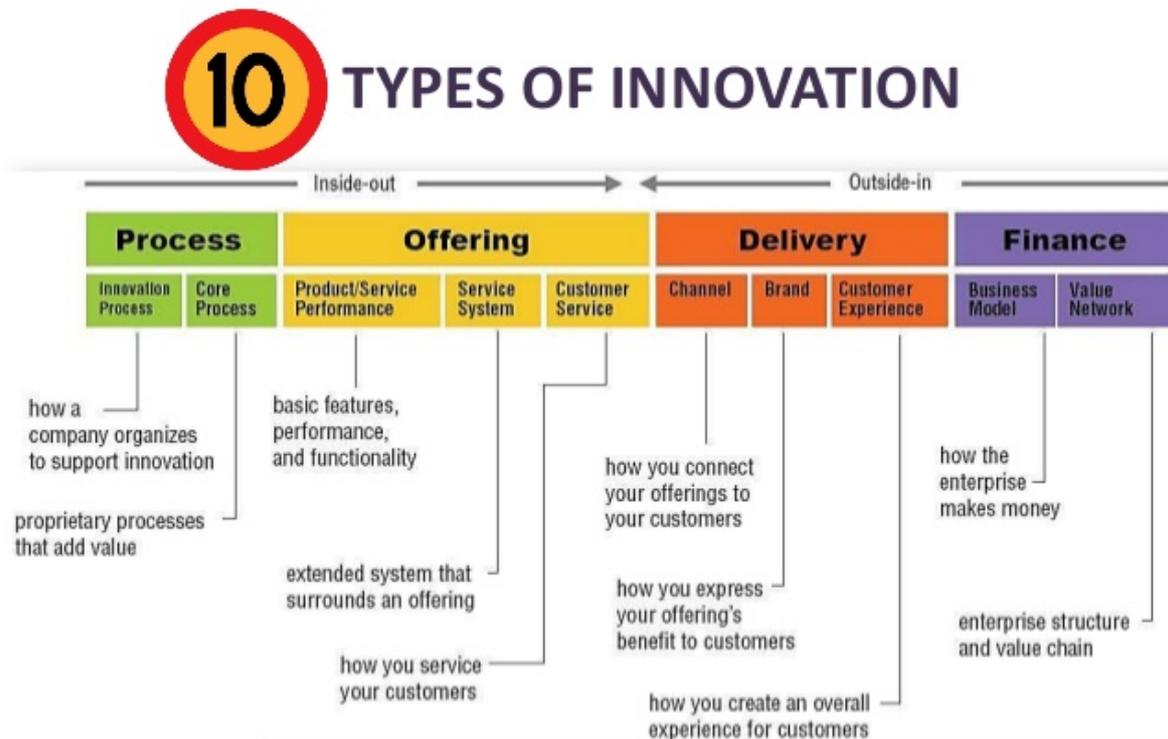
There’s more detail on Puranam’s principles of frugal development here:

- Puranam P. (2015, June 9). Elon Musk, frugal engineer. *Knowledge INSEAD blog*. <https://knowledge.insead.edu/blog/insead-blog/elon-musk-frugal-engineer-4085> (accessed 24 November 2021).

Ten types of Innovation

Doblin has identified 10 types of innovation that can be used independently or together to discover innovative opportunities. The framework in **Figure 4** can also be used as a diagnostic tool to identify and assess innovation in your organisation.

FIGURE 4: TEN TYPES OF INNOVATION



Putting Types of Innovation into Practice



1. Draw a table. In one column list the various types of innovation discussed in the section headed Types of Innovation. In the following column provide practical examples of each type of innovation in different organisations.
2. Critically analyse why one organisation is better than another.
3. Apply the principles of process, offering, delivery and finance in the 10 types of innovation to an example from your own organisation (or one you are familiar with).

6.2.4 No Purpose or Value? Then No Innovation

The purpose of innovation

Purpose is the key to improving the quality of innovation as it guides innovators to look beyond what is currently in place and challenges them to embrace risk and increase the quality of innovation. Purpose is what engages the innovator and lessens the risk aversion that organisations naturally have toward change. Nikos Mourkogiannis writes that purpose is often overlooked. Purpose:

“ Means a reason for doing something that appeals to our sense of what is right and what is worthwhile. In a business context, it is what drives an individual or group beyond the drive to make as much money as possible. Leaders of the most successful companies over the long term first discover a purpose that fits the aspirations of their colleagues and the requirements of their business.

(Mourkogiannis, 2007:1)

Defining the purpose behind your innovation should be considered a core activity, as it transforms ideas into a tangible form of value in a product or service.



Starting Your Innovation



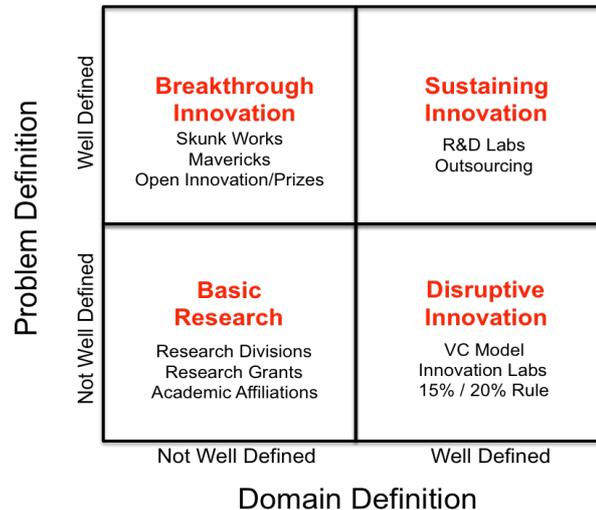
1. Identify at least five areas in your business (or one you are familiar with) that could do with some innovation.
2. Select one of the five and critically assess why this area requires innovation.
3. Now think of an innovative product or service for the area you have chosen.
4. Critically evaluate its current purpose and value to the organisation.
5. Assess this product according to the 10 types of innovation, and critically analyse the gaps in the framework.
6. Discuss whether you believe this impact will be accepted in your organisation according to Rogers's diffusions of innovation theory.

The value of innovation

Purpose gives innovation value. But unfortunately, value is often greatly misunderstood in innovation. Value in this case is a **change in mind-set** that ultimately affects how the customer trades with you. "Value is what makes someone decide to take out her wallet and hand you her money, because she's going to get something she wants – something in which she finds compelling value" (Kahan, 2013).

There are four ways an organisation can approach innovation and deliver value (Satell, 2015). See **Figure 5**.

FIGURE 5: THE INNOVATION MATRIX



(Satell, 2015)



Find out how the types of innovation can create value:

- Satell, G. (2017, June 21). The 4 types of innovation and the problems they solve. *Harvard Business Review*, June. <https://hbr.org/2017/06/the-4-types-of-innovation-and-the-problems-they-solve> (search EbscoHost on the student portal if this link does not take you directly to the article) (accessed 24 November 2021).

Innovation economics

Innovation contributes to an organisation’s competitive advantage and to economic growth in our dynamic (global) market. Innovation economics play a vital role in driving a country’s economic growth. “Innovation can turn new concepts into realities, creating wealth and power. For example, someone who discovers a cure for a disease has the power to withhold it, give it away, or sell it to others” (Sandefeur, nd).

Innovation economics interests researchers because innovation has both costs and benefits. Understanding what determines, drives and establishes innovation is vital in determining whether to pursue an innovation or not. Innovation has the power to turn concepts into reality, and to create wealth and power.



Getting to grips with innovation economics:

- Sandefur, T. (nd). Innovation. *Library of Economics and Liberty*. <http://www.econlib.org/library/Enc/Innovation.html> (accessed 24 November 2021).

Weighing the risk against the benefits

Understanding the benefits and the risks that innovation brings is vital in mapping an organisation to success. See **Table 2**.

TABLE 2: BENEFITS AND RISKS OF INNOVATION

Advantages	Risks
Improved productivity and reduced costs	Operational
Better quality	Commercial
Building a product range	Financial
To handle legal and environmental issues	Change management
More added value	
Improved staff retention, motivation and easier recruitment	

Because innovation is a complex process, it is important to understand the risks and how to mitigate them. Ways to do this include:

- Seeking professional advice when needed;
- Legally protecting your tangible and intangible assets (such as intellectual property);
- Conducting ongoing research; and
- Understanding the impact your innovation can have.

Innovation killers



Outsmart innovation killers:

- Schirtzinger, A. (2016, March 15). The top 10 innovation killers and how to neutralize them. *Sales Force*. <http://answers.salesforce.com/blog/2016/03/innovation-killers.html> (accessed 24 November 2021).

6.2.5 The Key to Making Innovation Succeed

For your organisation to innovate to its full potential, certain factors must be in place. We discuss the success factors for innovation next.

Vijay Govindarajan (2011) has identified nine critical factors that drive successful innovation, and which must be present:

- 1) A compelling case for innovation
- 2) An inspiring, shared vision of the future
- 3) A fully aligned strategic innovation agenda
- 4) Visible senior management involvement
- 5) A decision-making model that fosters teamwork in support of passionate champions
- 6) A creatively resourced, multi-functional, dedicated team
- 7) Open-minded exploration of the marketplace drivers of innovation
- 8) Willingness to take risk and see value in absurdity
- 9) A well-defined yet flexible execution process.



Ikea



Read the Ikea case study and complete the tasks that follow:

- *Paul Shepherd*. (2015, November 14). Case study: successful innovation – how Ikea innovates. <https://paulshepherd.co/successful-innovation-case-study/> (accessed 24 November 2021).

Tasks

1. Discuss critically what factors contribute to Ikea's successful innovation.
2. Evaluate Ikea's purpose.
3. Critically analyse the value Ikea delivers.
4. Identify an innovation in your organisation and discuss its purpose.
5. What value will this innovation bring?
6. Analyse the risks that could arise from this innovation.
7. Critically determine ways to mitigate these risks.
8. For each of Govindarajan's critical success factors, rate your organisation on a scale of 1 to 10, where 1= poor, 10 = excellent.
9. Now apply these questions to the innovation you picked in the previous exercise. Critically assess the value will it bring, the risks might it pose, and how could you mitigate them.

Levers of successful innovation

Davila *et al* (2013:41) provide a useful analysis of the types of innovation and the levers (or drivers) of innovation. Refer to the course glossary for definitions of “business model”, “value proposition”, “value chain”, “process technology” and “enabling technology” before considering **Table 3**.

As the table indicates, incremental innovation embraces the existing technologies and business model with little disruption to the value proposition, the value chain, the target customer, the products and services, the process technology and to any enabling technologies. Semiradical innovations may affect either the business model drivers or the technology drivers.

But radical innovation has a significant effect on both the business model and the technologies of the organisation. The significance of this is in the investment commitment – a radical innovation can cost six times as much as a semiradical innovation and a semiradical innovation as much as four times as much as an incremental innovation, depending on the context (Davila *et al*, 2013:42).

TABLE 3: LEVERS OF INNOVATION

Types of	Business Model Levers			Technology Levers		
	Value proposition (the what)	Value chain (the how)	Target customer (to whom)	Product and service	Process technology	Enabling technology
Incremental	Small change in one or more of the six levers					
Semiradical business model driven	Significant change in one or more of the three levers			Small change in one or more of the three levers		
Semiradical technology driven	Small change in one or more of the three levers			Significant change in one or more of the three levers		
Radical	Significant change in one or more of the three levers			Significant change in one or more of the three levers		

(Davila *et al*, 2013:41)

Davila *et al* (2013:42) provide the following key points, including benefits of each type of innovation. We have summarised these in **Table 4** for ease of discussion.

TABLE 4: DIFFERENT LEVES OF INNOVATION

Innovation type	Description
Incremental innovation	<ul style="list-style-type: none"> • Most prevalent form (uses about 80% of organisation's total investment in innovation) • Safe and predictable form of innovation investment • Consists of a portfolio of innovation projects aimed at small changes to one or two of the six levers in the business model or technologies of the organisation • A means to wring out as much value as possible from existing products (goods and or services), ie to create a sense of newness to rejuvenate sales • Provides protection from competitive corrosion which can eat away at market share, profitability or both (eg Gillette has done a good job of this with incremental improvements to its razor technologies since 2000) • Incremental innovation prevents a product from becoming a commodity – small amounts of added value continue to differentiate a product • Incremental investment in products that will not have the desired return on investment should be avoided. In the long term, the portfolio of innovation projects should be complemented with other types of innovation.
Semiradical innovation	<ul style="list-style-type: none"> • Substantial change to either the business model or the technology of the organisation • Provides crucial change to the competitive environment that incremental innovation cannot, eg Walmart applied the supermarket business model to retailing and coupled this with an advanced supply chain that cut costs dramatically • Simultaneously managing the changes in the business model and technology components of semiradical innovation is the most difficult challenge
Radical innovation	<ul style="list-style-type: none"> • Brings fundamental changes to the competitive environment in an industry – known as “game changers” that rewrite the rules of doing business (eg disposable nappies changed the industry and then led to a series of cascading semiradical and incremental innovations) • Typically includes partnerships with outside organisations to share costs and risks • <i>Ersatz</i> radical innovation is the combination of two semiradical innovations to create a radical innovation (eg the Barnyard Theatre, which combines theatre with a restaurant)

(Davila *et al*, 2013:42-56)

TABLE 5: WORLD'S MOST INNOVATIVE COMPANIES FOR 2019

Rank	Company
1	Google
2	Amazon
3	Apple
4	Microsoft
5	Samsung
6	Netflix
7	IBM
8	Facebook
9	Tesla
10	Adidas

(BCG, 2018)

While Apple was once rated highest in innovation (with a 30% increase in revenue growth and a 29% increase in margin growth in 2014), in the year 2016 Tesla was rated the premium innovation organisation. This comes as no surprise: projects such as the world's largest battery run on renewable energy are difficult innovations to beat. It only goes to show that continuous innovation is vital in achieving competitive advantage. Apple was number one on the *Forbes* 100 list of most valuable brands in 2019 (*Forbes*, 2019).



Relationship between Innovation and Growth



After studying **Tables 3** and **4**:

1. Distinguish between “business model” and “technology” levers.
2. Identify examples (where possible) of the four types of innovation in your organisation over the **past five years**, and critically assess the organisation with regard to innovation relative to other firms in your industry (eg your organisation is highly innovative; moderately innovative; or low in innovativeness):
 - 1.1 Incremental
 - 1.2 Semiradical business-model driven
 - 1.3 Semiradical technology driven
 - 1.4 Radical.
3. Using the example of a timeline in **Figure 2**, show how these innovations have contributed to increased performance in your organisation during this period. Performance could be defined as revenue growth, or, for example, margin growth.

4. Reflect critically on the slope of the line (eg your organisation may have implemented many incremental innovations without these translating into increased performance; or your organisation could have been responsible for radical innovations, but this may or may not have translated into the desired performance).
5. Argue the following points:
 - 5.1 The advantages from incremental innovation may be short lived and might not translate into sustainable performance improvements.
 - 5.2 Many organisations are trapped by rampant incrementalism and eventually die.
 - 5.3 Incremental innovation is a form of constrained creativity where only small changes are permitted. This stifles more radical innovation that could be more valuable.
- 6 What kind of innovation are you proposing?

6.2.6 Key Points

- Innovation is still a developing discipline.
- Innovation is a combination of invention plus exploitation as it combines the synthesis of knowledge in original, relevant, and valued new products, processes, or services.
- The innovation process is best described as: Theoretical conception (idea) + technical invention + commercial exploitation = Innovation.
- Five factors influence innovation: relative advantage, compatibility, observability, complexity and trialability.
- Three types of innovation are: generic typologies of innovation; incremental versus radical innovation; and frugal innovation.
- Purpose is the key to improving the quality of innovation, as it guides innovators to look beyond what is currently in place and challenges them to embrace risk and increase the quality of innovation.
- Purpose creates value in innovation.
- There is a benefits and risk to innovation.
- Nine critical success factors drive innovation; which are:
 - A compelling case for innovation;
 - An inspiring, shared vision of the future;
 - A fully aligned strategic innovation agenda;
 - Visible senior management involvement;
 - A decision-making model that fosters teamwork in support of passionate champions;
 - A creatively resourced, multi-functional, dedicated team;
 - Open-minded exploration of the marketplace drivers of innovation;
 - Willingness to take risk and see value in absurdity; and
 - A well-defined yet flexible execution process.

Remember to do your digital assessment for this section online!



It will help you strengthen and embed your understanding of the course. You will not be able to change your answers once you have submitted them, so make sure you have completed the relevant section of coursework first. Where you see **Select all that are relevant**, be aware that any number of the options presented could be correct. You will lose marks for incorrect selections, so choose carefully. Your combined marks from these assessments count towards a total of 20% of your course mark.

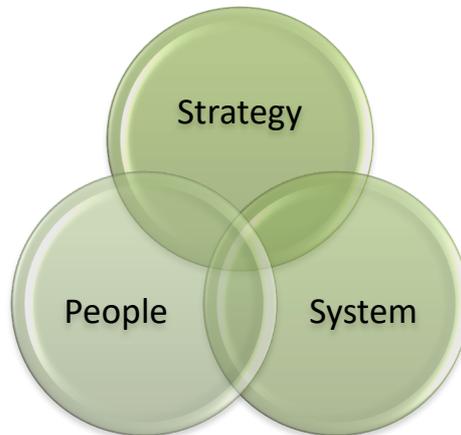
6.3 THE INNOVATIVE ORGANISATION

Timeframe	Minimum of 40 hours
Learning outcomes	<ul style="list-style-type: none"> • Critically evaluate different methods for generating ideas and managing uncertainty in the innovation process; • Exploit strategic alliances and networks to create innovative ways of doing business; • Reflect critically on the importance of innovation for organisations, and analyse the critical factors for innovation success; and • Demonstrate the importance of management information systems in innovation.
Prescribed book	<ul style="list-style-type: none"> • Chapters 3 and 11 in Trott, P. (2021). <i>Innovation management and new product development</i> (7th ed.). Pearson Education.
Prescribed articles	<ul style="list-style-type: none"> • Arora, E. (2016, September 5). Facebook – developing a culture of Innovation. <i>LinkedIn</i>, https://www.linkedin.com/pulse/facebook-developing-culture-innovation-ekta-arora (accessed 24 November 2021). • Bush, T. (2016, May25). Strategic planning tools for better results. <i>Pestle Analysis</i>. http://pestleanalysis.com/strategic-planning-tools/ (accessed 24 November 2021). • Kasanoff, B. (2016, January 30). Six lessons on innovation from the Wright brothers. <i>Forbes</i>, https://www.forbes.com/sites/brucekasanoff/2016/01/30/six-lessons-on-innovation-from-the-wright-brothers/-4f2b1f099f6f (accessed 24 November 2021). • Pershing, B. (2016, March 24). Nikola Tesla's innovations show how ahead of his time he was. <i>Learning Mind</i>. https://www.learning-mind.com/nikola-teslas-innovations/ (accessed 24 November 2021). • Luma Institute. (2014). A taxonomy of innovation. <i>Harvard Business Review</i>, January-February. https://hbr.org/2014/01/a-taxonomy-of-innovation (accessed 24 November 2021). • Pisano, G. (2015). You need an innovation strategy: interaction. <i>Harvard Business Review</i>, June. http://web.a.ebscohost.com/ehost/detail/detail?vid=3&sid=508283e5-18b2-4da6-ae9a-8ca7176aca9a%40sdc-v-sessmgr03&bdata=JnNpdGU9ZWhvc3QtGjZlZQ%3d%3d#AN=102786227&db=bsh (search EbscoHost on the student portal if this link does not take you directly to the article) (accessed 24 November 2021). • Tysiac, K. (2017, April 1). How to enable audit innovation. <i>Journal of Accountancy</i>, 223(4), 33-35, http://www.journalofaccountancy.com/issues/2017/apr/audit-innovation.html (accessed 24 November 2021).
Prescribed multimedia	<ul style="list-style-type: none"> • DigitalDictionary. (2018, Nov 28). <i>The simplex problem-solving process</i> [Video.] YouTube. https://www.youtube.com/watch?v=ZO5Kq6kLBtl (accessed 24 November 2021).
Section overview	<p>This section exposes you to the elements that create an innovative ecosystem: the strategy, the system and the people. It offers insight into the process and ethics of innovation and problem-solving. At the end of this section, you will understand why investing in these three areas is essential to drive corporate innovation.</p>

6.3.1 The Ecosystem of Innovation

When building an innovative ecosystem there are three core elements to focus on, shown in **Figure 6**.

FIGURE 6: THE INNOVATIVE ECOSYSTEM



(Adapted from Probert, 2014)

Each of these elements plays an integral role in building a flexible yet innovative organisation with a sustainable competitive edge in today's dynamic and continually changing market.

Strategy: a road map to innovation success

Corporate innovation often fails due to lack of initial strategic planning. It is a complex task that deals with planning for an uncertain future. Fortunately, there are tools and techniques that gather information to review the environment, identify trends and align technology with management activities and business strategy. PESTLE analysis for example, is a great tool that aids you in determining what political, economic, social, technological, legal and environmental factors could affect your organisation.



Why you need an innovation strategy:

- Pisano, G. (2015). You need an innovation strategy: interaction. *Harvard Business Review*, June. <http://web.a.ebscohost.com/ehost/detail/detail?vid=3&sid=508283e5-18b2-4da6-ae9a-8ca7176aca9a%40sdc-v-sessmgr03&bdata=JnNpdGU9ZWwhvc3QtbGl2ZQ%3d%3d#AN=102786227&db=bsh> (search EbscoHost on the student portal if this link does not take you directly to the article) (accessed 24 November 2021).

Strategic planning tools for your innovation road map to success:

- Bush, T. (2016, May25). Strategic planning tools for better results. *Pestle Analysis*. <http://pestleanalysis.com/strategic-planning-tools/> (accessed 24 November 2021).

Strategic alliances: partnerships into the future

Strategic alliances directly influence the role of innovation performance in a firm. Companies often build partnerships to engage with markets. These alliances are often formed, irrespective of location, with the aim of satisfying the needs of local and global markets. A great example of a strategic alliance is **Spotify and Uber**.

These firms partnered to offer their customers the ability, when hiring an Uber, and to be welcomed by their favourite playlist. Uber found that customers valued this offering, which gave competitive advantage and exclusivity. Spotify found it gave its customers the incentive to upgrade to its premium level – something that iTunes or YouTube do not offer.



How big firms pave the way for strategic alliances in innovative audits:

- Tysiac, K. (2017, April 1). How to enable audit innovation. *Journal of Accountancy*, 223(4), 33-35, <http://www.journalofaccountancy.com/issues/2017/apr/audit-innovation.html> (accessed 24 November 2021).

Systems for strategic input

Management information systems help you find the data you need to pinpoint a problem and put in place the correct strategic plan, with everyone understanding. A well thought out strategic plan enables those in the organisation to make informed decisions and meet bottom-line objectives.

In the case of driving innovation as a business objective, a strategic information system (SIS) can be useful. The goal of the SIS is to create a sustainable competitive advantage for a product or service. In a nutshell, SIS links business strategies with technology.



Strategic information systems (SIS) merge a firm's technology with strategic planning to create a structure to better plan and execute objectives, and improve responses to changing market conditions. SIS first emerged in the early 1980s, and have become more sophisticated and effective as technology has advanced

(Business Dictionary).



Draw Your Innovation Road Map to Success

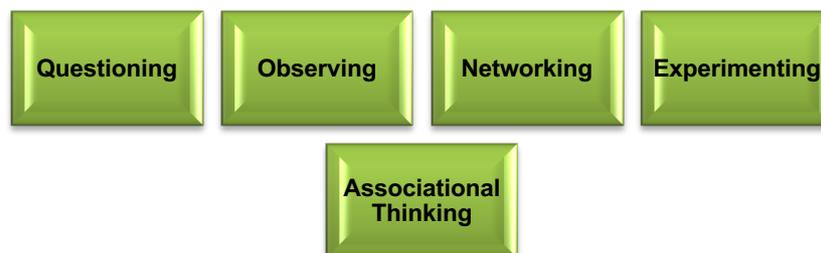


1. Think about the innovation ecosystem, and devise a strategy for your innovation idea.
2. What strategic alliances can you form to support this innovation?
3. What type of information system would best support your innovation?
4. Explain how this innovation gives your organisation a competitive advantage.
5. How will you sustain this innovation for the future?

The power of the people

People are crucial in driving innovation in an organisation. They build the corporate culture and ensure that the strategy and system lead to results. The corporate culture must embrace innovation if success is to be achieved. The five habits of highly innovative people are shown in **Figure 7**.

FIGURE 7: HABITS OF INNOVATIVE PEOPLE



(Adapted from Upbin, 2011)



Innovation needs innovative people:

- Kasanoff, B. (2016, January 30). Six lessons on innovation from the Wright brothers. *Forbes*, <https://www.forbes.com/sites/brucekasanoff/2016/01/30/six-lessons-on-innovation-from-the-wright-brothers/> - 4f2b1f099f6f (accessed 24 November 2021).

Tools to stimulate innovation in people

Stimulating innovation in the workplace is a continual process and requires thought and consistency. But because it is an intangible process, or considered “soft fluff”, it is often forgotten.



Power to the People: Building Innovation for Your Product



Read this article and complete the tasks that follow:

- Pershing, B. (2016, March 24). Nikola Tesla's innovations show how ahead of his time he was. *Learning Mind*. <https://www.learning-mind.com/nikola-teslas-innovations/> (accessed 24 November 2021).

Tasks

1. Nikola Tesla was obviously an innovative individual. Think of an innovative individual in your organisation. Explain how this individual is innovative in terms of the five habits of highly innovative people.
2. Explain how this individual contributes to your innovative organisation and how this person can contribute to your innovative idea.
3. What tools can you use in your organisation to stimulate innovation for your product?
4. What effect would these tools have on your product and on your company?
5. Explain what you can do as an individual to drive innovation in your organisation and for your product.

6.3.2 Keep Innovation Going

Sustained innovation “comes from developing a collective sense of purpose; from unleashing the creativity of people throughout your organisation; and from teaching them how to recognize unconventional opportunities” (Karlsberg and Adler, nd). There are seven strategies for sustaining innovation in an organisation. See **Figure 8**.

FIGURE 8: SEVEN STRATEGIES FOR INNOVATION



(Adapted from Karlsberg & Adler, nd)

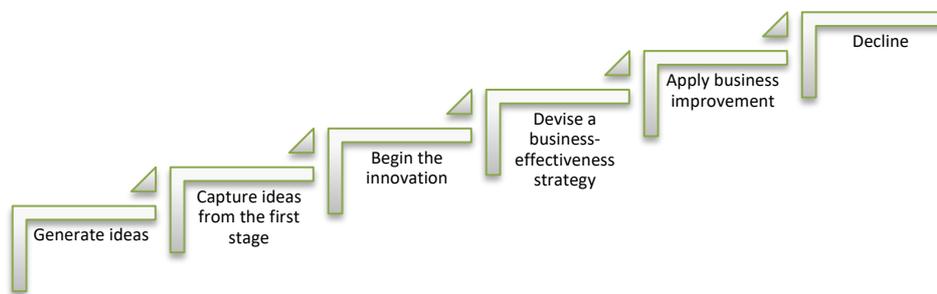
It is important that your organisation practises sustained innovation, as this will motivate your employees to continue to exude innovative behaviour that contributes to overall corporate innovation.

6.3.3 The Innovation Process

Innovation is a collaborative process in which new ideas come from a variety of sources. But an innovative idea cannot just be implemented. It must be tested first. Often there is an ideal solution, and even a vision, but it can be too complex for a lone individual to transform into reality.

The innovation process can guide you to from vision to reality in six easy steps. See **Figure 9**.

FIGURE 9: VISION TO REALITY: INNOVATION STEPS



(Adapted from Stanleigh, nd)

Stanleigh's innovation process is described next.

- **Stage 1: Generate ideas**
This is the exhilarating part of the process! Do this in team, not individually (which is what suggestion-box systems tend to promote). Innovative ideas generally come from a vision, an unreasonable demand, or a goal. To get innovation going in your organisation, ask: "What is impossible to do in my business today, but if it could be done, would fundamentally change what my business does?" Answers to this question will help you to see the boundaries of a new organisation and a new you! That is where innovation begins.
- **Stage 2: Capture ideas from the first stage**
Do this through team discussion or discussion among peers. Make sure to record the ideas. A great brainstorming technique is to ask each team member to silently brainstorm individually. Ask them to write each idea they come up with on separate sticky notes. Then have the team draw an affinity diagram on the wall or whiteboard by collectively organising all ideas into columns of similar ideas.
- **Stage 3: Begin the innovation**
Review the entire list of ideas and develop them into a series of statements of ideas. The team should then agree on which ones to explore further. Next, quantify the benefits of each statement of ideas to pursue.

Do this in reference to the department, the organisation and or the customer. Then describe how the statement fits with the organisation's strategy, mission, and objectives. Now you will have to estimate the business potential: the expected outcomes of implementing the idea. Although the organisation has yet to think through the innovation, these steps are designed to capture ideas and agree on a statement of feasibility before trying the innovation.

- **Stage 4: Develop a business-effectiveness strategy**

Innovation implementation begins here. It usually means a re-think of an existing process, product, or service. This is not the same as looking at an existing process and improving it. It is describing what a future process will look like. The innovation team will first draw this picture of the future. This is usually where the innovation resides. The easiest way to get started is to have the team members list their basic assumptions about the way things are now done (that the innovation is intended to overcome). Then they'll brainstorm, discuss, and record every single idea that arises about a possible future process. It helps to use yellow stickies to record ideas individually first and then consolidate them all. The team concludes by writing a paragraph that describes the innovation and illustrating it on a flowchart. This will provide them with a look at the entire future process.

- **Stage 5: Apply business improvement**

Once the innovation is applied, it is necessary to examine it continually for possible improvements to the process, product, or service. If the example is building a house in three hours, how could the team improve the process by using fewer people or less money? The team starts this process by identifying the business process gaps between what is done at present and what is done in the innovation. This is followed by identifying the blockages and barriers that will stop them from introducing the innovation. Estimating the difficulty, benefits, costs, support required, and risks is necessary before the team can refine the innovation process. Then it will be ready to apply the improvements identified.

- **Stage 6: Decline**

In time, it often becomes obvious that what was once an innovation no longer fits your bouquet of offerings. Continual improvement of the existing process, product, or service is no longer of value. Perhaps the former innovation has become outdated or outmoded. It is time to let it go, abandon the existing thinking, and set a new goal to start the innovation process once again. It is time for new innovations in response to external pressure.

The Luma Institute's taxonomy of innovation

The Luma Institute has boiled innovation down to three phases:

- **Looking** – the research phase – may take the form of ethnographic, participatory and or evaluative research;
- **Understanding** covers people and systems, patterns and priorities, and – crucially – problem framing; and
- **Making** requires working through concept ideation, modelling and prototyping, and explaining the rationale of the service or product designed.



The Luma Institute's interactive innovation model provides tools for each stage of the innovation process:

- Luma Institute. (2014). A taxonomy of innovation. *Harvard Business Review*, January-February. <https://hbr.org/2014/01/a-taxonomy-of-innovation> (accessed 24 November 2021).

The art of problem-solving

A fundamental aspect of the innovation process is problem-solving, because in many ways innovation **is** a form of problem-solving. There are seven steps in problem-solving:

1. Identify the problem;
2. Determine the collective interest;
3. List the possible solutions;
4. Evaluate the options;
5. Select an option or options;
6. Document the agreement; and
7. Agree on contingencies, monitoring and evaluation.

The Simplex tool helps you identify and solve problems creatively and effectively, with the end-result being a creative, well thought through and detailed innovation.



The Simplex problem-solving process – watch and learn:

- DigitalDictionary. (2018, Nov 28). *The simplex problem-solving process* [Video.] YouTube. <https://www.youtube.com/watch?v=ZO5Kq6kLBtl> (accessed 24 November 2021).

The innovation process must be nurtured and stimulated continuously, if corporate innovation is to be sustained.

Innovation culture

It is easy for organisations to say that they support a culture of innovation, but creating a culture conducive to innovation takes time and requires persistence. A fundamental principle of creating a culture of innovation is accepting change, because by nature innovation is a form of continuous change and adaptation to internal and external forces.

Mattes (2014) defines “innovation culture as the sum of self-sustaining patterns of behaviour, thinking and deciding that determine how a firm sees and conducts innovation”. But it is important to remember that innovation culture is only one pillar of successful innovation, the others being:

1. Strategy;
2. Processes;
3. Innovation management and governance; and
4. Innovation networks and ecosystems.

(Adapted from Mattes, 2014)

There are many tools and principles to transform your organisation’s culture to a culture of innovation by adopting change principle, though often the simplest have the greatest effect.



Find out how Facebook creates the ultimate innovation culture:

- Arora, E. (2016, September 5). Facebook – developing a culture of Innovation. *LinkedIn*, <https://www.linkedin.com/pulse/facebook-developing-culture-innovation-ekta-arora> (accessed 24 November 2021).

The key to a culture of innovation is to accept failure, and to encourage people to overcome it.



High Impact Innovation Processes



The optical lens is one of those examples that is very simple but took a long time to catch on. It was centuries before the invention of eyeglasses was linked to raising human IQ, and ultimately the invention of the microscope and the telescope.

1. Think of an example in your organisation that is simple but has a great impact on your business. Explain the value of this innovation.
2. Explain the process that this idea went through with regard to innovation.
3. Use this process to set out, in detail, how you will take your innovation from vision to reality.
4. Critically evaluate your innovative idea by means of the problem-solving process. What business problem are you trying to solve?

6.3.4 Key Points

- The innovation ecosystem consists of strategy, systems and people.
- Strategic information systems enable innovative practices.
- There are five habits of highly innovative people, namely:
 - Questioning;
 - Observing;
 - Networking;
 - Experimenting; and
 - Associational thinking.
- Sustained innovation comes from developing a collective sense of purpose; from unleashing the creativity of people throughout your organisation and from teaching them how to recognise unconventional opportunities.
- Innovation is a collaborative process where new and innovative ideas come from a variety of sources.
- There are six steps in the innovation process, namely:
 - Step 1: Generate ideas;
 - Step 2: Capture ideas from the first stage;
 - Step 3: Begin the innovation
 - Step 4: Devise a business effectiveness strategy;
 - Step 5: Apply business improvements; and
 - Decline
- A fundamental aspect of the innovation process is problem-solving, because in many ways innovation **is** a form of problem-solving. There are seven steps in problem-solving:
 1. Identify the problem;
 2. Determine the collective interest;
 3. List the possible solutions;
 4. Evaluate the options;
 5. Select an option or options;
 6. Document the agreement; and
 7. Agree on contingencies, monitoring and evaluation.

Remember to do your digital assessment for this section online!



It will help you strengthen and embed your understanding of the course. You will not be able to change your answers once you have submitted them, so make sure you have completed the relevant section of coursework first. Where you see **Select all that are relevant**, be aware that any number of the options presented could be correct. You will lose marks for incorrect selections, so choose carefully. Your combined marks from these assessments count towards a total of 20% of your course mark.

6.4 DRIVING BUSINESS INNOVATION

Timeframe	Minimum of 40 hours
Learning outcomes	<ul style="list-style-type: none"> • Assess innovation management models, tools, frameworks and processes; • Critically evaluate the innovative approaches used in product and service development; and • Critically evaluate different methods for generating ideas and managing uncertainty in the innovation process.
Prescribed book	<ul style="list-style-type: none"> • Chapters 4, 11, 12, 13 and 14 in Trott, P. (2021). <i>Innovation management and new product development</i> (7th ed.). Pearson Education.
Prescribed articles	<ul style="list-style-type: none"> • Doorsamy, M. (2017). Product portfolio management best practices for new product development: A review of models. <i>Foundations of Management</i>, 9, 139-148. https://www.researchgate.net/publication/316743189_Product_Portfolio_Management_Best_Practices_For_New_Product_Development_A_Review_Of_Models (accessed 24 November 2021). • Marker, A. (2021, December 14). Management information systems: In business, in academia, and in the future. <i>Smartsheet</i>. https://www.smartsheet.com/management-information-systems (accessed 10 March 2022). • MP. (2015, December 3). SolarCity: where sunshine meets innovation. <i>Harvard Business School Open Knowledge</i>. https://rctom.hbs.org/submission/solarcity-where-sunshine-meets-innovation/ (accessed 24 November 2021). • Thomas, E. (2014). Platform-based product design and environmental turbulence. <i>European Journal of Innovation Management</i>, 17(1), 107-124. https://www.emerald.com/insight/content/doi/10.1108/EJIM-06-2013-0055/full/pdf?title=platform-based-product-design-and-environmental-turbulence-the-mediating-role-of-strategic-flexibility (accessed 24 November 2021).
Recommended multimedia	<ul style="list-style-type: none"> • Apple Explained. (2018, November 26). <i>Is Apple still innovative?</i> [Video]. YouTube. https://www.youtube.com/watch?v=U5Yx2p2ZguU (accessed 24 November 2021). • Company Man. (2018, August 29). <i>IKEA – Why they're so successful</i> [Video.] YouTube. https://www.youtube.com/watch?v=QgbtoL65X04 (accessed 24 November 2021). • DigitalDictionary. (2018, Nov 28). <i>The simplex problem-solving process</i> [Video.] YouTube. https://www.youtube.com/watch?v=ZO5Kq6kLBtl (accessed 24 November 2021). • Hall, D.J. (2011, December 14). <i>Synectics worked example</i> [Video.] YouTube. http://www.youtube.com/watch?v=5mKHVP2CHn0 (accessed 24 November 2021). • Ionology. (2016, December 16). <i>The 5 secrets of data driven decision making</i> [Video.] YouTube. https://www.youtube.com/watch?v=dCK6e8EDVnQ (accessed 24 November 2021). • Middleton, S. (2014). <i>How to make better decisions</i> [Video]. YouTube. http://www.youtube.com/watch?v=YsEynS4lp2Y (accessed 24 November 2021).

	<ul style="list-style-type: none"> • QUT IFB101. (2015, February 12). <i>Diffusion of innovations</i> [Video.] YouTube. https://www.youtube.com/watch?v=kxVeLITEgtU (accessed 24 November 2021). • Samsung. (2019, July 28). <i>Samsung's belief: meaningful innovation for the people</i> [Video.] YouTube. https://www.facebook.com/SamsungGlobal/videos/519954482112360/ (accessed 24 November 2021). • Stockholm University. (2016, July 28). <i>Green Innovation: The forest as future</i> [Video.] YouTube. https://www.youtube.com/watch?v=J2hDEcU-ODs (accessed 24 November 2021). • TEDx. (2017, June 29). <i>MOOCs: knowledge at your fingertips.</i> [Video.] YouTube. https://www.youtube.com/watch?v=MnFg7cGYFrk (accessed 24 November 2021).
Section overview	We examine various forces the drive innovation in an organisation. We delve into the role of creativity, the influences of innovation, and various models of innovation. We close with a detailed insight into how management information systems can help you drive innovation.

6.4.1 Business Innovation Influencers

Managing uncertainty

One of the most difficult tasks is managing the tension between efficiency (stability or certainty) and creativity (instability or uncertainty). Even if an organisation opts for a portfolio of incremental innovation projects, this generates some instability and uncertainty. Consider an organisation whose competitive strategy is built around low cost and high volumes – if the organisation makes way for creativity and improvements it could risk losing this competitive edge.

The argument is that organisations must make room for creativity and innovation in the short term in order to ensure the long-term sustainability of the organisation. But, uncertainty must be managed.

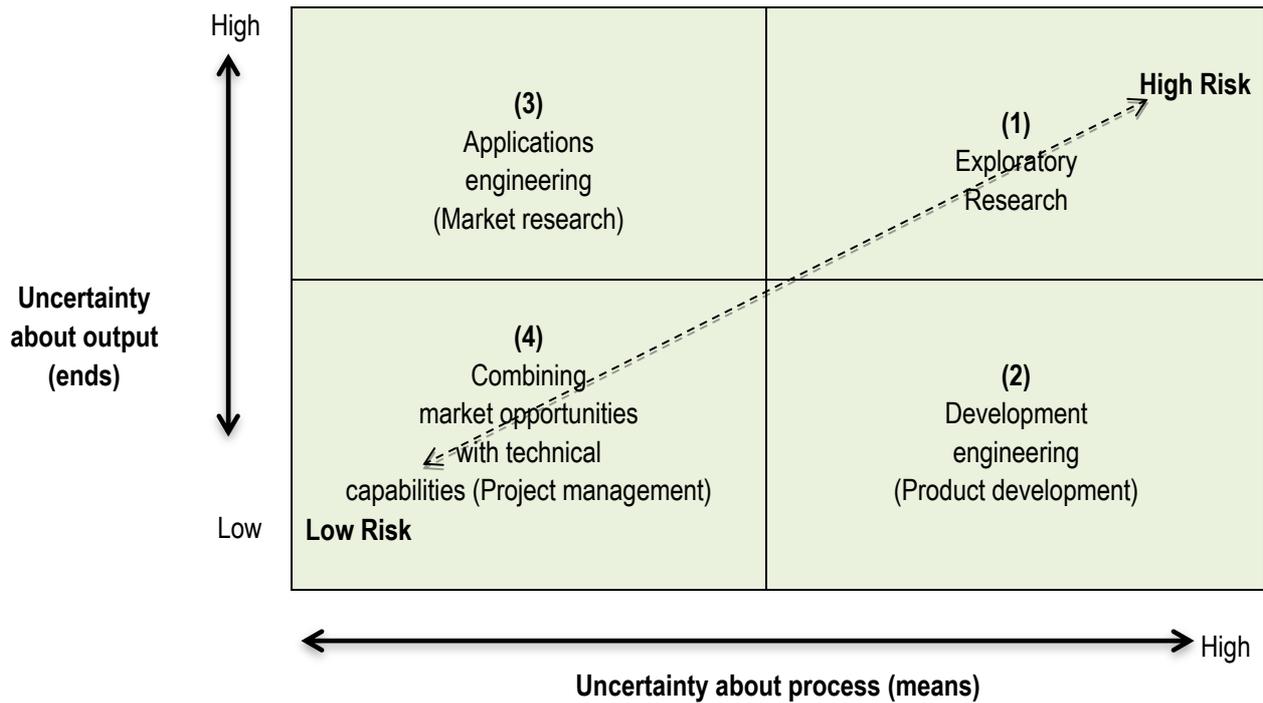
Pearson's uncertainty map (Trott, 2021:109) reflects two vital dimensions in an innovation project:

- Uncertainty about **ends** (the output, ie deliverables); and
- Uncertainty about **means** (the inputs and transformation process, ie how the output will be achieved).

Unlike day-to-day projects, which are largely based on prior knowledge (eg construction of a building) there is great uncertainty in innovation projects, arising from imperfect knowledge. Decisions about whether to cancel, continue, or increase funding must be made as the new knowledge emerges.

Pearson's map addresses the nature of the uncertainty (ends and means) and how it changes over time – from quadrants 1, 2 and 3 to quadrant 4, where uncertainty about ends and means is lowest.

FIGURE 10: PEARSON'S UNCERTAINTY MAP



(Pearson in Trott, 2021:109)

For the purpose of discussion, we have summarised **Figure 10** in **Table 6**, with examples.

TABLE 6: PEARSON'S FOUR QUADRANTS

Quadrants	Levels of uncertainty	Examples
1	<ul style="list-style-type: none"> • High degree of uncertainty about means and ends • The new product (good, service, or result) is not clearly defined and how to achieve it is also not clear • Also known as “blue sky research” (theoretical research) without regard to future application • Largely the domain of university research laboratories and science-based organisations (curiosity-driven knowledge) 	<ul style="list-style-type: none"> • Genetics and stem cell biology • Tidal power research • Invisibility cloaks
2	<ul style="list-style-type: none"> • The end or target is clear but the means of achieving it are not yet established • Referred to as “development engineering” (ongoing), as many projects may be begun to try to determine the means 	Guinness “in-can system” – the company was clear about the market that wanted the taste of Guinness in a can, but did not know precisely how this would be achieved.

Quadrants	Levels of uncertainty	Examples
3	<ul style="list-style-type: none"> • Uncertainty regarding ends • A technology (invention) exists (the means), but the organisation is uncertain how to put it to use profitably 	Google Maps provides a useful technology, but not all organisations know how to put it to use it profitably.
4	<ul style="list-style-type: none"> • The most certainty (means and ends are known) • Market opportunity and technical capability are certain • Speed to market is key, since the competition is also likely to understand the market and have the technical capability 	Tax officials use Google Maps (means) to catch tax evaders (ends). They use the technology to look for big home improvements or numerous expensive cars parked in driveways, which suggest that people are earning more than they say they are.

(Trott, 2021:109-111)

Pearson's uncertainty framework deals with two important issues – uncertainty and the risk that surrounds it.

Innovation management is not limited to one function in the organisation; by leveraging the skills and knowledge of multiple departments (especially marketing and product development) the organisation can leverage the appropriate knowledge (explicit and tacit or experiential).

This framework also shows that innovation derives from many sources including those outside the organisation (ie through networks and partnerships), especially if the cost of invention is prohibitively high.

Lastly, it is important to recognise that “uncertainty is not strictly a shortcoming but an important potential” (Böhle, 2011). Endeavours to eliminate uncertainty hold the risk of undermining or preventing innovation. Böhle prefers the words “overcoming uncertainty” to “eliminating uncertainty”.



- The goal of innovation is to replace or complement what is currently known with the unknown and therefore uncertain. Therefore, the successes of innovations are often defined subsequently as it is not possible to identify in advance the extent to which the problem may be solved (or the opportunity realised).
- Innovation processes are not linear – they are iterative and may result in steps taken in different directions depending on success and failure. Milestones and interim evaluations are also difficult to quantify, as no dependable criteria might exist for assessing the success of an innovation reliably during the innovation process.
- Innovations must be designed on a customised basis taking influencing factors into account, eg object, technical capabilities, problems and obstacles.
- Pre-imposed requirements, rules and checks hinder creativity. Paradoxically, creative freedom also restricts innovation.

(Böhle, 2011)



Identifying Innovation Influencers



1. Does your organisation harness creativity and inventions from exploratory research and turn these into profit-generating innovations for its markets? Why, or why not?
2. Has your organisation identified target markets (the ends) but not come up with product solutions (the means) to serve these markets? What are the constraints and what is your organisation doing to overcome them?
3. What innovative technologies (or new business model) does your organisation possess? Does it have a clearly identified target market for these (means and ends)? And how can they be used to drive innovation for your product?
4. Insert examples from your organisational context into Pearson's uncertainty map. Reflect on what you have learned through the use of this framework as an analysis tool. Critically evaluate how this will impact your innovation.
5. Refer to Figures 3.3 and 3.4 in your textbook. Use these diagrams to synthesise your understanding of the relationships between uncertainty and risk in innovation management for your product or service.

6.4.2 Organisational Factors that Influence Innovation

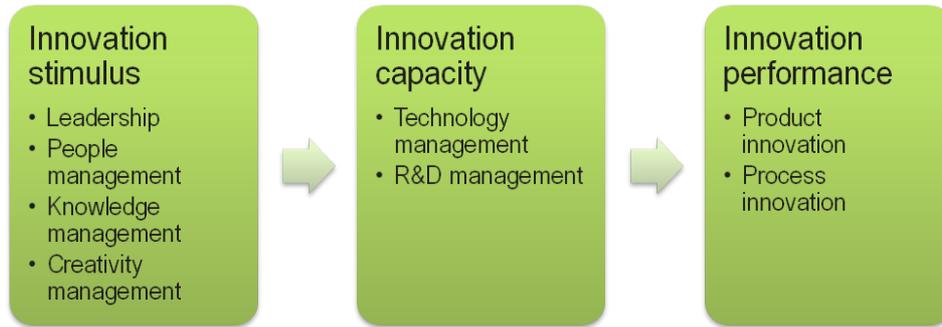
Idea generation is the first step toward achieving innovation, and as you will remember this is followed by invention and commercialisation. The sum of these is innovation. Here we consider a range of organisational factors that contribute to successful innovation:

- Stimulus, capacity, and performance;
- The impact of organisational structure;
- The management of individuals, especially knowledge workers;
- IT systems; and
- Management tools and guidelines.

Stimulus, capacity, and performance

To ensure the organisation follows through to commercialisation, three important elements are required – stimulus, capacity, and performance. Consider the elements in **Figure 11**.

FIGURE 11: INNOVATION STIMULUS, CAPACITY AND PERFORMANCE



(Prajogo & Ahmed in Trott, 2021:114)



Organisational Factors and Their Influence on Innovation



1. Think critically about the three elements in **Figure 11**. Evaluate your organisation against the factors listed under stimulus, capacity, and performance. For example, you might rate leadership of innovation as high, but the management of knowledge (explicit and experiential knowledge) as low.
2. After completing your evaluation, identify key areas for improvement and justify these with regard to the uniqueness of your organisation's needs. For example, your organisation might be pursuing an aggressive growth strategy, in which case innovation is a key determinant for success. Or your organisation might be a retailer whose strength lies in purchasing technologies in the form of products and matching these to customer needs (such an organisation is likely to have limited product technology capabilities).
3. Now critically evaluate your findings about your innovation product. Look closely at how these factors can positively affect the success of your idea.

Relationship between organisational structure and innovation

The second important consideration is organisational structure. Evidence suggests an inverse relationship between formalisation and innovation: the more mechanistic the structure, the less space there is for innovation to succeed, whereas organic structures facilitate innovation.

- **Mechanistic** (restricted information flow, formal line management with rigid procedures, strict control systems, constrained on-job behaviours); and
- **Organic** (free flowing information, flexible management styles, knowledge power versus position power, flexible procedures, loose control, participative decision making with group consensus).

To explain **organic**, we use the example of a **lattice** organisation. The organisation is organised into teams rather than traditional hierarchies. The teams are not formal. They are fluid and dynamic and they form in response to needs. There are as few impediments to conversation and collaboration as possible (eg no organisational charts and no chains of command). Accountability is to the team, and peer review processes determine individual compensation.

This network-based model emerged in the late 1950s driven by Bill Gore's desire to create a company that would become "a bazaar of innovation and a marketplace of creativity" (Collins, 2014). Today his organisation, WL Gore and Associates, employs about 7000 people in more than 45 plants and sales locations worldwide. It is also ranking high on the top-companies-to-work-for list.

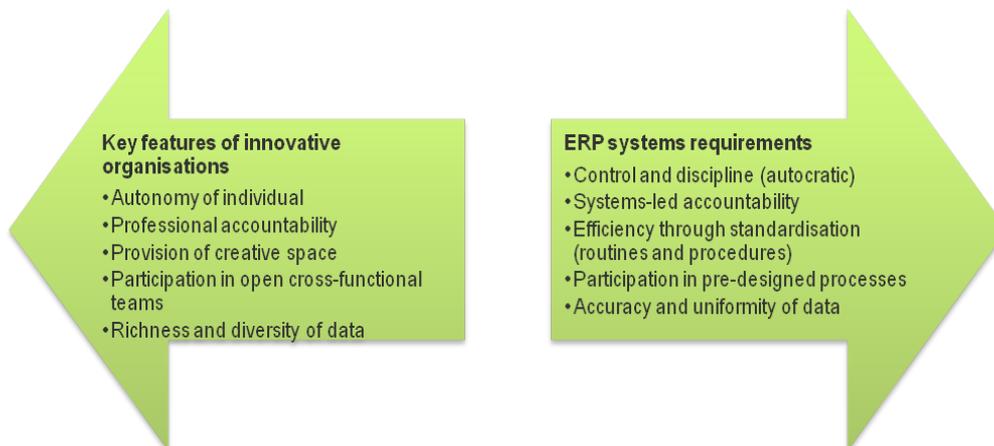


1. Carry out your own research into the lattice organisation and Gore's philosophy on innovation management by visiting their website <http://www.gore.com>.
2. How conducive to innovation is the structure of your organisation?
3. How will the structure of your organisation impact your innovative idea?

Unlocking information through information technology systems

While Information Technology (IT) holds the key to significant benefits for the organisation, for example in searching for information, providing easy access to shared information, analysing vast quantities of information, co-ordinating processes, etc, it also has its limitations. These are shown in **Figure 12**, using the example of an enterprise resource planning (ERP) system (Trott, 2021:1129).

FIGURE 12: PARADOX OF ERP SYSTEMS AND INNOVATION ORGANISATIONAL REQUIREMENTS



(Trott, 2021:129)

The two paradigms pull in opposite directions because they exhibit conflicting principles. One of the most significant issues in ERP systems is autonomy. For example:

- Working practices peculiar to certain employees must be removed for ERP to be effective;
- Employees may find their daily activities dominated by highly prescriptive procedures on their computer screens; and or
- An ERP system aids management control.



1. Reflect critically on the competing forces described above with regard to your own organisation.
2. What might the implications of an ERP system be for a highly innovative organisation such as Google?

Creativity

Here our attention turns (1) to creators (employees with a propensity to provide plausible ideas, which can be implemented, and which will add value), and (2) to fostering a creative culture.

Creators

Creativity can be learned. Good creativity techniques and idea generation tools can make methodical people creative (Trías de Bes and Kotler, 2011:61). However, it does help to start by recognising someone who has creative potential. Trías de Bes and Kotler (2011:62-63) combine these characteristics into the following profile:

- Flexible (they go beyond the obvious);
- Fluid (they generate many ideas about a problem);
- Elaborative (they expand the task in detail);
- Tolerant of ambiguity (they stand up well to conflict);
- Able to see the whole (systemic approach);
- Inquiring (interest in many disciplines);
- Sensitive to the interests of others (they understand the needs of others);
- Curious (interested in “playing” with things);
- Independent (with ideas of their own);
- Reflective (they think about what they see and hear);
- Action-oriented (they go beyond thinking and the idea – they act);
- Able to concentrate (they work in a consistent manner);
- Persistent (they don't give up easily);
- Committed (they get involved with things); and
- Sense of humour (they are able to laugh and use humour to put things in perspective).

In the main, these people have the following qualities: verbal fluency, high IQs, imagination, the ability to influence others and the environment, they are not afraid to take risks, and they take interest in properly defining the problem to be solved. They are often seen to use metaphors and images, they are logical, and start by asking “why?” in most situations (*ibid*).

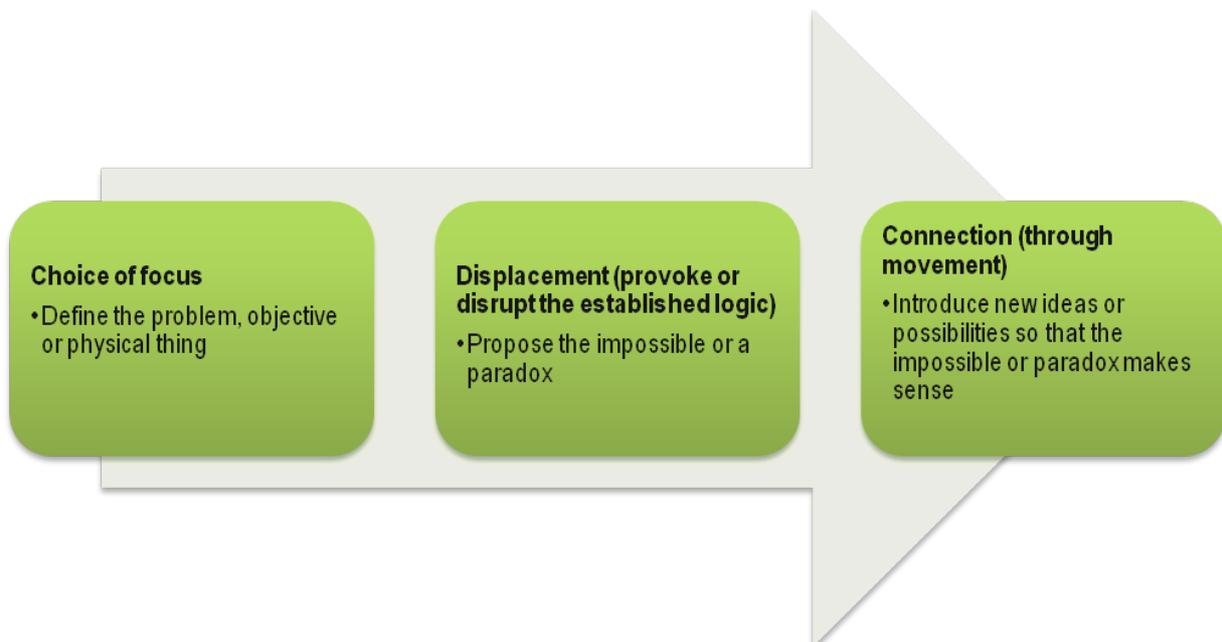


Pause and think about yourself and your colleagues.

1. Do you exhibit the characteristics of a creative person?
2. Identify colleagues with the characteristics provided by Trías de Bes and Kotler (2011) above.
3. What does, or could, your organisation do to ensure these qualities are nurtured – and harnessed?

Because creativity has become better understood over the past decade, the main techniques and tools of creativity are based on the characteristic thinking patterns of creative people – that is to: see and analyse individual components and then synthesise these to arrive at new ideas. Consider the following creative process.

FIGURE 13: HOW CREATIVITY WORKS



(Trías de Bes & Kotler, 2011:64-68)

The creative process is best explained through an example.



Focus: The price of a product

Displacement: Instead of us charging our customers, we pay our customers (propose the impossible)

Connection: Extend a loan to purchase the product (new idea that makes the seemingly impossible possible)

Techniques and methods for generating ideas

There are multiple techniques and methods for generating ideas. We have summarised some of the more popular ones in **Table 7**, with examples.

TABLE 7: METHODS FOR IDEA GENERATION

Method	Description	Example
Synectics	A problem-solving methodology using metaphors and analogies that involve thought processes to stimulate new and creative thinking about the problem.	See how Hall uses a dilapidated old building to think differently about product sales: <ul style="list-style-type: none"> Hall, D.J. (2011, December 14). <i>Synectics worked example</i> [Video.] YouTube. http://www.youtube.com/watch?v=5mKHVP2CHn0 (accessed 24 November 2021).
Blue Ocean strategy	The break with the belief that competition is about either differentiation or cost. It requires redefining your industry (new industries or markets) free of competition. The idea is to move beyond the fragmented, hypercompetitive markets saturated with competitors (the blood red oceans of fierce fighting) to create new spaces where competition is irrelevant – temporary monopolies (blue oceans).	The case of the Wii, which redefined the video game industry by getting rid of all wires and combining physical exercise, thus attracting a large number of older users who were not previously predisposed to computer games.
Morphological analysis	Solving problems by analysing their parts. Good for physical products or service design problems. Essentially a combinatorial method – thinking about what possibilities each new combination leads to.	Watch this short video, in which Middleton uses examples to demonstrate this type of analysis. <ul style="list-style-type: none"> Middleton, S. (2014). <i>How to make better decisions</i> [Video]. YouTube. http://www.youtube.com/watch?v=YsEynS4lp2Y (accessed 24 November 2021).
Visits and trips	This involves visiting locations, preferably unrelated to your products (goods or services) with the aim of finding inspiration that can be used in your organisation. A trip to different locations across the globe can also inspire new emotions about your products.	A fast-food manager might visit a bank to find inspiration on how to manage queuing better.
Co-creation	Here customers (or consumers) are brought into the creative process. Used most often in B2B and service markets where direct contact with customers is highly desirable.	Some brands have fanatical cult followings, such as Harley-Davidson. Enthusiasts are consulted on new ideas.

Method	Description	Example
Redefining customer value	<p>Value can be defined as the ratio of what the customer gets, divided by his or her efforts. You can increase customer value in two ways:</p> <ol style="list-style-type: none"> 1. Giving more (quality or quantity) for the same price; and 2. Offering the same product for less total effort. 	Ikea completely reshaped customer value by shifting assembly to the customer in exchange for lower prices.

(Hall, 2014; Middleton, 2014; Trías de Bes & Kotler, 2011)



Defining Customer Value



Consider the last method from Table 7 – redefining customer value. Use your product or service idea for this exercise.

$$Customer\ value = \frac{what\ the\ customer\ gets}{customer\ efforts}$$

1. Analyse customer value: what does your product or service deliver, and what effort must the customer make?
2. Now, play around with your options for increasing, reducing, or eliminating such efforts in order to see if there is a final increase in the value to your customers.
3. Once you have found a new combination, the next step is to connect and develop the idea for turning the new combination into a new product, new service, or new business model.

Fostering a creative culture

Culture can make or break creativity. Cultural inhibitors and drivers of creativity (Trías de Bes & Kotler, 2011):

- **Inhibitors**

- Fear of error (and possible ridicule);
- Fear of retaliation (“Will it hurt my career?” Not every idea is a good one – that is an indisputable fact);
- Deadlines and pressure (which literally squeeze out collaborative thinking);
- Overdoing internal competition (when individual achievement is at stake an employee will stop sharing information);
- Downsizing and crises (economic downturns put added pressure on morale and dampen spirits); and
- Lack of methods and processes (little or no teaching of employees to use creative methods and techniques).

- **Drivers**

- The CEO who provides freedom for employees to think creatively and independently and fosters a collaborative spirit (creative release time);
- Professional and cultural diversity (bring in people from different backgrounds, experiences, cultures and traditions);
- Customer proximity (get close to the users and how they experience products);
- Common spaces (eg the “innovation gym” at P&G);
- Create a distinct atmosphere that appeals to all the senses (lighting, colour, sounds, smells, textures); and
- A portfolio of innovation projects (refer back to incremental, semiradical, and radical).



Use this list to critically evaluate the extent to which your organisation exhibits an innovative culture.

Turning creativity into a concept

Here creators and developers work together to transform ideas into concepts – the elements and resource requirements that will fully justify investing in the idea’s development.



“The concept is more developed and defined than the idea. It is not a complete tangibilization of the idea, but it contains the elements and ingredients that fully justify investing in its development. The concept consists of a brief, but sufficiently explicit description of how an idea will translate into customer value and why it will capture customer interest and purchase intent [in the case of a product].”

(Trías de Bes & Kotler, 2011:87)

While the above description of the concept refers to a product (good or service), consider that an innovation can be a result, such as an improvement to organisational processes. The following example outlines a concept description. Concept descriptions vary depending on the type of concept. Essentially this is a stage-gate (“Go” or “No go”) where the business case for the idea is conceptualised, albeit in subjective terms.



Concept: a special cereal to eat with yoghurt

Name: “Cereal for Yoghurt.”

Images that it describes: Use stock photos or drawings to show a range of possible images (the collage of images pass through an elimination process using a project team).

The business source it feeds off (volume): The following question must be answered, “What other products will people stop consuming in favour of this innovation?” (eg direct competitors other health cereals; distant competitors such as other food products in favour of this product). This competitive reference must help to identify other marketing mix elements (price, place, and promotion).

The insight it appeals to: Describe the inner thoughts, needs, feelings that the product appeals to or will satisfy, eg “I want a healthy but easy-to-eat combination breakfast.”

The fundamental benefits it covers: Validation statements such as: “This cereal will provide me with a healthy start to my day.”

The reason people would buy it: A validation statement: “The texture of the cereal will work better with yoghurt because all other cereal textures are too coarse and should only be eaten with milk.” Here, seals of approval from experts, associations, and other authoritative bodies add credibility.

The end benefit it is aimed at: “I want to be healthy” (eg lifestyle choice).

The social trend in which it is framed: Obesity and low GI.

A subjective assessment of ease of development and market potential: Consider that there are several concepts under evaluation in the portfolio of innovations – these will be compared in terms of their potential and difficulty. High potential and low difficulty products should be considered first.

(Trías de Bes & Kotler, 2011:87-94)

6.4.3 Innovation in Product and Service Development

Product platforms

The car industry is a classic example of product platforms. Several models share the same basic frame, suspension and transmission, and other features distinguish the models from each other. A current example of a platform product design is the next generation Mercedes-Benz B-class. The design will allow the Mercedes-Benz to offer a family of smaller products based on the same core (five smaller models ranging from a hatchback to a sport-utility vehicle).



A **product platform** is a common design, formula, or versatile product, based on which a family (line) of products is built over time.

(Business Dictionary, 2014e)

Thomas's (2014) research shows that the higher the level of environmental turbulence, the more organisations turn to platform product design. Her research also shows that the higher the level of platform design, the better the level of market performance (both in the short and long terms).

As Thomas explains, an integrated architecture results in a one-time product. However, when the architecture is modular (decomposable into relatively independent parts) the opportunities provide for a more flexible adaptation of products. This is often referred to in business literature as mass customisation.



Mass customisation is the production of personalised or custom-tailored goods or services to meet consumers' diverse and changing needs at near mass production prices. Enabled by technologies such as computerisation, Internet, product modularisation, and lean production, it portends the ultimate stage in market segmentation where every customer can have exactly what he or she wants.

(Business Dictionary, 2014f)



Read Thomas's article and then answer the questions that follow.

- Thomas, E. (2014). Platform-based product design and environmental turbulence. *European Journal of Innovation Management*, 17(1), 107-124. <https://www.emerald.com/insight/content/doi/10.1108/EJIM-06-2013-0055/full/pdf?title=platform-based-product-design-and-environmental-turbulence-the-mediating-role-of-strategic-flexibility> (accessed 24 November 2021).

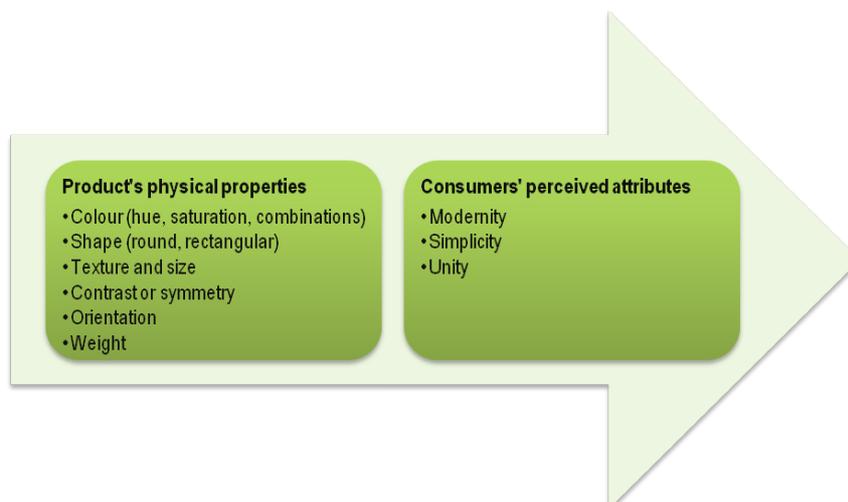
Questions

1. Identify the general strengths and weakness of platform-based product design.
2. Identify examples of platform-based product design in three different industries and discuss the possible success and failure factors for the respective organisations (goods and services).
3. Critically evaluate this approach to product development in your organisation, using examples to support your evaluation.
4. Where does your innovation fit in this framework?

Design considerations (why appearance counts)

Product developers use different categories within which to focus product design, for example modernity, simplicity, or playfulness. Knowledge of what appearance attributes are perceived by consumers help designers to communicate certain pre-specified meanings in a product (Blijlevens, Creusen & Schoormans, 2009). As Blijlevens *et al* (2009) point out, "When the product meaning that is communicated is not clear to the consumer, he or she will have difficulty assessing the product and will appreciate the product less."

FIGURE 14: PRODUCT APPEARANCE PERCEPTION



(Blijlevens, Creusen & Schoormans, 2009)

Firms such as Apple emphasise exceptional commitment to design in all of their products. We have selected a range of video clips with the intent of using Apple as a case study.



Innovation Inspiration: Apple Case Study



Watch these videos (and others on You Tube) and then answer the questions that follow.

- Apple Explained. (2018, November 26). *Is Apple still innovative?* [Video]. YouTube. <https://www.youtube.com/watch?v=U5Yx2p2ZguU> (accessed 24 November 2021).
- Samsung. (2019, July 28). *Samsung's belief: meaningful innovation for the people* [Video.] YouTube. <https://www.facebook.com/SamsungGlobal/videos/519954482112360/> (accessed 24 November 2021).

Questions

1. Based on what you have learned through these video clips, reflect critically on the characteristics of an innovative person, team, and organisation.
2. Think critically about the role that innovative design plays in product development. Compare several products (or services) to support your analysis.
3. Explain why you think Apple has such a fanatical following. What part does innovation play in this following?
4. What take-aways from this exercise will you implement to ensure your product is a success?

Product proliferation

Some organisations offer a very wide range of products, for example Proctor & Gamble offer an array of sizes and gender-specific products. “Every product, the reasoning goes, must stand on its own bottom line” (Anand, 2008).



Read more about product development, and then complete the tasks that follow:

- Doorsamy, M. (2017). Product portfolio management best practices for new product development: A review of models. *Foundations of Management*, 9, 139-148.
https://www.researchgate.net/publication/316743189_Product_Portfolio_Management_Best_Practices_For_New_Product_Development_A_Review_Of_Models (accessed 24 November 2021).

Tasks

1. Reflect critically on this short article – is it still a competitive strategy today? Why, or why not?
2. What are the implications for research, development and innovation?
3. Select a fast-moving consumer goods organisation such as Kellogg's, and discuss why product proliferation may or may not be an appropriate strategy for it.
4. What industry sectors might or might not benefit from this strategy? Explain why.
5. Is product proliferation relevant to your product? If so, how will you implement this? What do you aim to achieve?

All you need to know about packaging

Innovative forms of packaging not only maintain brand leadership, but must be distinctive across different cultures. For example, customers in India prefer to purchase their shampoo in individual sachets rather than in bottles (Trott, 2021). Packaging has evolved considerably, and since packaging is often the first point of contact with the customer it is essential to make it appropriate for both customer and product needs.

Intelligent packaging systems that sense and register changes in the contents are being used in food packaging. Other new features include radio frequency identification tags to prevent counterfeiting (Hancock in Trott, 2021).

The three key principles of packaging (Trott, 2021) are:

- **Protection** (and tamper proofing) – from climatic, bacteriological and transit hazards;
- **Containment** – after the product has been initially used (e.g., dispensing and resealing features); and
- **Identification or labelling** – marketing information, product use and legal requirements.

While the label indicates the functional requirements it also has to provide information about the source of the product, contents, how to use the product, universal product codes, warnings, certifications, how to care for the product, nutritional information, type and style of the product and, for example, size, weight and number of servings. In some cases, packaging must be childproof.



Together, the elements of packaging must provide an optimal overall cost.

Innovative ways to reduce costs include bar coding accessible by smartphone apps. Today airlines e-mail to their customers flight information that includes bar codes. It is no longer necessary to print e-tickets – customers merely show the bar code on their cell phones, and this is scanned before entering departure lounges. The paperless world of airline bookings is a significantly innovative way of reducing packaging costs associated with services, and has environmental benefits.

Innovation features of packaging include dispensing, storage, stability, handling, opening or resealing, after-use (or secondary use) and disposal, with many products designed on “green” principles.



1. Identify examples of innovative breakthroughs in the ways in which organisations package goods and services, relating to protection, containment, and identification and labelling.
2. Reflect critically on what might be driving innovation in these three categories.

Leveraging innovations across industries

Much has been written about improving existing products in existing industries in innovative ways. However, consider the following excerpt from Meyrav (2014) – not only might the source of the innovation be located elsewhere, but also the potential to leverage it across multiple applications may exist.



Israeli company reinvents the wheel – literally

Wheeling down a flight of stairs may no longer be a formidable challenge for those confined to a wheelchair. Israeli company SoftWheel has developed a next-generation wheel that has its own inner-suspension system for shock absorption.

SoftWheel is the brainchild of Gilad Wolf, a farmer who found himself bound to a wheelchair for three weeks. “Four years ago, I broke my pelvis ... when I was wheeled to the synagogue one day, I was in agony when we went over some Ackerstein stones (a traditional stone used for sidewalks in Israel, which has many grooves).

“I work with tractors, and I noticed that tractors have a simple and ingenious airbag-based shock-absorbing construct. So, I put two and two together: I built a wheelchair and combined a similar construct for each wheel. It made the wheelchair experience completely different. I took the idea and started to roll with it,” Wolf explained. While the company’s first product, Acrobat, is designed for wheelchairs, the company believes its product has a much wider-ranging application. “We understood very quickly that it’s not only a wheelchair product, but a complete game-changer,” says CEO Daniel Barel. “It is a platform for anything that has wheels.”

The Acrobat is designed to absorb shock and can be adjusted for each rider. In regular wheelchairs, (even “premium” ones) shock is spread evenly throughout the wheel; then transferred in its entirety to the rider. The Acrobat wheel operates differently. When the wheel is subjected to impact, the inner suspensions automatically shift towards the source of the impact and then back to its position, within three tenths of a second. This mechanism drastically reduces the shock felt by the rider, which makes it easier to traverse bumpy roads, go down curbs – or even stairs.

“Our technology has been tested by major wheelchair manufacturers around the world, both in Europe and the US and the results were off the charts,” says Barel. According to him, Acrobat wheels will be on the market this fall. “We’ve finished development for the wheel, and we build our own production line in Israel.” In the future, the company aims to expand its reach to all kinds of vehicles, including cars and even airplane landing gear.

(Meyrav, 2014)

As the excerpt demonstrates, an unforeseen occurrence can manifest into a full-blown innovation. Key to this in SoftWheel’s case was the connection that Gilad Wolf made between his tractors and the discomfort he felt in a wheelchair. This cross-pollination of thinking provides a fertile source of new ideas.

Green innovation

In our closing section, our attention turns to green innovation.



Imagine! The forest as future:

- Stockholm University. (2016, July 28). *Green Innovation: The forest as future* [Video.] YouTube. <https://www.youtube.com/watch?v=J2hDEcU-ODs> (accessed 24 November 2021).

The argument presented by the institute is that “They [children] can reuse everything and throw away nothing.” To achieve this, products must be:

1. Made with materials that are safe for humans and the environment;
2. Designed so all ingredients can be reused safely by nature or industry;
3. Assembled and manufactured with renewable, non-polluting energy;
4. Made in ways that protect and enrich water supplies; and
5. Made in ways that advance social and environmental justice.



1. Carry out your own research on innovative ways in which organisations are changing how they do business – ways that are consistent with the five attributes just described.
2. Think about your own organisation – critically evaluate the extent to which it is using an innovative business model and or technologies to re-use everything and throw away nothing.
3. Apply these concepts to your innovation and evaluate the outcome. What will be the best way to do business for your product? Critically assess how this will affect how you package your product.

6.4.4 A Model for Driving Innovation

The five drivers of business innovation

“Innovation is critical not only to business success, but to its very survival” because “fresh approaches, new ways of delivering ideas, visual and content changes all keep people interested and coming back” (Shane, 2012). There are five drivers of innovation, namely:

- Technology;
- Demographics;
- Attention;
- Usability; and
- Three F’s: Fresh, Fun, Fab.

According to Perry-Smith and Mannucci (2017:59) innovation is “essentially a social process, we consider the social drivers of each phase in the form of network characteristics”. In other words, as an idea evolves into reality, we must remember that innovation does not happen in isolation with one individual. It must be stimulated across the organisation by means of open communication, direction and driven by enthusiasm for a new idea.

Tools that drive innovation

A number of “soft” tools drive innovation in the organisation. They are often associated with the idea-generation phase of creativity and innovation. But the techniques in **Table 8** can also be used to battle surprise problems that occur throughout the innovation process.

TABLE 8: TOOLS FOR CREATIVITY

Brainstorming	<ul style="list-style-type: none"> • Developed by the advertising executive Alex Osborn, brainstorming is among the most effective tools for driving innovation. It's also among the most misunderstood. • Brainstorming done right isn't just throwing ideas out. It's a formalized process that generates solutions much more than the sum of their parts.
Mind mapping	<ul style="list-style-type: none"> • Another popular but misunderstood tool, mind mapping goes beyond just capturing a linear flow of words. When done right, mind mapping captures data, challenges ideas, promotes creative solutions, and defines actions steps. And it can be done in words and pictures.
Forced connections	<ul style="list-style-type: none"> • This tool is the premise that underpins many creative thinking techniques. It requires you to take a stimulus and ask: "When I look at this what ideas do I get for solving the problem?" Answering this question forces you to combine two previously unconnected things.
Rapid prototyping	<ul style="list-style-type: none"> • Rapid prototyping drives innovation by quelling the fear companies have that developing a new product or service cost huge sums. Developing simple prototypes can be a vehicle for continual learning. • Rapid prototyping helps companies move incrementally towards a finished product or service and decreases risk while creating energy. Rapid prototyping often saves millions in new product development.
Ethnography	<ul style="list-style-type: none"> • This research tool involves watching customers interact with a product or service in their environments to see what works best. It's great for gaining customer input that can really help drive innovation. It's also great for unearthing needs customers can't articulate because of familiarity.
Praise first	<ul style="list-style-type: none"> • An affirmative judgment technique, this tool does three things. It praises what's good about an idea, lists the limits of the idea in the form of a question, and applies creative thinking to overcome these limitations. It helps give an idea a fair hearing.
Phrase problems as questions	<ul style="list-style-type: none"> • This technique can frame challenges clearly. Sometimes when looking at problems, we get stuck because our brain looks for evidence that supports the assertion. • But re-phrasing the challenge as a question triggers our brains to start solving the problem. The sudden shift in perspective invites solutions automatically.

(Adapted from Miller, nd)

Management information systems as drivers of innovation

A management information system (MIS) is extremely useful in tracking innovation. It tracks, organises, evaluates and manages information in any given organisation. In essence, it studies people, technology and organisations in order to determining whether innovation is being driven to its full capacity.



Management information systems can be defined as:

An organised approach to the study of the information needs of an organisation's management at every level in making operational, tactical, and strategic decisions. Its objective is to design and implement procedures, processes, and routines that provide suitably detailed reports in an accurate, consistent, and timely manner.

In a management information system, modern, computerized systems continuously gather relevant data, both from inside and outside an organisation. This data is then processed, integrated, and stored in a centralized database (or data warehouse) where it is constantly updated and made available to all who have the authority to access it, in a form that suits their purpose.

(Business Dictionary, nd)

&&&



Learn more about the evolution and purpose of management information systems:

- Marker, A. (2021, December 14). Management information systems: In business, in academia, and in the future. *Smartsheet*. <https://www.smartsheet.com/management-information-systems> (accessed 10 March 2022).

According to Khalil (1996:32), “**organisations** are only as **innovative** as their employees. An **innovative** organisation provides an environment that sparks and sustains its employees' creative thinking processes. A conducive environment should provide employees with intrinsic rather than extrinsic motivation, access to relevant **information**, continuous reminders and hints, and enable them to transfer problem-solving experiences to new problems. Any attempt to provide such an environment should take advantage of the powerful **tools** of IT and the expertise of the **information systems** (IS) groups”.

6.4.5 Key Points

- Innovation becomes stunted when there is business uncertainty.
- Innovation management is not limited to one function in the organisation; by leveraging the skills and knowledge of multiple departments (especially marketing and product development) the organisation can leverage the appropriate knowledge (explicit and tacit or experiential).
- Organisational factors that contribute to successful innovation: stimulus, capacity, and performance; the impact of organisational structure; the management of individuals especially knowledge workers; IT systems; and management tools and guidelines.
- The creative process is best described through: focus, displacement, connection.
- A systematic approach to creativity may include mind mapping, brainstorming, forcing connections and synectics.
- A product platform is a common design, formula, or versatile product, based on which a family (line) of products is built over time.
- Three key principles to packaging are: protection, containment, and identification or labelling.
- There are five drivers of innovation: technology, demographics, attention, usability, 3 F's: Fresh, Fun, Fab.
- Management information system can drive and monitor innovation progress in your organisation.

Remember to do your digital assessment for this section online!



It will help you strengthen and embed your understanding of the course. You will not be able to change your answers once you have submitted them, so make sure you have completed the relevant section of coursework first. Where you see **Select all that are relevant**, be aware that any number of the options presented could be correct. You will lose marks for incorrect selections, so choose carefully. Your combined marks from these assessments count towards a total of 20% of your course mark.

6.5 MANAGING INNOVATION

Timeframe	Minimum of 40 hours
Learning outcomes	<ul style="list-style-type: none"> • Assess innovation management models, tools, frameworks and processes; and • Critically evaluate different methods for generating ideas and managing uncertainty in the innovation process.
Prescribed book	<ul style="list-style-type: none"> • Chapters 1 and 6 in Trott, P. (2021). <i>Innovation management and new product development</i> (7th ed.). Pearson Education.
Prescribed articles	<ul style="list-style-type: none"> • Berkhout, A.J., & Van der Duin, P. (2007). New ways of innovation: an application of the cyclic innovation model to the mobile telecom industry. <i>International Journal of Technology Management</i>, 40(4), 294-309. https://www.researchgate.net/publication/228626269_New_ways_of_innovation_An_application_of_the_cyclic_innovation_model_to_the_mobile_telecom_industry (accessed 24 November 2021). • Breznik, L., & Hisrich R. (2014). Dynamic capabilities vs. innovation capability: are they related?' <i>Journal of Small Business and Enterprise Development</i>, 21(3), 368-384, https://www.researchgate.net/publication/264657070_Dynamic_capabilities_vs_innovation_capability_Are_they_related (accessed 24 November 2021). • <i>TechRadar</i>. (2019, February 23). A decade of Innovation; Samsung marks the beginning of a new era. https://www.techradar.com/news/a-decade-of-innovation-samsung-marks-the-beginning-of-a-new-era (accessed 24 November 2021).
Section overview	<p>This section introduces the different methods of generating innovative ideas and how to manage uncertainty in the innovation process. You will be introduced to three innovation management frameworks with a view to understanding innovation as a management process (or integration of processes). In the first framework, by Trott, entrepreneurship is central to successful innovation management; in the second framework a creative culture plays a significant role; and in the third framework Boyd and Goldenberg emphasise systematic approaches. While we provide three frameworks for comparative purposes, you are encouraged to identify further frameworks to enrich your understanding.</p>

6.5.1 The Evolution of Innovation Framework Models

Innovation is one of the most important factors in economic competition. The frameworks discussed here will provide you with a process that reduces complexity and brings together key elements. But in order to understand how these management frameworks affect innovation, you must understand (from an organisational perspective) how the innovation process has evolved. The next table suggests that many of these models stand side by side and often overlap with regard to processes and stakeholder management.

TABLE 9: EVOLUTION OF INNOVATION FRAMEWORK MODELS

Model	Generation	Characteristic	Strengths	Weaknesses
Technology push	First	Simple linear sequential process, emphasis on R&D and science	<ul style="list-style-type: none"> • Simple • Radical innovation 	<ul style="list-style-type: none"> • Lack of feedback • No market attention • No networked interactions • No technological instruments
Market pull	Second	Simple linear sequential process, emphasis on marketing. The market is the source of new ideas for R&D	<ul style="list-style-type: none"> • Simple • Incremental innovation 	<ul style="list-style-type: none"> • Lack of feedback • No technology research • No networked interactions • No technological instruments
Coupling	Third	Recognising interaction between different elements and feedback loops between them. Emphasis on integrating R&D and marketing	<ul style="list-style-type: none"> • Simple • Radical and incremental innovation • Feedback between phases 	<ul style="list-style-type: none"> • No networked interactions yet • No technological instruments
Interactive	Fourth	Combination of push and pull models, integration within firm, emphasis on external linkages	Actor networking Parallel phases	<ul style="list-style-type: none"> • Complexity increment of reliability • No technological instruments
Network	Fifth	Emphasis on knowledge accumulation and external linkages, systems integration and extensive networking	<ul style="list-style-type: none"> • Pervasive innovation • Use of sophisticated technological instruments • Networking to pursue innovation 	Complexity increment of reliability
Open	Sixth	Internal and external ideas, and internal and external paths to market can be combined to advance the development of new technologies	Internal and external ideas, and internal and external paths to market, can be combined	<ul style="list-style-type: none"> • Assumes capacity and willingness to collaborate and network • Risks of external collaboration

(Adapted from Impasco, nd)

Exploring innovation models from an organisational perspective can assist executive management teams in framing, understanding, and executing key phases in the innovation life cycle and its counterparts. In doing so organisations can design the most optimal innovation processes for their products and services, allowing them to pre-empt and adapt to future opportunities and challenges.

6.5.2 Frameworks for Managing Innovation Effectively and Efficiently

Trott's framework for the management of innovation

Trott (2021:30) points out that innovation has been driven by different thinking in different industries. To summarise:

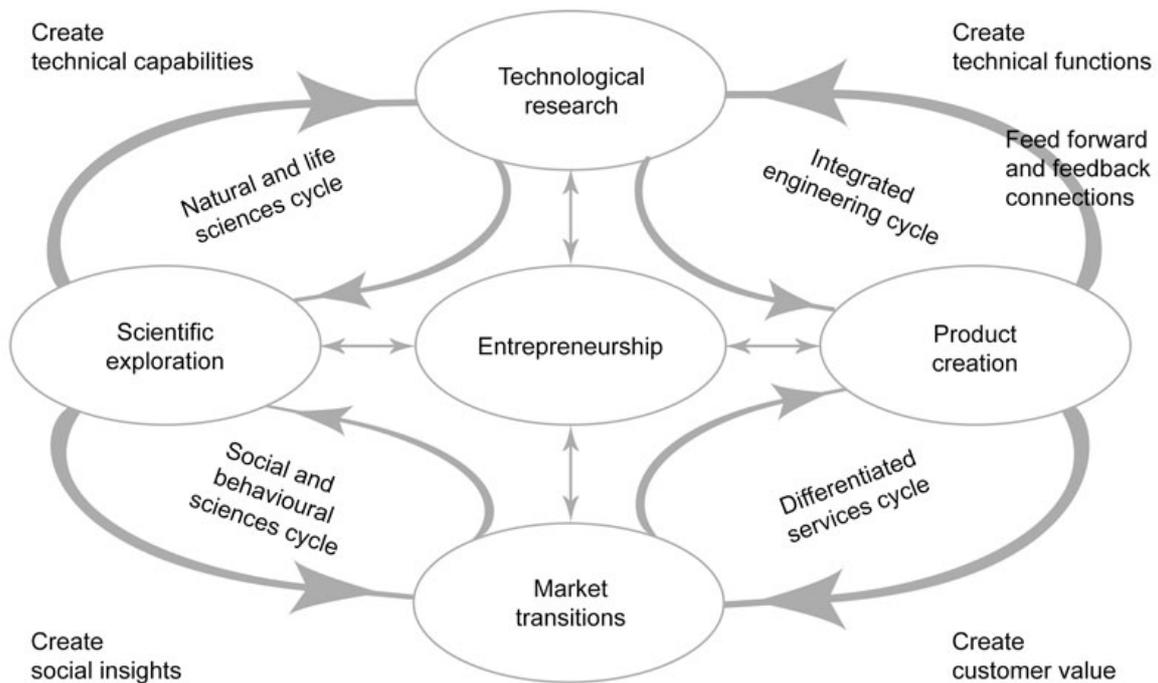
- Market-driven versus resource-based views;
- Serendipity (unexpected discoveries);
- Linear models (eg the creation of new knowledge dominated by universities and large science-based organisations, coupled with technology developments by organisations, and then driven by the expressed needs and wants of consumers);
- Technology push versus market pull;
- Simultaneous coupling model, which includes the three cornerstones of research and development, manufacturing, and marketing;
- Architectural innovation (the Henderson-Clark model);
- Interactive model (like the coupling model, there is no explicit starting point – information flow and competencies stimulate innovation, which can arise from multiple sources such as latest science and technology, needs in society, technology push, market pull, idea generation, etc. Refer to Figure 1.7 in Trott, 2021:25);
- Innovation life cycles (competitive forces produce iterations of increasingly advanced innovations, eg the cell phone); and
- Open and collaborative innovation (innovation that takes place external to the organisation such as that found up and down the supply chain, including by end users).

Trott (2021) says that innovation might be all of the above, but since managers have the difficult task of trying to manage these complex processes, given the limitations of the various approaches and models (eg insufficient attention paid to behaviours; innovation models not embedded in the strategic thinking of leadership, etc), he recommends a more comprehensive framework.

The innovation cycle

The framework provided in **Figure 15** “attempts to capture the iterative nature of the network processes in innovation and represent this in the form of an endless innovation circle with interconnected cycles” (Berkhout in Trott, 2021:32).

FIGURE 15: THE INNOVATION CIRCLE WITH INTERCONNECTED CYCLES



(Berkhout *et al* in Trott, 2021:32)

The four principal nodes of the model function as roundabouts (nonlinear):

- Scientific exploration (research);
- Technological research;
- Product creation; and
- Market transitions.

Berkhout (2007) explains his model as follows:



“The **Cyclic Innovation Model (CIM)** presents the processes in innovation by a circle of change. Changes in science (left) and industry (right), and changes in technology (top) and markets (bottom) are cyclically connected. Nodes function as roundabouts, entrepreneurs generate the driving forces.”

(Berkhout, 2010)



Read the full article to understand symbiosis in what Berkhout (2010) argues is true innovation.

- Berkhout, A.J., & Van der Duin, P. (2007). New ways of innovation: an application of the cyclic innovation model to the mobile telecom industry. *International Journal of Technology Management*, 40(4), 294-309.
https://www.researchgate.net/publication/228626269_New_ways_of_innovation_A_n_application_of_the_cyclic_innovation_model_to_the_mobile_telecom_industry (accessed 24 November 2021).

Where ideas emerge

Entrepreneurship plays the central role of making use of opportunities. Notably, “without the drive of entrepreneurs there is no innovation, and without innovation there is no new business” (Trott, 2013:31). New ideas can emerge from anywhere in the circle and propagate clockwise or anti-clockwise.



- Trott (2021:33) points out that young people like to work in such an environment, and that young entrepreneurs prefer to work flexibly in flatter organisations.
- The framework is not a chain, but a circle of innovations built on innovations.
- Failures are seen as opportunities for new insights.
- Time is a crucial factor in innovation – the dynamic of the circles facilitates speed.
- Managers might need to manage differently.

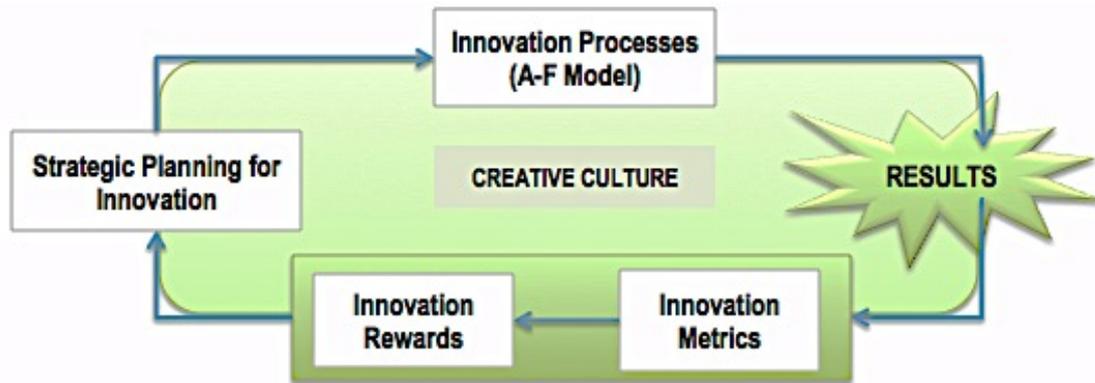
The framework provided by Trott (2021) poses new management challenges, namely the need for:

- Virtual management (cross-border and cross-functional teams may be required);
- Managing without authority (influence rather than traditional forms of power may be required in these new relationships); and
- Shared leadership and building of extensive networks (to support knowledge flow).

Trías de Bes and Kotler’s framework for innovation

Figure 16 shows how Trías de Bes and Kotler’s A-F model (2011) fits into the framework they propose for innovation management.

FIGURE 16: TOTAL INNOVATION SYSTEM



(Trías de Bes & Kotler, 2011)

Trías de Bes and Kotler (2011) argue that an innovation framework must have “four legs”:

1. **Strategic planning** is where innovation priorities and objectives are defined in alignment with the strategic direction of the organisation (eg vision, mission, and goals); innovative projects are generated in strategic planning;
2. The innovation projects will be put through **innovation processes**, of which the A-F Model is a function; these innovation processes provide tools (eg a stage-gate or “Go”, “No go” system) for transforming an idea into an innovation;
3. Innovative projects (eg new products and processes) produce either positive or negative results as measured against **metrics**, which in turn determine **rewards**; and
4. The above three legs are sustained against a backdrop of a **creative culture**, an essential part of the innovation framework.

Industries and organisations that operate in different industries may adopt distinctive strategies to innovation – incremental, semiradical, or radical innovation projects. However, Trías de Bes and Kotler (2011:27) point out the need for innovation guidelines (or parameters). These guidelines are specific about what types of innovations will be considered, for example, only innovations:

- With projected sales in excess of \$2m;
- That will break even within three years;
- With a return on investment (ROI) of 15%; and
- That are achievable with existing human resource capacity.

The purpose of the guidelines (one or more) is to limit the number of innovations; to direct the focus toward strategic goals; and to manage risks. Trías de Bes and Kotler (2011:28) take this a step further: they recommend a checklist for the innovation process as shown in the next example.



Checklist example for an innovation project

1. Is the innovation project really necessary? Why?
2. What are the benefits of the innovation project to customers?
3. Will the innovation project help employees or the organisation? How?
4. Is it necessary to undertake the innovation project now? If not when?
5. What is the impact of the innovation project on business operations and how might it impede other business goals?
6. What are the ultimate innovation project goals and how will progress be measured?
7. Is the innovation project cost-effective? What are the cost-benefit advantages?

(Trías de Bes & Kotler, 2011:28)



Check: Innovation Project Framework



1. Reflect critically on the checklist just given. What other questions might be appropriate? Use the 5Ws and 1H to refine the questions.
2. Using the complete set of questions from question 1, draw up a checklist for your innovation project. Determine the specific guidelines applied to this project (eg ROI). Add this to your innovation project.
3. Compare the frameworks of Berkhout (2007) and Trías de Bes and Kotler (2011).
4. Using a synthesis of both frameworks, create an innovation framework for your innovation project. Critically evaluate the outcomes. Add this to your innovation project.

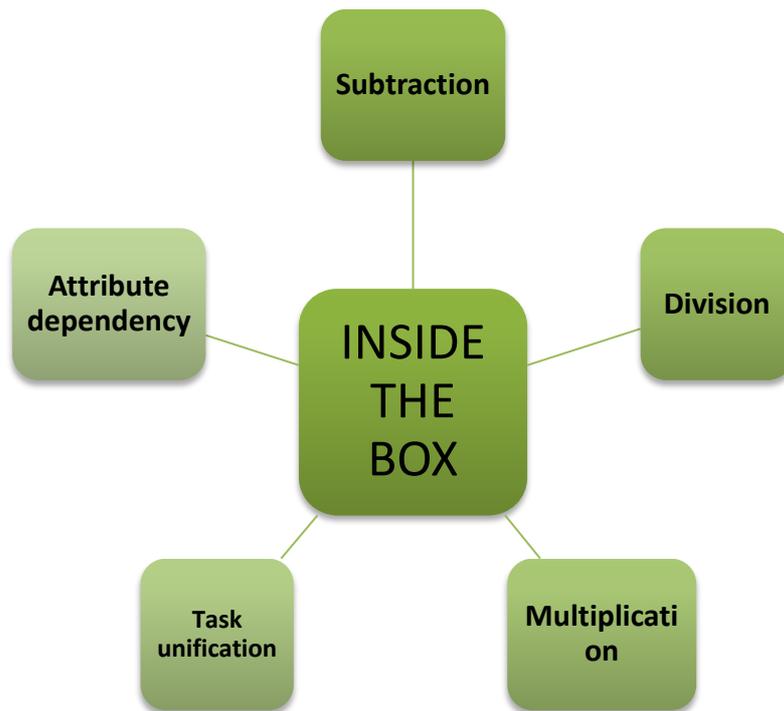
Boyd and Goldenberg's framework for innovation

Boyd and Goldenberg (2013) provide a different perspective – their research indicates that business innovation is “right in front of you” (inside the proverbial box). To access innovation requires you to follow five templates:

- Subtraction;
- Division;
- Multiplication;
- Task unification; and
- Attribute dependency.

They argue that patterns play an important role in our everyday lives, and paradoxically, by applying these patterns, “unconventional and surprising outcomes occur” (Boyd & Goldenberg, 2013:7). See **Figure 17**.

FIGURE 17: BOYD AND GOLDENBERG'S FIVE TEMPLATES



(Boyd & Goldenberg, 2013:7)

Before considering each of the five aspects of **Figure 17**, we should highlight an important principle that drives Boyd and Goldenberg's (2013) approach: the closed world principle. In the closed world principle, the best and fastest way to innovate is to look at resources close at hand. While this might be counterintuitive, because most people are told to get outside their current domains and use random stimuli, Boyd and Goldenberg (2013) argue that everything you need to be innovative is within your immediate world.

Subtraction

Subtraction works by eliminating an essential component of a system (product or process). "The product to be eliminated must be an internal component, meaning one that is within your control" (Boyd & Goldenberg, 2013:45). On removing one element you must imagine leaving all other elements intact. Not easy at first since you could hardly imagine a car without, for example, wheels. Boyd and Goldenberg stress that we suffer from "fixedness" – we perceive things in the same way we have always seen them (or as they have always been used).



Applying templates that work assists in creating systematic inventive thinking in an organisation.



Examples

- Contact lenses are a subtracted product of spectacles (the lenses without the frames).
- Taking water out of soup produced the more convenient powdered instant soup.
- By simply restricting conversations to 140 characters Twitter has become a vast digital dialogue – a partial subtraction of text down to 140 characters dramatically increased the volume of and participation in what people are doing and thinking.

(Boyd & Goldenberg, 2013)

Division

This approach requires you to divide an existing product (good or service) into multiple parts and then reconfigure them in a novel way. After doing this, consider the possibilities and benefits that the new configuration offers. Your objective is to create a new benefit altogether, or an existing benefit delivered in a novel way.

Boyd and Goldenberg (2013:74) suggest three types of division:

- **Functional division** – separate specific functions of a product and position them somewhere else (two classic examples include placing the noisy air conditioning motor on the outside of the house with the air conditioning unit/thermostat on the inside of the house; separating the TV controls from the TV set in the form of a remote);
- **Physical division** – cut a product into pieces (eg aeroplane seating is divided into first class, business class, premium class, and tourist class offering more customised options to travellers); and
- **Preserving division** – divide a product into smaller versions of itself (eg a hard drive and a memory stick; hair shampoo in a bottle and in convenient sachets).

Multiplication

You could argue that simply multiplying a product (good or service) would not achieve anything, but if you were to change the functionality of a product through its multiplication then you could derive a different benefit (Boyd & Goldenberg, 2013). The classic example of this is the razor blade. Twin blades give a closer shave than a single blade because each blade performs a different function – the first blade pulls the hair up so that the second blade (at a slightly different angle) can cut it off. We now have the Gillette Mach3 (three blades), the Schick Quattro (four blades), and the Gillette Fusion (six blades).

Task unification

Task unification is the assigning of an additional task (or function) to an existing component (or resource) in a product (good or service) or process (Boyd & Goldenberg, 2013:135). Consider the next example.



A sticker that turns into soap under running water – Fruitwash

A sticker is placed on a fruit (or vegetable) such as an apple. When the apple is placed under running water the sticker dissolves into soap; one that removes wax, pesticides, and dirt from the fruit. The sticker has been assigned an additional task as it performs its primary task:

- No stickers to peel off and throw away;
- No expensive produce wash needed;
- Displays price look-up codes for fast and accurate check-out;
- Label can be removed normally by peeling off;
- Water resistant (washing or rubbing with water triggers the turn); and
- Helps remove water-resistant wax, pesticides and fungicides.

(Innovationinpractice.com, 2012)

Attribute dependency

This approach requires you to “take two attributes (or characteristics) that were previously independent of each other and make them dependent in a meaningful way” (Boyd & Goldenberg, 2013:160). Consider the example given below of the proposed Da Vinci Tower in Dubai (UAE). In this example, the shape of the building changes because each floor rotates separately. Further, the energy generated will power other buildings.



Dynamic architecture – the Da Vinci Tower in Dubai (UAE)

The Da Vinci Tower is a proposed 313-metre tower in Dubai. Each floor will be able to rotate independently. This will result in the tower constantly changing shape. Each floor will rotate a maximum of one full rotation in 90 minutes. The entire tower will be powered by wind turbines and solar panels that will also provide electricity to five other buildings in the vicinity. The turbines will be located between each of the rotating floors and could generate up to 1,200,000 kilowatt-hours of energy.

(Innovationinpractice.com, 2014)

Boyd and Goldenberg (2013:163) say that 35% of innovations can be attributed to this approach.



The approaches of Boyd and Goldenberg (subtraction, division, multiplication, task unification, and attribute dependency) are all aimed at defeating "fixedness" by using systematic innovative thinking.

Innovation management maturity model

The innovation management maturity model is a framework to assess a company's innovation programme by reviewing the people, processes and tools needed to from idea to market. It identifies the gaps that drive innovations within your organisation. This model encompasses the entire product life cycle, from idea to final product.



Maturity Assessment



Assume you have been given the task of increasing the market share significantly of one product line (good or service) at your own organisation. Use each of the five approaches described above to find a way in which to achieve this objective. You should start by expanding your understanding of the concepts by going to the authors' website at: <http://www.innovationinpractice.com/> (accessed 24 November 2021).

1. Compile a two-page synopsis of your findings for your organisation. Critically analyse how this will impact your innovation project.
2. Conduct an online maturity innovation assessment of your organisation for your innovation project: Planview. 2017, <http://www2.planview.com/im3/?1/> (accessed 24 November 2021).
3. Critically analyse the results of your online assessment and determine how the level on innovation will impact the roll-out of your product/service.

6.5.3 Walking in the Boots of Innovation Governance

Very few organisations have a systematic approach that identifies and compares potential innovation models. In actual fact, this is a key step that must not be underestimated, as allocating innovation responsibilities is key to driving the success of the company.

“[In]novation governance can be thought of as a system of mechanisms to align goals, allocate resources and assign decision-making authority for innovation, across the company and with external parties” (Deschamps, 2013). Deschamps has identified a list of innovation governance responsibilities:

- Defining roles and ways of working around the innovation process;
- Defining decision power lines and commitments on innovation;
- Defining key responsibilities of the main players;
- Establishing the set of values underpinning all innovation efforts;
- Making decisions that define expectations;
- Defining how to measure innovation;
- Making decisions on innovation budgets;
- Orchestrating, balancing and prioritising innovation activities across divisions; and
- Establishing management routines regarding communications and decisions.

(Deschamps, 2013)

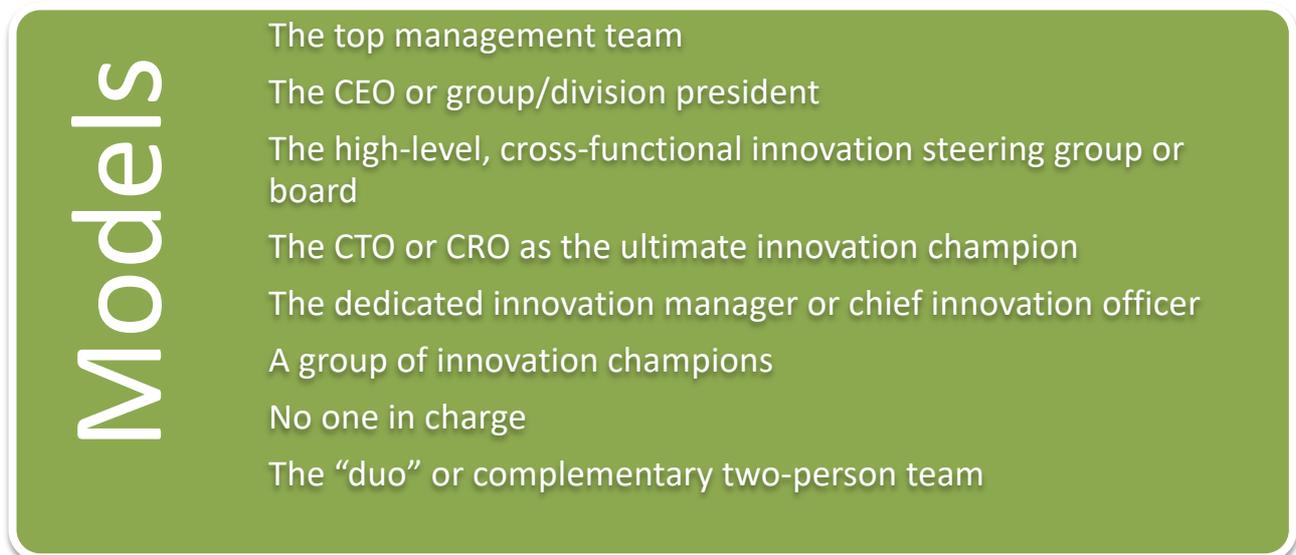
Deschamps' examples give a good indication of the scope, content and process that can be involved in innovation governance. But defining these responsibilities is pointless unless certain questions are asked to what the organisation is doing:

- Why innovate?
- Where do you look to innovate?
- How much innovation do you want?
- How can you innovate more effectively?
- With whom can and should you innovate? and
- Who is responsible for the innovation?

(Deschamps, 2013)

These questions help determine the scope of innovation and governance, while the nine models in **Figure 18** are specific approaches that companies have put in place to clarify and support the previous governance questions.

FIGURE 18: NINE MODELS OF GOVERNANCE



(Adapted from Deschamps, 2013)

It is important to remember that innovation is a cross-functional activity that requires teamwork. At no time will innovation be the sole responsibility of an individual. Thus, when managing innovation, those responsible for initiatives must ensure the right parameters are in place to drive top-down and bottom-up innovation.

6.5.4 Building Innovation Capabilities

Innovation has become management's new imperative for creating competitive advantage in a complex global economy. As a result, managing innovation capabilities has become a key process for establishing strategic objectives in organisations. In other words, innovation management can be seen as a form of organisational capability.

However, improving innovation capabilities in any organisation is never a quick fix, and requires a large investment from the organisation and its people. Each organisation has its own needs, objectives, processes, systems and goals, and so innovation is unique to each organisation. When assessing innovation capabilities at your company it is important to:

- Investigate the visibility of barriers to innovation within the company;
- Evaluate your current innovation environment;
- Determine ways to engage employees and innovation teams who have the skills to innovate;
- Review the metrics and incentives to allow this capability to function and develop over time;
- Implement innovation practices and approaches that are based on proven principles; and
- Design processes, systems and organisational structures that support innovation results.

Innovation capability is the “potential to generate new ideas, identify new market opportunities and implement marketable innovations by leveraging on existing resources and capabilities” (Hii and Neely, 2000:5). This notion of innovation becomes central in developing a strategic plan, as developing innovative capabilities is a continuous process in a dynamic marketplace.



Learn to use innovation capabilities to outsmart competition:

- Breznik, L., & Hisrich R. (2014). Dynamic capabilities vs. innovation capability: are they related? *Journal of Small Business and Enterprise Development*, 21(3), 368-384, https://www.researchgate.net/publication/264657070_Dynamic_capabilities_vs_innovation_capability_Are_they_related (accessed 24 November 2021).

'What, why and how' of innovation management

When determining innovation capabilities for the present and future you must view innovation management in two opposing ways:

1. As a series of innovation processes; and
2. As a change management process.

This will allow the organisation and its people to view and respond to opportunities, and use the innovation process as a means to create or introduce new products or services.



Read this case study:

- *TechRadar*. (2019, February 23). A decade of Innovation; Samsung marks the beginning of a new era. <https://www.techradar.com/news/a-decade-of-innovation-samsung-marks-the-beginning-of-a-new-era> (accessed 24 November 2021).

Now that you are inspired by Samsung, identify an innovation project for your organisation and then answer the following questions to start the innovation process.

- Who owns the process?
- Who has the power to change it?
- What are its objectives?
- What are the success metrics?
- Who are the customers of this process?
- Who gets to participate?
- What are the data or information inputs for this process?
- What analytical tools are used?
- What events and milestones drive this process?
- What kind of decisions does this process generate?
- What are the decision-making criteria?
- How are decisions communicated, and to whom?
- How does this process link to other management systems?

Now update your innovation project portfolio:

- Refer back to your strategic plan outline and make any changes you need for your innovation project.
- Critically assess how you will govern the innovation process to ensure success.
- Determine which capabilities are currently present in your organisation. Which capabilities can be better exploited to produce other products or services, and which require strategic alliances?
- What factors will be conducive to such developments?

(Adapted from Hamel, 2006)

6.5.5 Key Points

- Innovation has been driven by different thinking, largely as a consequence of the industries in which organisations operate.
- Managers have a difficult task of trying to manage complex innovation processes, due to the limitations of the various approaches and models.
- The four principal nodes of the model function as roundabouts (nonlinear): scientific exploration (research); technological research; product creation; and market transitions.
- The cyclic innovation model (CIM) presents the processes in innovation by a circle of change.
- Strategic planning is where innovation priorities and objectives are defined in alignment with the strategic direction of the organisation (e.g., vision, mission, and goals); innovative projects are generated in strategic planning.
- The innovation management maturity model is a framework to assess a company's innovation program by reviewing the people, processes and tools needed to from idea to market. It basically identifies the gaps that drive innovations within your organisation.
- Innovation governance can be thought of as a system of mechanisms to align goals, allocate resources and assign decision-making authority for innovation, across the company and with external parties.

Remember to do your digital assessment for this section online!



It will help you strengthen and embed your understanding of the course. You will not be able to change your answers once you have submitted them, so make sure you have completed the relevant section of coursework first. Where you see **Select all that are relevant**, be aware that any number of the options presented could be correct. You will lose marks for incorrect selections, so choose carefully. Your combined marks from these assessments count towards a total of 20% of your course mark.

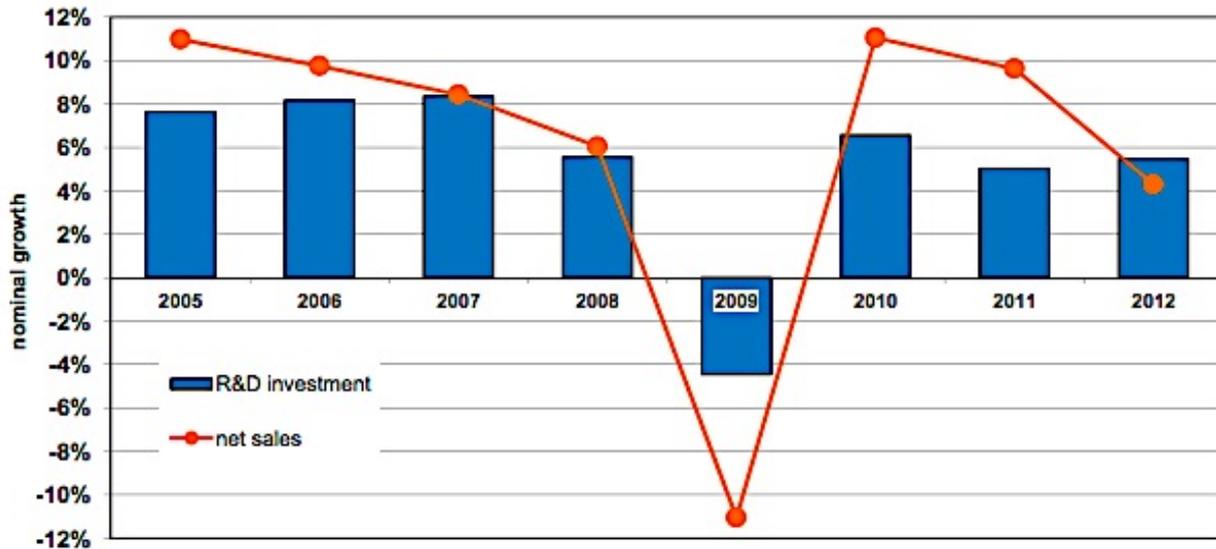
6.6 STRATEGIC ENABLERS OF INNOVATION

Timeframe	Minimum of 40 hours
Learning outcomes	<ul style="list-style-type: none"> • Exploit strategic alliances and networks to create innovative ways of doing business; • Compare and contrast innovation with research and development; and • Assess the value of integrating issues related to ethics and corporate social investment within innovation.
Prescribed book	<ul style="list-style-type: none"> • Chapters 9, 10, 15 and 16 in Trott, P. (2021). <i>Innovation management and new product development</i> (7th ed.). Pearson Education.
Prescribed articles	<ul style="list-style-type: none"> • Jaruzelski, B., Chwalik, R., & Goehle, B. (2018, October 30). What the top innovators get right. <i>Strategy+Business</i>. https://www.strategy-business.com/article/00221?gko=92884 (accessed 24 November 2021). • Mulgan, G. (2006). The process of social innovation. <i>Innovations</i>, Spring 2006. https://direct.mit.edu/itgg/article/1/2/145/9448/The-Process-of-Social-Innovation (accessed 10 March 2022). • WIPO. (2016). Understanding Industrial Property. http://www.wipo.int/publications/en/details.jsp?id=4080 (accessed 24 November 2021).
Section overview	This section exposes you to the impact of strategic enablers on organisational innovation. We take a closer look at the role of R&D in light of innovation and the alignment of these activities and strategies to innovation. There is a deep dive into the importance of knowledge and ethics as a form of innovation.

6.6.1 Understanding What Research and Development Really Is

Economic conditions, geographic location, industry context, and the competitive positioning of an organisation with regard to its markets, products, and capabilities determine the effort spent on research and development (R&D). That said, during the three years following the financial crisis in 2008-2009, 1,496 companies (out of the top world 2,000 companies) increased their R&D investments by an average 6.2% per year (2010-2012). This resilience during a period of economic uncertainty reflects the strategic importance that organisations attach to their investment in R&D (European Commission, 2013).

FIGURE 19: INVESTMENT IN R&D COMPARED TO NET SALES GROWTH



(European Commission, 2013)

Volkswagen tops the world R&D investment rankings, with \$15.3-bn spent on R&D in the decade to 2015. Samsung Electronics (South Korea) follows closely at \$14.1-bn, according to PwC (Brodie, 2017).

Automobile, ICT, pharmaceutical and biotechnology firms spend the most on R&D. Several governments provide significant tax incentives for companies undertaking research and development work (eg the UK government) – the aim is to encourage investment in R&D, making the country an attractive location for overseas companies to undertake their R&D activities. For this reason, R&D is defined in accordance with requirements pertaining to each country.



UK government: an **R&D activity** should aim to achieve an advance in science and technology through the resolution of a scientific or technological uncertainty. This includes work that:

- Generates scientific or technical knowledge;
- Creates a process, material, device, product or service which is new to the field; or
- Appreciably improves something that already exists through scientific or technological change.

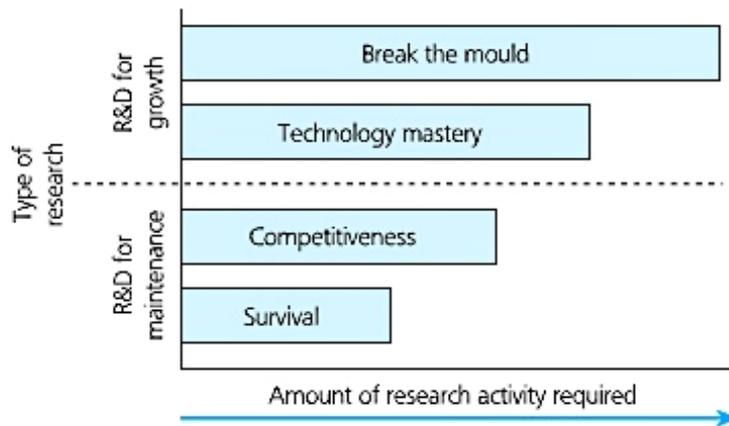
The R&D should not be seeking to create what is already available (except if it is a trade secret) or could be made available by a competent professional working in the relevant field.

(Blick Rothenburg, 2014)

6.6.2 Aligning R&D Strategies for Innovation

Trott (2021:298) proposes the model shown in **Figure 20** as a guide to establishing whether an organisation's research activity is appropriate for its current and future position in the market.

FIGURE 20: DETERMINING THE LEVEL OF RESEARCH ACTIVITY



(Trott, 2021)

The objective is to match the R&D activity to the strategic needs of the organisation:

- **Survival position** – the organisation expects to leave the business (or a business unit). The role of R&D is to ensure the organisation's interim survival against technological mishaps to both products and processes;
- **Competitive position** – here the objective is to sustain a competitive position, so the role of R&D is to make improvements to products and processes that retain the organisation's competitive position in the market. In some industries, remaining competitive may require R&D to work fiercely, whereas in other industries competition may be less fierce;
- **Technology mastery** – here the organisation wants to position itself as an industry leader, in which case the R&D team must be at the cutting edge of all potential developments. A higher R&D expenditure will be required to maintain this level of commitment to mastery; and
- **Break the mould** – this strategy aims to research and develop new patentable technologies and could involve significant scientific research into new ways of doing business.



1. Reflect on the four levels described. At the survival level a big car manufacturer may be phasing out a particular model and therefore adopting a survival position. But R&D may also be tasked to develop a solar powered vehicle in an attempt to break the mould in the mid-range car market.
2. Think about your organisation and the industry in which it operates. How is R&D positioned?

Trott's (2021) model provides a framework within which to check the legitimacy of R&D decisions. If, for example, a strategic decision is taken to exit a business this will have a profound influence on the nature of activities, including the level of innovation.

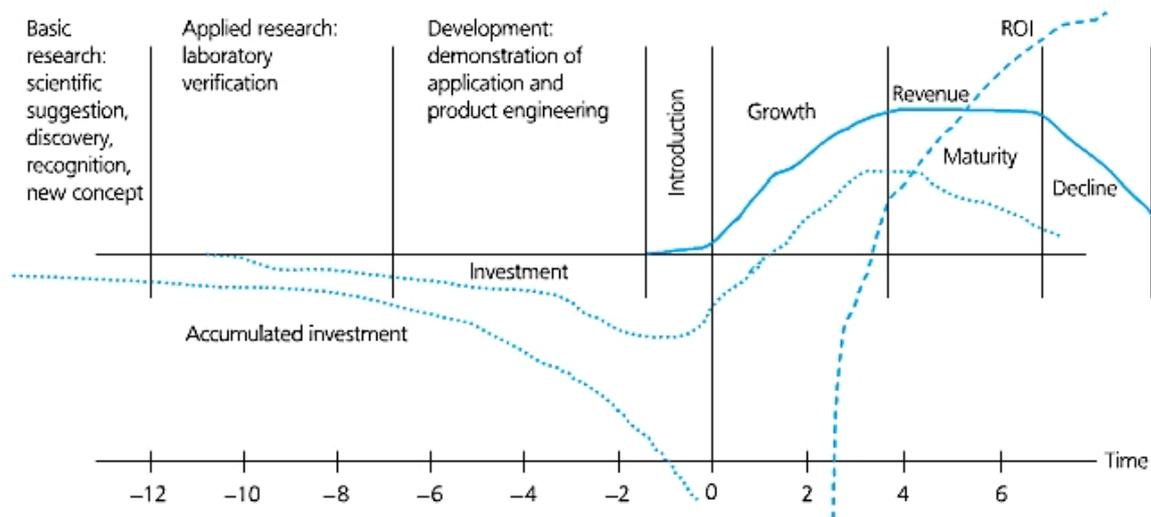
6.6.3 R&D Activities You Need to Know

Typically, R&D is concerned with four major activities:

- **Basic research** – fundamental science conducted in laboratories of large organisations and universities (outputs are new discoveries, such as centrifugal force);
- **Applied research** – the use of existing scientific principles for the solution of a particular problem (outputs are new technologies and patents, such as the vacuum cleaner, which was based on the science of centrifugal force);
- **Development** – involves overcoming a technical problem associated with a new product or an enhancement of it (for example the development of the upright vacuum cleaner into a cylinder model); and
- **Technical service** – this is a support function provided to existing products and services (for example cost and performance improvements, such as a disposable bag for a cylinder vacuum cleaner).

Trott (2021) shows how the above relates to the overall product innovation process in **Figure 21**. You will notice the accumulated investment and return on investment (ROI) implications in the various activities.

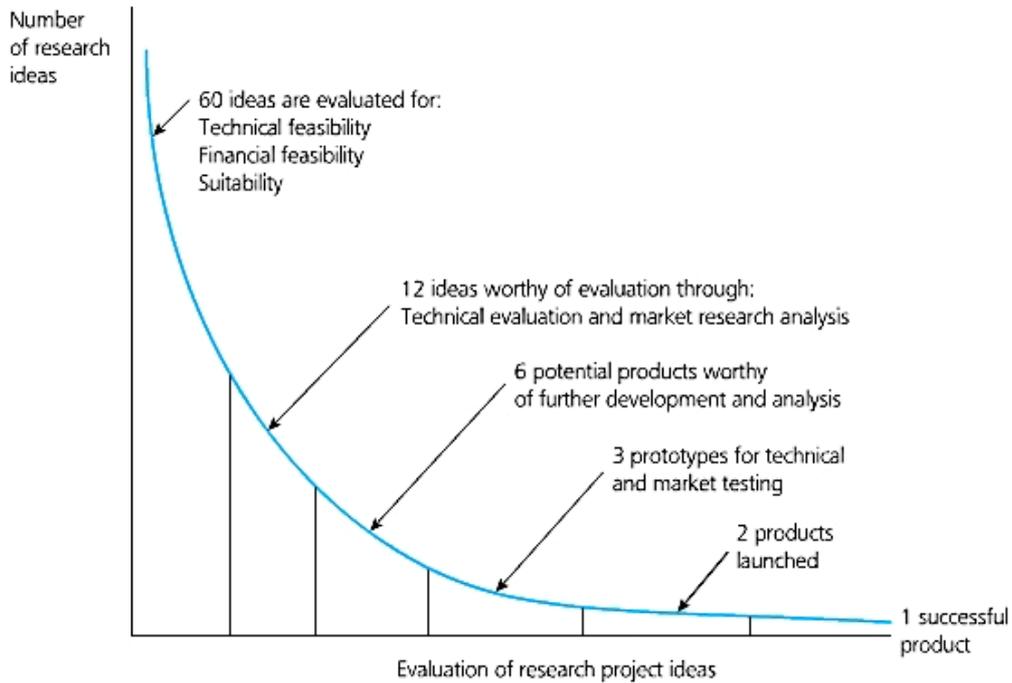
FIGURE 21: R&D AND PRODUCT LIFE CYCLE



(Trott, 2021)

Figure 21 might assume a seamless passage from basic research through to product launch, but consider that 60 ideas might emerge as a consequence of a scientific principle and only one actual product might be successful. Trott (2021) shows a typical dropout rate in **Figure 22**.

FIGURE 22: DROPOUT RATES FOR R&D PROJECTS



(Trott, 2021)

R&D managers are responsible for a portfolio of projects, from incremental to radical. Their aim is to select those that will be successful and drop those that will not. As **Figure 22** indicates, the ideas pass through several stage gates including, in the main, market, technical and financial feasibility. Over and above the diagram provided, Trott (2021) provides a useful summary of R&D evaluation criteria, which we have included for discussion, shown in **Table 10**.

TABLE 10: R&D PROJECT EVALUATION CRITERIA

Criteria	Typical questions
Technical	Do we have experience of the technology? Do we have the skills and facilities? What is the probability of technical success?
Research direction and balance	How does it compare with research goals? Do we have a balance of risk in our project portfolio?
Competitive rationale	How does this project compare relative to the competition? Is it necessary to defend an existing business? Is the product likely to be superior?
Patentability	Can we obtain patent protection? What will be the implication for defensive research?

Criteria	Typical questions
Stability of the market	How stable is the technology? Is the market developed? Is there an industry standard?
Integration and synergy	What is the level of integration of this project relative to other products and raw materials? Will it stand alone?
Market	What is the size of the market? Is it a growing market? Is there an existing customer base? Is the potential big enough to warrant the resource allocation?
Channel fit	Do we have existing customers who might be interested, or must we find new customers?
Manufacturing	Can we use existing resource capabilities? Will we require new equipment, skills, etc?
Financial	What is the expected investment required and the rate of return? (For payback period, IRR and NPV refer to your finance course.)
Strategic fit	Does it support our short and long-term plans for the business?

(Trott, 2021:307)



R&D Assessment



The cautionary tale of Pfizer's Viagra (p 309 in Trott, 2021) shows that even in the face of negative data there is a need to encourage innovation and support scientific freedom. The plug could have been pulled on this R&D project, but the team managed to gain two years of funding to develop the drug and undertake clinical trials. The rest, as they say, is history. Viagra is now one of the most recognised brands in the world.

1. Conduct a research and development assessment for your innovation portfolio by answering questions 2-6.
2. Describe your product in detail, maximum of two pages.
3. Prepare a short presentation that aligns the R&D on your product with organisational strategies, R&D activities and R&D spending.
4. Conduct an R&D project evaluation and critically evaluate your findings.
5. What type of spending do you think will be involved in this initiative?
6. If necessary, realign your product.

6.6.4 R&D: The Big Spender

Before we consider some of the success and failure factors in innovation, it is useful to get a sense of useful parameters for R&D spending.



Overspending on R&D



Read about avoiding overspending on R&D, and then complete the tasks that follow:

- Jaruzelski, B., Chwalik, R., & Goehle, B. (2018, October 30). What the top innovators get right. *Strategy+Business*. <https://www.strategy-business.com/article/00221?gko=92884> (accessed 24 November 2021).

Tasks

1. What is your organisation's R&D spending as a percentage of revenue? How does this compare with other organisations in your industry sector? Refer to Exhibits 2 and 3 in the reading to help you in your evaluation.
2. "There is no long-term correlation between the amount of money a company spends on its innovation efforts and its overall financial performance. Instead, what matters is how companies use that money and other resources", Jaruzelski *et al*, 2018). Reflect critically on the R&D spend in your organisation and, more specifically, on digital enablers. How does this report make you think differently about R&D spending in your organisation and for your innovation project?
3. Identify other key learning points from this report. Discuss the relevance of these for your organisation and your project.

6.6.5 Protect What's Yours

The role of intellectual property law is to encourage creativity and innovation by protecting intellectual property. After all, an organisation would not want to spend millions of dollars developing a new product only to discover that a competitor had copied it at a fraction of the price. Broadly, intellectual property is protected in law through:

Copyright (rights over literary and artistic works)

- **Industrial property:**
 - **Trademarks** (signs capable of distinguishing the goods or services of one organisation from those of another);
 - **Patents** (an exclusive right granted for an invention);
 - **Industrial designs** (ornamental or aesthetic aspects of an article or two-dimensional features such as patterns, lines or colour); and
 - **Geographical indications** (a sign used on goods that have a specific geographical origin and possess qualities or a reputation due to that place of origin, eg Champagne).

These laws enable people to earn recognition including financial benefit from what they have created or invented. The World Intellectual Property Organisation (WIPO), and the intellectual property system, aims “to foster an environment in which creativity and innovation can flourish” (WIPO, 2014).



A comprehensive guide to current policy, law and use of intellectual property can be found on the WIPO website: <http://www.wipo.int/about-ip/en/> (accessed 24 November 2021).

Apart from intellectual property, organisations have trade secrets, which are special ways of working, or recipes, such as the one for Coca-Cola. Some organisations prefer not to use intellectual property law because they do not want to reveal their secret to their competitors (a requirement in intellectual property law).

Table 11 provides a summary of industrial property law for the purposes of discussion. Industrial property includes industry and commerce, agricultural and extractive industries, and manufactured or natural products (WIPO, 2014).

TABLE 11: INDUSTRIAL PROPERTY (IP)

<p>1. Patents for invention (balances the interests of inventors and the interests of the general public)</p>	<ul style="list-style-type: none"> • Inventions are new solutions to technical problems (discoveries such as a new plant are not inventions, but a new product from this plant is an invention – human intervention must be added). • The right granted to an inventor by a state (or regional office acting for several states), which allows the inventor to exclude anyone else from commercially exploiting his/her invention for a limited period, generally 20 years. • Exclusive rights provide incentives to individuals – recognition for creativity and opportunities for material reward (in turn contributing to economies and human life). • In return the inventor must disclose the patented invention to the public so that others can gain the new knowledge and further develop the technology (the disclosure of the invention is therefore an essential consideration). • The patent application must fulfil certain conditions (eg industrial applicability, novelty, inventive step, and patentable subject matter according to the country's policies).
<p>2. Utility models</p>	<ul style="list-style-type: none"> • A name given to a title of protection for certain inventions such as inventions in the mechanical field. • Usually sought for technically less complex inventions or for inventions that have shorter commercial lives (eg for innovations of an incremental nature which may not meet the patentability criteria). • Less stringent process required than for patents. • Shorter term – usually seven and 10 years with generally lower fees.

3. Industrial designs	<ul style="list-style-type: none"> • The ornamental or aesthetic aspect of a useful article (eg the shape, pattern, colour). • Must be able to be produced by industrial means. • Visual appeal is one of the main factors that influence consumers in their preference of one product over another, so registering industrial designs allows manufacturers to protect one of the distinctive elements that determine market success. • The usual maximum term is from 10 to 25 years (varies from country to country).
4. Intellectual property with regard to integrated circuits	<ul style="list-style-type: none"> • Relatively new, includes layout design or topography of integrated circuits (used in, for example: watches, televisions, washing machines, cars, computers and servers). • Requires a major investment but possible to copy for a fraction of the cost, thus requiring protection.
5. Trademarks	<ul style="list-style-type: none"> • A sign or a combination of signs which distinguish a good or service from those of another (eg using words, letters, numerals, pictures, shapes, and colours). • The owner of the registered trademark has an exclusive right in respect of his or her mark. • Identifies commercial source of goods and services, including collective marks such as those used for associations and for the purposes of certification or guarantee (eg Woolmark certifies compliance with defined standards). • Some countries allow for less traditional forms of trademarks such as three-dimensional signs (eg the Toblerone chocolate bar and the sound of a lion's roar at the start of MGM films). • Can include olfactory signs (eg perfume). • The period of protection varies (can be renewed indefinitely on payment of fees).
6. Trade names	<ul style="list-style-type: none"> • Includes commercial names and designations (descriptions). • A trade name must be protected without the obligation of filing or registration (protecting it from being used by another organisation).
7. Geographical indications	<ul style="list-style-type: none"> • A sign used on goods that have a specific geographical origin and possess the qualities or reputation that are unique to that place of origin (eg Roquefort, for cheese produced in a certain region of France). • Not limited to agricultural products (eg Swiss watches). • Unauthorised parties may not use geographical indications if such use is likely to mislead the public as to the true origin of the product.

(WIPO, 2014)



Refer to this document and then complete the tasks that follow:

- WIPO. (2016). Understanding Industrial Property.
<http://www.wipo.int/publications/en/details.jsp?id=4080> (accessed 24 November 2021).

Tasks

1. In light of the seven classifications of intellectual property, critically evaluate the extent to which your organisation has protected its intellectual property.
2. Google is committed to having one of the world's largest patent portfolios. The company was on track to be awarded about 1,800 patents in 2013 (Regalado, 2013). Other patent giants include General Electric and Intel. Why do you think patents are so important to these organisations (what is their strategic intent)?
3. As many 250,000 patents can cover a typical smartphone. Discuss the implications of this for the industry.
4. For your innovation project, write a two-page plan that describes the best way to protect your intellectual property. Add it to your portfolio.

Alternative strategies to patenting

Clearly, patenting has many benefits including (Cohen in Trott, 2021:337):

- Preventing copying;
- Patent blocking;
- Preventing suits;
- Used in negotiations (value);
- Enhances reputation;
- Provides licensing revenue; and
- Measurement of performance.

It is argued that patents can impair competition with increased use of patent thickets in software and internet-related industries as a defensive mechanism. Leiponen and Byma (in Trott 2021:193) list alternative strategies to patents, since not all organisations believe patenting suits their needs. Their list is reproduced in **Table 12** for the purposes of discussion.

TABLE 12: ALTERNATIVE STRATEGIES TO PATENTING

Alternatives	Description
Secrecy	Relatively easy, no legal protection.
Accumulated tacit knowledge	Acquired through experience – an asset that is difficult to imitate especially when held in a team of experts (eg specialised product development team).
Lead-time	Ability to secure market share and profit faster than any other organisation.
After-sales service	Sustaining market share acquired by the lead-time advantage through after-sales service (locking in value throughout the value chain).
Learning curve	Prior knowledge accelerates the process, making it increasingly efficient over time.
Complementary assets	The original product is coupled with complementary assets, making it more desirable (inaccessible to competitors who do not have similar assets).
Product complexity	Increased complexity prevents imitation (reverse engineering is not easy to accomplish).
Standards	Setting new standards (potentially risky) but winners can take the whole market and losers get nothing (eg in the payment card industry).
Branding	An important way to appropriate returns from innovation – loyal customers unlikely to budge.

(Leiponen & Byma in Trott, 2021:193)



1. What famous patent infringement cases have there been in your industry?
2. What can you (your organisation) learn from these cases?

The power of knowledge in innovation

It is useful to start by distinguishing between the following concepts (Trott, 2021):

- **Explicit knowledge** – knowledge that can be documented, for example a company procedure;
- **Tacit knowledge** – experiential knowledge, which cannot be shared or documented easily since it requires years to master, for example design knowledge;
- **Firm-specific knowledge** – knowledge that is useful and applicable to the organisation now and in the future;
- **Core competencies** – abilities central to the long-term sustainability of an organisation (knowledge and technical competence; know what, why, who, when, where and how). Difficult to emulate, allowing the organisation to differentiate itself; and
- **Absorptive capacity** – the ability to acquire and utilise new knowledge effectively, efficiently and economically.

Organisations that display all these competences should be well placed to maximise returns on R&D investment.



Critically evaluate your organisation against the following:

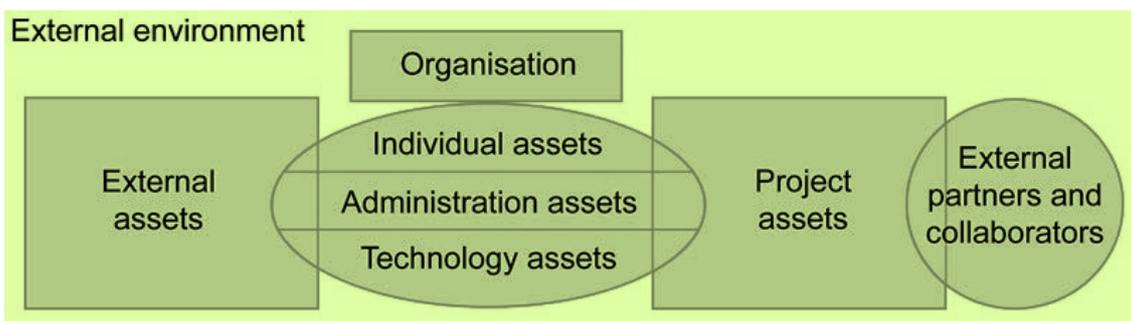
- Explicit knowledge base (documented knowledge and information);
- Tacit knowledge (held by individuals and teams);
- Firm-specific knowledge (useful to the organisation now and in the future);
- Core competencies that other organisations find hard to replicate; and
- Absorptive capacity (the capacity to innovate).

Core knowledge competencies

Competitive advantage may not reside in an organisation's products but rather in its core competencies. These competencies use knowledge, skills, culture, systems, structures (ways of working), in unique ways (strategies), which are difficult to replicate since they have been acquired over time. Too often organisations think of knowledge management as technology driven (eg information management). Given that this “commonly held view of an organisation's knowledge base comprising only technical matters is too narrow”, Nelson (in Trott, 2012:207-208) shows this base has several dimensions:

- Individual assets;
- Technological assets;
- Administrative assets;
- External assets; and
- Projects.

FIGURE 23: THE KNOWLEDGE BASE OF AN ORGANISATION



(Nelson in Trott, 2021)

The dimensions are explained as:

1. **Individual assets** – the knowledge and skills of individuals in the organisation, the application of which influence organisational success (tacit and explicit knowledge);
2. **Technological assets** – the set of reproducible capabilities in products, processes and support areas;
3. **Administrative assets** – the structure, routines, systems, policies and procedures for getting things done, including the culture that shapes assumptions, values, and motivation;
4. **External assets** – the relations that the organisation establishes (eg in its supply chain; with industry stakeholders); and
5. **Projects** – the means through which all assets are deployed and transformed.



Organisational Assets



Using the dimensions listed previously, critically evaluate your organisation's assets.

1. Start by giving examples of each kind of asset discussed (show these in a diagram such as the one in **Figure 23**).
2. Analyse the strengths and weaknesses of each dimension.
3. Based on your analysis, identify your organisation's core competencies.
4. Analyse what makes these core competencies difficult (or easy) to replicate.
5. Critically evaluate the long-term profits the organisation seeks to gain from its core competencies.
6. What might you do differently to strengthen the knowledge base of your organisation to ensure long-term sustainability of profit?
7. Reflect critically on the link between the organisation's knowledge base and your innovation project.
8. List at least 10 ways to drive knowledge sharing in your organisation, and critically assess how these can contribute to sustaining your innovation project.
9. In your experience, what is the role of knowledge assets as value drivers for business performance and growth in your organisation? And how can this contribute to the sustainability of your product?

6.6.6 Strengthening the Bond: Alliances and Networks

We saw the impact of a strategic alliance through Spotify and Uber's relationship. But let us step back a bit and consider the definition of a strategic alliance.



“A **strategic alliance** is an agreement between two or more partners to share knowledge or resources, which could be beneficial to all parties involved. These alliances include licensing arrangements, supplier relations, outsourcing, joint ventures, collaboration, R&D consortia, industry clusters and innovation networks.”

(Trott, 2021:254)

Strategic alliances are extremely powerful but so are innovation networks. However, innovation networks are less well known.

Innovation networks



“**Innovation networks** are organisations that create, acquire, and integrate complex technologies without centralised and detailed managerial guidance (eg people, businesses, universities, and government agencies). The proliferations of these self-organising innovation networks appear to facilitate the broadening global linkages of products, processes, and markets.”

(InnoSupport, 2014)

Procter & Gamble (P&G) have a “Connect + Develop” programme that has helped to extend the company's innovation process to include 1.5 million people outside P&G. P&G views the network as intellectual assets that when linked can find ideas and solve problems (Huston, 2007). One of the risks is exposing your hand to competitors. Some organisations overcome this by focusing on the science problem and avoid signalling the potential end use. Perhaps one of the most common of these networks is the supplier network.



Supplier days

Toyota has a briefing centre; anyone can come in and pitch an idea to Toyota. GE holds events in specific locations. In China they invite hundreds of suppliers in and say: “Here are our top problems. Can you solve them?”

These examples demonstrate the architecture of participation. The organisation needs to know what it is trying to do and which networks to target. It then draws up a brief (problem description), which typically includes taxonomy of science terms to ensure it attracts the right participants. This brief is then distributed to a network. This is referred to as a transaction-based network – the organisation wants something, they appeal to the appropriate network, and they get something back. As Huston (2007) points out, you may be inundated, so designing the network to match the organisation’s absorptive capacity is a key issue.

6.6.7 Innovating Ethically: Giving Back

The ethics behind innovation is often referred to as social innovation.

“ Social innovation is the process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress.

Social innovation is not the prerogative or privilege of any organisational form or legal structure. Solutions often require the active collaboration of constituents across government, business, and the non-profit world. It focuses attention on the ideas and solutions that create social value — as well as the processes through which they are generated, not just on individuals and organisations.

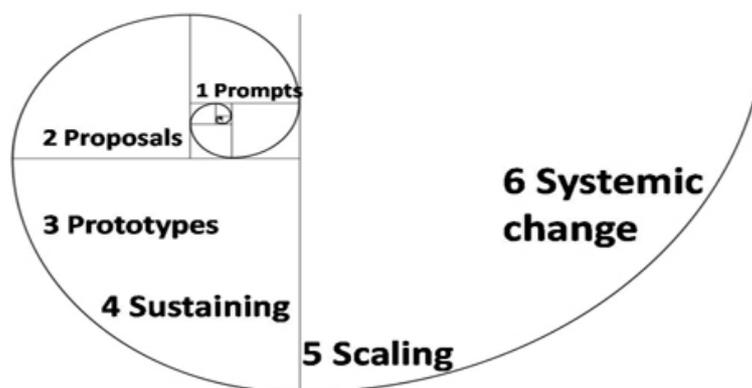
(Stanford University, nd)

Social innovations are strategies and concepts that the organisation has designed to meet the social needs of collective system. They can be as varied as education, family planning, or working conditions, to name a few. The aim of these social innovations is to support and strengthen a society.

Social processes in innovation

Since innovation is a social process, collaboration is a fundamental factor that must be included. Collaboration represents the collective and drives the holistic social innovation process. According to the Social Innovator (nd) there are six steps in the social innovation process, shown in **Figure 24**.

FIGURE 24: SOCIAL INNOVATION PROCESS



(Mulgan, 2006)



Creating a smooth social innovation process:

- Mulgan, G. (2006). The process of social innovation. *Innovations*, Spring 2006. <https://direct.mit.edu/itgg/article/1/2/145/9448/The-Process-of-Social-Innovation> (accessed 10 March 2022).

Corporate social innovation

Innovation is fundamental in addressing social and environmental issues as it stimulates shared value and collaboration.

6.6.8 Key Points

- Economic conditions, geographic location, industry context, and the competitive positioning of an organisation with regard to its markets, products, and capabilities determine the amount of effort spent on R&D.
- Trott's model can be used to establish whether an organisation's research activity is appropriate for its current and future position in the market.
- Survival position is the organisation anticipating exiting the business (or a business unit). Here the role of R&D is to ensure the organisation's interim survival in the face of technological mishaps to both products and processes.
- To sustain a competitive position, R&D must improve products and processes. In some industries, remaining competitive may require R&D to work fiercely.
- Technology mastery is needed to be an industry leader, in which case the R&D team must be at the cutting edge of all potential developments. A higher R&D expenditure will be required to maintain this level of commitment to mastery.
- "Breaking the mould" is intended to develop new patentable technologies and could involve significant scientific research into new ways of doing business.
- There are four major activities in R&D, namely:
 - **Survival position** – the organisation expects to leave the business (or a business unit). The role of R&D is to ensure the organisation's interim survival against technological mishaps to both products and processes;
 - **Competitive position** – here the objective is to sustain a competitive position, so the role of R&D is to make improvements to products and processes that retain the organisation's competitive position in the market. In some industries, remaining competitive may require R&D to work fiercely, whereas in other industries competition may be less fierce;
 - **Technology mastery** – here the organisation wants to position itself as an industry leader, in which case the R&D team must be at the cutting edge of all potential developments. A higher R&D expenditure will be required to maintain this level of commitment to mastery; and
 - **Break the mould** – this strategy aims to research and develop new patentable technologies and could involve significant scientific research into new ways of doing business.

- The role of intellectual property law is to encourage creativity and innovation by protecting intellectual property.
- A strategic alliance is an agreement between two or more partners to share knowledge or resources that could be beneficial to all parties involved. These alliances may include licensing arrangements, supplier relations, outsourcing, joint ventures, collaboration, R&D consortia, industry clusters and innovation networks.
- Innovation networks are organisations that create, acquire, and integrate complex technologies without centralised and detailed managerial guidance.
- Social innovation focuses attention on the ideas and solutions that create social value as well as the processes through which they are generated.

Remember to do your digital assessment for this section online!



It will help you strengthen and embed your understanding of the course. You will not be able to change your answers once you have submitted them, so make sure you have completed the relevant section of coursework first. Where you see **Select all that are relevant**, be aware that any number of the options presented could be correct. You will lose marks for incorrect selections, so choose carefully. Your combined marks from these assessments count towards a total of 20% of your course mark.

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8. GLOSSARY OF TERMS

Term	Explanation
Absorptive capacity	The ability to acquire and utilise new knowledge effectively, efficiently and economically.
Core competencies	Abilities central to the long-term sustainability of an organisation (knowledge and technical competence; know what, why, who, when, where and how).
Creative process	Is best described as: focus, displacement and connection.
Cyclic innovation model	Presents the processes in innovation by a circle of change: changes in science, industry, changes in technology, and markets are cyclically connected.
Division	Divide an existing product (good or service) into multiple parts and then reconfigure them in a novel way
Explicit knowledge	Knowledge that can be documented, for example a company procedure.
Firm-specific knowledge	Knowledge that is useful and applicable to the organisation now and in the future.
Frugal innovation	The ability to generate considerably more business and social value while significantly reducing the use of scarce resources. It is about solving – and even transcending – the paradox of doing more with less.
Innovation	Theoretical conception (idea) + technical invention + commercial exploitation
Innovation economics	Reformulates the traditional model of economic growth so that knowledge, technology, entrepreneurship, and innovation are positioned at the centre of the model rather than seen as independent forces that are largely unaffected by policy.
Innovation governance	Innovation governance can be thought of as a system of mechanisms to align goals, allocate resources and assign decision-making authority for innovation, across the company and with external parties.
Innovation process	Guides you from vision to reality in 6 steps.
Management information systems	An organised approach to the study of the information needs of an organisation's management at every level in making operational, tactical, and strategic decisions.
Mass customisation	The production of personalized or custom-tailored goods or services to meet consumers' diverse and changing needs at near mass production prices. Enabled by technologies such as computerisation, Internet, product modularization, and lean production, it portends the ultimate stage in market segmentation where every customer can have exactly what he/she wants.
Maturity model	Is a framework to assess a company's innovation program by reviewing the people, processes and tools needed to from idea to market.
Mechanistic structure	This type of structure restricts the information flow, formal line management with rigid procedures, strict control systems and constrained on-job behaviours

Term	Explanation
Product platform	A common design, formula, or versatile product, based on which a family (line) of products is built over time.
Social innovation	Social innovation is the process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress.
Subtraction	Is the product that is eliminated and must be an internal component, meaning one that is within your control.
Sustained innovation	Is developing a collective sense of purpose; from unleashing the creativity of people throughout your organisation and from teaching them how to recognize unconventional opportunities.
Tacit knowledge	Experiential knowledge, which cannot be shared or documented easily since it requires years to master, for example design knowledge.

9. VERSION CONTROL

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15 December 2017	5_e	TS	Added article and model
8 January 2018	5_e_f	SK	Finalised guide
12 January 2018	5.1_e	JC	Edited further to online QC
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13 January 2020	5.3	KA	Updated cases [nothing older than 2014 except key theorists] and links in SG, revised DA's and assignment
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