



# Technology-based Entrepreneurship

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## Who am I?



- Terrence E. Brown is Associate Professor of Entrepreneurship and Innovation. My research area is – **Value creation through the formation, management, rapid growth and rejuvenation of business enterprises**. Currently his main research interests are:
- Business Model Innovation
- Opportunity Development Process
- Open and User Driven Innovation
- Translating theory into action techniques for managers and entrepreneurs
- Former Daen, Stockholm School of Entrepreneurship
- I am the founding Editor-in-Chief of the international, double-blind, peer-reviewed journal, [International Journal of Entrepreneurial Venturing \(IJEV\)](#).
- I have been published in academic journals such as the *Strategic Management Journal*, *Journal of Business Venturing* and *Journal of Small Business Strategy*.
- I am on the editorial boards of journals such as *Journal of Small Business Management*, *International Journal of Internet and Enterprise Management*, *International Journal of Industrial Ecology*.

## Our course

- 7.5 ECTS
- Approx. 7 weeks
- 50 students
- Projects
- Teams
- Business simulation (Marketplace LIVE)

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## How is tech-based entrepreneurship different?

- Level of technology risk
- Time to market
- Resource requirements
- Scalability
- Leadership requirement

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## Characteristics that may give high tech ventures high potential

- Create new value for customers
- Have some type of tech IP that is hard to replicate
- First mover advantage
- Scalable
- Barriers to entry
- High level of initial risk

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## The Technology Innovation Life Cycle

- Stages in the technology innovation lifecycle:
  - **Diagnose:** identify and evaluate new ideas for products and processes
  - **Develop:** the idea is transformed through planning and developing into a viable product or process
  - **Deploy:** planning the migration and roll-out.
- **Roll out:** the process of introducing the new product to the market or employing the new or improved process in particular areas of the business.

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## What is Innovation?

- **Innovation:** the whole process from the inception of an idea through developing and testing to successfully putting the innovation in use – whether commercially in a market or as part of improving a business.
- **Innovation vs Invention**

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## Defining Innovation

- ***Creative destruction*** (Shumpeter, 1942): when innovative solutions are introduced by entrepreneurs, undermining the current practice in the economy, and thereby moving existing products, production methods and even companies of business.
- Entrepreneurial practices of **supporting innovation** serve as catalyst for **building the economy**.
- Frequency or infrequency of **innovative ideas** – **ups and downs of economic waves** and cyclical nature of economic development.

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## Disruptive Technology

- A new technology that gets its start away from the mainstream of a market and then, as its functionality improves over time, invades the main market
- Revolutionizes the industry structure and competition, often causing the decline of established companies because they listen to customers who say they do not want it
- Causes a **technological paradigm shift**

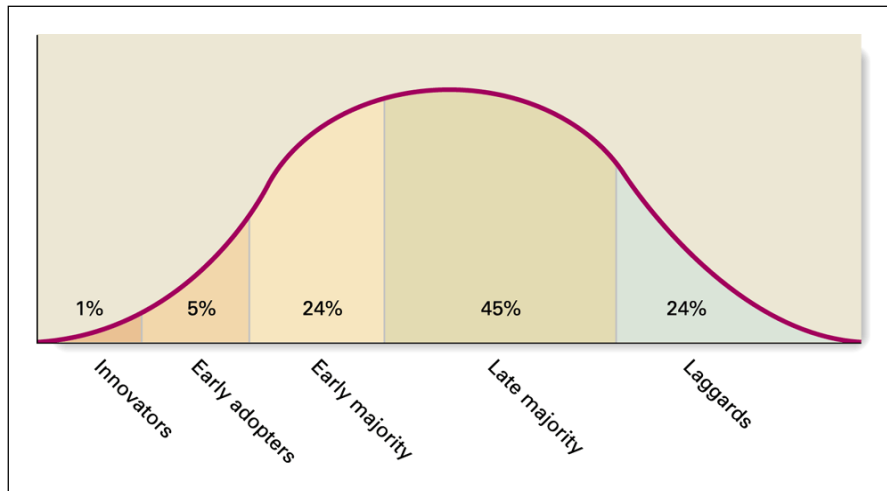
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## Diffusion of Innovations

- The Roger's Diffusion of Innovation Paradigm
  - **The Individual Innovativeness Theory:** the rate of adoption depends on the degree of innovativeness of an individual or other unit.
  - **The Theory of Perceived Attributes:** there are five attributes of the innovation that determine the rate of adoption and success: relative advantage; compatibility; complexity; trialability; observability.

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# Diffusion of Innovations and the Technology Adoption Life Cycle

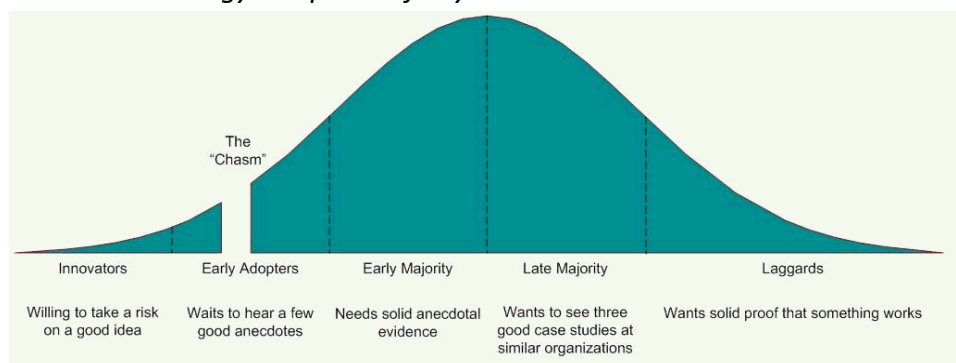


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# Diffusion of Innovations

## *The Revised Technology Adoption Life Cycle.*



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## Crossing the Chasm

- Correctly identify the needs of the first wave of early majority users
- Alter the business model in response
- Alter the value chain and distribution channels to reach the early majority
- Design the product to meet the needs of the early majority and so that it can be modified and produced or provided at low cost
- Anticipate the moves of competitors

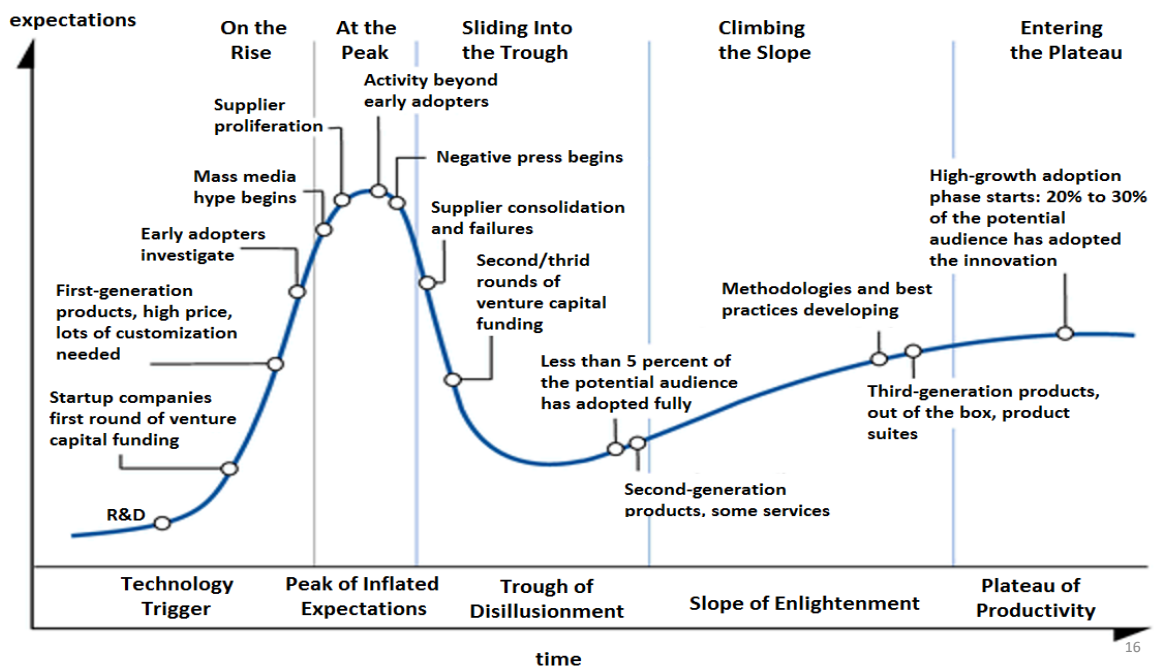
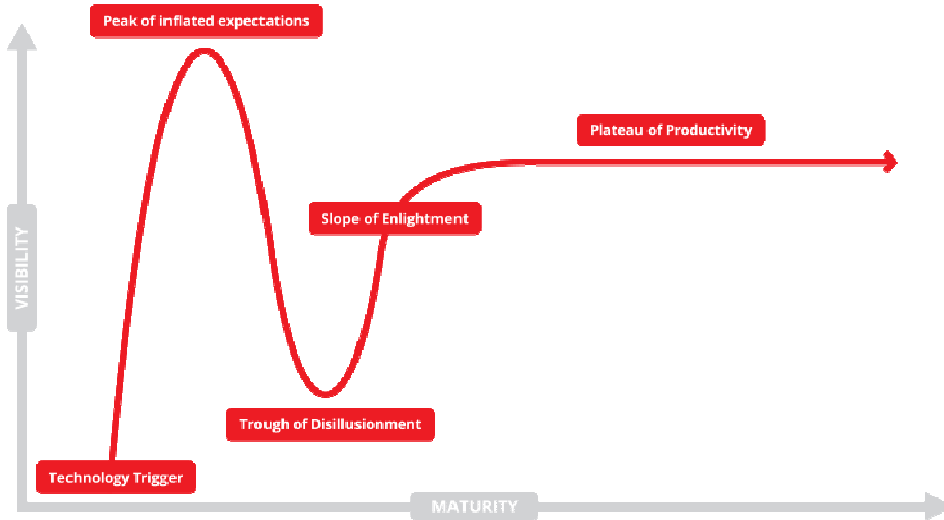
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## Strategic Implications: Crossing the Chasm

- Crossing the chasm between early adopters and early majority
  - Innovators and early adopters are **technologically sophisticated** and will tolerate engineering imperfections - the early majority are not
  - Innovators and early adopters are typically reached through **specialized distribution channels** - the early majority are not
  - Innovators and early adopters are relatively few in number and **not particularly price sensitive** - the early majority are not

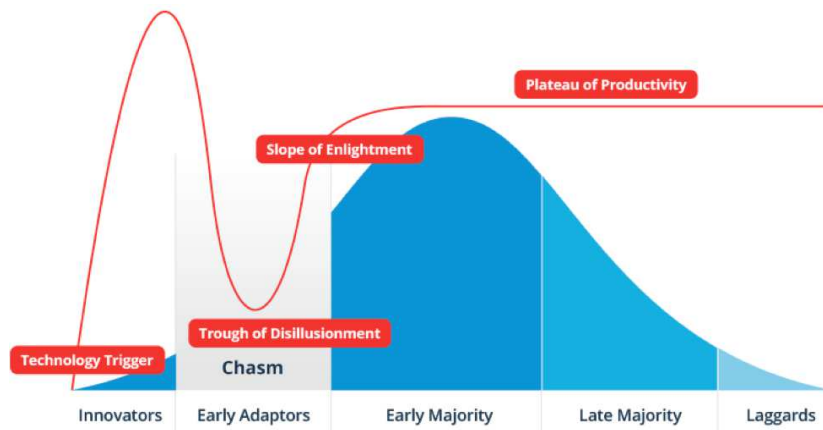
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# Gartner's Technology Hype Cycle

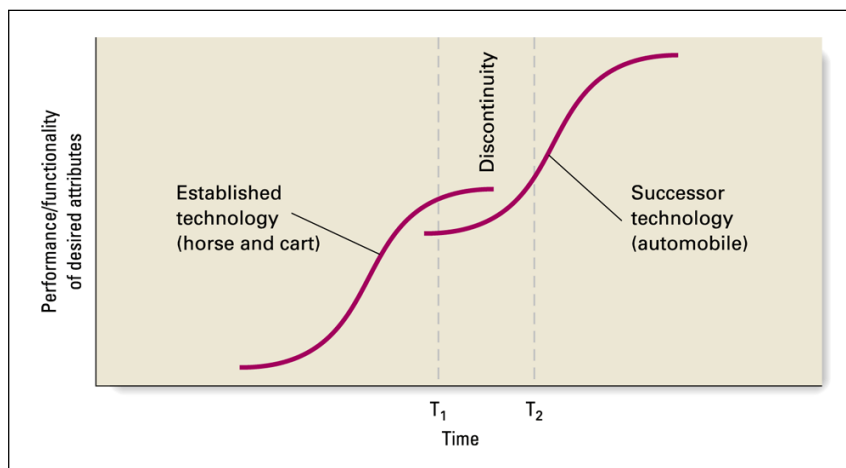




# Tech Hype Cycle & Crossing the Chasm



# Established and Successor Technologies



## Sources of Innovation

### Innovation management methodology

(O'Sullivan and Dooley, 2009):

1. Understand requirements and define goals
2. Engage users and model processes
3. Create actions and empower teams
4. Develop migration plan
5. Implement actions and monitor results

## Introduction to Technology Transfer

- **Universities** play a significant role in the development, support and shaping of **technology entrepreneurship**.
- Universities as catalysts of new venture formation and regional development (Markman et al., 2005).
- **Technology entrepreneurs** are key actors both in the creation of new knowledge and its exploitation within and outside university boundaries.
- Nations with strong research systems and capacity to leverage the commercial opportunities will prosper economically and socially.

## Third-mission Activities

- Third-level institutions – drivers of knowledge that impact the economy and society through technology and knowledge transfer.
- Technology Transfer Offices - protect IP and support innovation and entrepreneurship
  - Student internships
  - Jointly sponsored symposia
  - Joint research projects
  - Guest speakers
  - Executive development workshops
  - Roundtables
  - Joint curricula development
  - Alumni associations
  - Research commercialisation

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## Technology Transfer and Mechanisms

- **Technology transfer:** the process whereby invention or intellectual property from academic research is licensed or conveyed through use rights to a for-profit entity and eventually commercialised (Friedman and Silberman, 2003, p. 18)
- **Commercialization** of university-discovered technologies is a driver of economic growth.
  - University-industry Technology Transfer Process
  - Specific Mechanisms for Technology Transfer in Third-level Institutions

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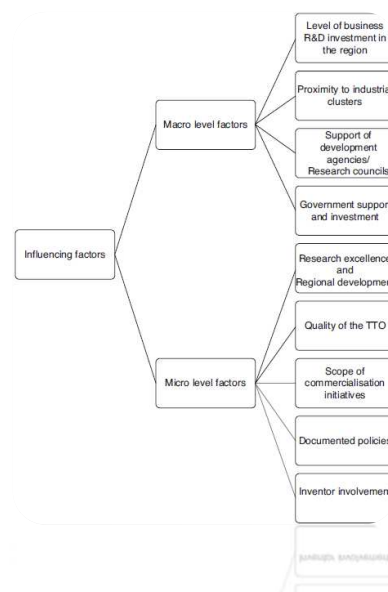
## Third-mission Activities

- **Technology Transfer Offices (TTOs)** serve to protect the IP of the university and seek the best uses for research; transfer knowledge and technology from the research labs to Technology Entrepreneurs:
  - University research sponsored by companies
  - Academic consulting
  - Licencing of university-owned IP to companies
  - University support for start-up companies
  - “Mega agreements”
  - Research centres
  - Industry consortia to support university research.

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## Stimulants and Barriers to Technology Transfer

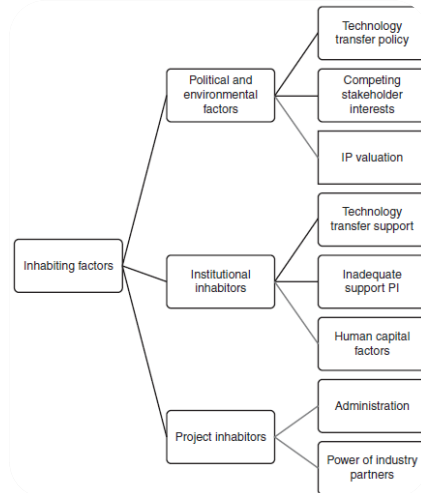
Figure 2.2 Influencing factors:  
macro and micro factors, p.  
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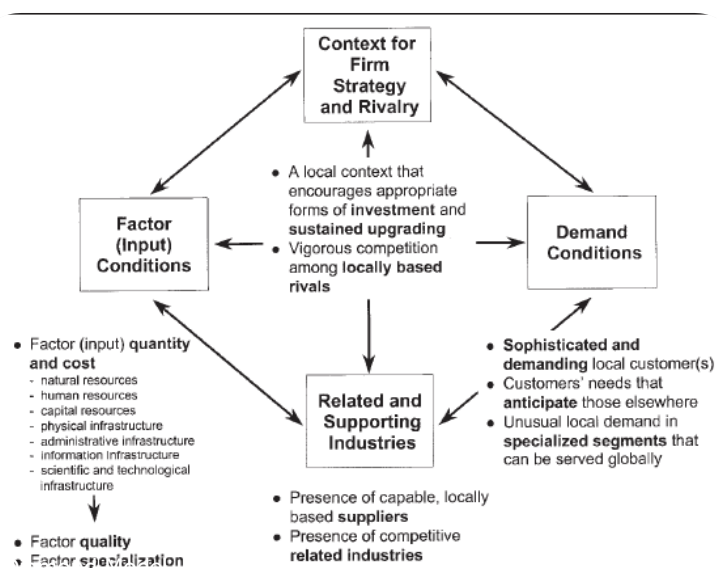
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# Inhibitors to commercialisation

Figure 2.4 Inhibitors to commercialisation, p. 51



# Clusters/Regional Innovation Systems



## Questions & Discussion?

# Entrepreneurship for Engineers

## Our course

- 6 ETCS
- Approx. 16 weeks
- Designed for (currently) EIT Digital
- First part of two part sequence
- 75 students

## Concept, Theory and Practice

- Management
- Business
- Entrepreneurship focusing on Ideation

## Flipped classroom

- Learning Management System (LMS)
- Videos
- Interactivity
- Content creation
- Diagnostic exam



## Are engineers different?

- Yes
- Hard vs soft
- Solution vs problem
- Technical skills

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## Context

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## Questions & Discussion?