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# Diffusion of Innovations

How do people adopt innovations?

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# But before we begin...

A couple of things

How is it going with the benchmarking report? Can you manage the workload?

The conclusion that never was: what did you get out of last week's game history lecture? Something new? Something missing?

As a bonus item: a little exam!

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# Agenda

Diffusion of innovations theory

A case study

Criticism of the theory, alternative approaches

Another case study

Instructions for the presentation & assignment

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# Diffusion of Innovations theory

Part of the "systems" aspect of Thematic Studio II

Originates from the early 20th century

First discovered and applied in the context of agriculture

Everett M. Rogers' *Diffusion of Innovations* a seminal book, first published in 1962

The discussion here mostly based on the book

A holistic theory on how (groups of) people adopt new innovations

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# What is an innovation? Or diffusion?

According to Rogers:

"An *innovation* is an idea, practice, or object that is perceived as new by an individual or other unit of adoption."

"*Diffusion* is the process in which an innovation is communicated through certain channels over time among the members of a social system."

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# Examples of innovations

Originally something agricultural: weed spray, hybrid seeds, or farming equipment

Often seen in the context of business and marketing: how a product is adopted by the market

Can be something completely different too: health, education, sociology, technology, and so on

*Not necessarily a positive change!*

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# The innovation-decision process

1. Knowledge: becoming aware of an innovation (need or push?)
2. Persuasion: forming an attitude on it (looking and asking around)
3. Decision: choosing to adopt or reject the innovation
4. Implementation: putting it into use (integration with everyday practices)
5. Confirmation: considering if the decision was right

Let's think of everyday examples together.

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# Perceived attributes of innovations

Relative advantage: how much better than the old one

Compatibility: values, norms, past experiences and needs

Complexity: easy to use and understand

Trialability: how easy it is to experiment with the innovation

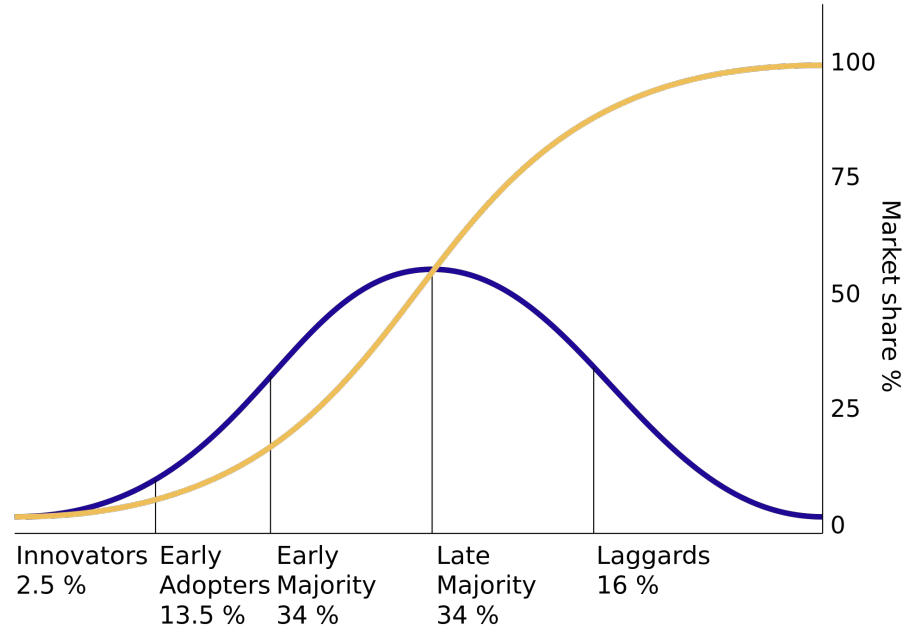
Observability: how visible the results of an innovation are to others

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# Phases and groups



Thanks fly to Wikimedia Commons

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# Characteristics of adopter groups

Innovators: technically capable, venturesome, risk-takers

Early Adopters: more integrated, opinion leaders

Early Majority: first big group, take their time

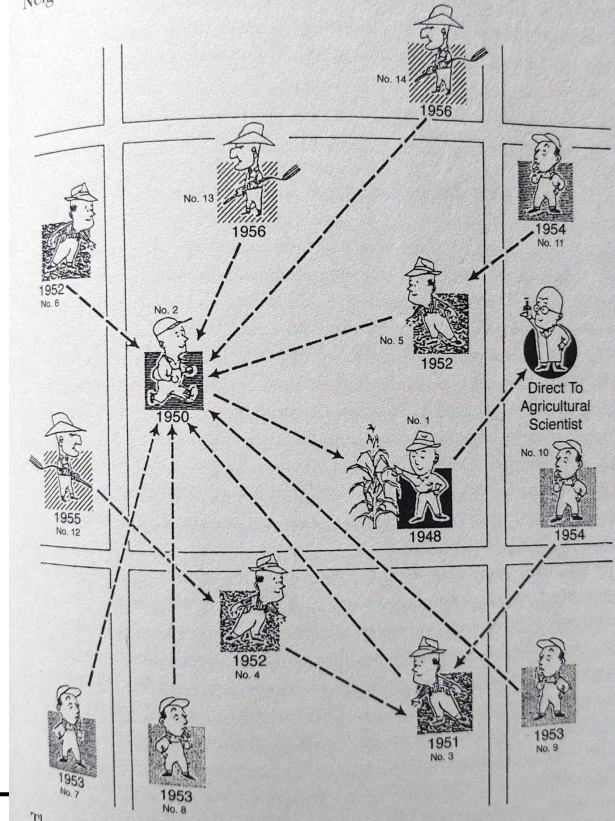
Late Majority: second big group, peer pressure, need convincing

Laggards: last to adopt, point of reference in the past, isolated,  
*not derogatory!*

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# Weed spray in Iowa

Figure 7-4. The Diffusion of a New Weed Spray in an Iowa Farm Neighborhood



Pic by Bohlen et al. (1958)

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## A couple of notes

Not all innovations succeed: the adoption may never reach 100%

An innovation will eventually be replaced by another

The adopter doesn't need to be a *person* but can be a larger unit as well, such as a family, school or company

Therefore, decisions may be made collectively or by an authority as well

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# Re-invention

People don't always use innovations as planned

Initially omitted by diffusion studies

Who is the expert now? Embracing re-invention or losing control?

Adapting to actual needs, simplification, pride, individualism

Case: home computers

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# Home computers: what to do with them?

Starting from the late 1970s many companies started building and selling home computers

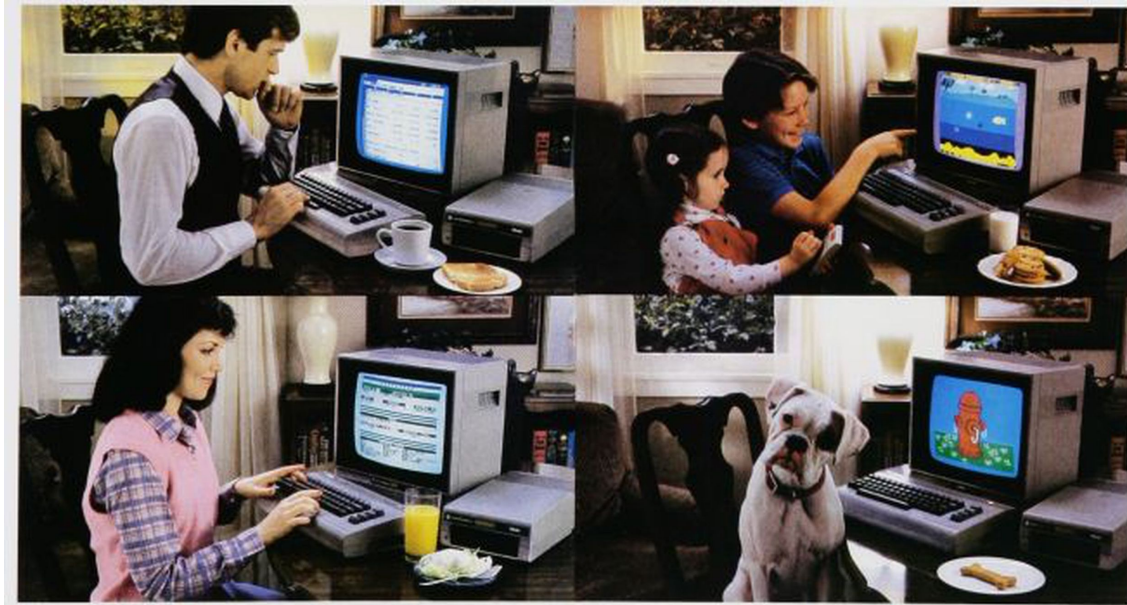
Expectations based on:

- Existing computer uses
- Existing game console uses
- Speculation

Marketing an important factor: how to sell this to people?

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# Commodore ad from the 1980s



## COMMODORE MAKES SOFTWARE FOR EVERY MEMBER OF THE FAMILY.

Commodore makes software for uncles, cousins, aunts who teach, aces, nephews, brothers, sisters preparing for exams, fathers, mothers and brothers-in-law in roofing and fling.

You see, Commodore makes software for fun, profit, homework, homework and office work. Our EasyCalc (upper left) is an electronic spreadsheet that's 63 columns x 204 rows with graphics

and bar charting. And even with color options. Fish Me!™ (upper right) is an educational math program in a game format. With our Manager program (lower left), you get a sophisticated

stablemate system with four built-in filing applications. Or you can design your own. Why, in the lower right hand corner, there's even a... (oh, we don't make that one yet)

But we're working on it. Incidentally, we also make the perfect place to use all these software programs (except the last one), the all purpose Commodore 64™, the world's best selling computer.

## ALMOST.

**COMMODORE 64**  
IT'S NOT HOW LITTLE IT COSTS,  
IT'S HOW MUCH YOU GET.

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## Re-invention in action

In the end, home computers found many unexpected uses the designers never anticipated

An answer without a question?

The contrast between marketing (aimed at parents) and reality: gaming was undoubtedly the main use for computers

Compare to much later *Raspberry Pi* computers, which endorsed creative uses right from the beginning (2014-)

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# Case example: demoscene and its platforms

A topic I've been studying since 2004, did two theses too

A form of digital subculture

Started in the mid-1980s, so there have been several platform migrations

I used diffusion of innovations theory for analyzing how a community adopts new technology

*What "demoscene"?*

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# Major migrations

Commodore 64 – Commodore Amiga

Amiga 500 – Amiga 1200

Amiga – PC

MS-DOS – Windows

Mail swapping – BBS – Internet

Smaller-scale diffusion with for example sound cards, graphics cards

Old platforms never completely disappear

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# Diffusion in the demoscene

Innovation-decision process:

Community members typically well-versed with technology and aware of new developments

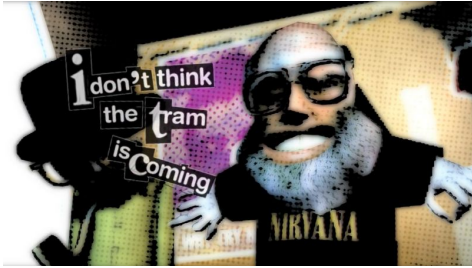
Decision on the migration a collaborative effort, conflict is always involved

External factors, such as the market do play a role

Implementation requires learning new skills

Confirmation – platforms either become mainstream or fall out of use

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# Diffusion in the demoscene



Perceived attributes of innovations:

Technically a new machine is most often more capable than the old one

The values of the demoscene may hinder adoption: too easy to do cool stuff, pushing the machine to its limits

Complexity hardly ever a question – technical skills expected

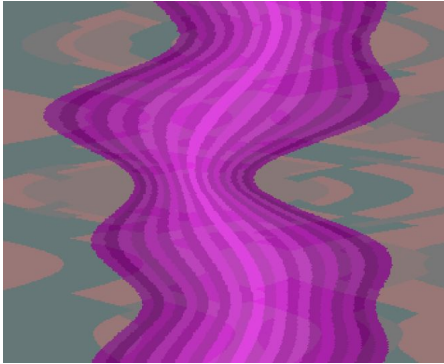
A computer can be an expensive device, experimenting together

Fame – how the audience reacts (and do you have one)

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# Diffusion in the demoscene



Adopter groups:

Isolate attempts at demos for a new/rare platform – often by the same people (innovators)

Opinion leaders change attitudes by example, the role of *parties*

Eventually the majorities follow – actually the scene is pretty mainstream in this respect

Some choose to never adopt, leaving the community or sticking to old platforms

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# Criticism

Pro-innovation bias (positivism)

The recall problem: exact times and causalities are hard to measure

Issue of equality – spreading of innovations may promote inequality

Too mechanistic "one size fits them all" model?

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# Alternative takes: domestication

Domestication theory, a largely European approach to *how* technology is adopted by its users

Appeared in the 1990s, even though earlier similar studies exist

No grand unified theory unlike in diffusion, but rather a collection of various models

Mostly qualitative research, not quantitative

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# One more case: Finnish Machine Wars

A little study I conducted with Petri Saarikoski, could be considered as an example of domestication studies

Also an example of how computer adoption is not all roses, but adapting, giving up, conflict and uncertainty

Published in 2014 on *IEEE Annals of the History of Computing*

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# Starting points

Personal recollections and observations on conflicts between the supporters of different computer or gaming platforms

Compare to *brand communities*

Research material: computer magazines, readers' letters and online discussion forums

The term "computer wars" was already widely used in the 1980s by the press

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# Early home computers (1982–1989)

The *MikroBitti* magazine and its readers' letters

Commodore 64 vs. the others: MSX compatibles, Sinclair Spectrum, Amstrad CPC and others

*To “Star is Born” I would like to say that you can jump into a lake with your Amstrad, C64 rulez!*

Later fighting between the Commodore Amiga and Atari ST

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## The 1990s' wars

PC compatibles on the rise, Commodore's declining market share and eventual bankruptcy

*The machine war just keeps going, even if the outcome is clear ...  
The PC wins, it does not matter if the Amiga was invented by the gods, because every company, school, industry and, nowadays, even film company is using the PC, so EVERYONE is using a PC.*

Another conflict between the PC and "childish" game consoles, growing popularity of the Playstation

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## Recent wars (2000–)

Still the PC vs. consoles

Reignited PC vs. Mac conflict

Xbox 360 vs. PlayStation 3 vs. Nintendo Wii (also known as Shitbox, GayStation and Kidtendo)

*Don't even try, these Sony Defense Force idiots can't realize that there could be something wrong with a Playstation exclusive game, which is why they have this comic need to label all critics as xbots or fanboys.*

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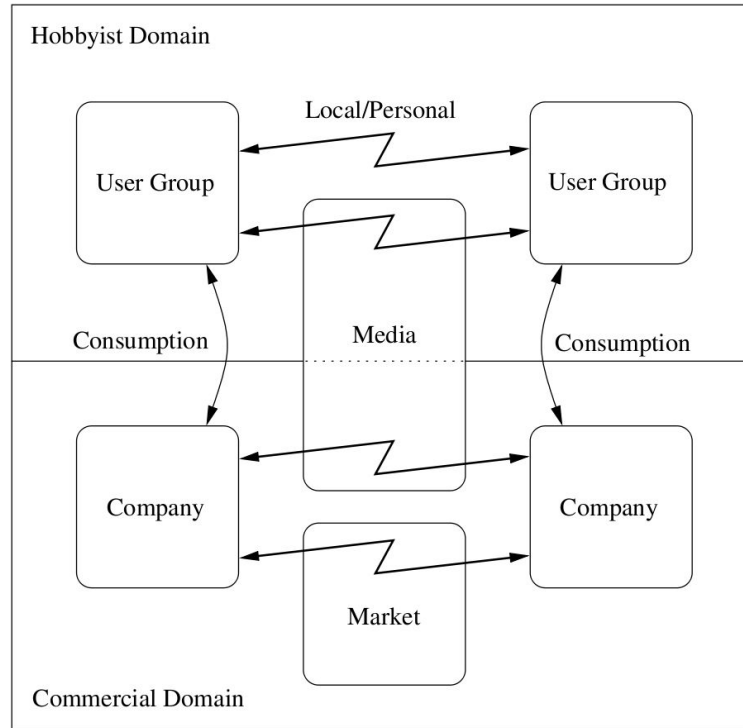
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# Arguments for and against

1. Technology (processing power, graphical capabilities, stability etc.)
  2. Community (alleged properties of a user group)
  3. Games (amount or quality of available games)
  4. Company (wrongdoings or strengths of a company)
  5. Market share
  6. Price of hardware or games
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# General model of the "wars"



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# Findings

Some of the "wars" decades old already, arguments for and against have hardly changed by time

Move from readers' letters to online forums, anonymity

The "wars" have turned increasingly international

Media – enabling and fueling the discussions, yet moderating them at the same time

Not always as serious as it might seem

Identifying with a group of users provides stability

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# Diffusion essay

- A personal reflective essay on the diffusion of an innovation you've experienced yourself
  - Choose the topic yourself – confirm with us if unsure
  - Discuss at least the topics of
    - a. *Innovation-decision process*
    - b. *Perceived attributes of innovations*
    - c. *Adopter groups*
  - If some part of the theory doesn't apply, you can say that too
  - Maximum length: two A4 pages
  - Graded 0–5 based on the quality of writing, reflection, structure and use of theory
  - Deadline: Feb 12
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# Presentation on Thursday

You don't need to have the essay ready by Thursday yet, but...

Decide your topic and analyze it in the light of the *diffusion of innovations* theory

Present it to others in 15 minutes (max.)

Discussions will help you with the essay – give honest feedback to others and ask questions

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