

Introductory lectures on medical technology transfer and commercialisation

2024-2025



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Briefly about me and my activities



• I am always trying to
• find a variety of useful and
• interesting and fun to do
• things.

• **Work**

• I have always had a varied career. I have had the challenge associated with the ownership of a business and I have also had the challenge of being a manager.

• **My professional activities**

- Chairman of the National Institute of Business Management
- Director of the National Institute of Business Management
- Director of the National Institute of Business Management

• I am always trying to find the best way to communicate the results of my work and to make my work as effective as possible.

Topics

- I Healthcare Innovations
- Startups in I Healthcare
- Technology Translation challenges
- Growth of Startups



Introduction

From Philosophy to Health

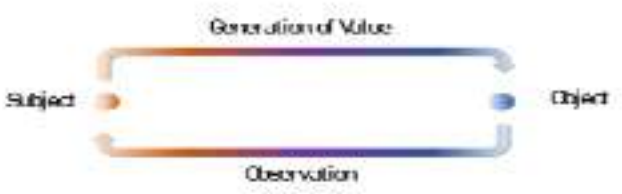
STOIC VIRTUES

- Demeanor/Beliefs
- Logic
- Controlled Body and Mind
- Generation of Virtue



Reality

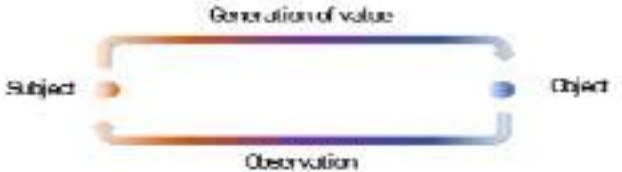




A closed-loop "subject-object" interaction

- New observation → new knowledge
- New knowledge → new technology
- New technology → new value
- New value → new observation





Value

- *Zero to One* New technology
- *One to Infinity* Accessible technology



Healthcare



Healthcare Innovations

From Science to Medicine

Dr. [Name]

Healthcare innovations

- Medtech (Hardware)
- Digital Health (Software)
- Biotech
- iHealth
- Fertech
- etc...



The Problem

No Lab, no / lab

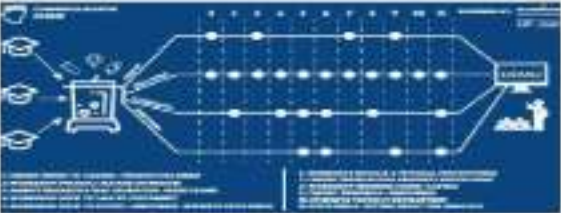
Technology Translation Issues

Lack of a technology translational education

Lack of a proper internal innovation ecosystem

Lack of Governmental and VC fund support





The diagram shows a multi-core processor architecture. The central part is a grid of 16 cores, arranged in 4 rows and 4 columns. The top of the grid is labeled 'CPU' and the bottom is labeled 'GPU'. To the left of the grid is a central 'CPU' block, and to the right is a 'GPU' block. Arrows indicate data flow and control signals between these components and the individual cores. The diagram also includes various labels and arrows indicating data flow and control signals.

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Healthcare Startups

From a Medical Problem to a Healthcare Solution

Dr. [Name] | [Company Name] | [Contact Information]

What "a startup?"

- + Disruptive New technology
- + One industry Accessible technology

means?

"A startup is the living embodiment of a bold business dream"

by Guy Kawasaki
The Entrepreneur 1997
Entrepreneur.com



Startup is a Venture

The vision of all successful startups

- An unmet **problem**
- Need for innovation
- A **revolution** (product or service)
- New value

Startup = product or service = new value



Regular Businesses versus Startups

Competition is **relatively** greater



There is **high** innovation



Strategic Planning Steps

Management Information



Healthcare startup (examples)

From a Medical Problem to a Healthcare Solution

Healthcare innovations

- Medtech (Hardware)
- Digital Health (Software)
- Biotech
- iHealth
- Fertech
- etc...



Medtech



Bdetect



FDA Clears New Insulin Pump and Algorithm-Based Software to Support Enhanced Automatic Insulin Delivery

Agency Commends its Support Innovation of Next-Generation Technology in Diabetes Management

Files | Home | About | Site Map | Site



Longevity

Empowering Secondary Health Data Use and accelerating healthcare research. Without borders.





Intellio Medicine Initiates First-in-Human Study of INPROTE-014

A Study to Assess the Safety and Efficacy of INPROTE-014 in Patients with Type 2 Diabetes Mellitus





Start prevention today!

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Artificial Intelligence

Artificial intelligence can learn from patterns of objects or words or many other kinds of data, and use that information to make decisions or perform tasks that would normally require human intelligence.



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$$11 \times 40 \times 32 \times 1 \times 7 = 150GB$$

Representative Examples
of Data Protection and
Backup as a Service



Traditional Backup

- Manual Backup Job
- Manual backup Recovery
- Complex Disaster Recovery
- High RPO/RTO
- Prone to Error
- Manual restore
- Complex with Cloud

Backup as a Service

- Virtual backup
- Virtual Disaster Recovery
- Easy to manage
- Cost save
- Virtual restore

Health Technology Translation

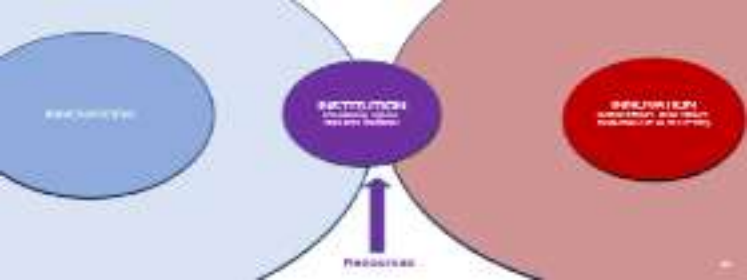
"If you're trying to create a company, it's like baking a cake. You have to have all the ingredients in the right proportion." - Elon Musk

The Value must be converted into an asset



Stakeholders involved

- **Innovation:** HUMAN IDEA AND AN AMBITION
- **Academy/Research Institute** – help to validate the technology
- **Business Development team** – help to accelerate the growth of the Startup
- **Investors** – financial support / academic network
- **Partners (Industry)** – provides the ecosystem, manufacturing and marketing tools
- **Customers** – want to use the technology/ product/ service



REGULATION

INSTITUTION
Institutional Capital
Trust and Norms

INNOVATION
Innovation, Creativity, and Entrepreneurship
Innovation as a Strategy

Resources

\$89M <small>Revenue</small>	1,099 <small>Patent Applications</small> <small>Patent Applications</small>		1,950 <small>Patent Applications</small>
147 <small>Patents</small>	Stanford Office of Technology Licensing <small>Office of Technology Licensing</small>		510 <small>Patents</small>
38 <small>Patents</small>	1,977 <small>Patents</small>	501 <small>Patents</small>	168 <small>Patents</small>

Commercialization of MIT Technology

INTELLECTUAL PROPERTY

www.mit.edu/ip

MIT

110

MIT

110

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Growth of the startup

- Ecosystem | Accelerators, Incubators, Angel Investors, Championships, Partnerships and Fellowship
- Financial: IIT, Government, Private, | (Vend)
- Technological: TRL1-9

Healthtech ecosystem

"Human behavior is subject to the same laws as any other natural phenomenon. Our customs, behaviors, and values are byproducts of our culture." - Jacques Fresco

Diagram: Startup Cycle
 Entrepreneurial Cycle



Growth (ecosystem)

- I Adaptors
- Incubators
- Champions
- Accelerators
- Partnerships and Fellowships
- Funding (VC, Government)



Incubators



Open Accelerator

With the right support for the startup, innovation can be a reality.



Championships

Entrepreneurship World Cup



Healthtech funding

"Money is like gasoline during a road trip. You don't want to run out of gas on your trip, but you're not always aware of gas tank levels. You're not always aware of alternative financing, but it shouldn't be about the money."

David H. Hill, CEO of Hill & Hill

Funding opportunities

- IIT
- Government
- Private (VC, business angels)
- Crowdfunding
- Hybrid

Government

- EU programs (IT, IIG, Horizon, Erasmus, etc)
- National programs

ERA PerMed

European Research Area
PerMed



European Research Council

www.erc.europa.eu

NCM-Grants

Network of Centres of Excellence
for the study of the impact of
innovation on the economy



European

INNOVATION

Council

Private

- Plain language
- VC (broad spectrum specialization)



Crowdfunding

- Indiegogo
- Kickstarter



INDIEGOGO

KICKSTARTER

Healthcare technology readiness level

"We just want to have a great product."

—Hector Ruiz, Founder iDx Ltd. Spain



Preparation and Development: [Illegible text]

Implementation and Final: [Illegible text]



TRL Matrix

TRL	Definition	Activities	Resources	Time
1	Basic research	Identify a problem	Basic research	1-2 years
2	Concept development	Develop a concept	Concept development	2-3 years
3	Proof of concept	Develop a proof of concept	Proof of concept	3-4 years
4	Technology demonstration	Develop a technology demonstration	Technology demonstration	4-5 years
5	Validation	Develop a validation	Validation	5-6 years
6	Verification	Develop a verification	Verification	6-7 years
7	Refinement	Develop a refinement	Refinement	7-8 years
8	Final testing	Develop a final testing	Final testing	8-9 years
9	Deployment	Develop a deployment	Deployment	9-10 years

Requirements for Technology Transfer

"The right to protect the health and well-being of every person of those we love is a basic human right."

—Ms. Anita Hillen, Nurse (MD) at ResCare

theranos



Theranos scandal: Who is Elizabeth Holmes and why was she on trial?

By [Name] 12/12/2018

Theranos 

STRENGTHENING THE ECONOMY
AND
IMPROVING THE QUALITY OF LIFE

**The Thomson report is
made available for the job
development test market**



Administrative requirements

- Cost effectiveness and Intellectual Property Assessment
- Intellectual Property Rights
- Regulations
- Business model



Intellectual property rights (IPR)

- Hard IP – a patent
- Soft IP – a know-how

Soft IP vs. Hard IP

Hard IP rights are those conferred by patent or other forms, which soft IP refers to the rights conferred by copyrights, trademarks and other development rights.



Medical Device Classes



Very High Risk

Multiple Safety Approvals required

Business As Usual

Medical Devices

Class III

- High risk
- Implantable
- Life supporting
- Life sustaining
- Life threatening

Class II

- Medium risk
- Implantable
- Life supporting
- Life sustaining
- Life threatening

Class IIa

- Low to medium risk
- Implantable
- Life supporting
- Life sustaining
- Life threatening

Class I

- Low risk
- Non-implantable
- Non-life supporting
- Non-life sustaining
- Non-life threatening

In-Vivo Degradation Medical Devices

Class C

- High risk
- Implantable
- Life supporting
- Life sustaining
- Life threatening

Class C

- Medium risk
- Implantable
- Life supporting
- Life sustaining
- Life threatening

Class II

- Low to medium risk
- Implantable
- Life supporting
- Life sustaining
- Life threatening

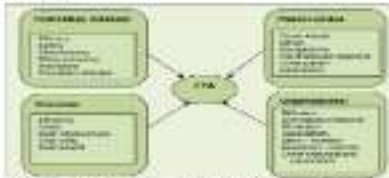
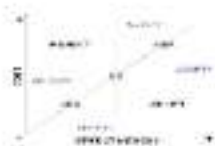
Class A

- Low risk
- Non-implantable
- Non-life supporting
- Non-life sustaining
- Non-life threatening

USA vs EU/ Medical device regulation and IFR

- In EU from the regulatory perspective
 - Medical devices in a Medical Device (MDD/MDR) regulation
- However in EU from the IFR perspective
 - Medical Devices are all registered in a public (Netherlands) IFR

Cost effectiveness and HTA



Source: Health Economic Review, Health Economic Synthesis, Health Economic Appraisal, Health Economic Synthesis, Health Economic Review, Health Economic Synthesis, Health Economic Appraisal, Health Economic Synthesis

Business model

- Licensing (royalty free, exclusive etc)
- SaaS
- B2B – business to business
- B2C – business to customers
- B2G – business to government

Types of Start-up



Final remarks

SiPhox Health and Longevity
Improving Healthspan
with At-Home Health Testing

SiPhox Health and Longevity

Thank you!
Q&A



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