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# **Adoption & Diffusion of HCAI Technologies**

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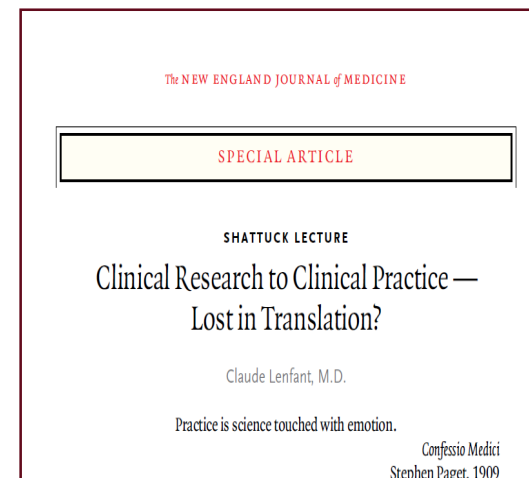
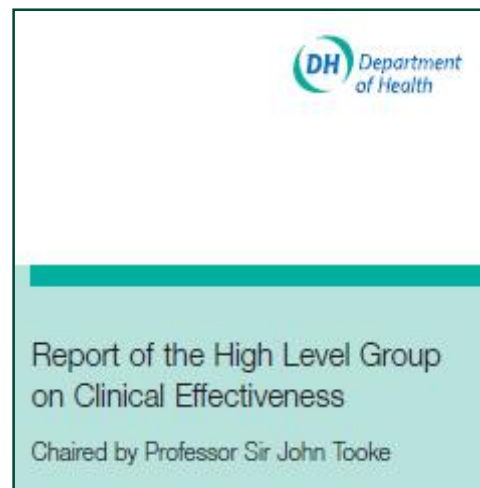


# Presentation Outline

1. The % Implementation Gap+
2. Definitions: What is Innovation? ....Technology?  
...Adoption? ....Diffusion? ....Implementation?
3. The Conventional Diffusion model and  
Limitations
4. A Framework for the Diffusion of Healthcare  
Innovations

# 1. The “Implementation Gap”

- “ Health care organisations often **fail to implement good research findings in practice** and are therefore, not able to increase efficiency and quality of care



## Where we contribute

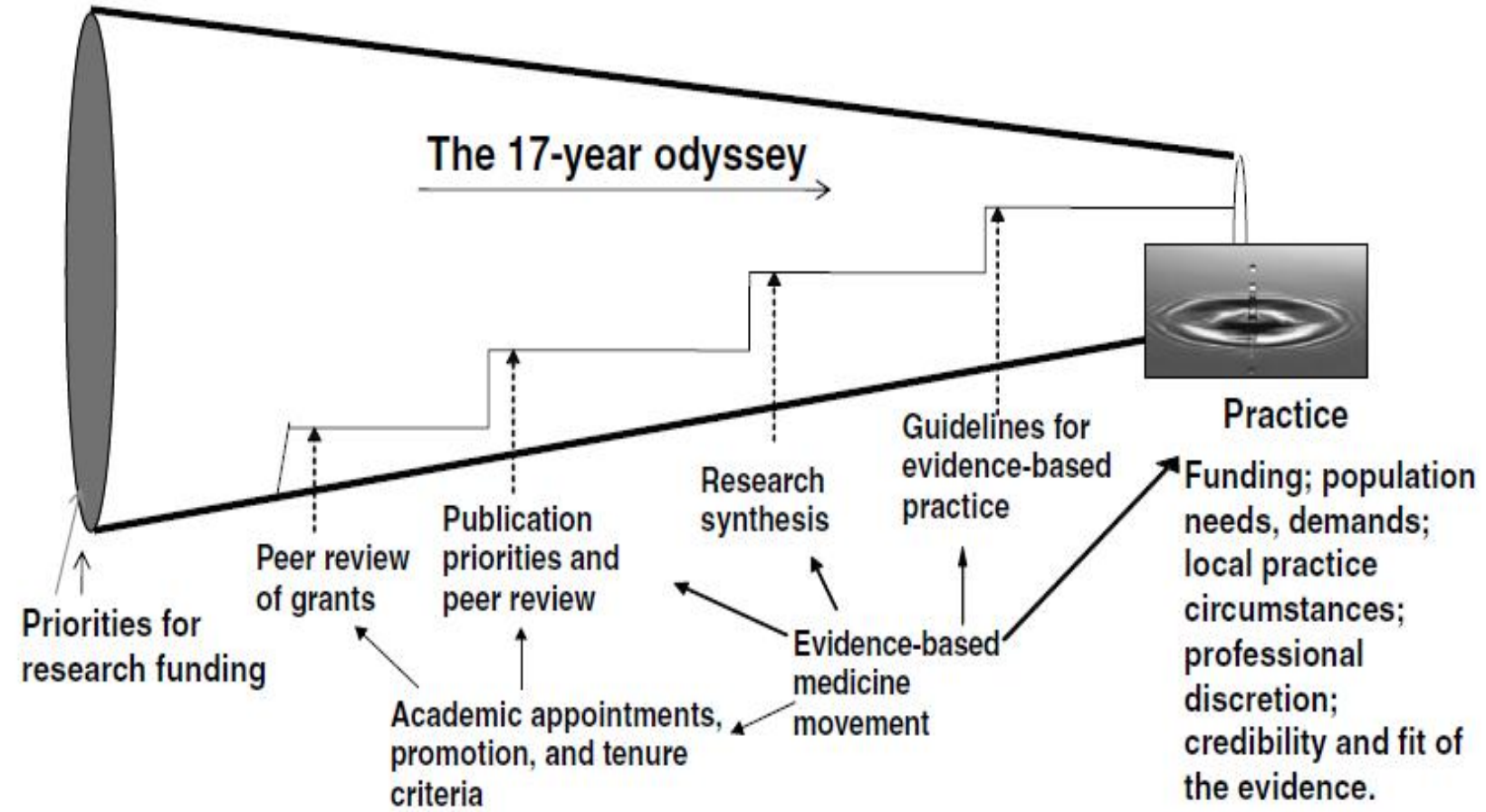
Translational  
Research - Type 2  
% Implementing &  
rolling out  
innovations+  
% Knowledge  
utilisation+



Translational  
Research - Type 1  
% Bench to bedside:  
Designing .  
Evaluating  
Promising  
Innovations+



# .... between Science and Practice



*Green et al, (2009:p.155) Annual Review of Public Health*

*Weingarten et al 2000 Arch. Intern. Med. 160:301-8*

*Balas & Boren 2000 Yearbook of Medical Informatics 2000: Germany: Schattauer*

# 1. Controlling Scurvy in the British Navy

- “ In the early days of long sea voyages scurvy killed more sailors than did warfare, accidents and other causes (Vasco da Gama's crew sailed in 1497 around Cape of Good hope: out of 160 men 100 died of scurvy)
- “ **In 1601** James Lancaster an English Captain conducted an experiment to evaluate the effectiveness of lemon juice with impressive positive results
- “ In **1747** Dr James Lind carried out another experiment on HMS Salisbury confirming the above results (**almost 150 years time lag!**)
- “ The British Navy adopted the innovation in **1795** (**48 years later!**) → **scurvy was wiped out immediately**
- “ **In 1865** the British Board of Trade adopted a similar policy and eradicated scurvy in the merchant marine (**70 more years later!**)
- “ **Why were the authorities so slow to adopt the idea of citrus for scurvy prevention?**

*Case illustration based on Mosteller (1981)*

*Rogers (2003:7) Diffusion of Innovations 5<sup>th</sup> Edition Free Press*

## 2. What is Innovation?

*“An innovation is an idea, practice, or object that is **perceived as new** by an individual or other unit of adoption. It matters little, so far as human behaviour is concerned, whether or not an idea is objectively new as measured by the lapse of time since its first use or discovery”*

Rogers (2003:12) Diffusion of Innovations 5<sup>th</sup> Edition Free Press



## **2. How does innovation differ from any other kind of organisational change?**

## 2. How does innovation differ from any other kind of organisational change?

1. innovation represents **newness**
2. it is **not the same** thing **as invention** (the latter is concerned with the discovery of new ideas or approaches whereas innovation is concerned with their application)
3. it is both a **process** and an **outcome**
4. it involves **discontinuous change**

*Osborne, (1998), Human Relations, 51(9):1133-54*

## 2. What is Technology?

Technology is a *design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome*

**Hardware** (tool material, physical object) . **Software** (information aspects, coded commands, instructions, ideas)



Rogers, (2003 p;13)

## 2. What is ...**Adoption?** ...**Diffusion?** ...**Implementation?**

- “ **Adoption** is ‘the *decision* to make full use of the *innovation as the best course of action available*’  
Rogers (2003: 21)
- “ **Diffusion** is ‘the *process* by which an *innovation is communicated* through certain channels over *time* among the members of a *social system*’ Rogers (2003: 5)
- “ **Implementation** *occurs when an individual or other decision making unit puts an innovation to use...it involves overt behaviour change as the new idea is actually put into practice*” Rogers (2003: 179)

## 3. The Conventional Innovation Diffusion Theory

- “ Plato and Aristotle %imitation theory+mimicry or imaginative creation in poetry and fine arts
- “ French Sociologist Gabriel Tarde (1890) %The Laws of Imitation+and European anthropologists
- “ In USA: 1943 Ryan & Gross%diffusion study of hybrid seed corn in Iowa . Rural Sociology
- “ Theory popularised by Everett Rogers in his book %Diffusion of Innovations+1962 (5<sup>th</sup> edition 2003)

## **3. Four Main Elements of the Diffusion Process**

- a. Innovation
- b. Communication Channels
- c. Time
- d. Social System

## 3a. Perceived Characteristics of Innovations

**Relative advantage** the degree to which an innovation is perceived as being better than the idea it supersedes

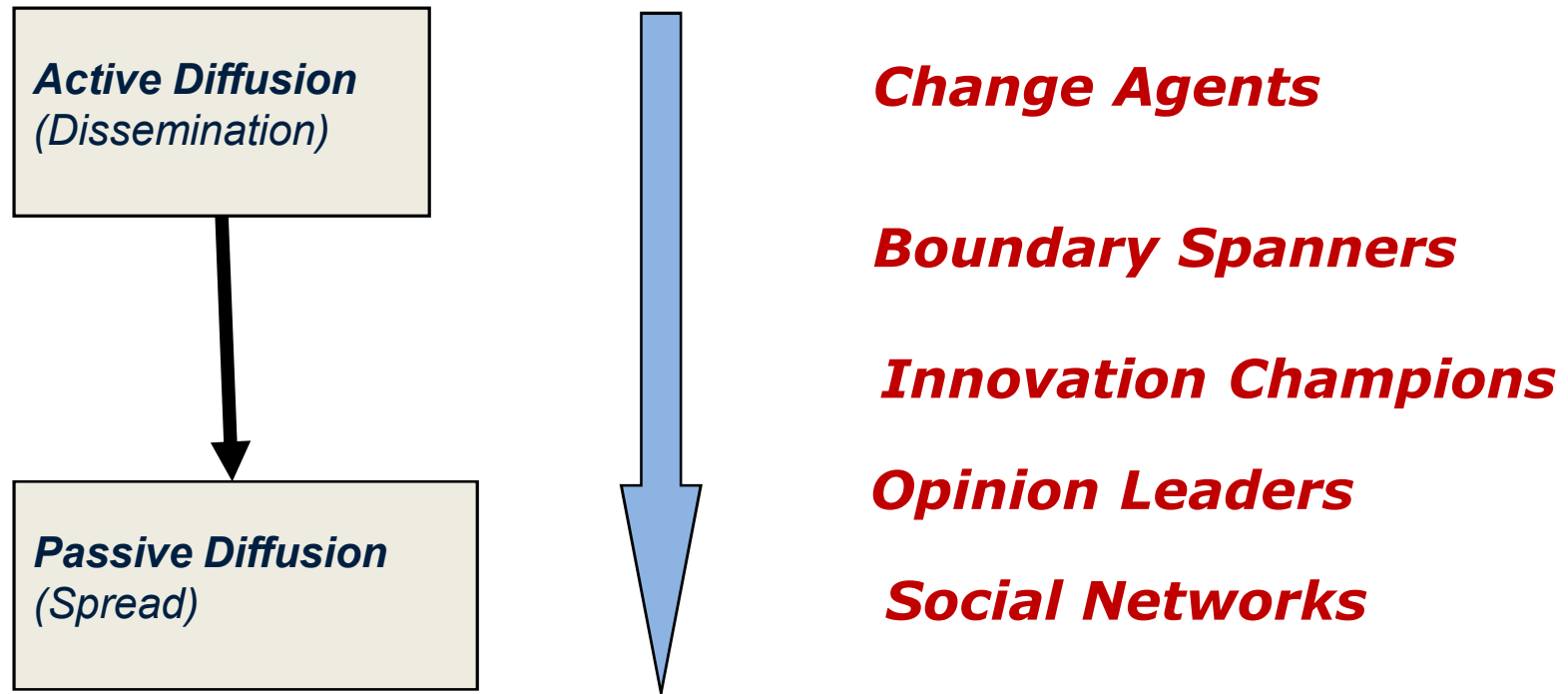
**Compatibility** the degree to which an innovation is perceived to be consistent with the existing values, past experiences and needs of potential adopters

**Complexity** the degree to which an innovation is perceived as difficult to use

**Trialability** the opportunity to experiment with the innovation on a limited basis

**Observability** the degree to which the results of an innovation are visible to others

## 3b. Communication Channels



*Kyratsis, (2004), PhD first year review, Imperial College Business School*  
*Greengalgh et al, (2004) ,Milbank Quarterly , 82(4): 581-629*

**Mass Media  
(Awareness)**



**Inter-personal  
Channels  
(Persuasion)**

## **3c. Time: Innovation-decision process**

### **Stages of Individual Innovation-decision process**

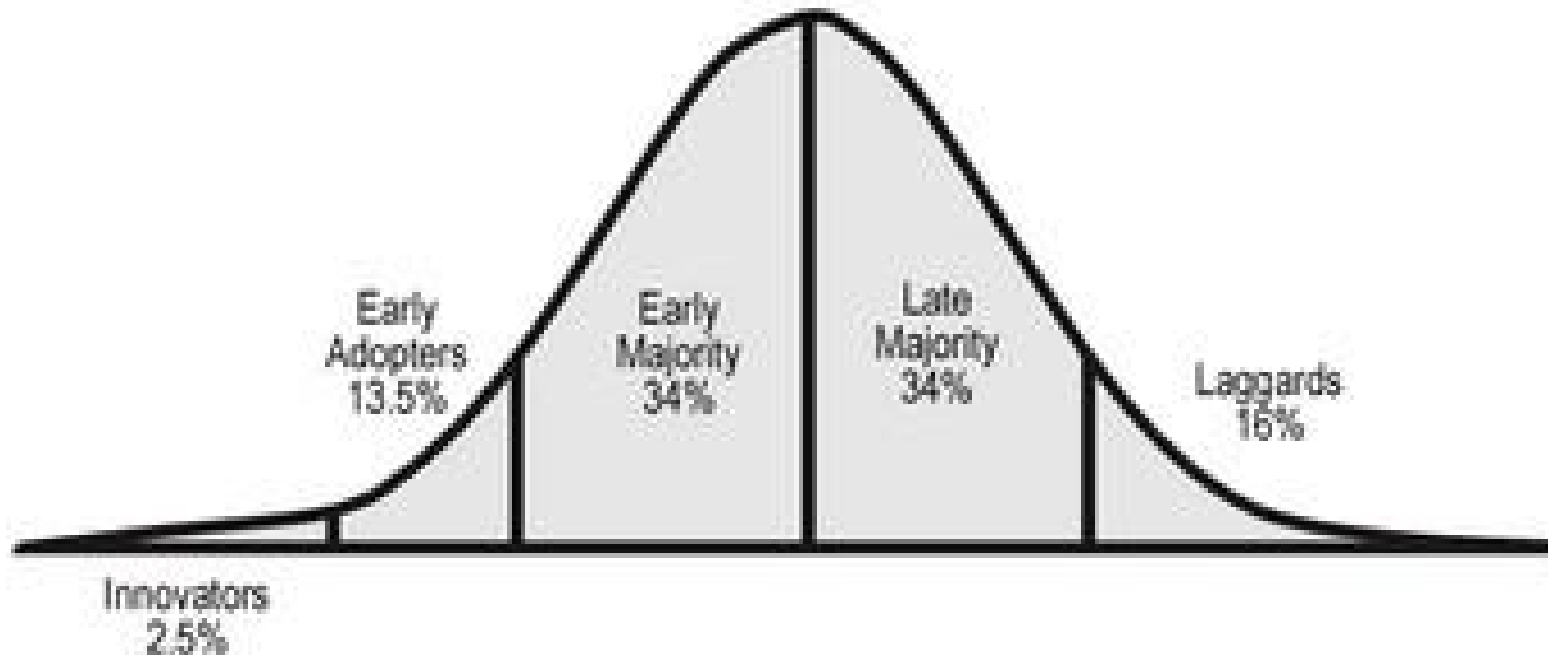
- 1. Knowledge**
- 2. Persuasion**
- 3. Decision**
- 4. Implementation**
- 5. Confirmation**

### **Stages of Organisational Innovation-decision process**

- 1. Agenda setting**
- 2. Matching**
- 3. Redefining/Restructuring**
- 4. Clarifying**
- 5. Routinizing**

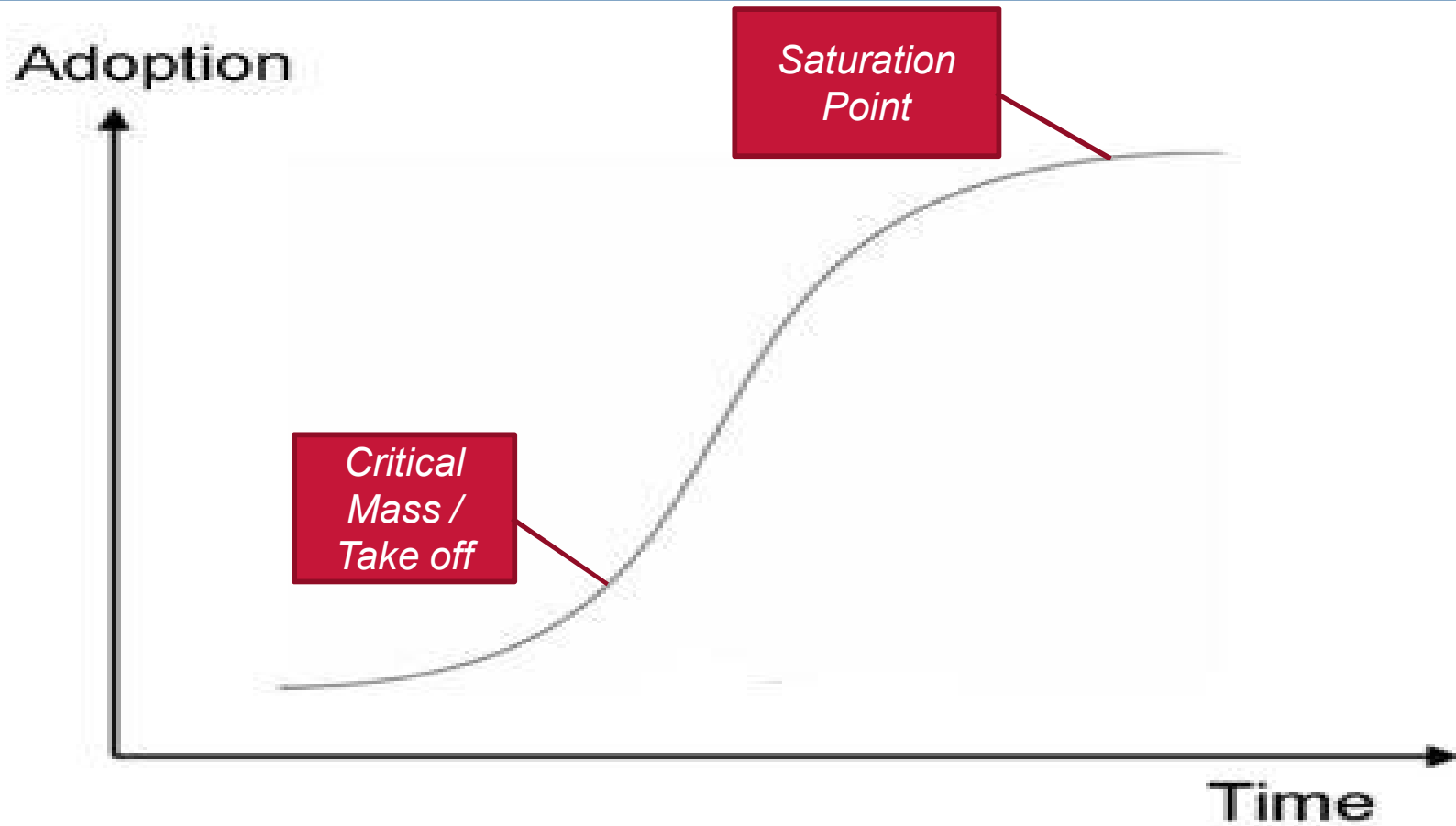
## 3c. Time: Adopter Categories

### Categories of Innovativeness\*

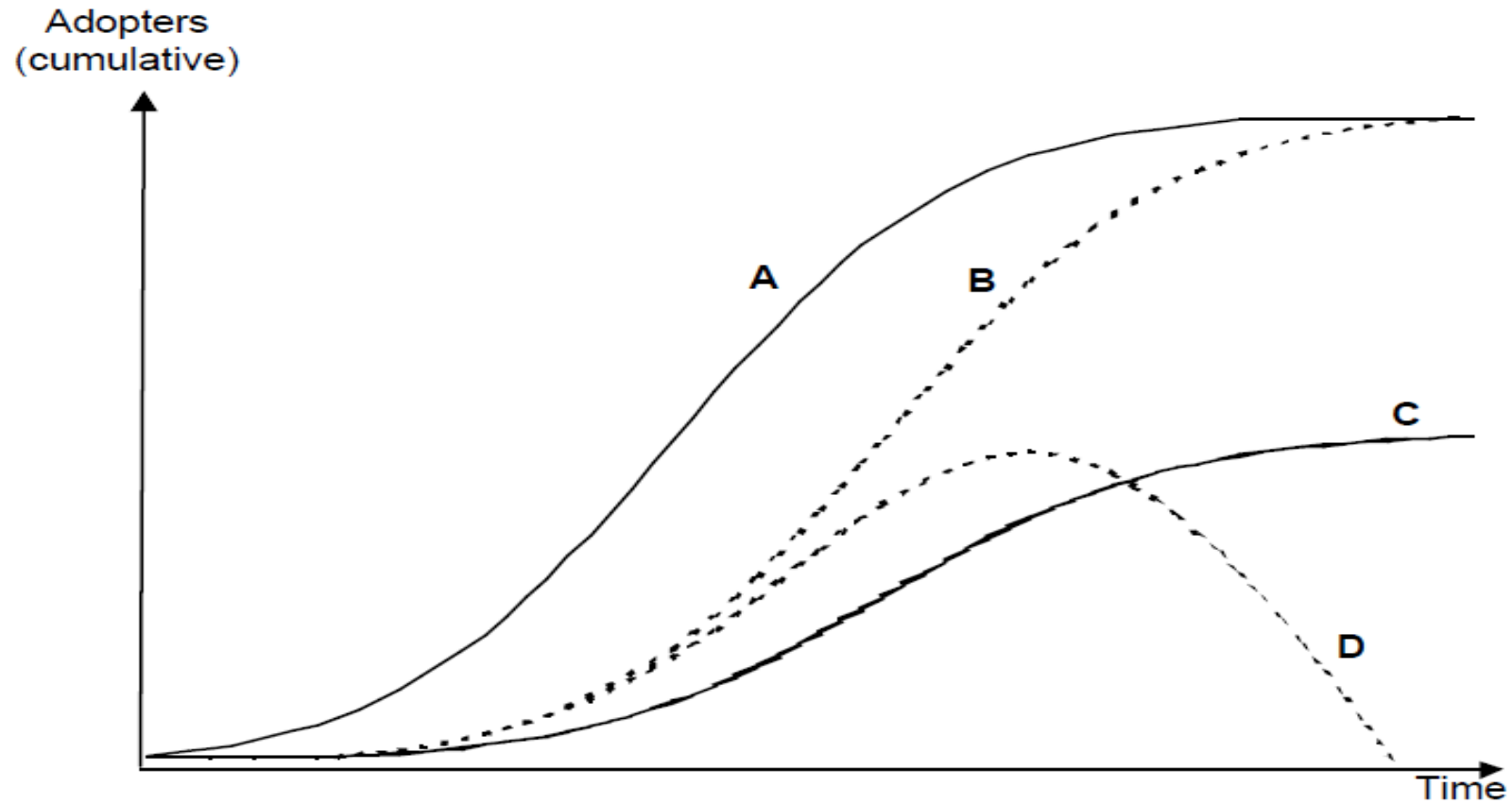


\*From E.M. Rogers, *Diffusion of Innovations*, 4th edition (New York: The Free Press, 1995)

## 3c. Time: Rate of Adoption



## 3c. Time: Diffusion Curves



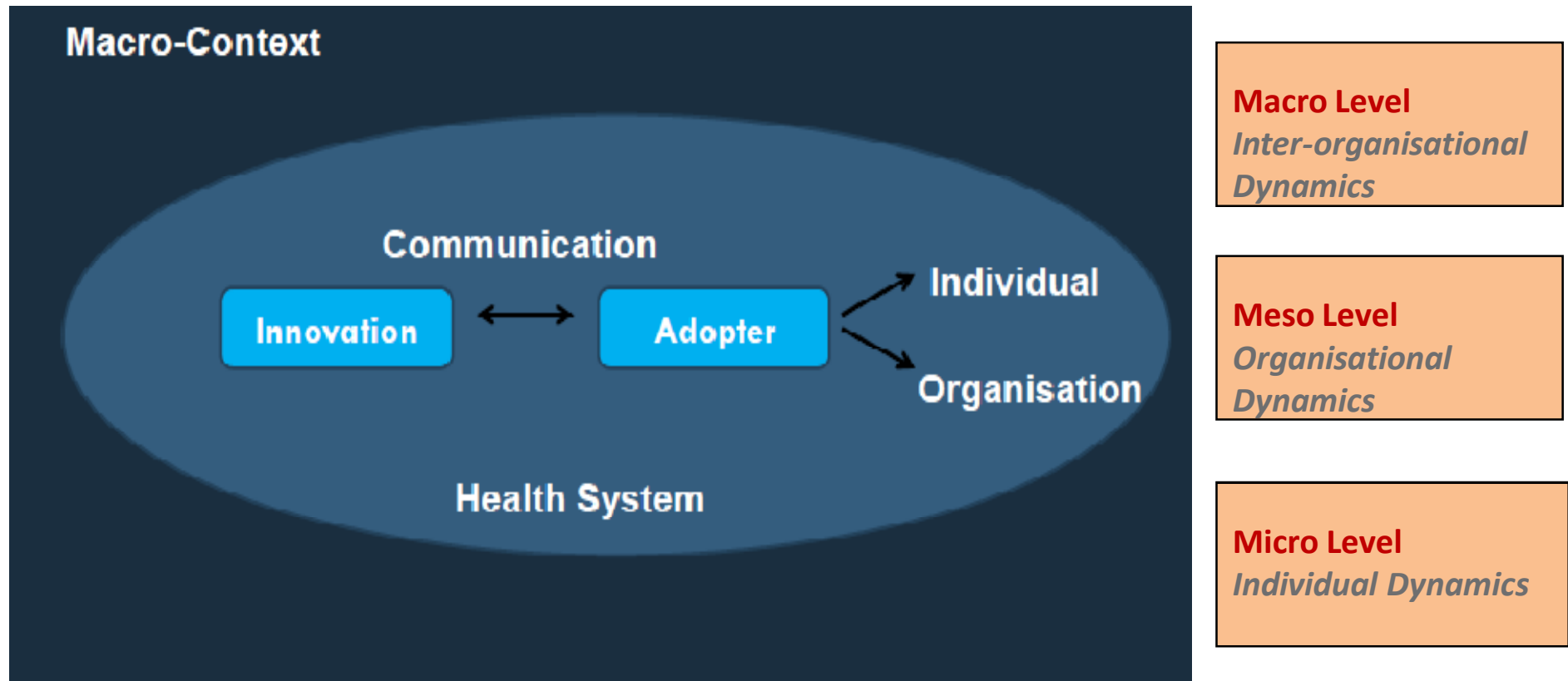
## **3d. The Social System**

- “ Social system constitutes a boundary within which innovation diffuses
- “ Norms and their impact on diffusion
- “ Opinion Leaders
- “ Change Agents
- “ Champions

## 3. Limitations of Classic DoI Model

- “ Pro-innovation bias
- “ Individual-Blame bias (Why not problem solving? Innovation seeking?)
- “ Primarily focuses on adoption by individuals: the theory takes little or no account of the complex process of **adopting innovations within organisations** (departments . teams . professional boundaries)
- “ **Important communication channels in healthcare settings ignored** (Professional associations? Professional journals? Regulatory requirements & Policy discourse?)
- “ **Role of Context is under-theorised** (inter-organisational dynamics, organisational types & boundaries, wider contextual and institutional influences) little attention to **diffusion across organisations**

## 4. A Framework for Analysing the Diffusion and Adoption of Health Innovations



*Atun, Kyratsis et al, (2007) Health Policy & Planning 22(1): 28-39*

*Kyratsis, & Atun (2005), Diffusion & adoption of Complex Health innovations, Discussion Paper, Centre for Health Management Imperial College Business School*

# Thank you for your attention!! Questions?

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