Diffusion of Innovations

How do people adopt innovations?

Agenda

Motivation

Diffusion of innovations theory

A case study

Criticism of the theory

Instructions for the assignment

Motivation

The diffusion theory and assignment …

- are part of the "systems" aspect of TS2
- help to understand how communities, networks and organizations behave
- support entrepreneurship, often applied in business/marketing contexts

Diffusion of Innovations theory

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

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."

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!

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.

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

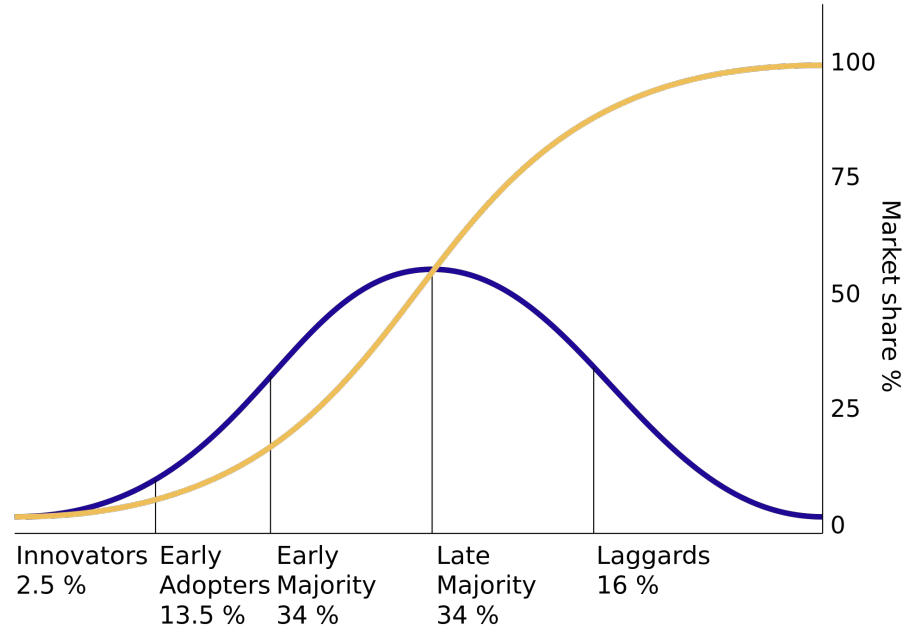Trialability: how easy it is to experiment with the innovation

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

Phases and groups

Innovators 2.5 % · Early Adopters 13.5 % · Early Majority 34 % · Late Majority 34 % · Laggards 16 % · Market share %

Thanks fly to Wikimedia Commons

Characteristics of adopter groups

Innovators: technically capable, venturesome, risk-takers

Early Adopters: more integrated, opinion leaders

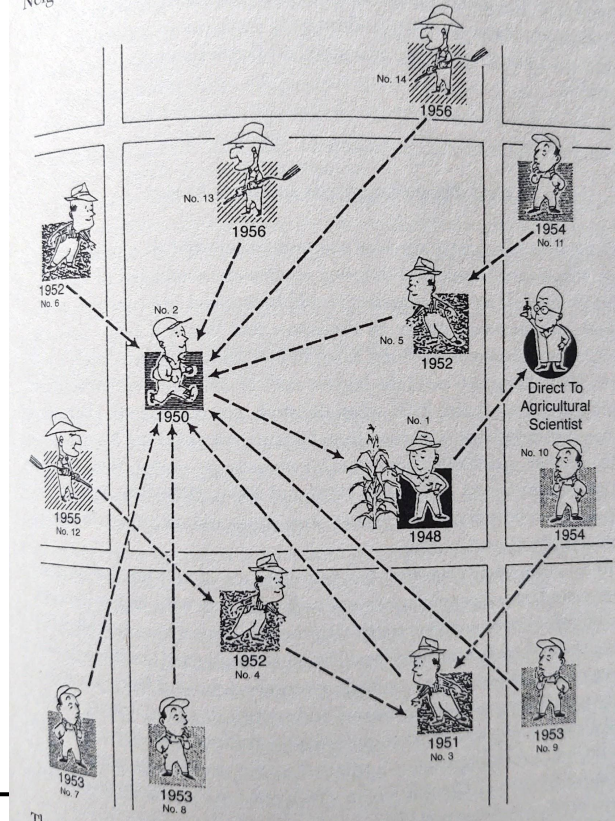Early Majority: first big group, take their time

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

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

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)

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

A couple of notes more(!)

The three main parts:

1. **The innovation-decision process** is about the "adopter unit" i.e. person or organization, **not** about society at large
2. **Perceived attributes of innovations** are about the innovation itself
3. **Adopter groups** are about when and why different groups adopt **in the big picture**

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

Home computers: what to do with them?

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

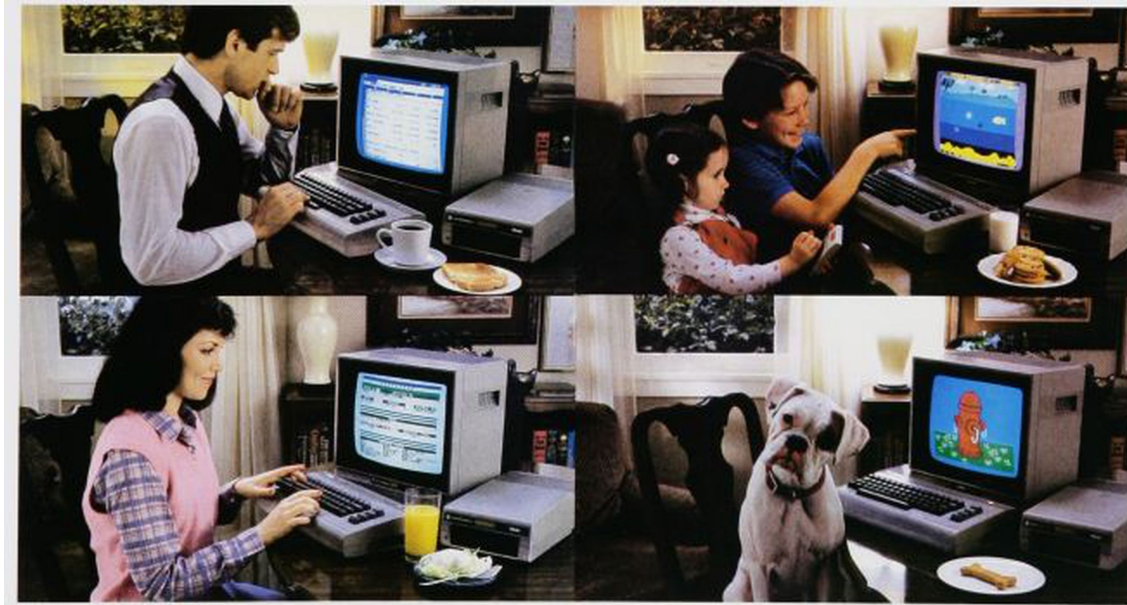Expectations based on:

- Existing computer uses
- Existing game console uses
- Speculation

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

Commodore ad from the 1980s

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–)

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"?

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

Diffusion in the demoscene

Innovation-decision process:

Community members typically well-versed with technology and aware of new developments
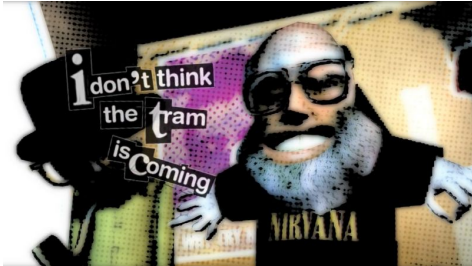
Decision on the migration a collaborative effort, conflict is always involved

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

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

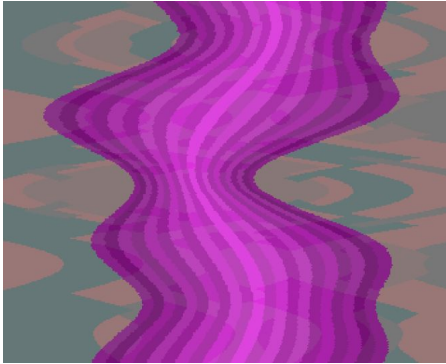Complexity hardly ever a question – technical skills expected

A computer can be an expensive device, experimenting together

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

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

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?

Diffusion essay

- A reflective essay on the diffusion of an innovation you've experienced *and/or* is relevant for your topic
- 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: three A4 pages
- Graded 0–5 based on the quality of writing, reflection, structure and use of theory
- Deadline: Feb 14

Tutoring next week

There's (optional) tutoring available for groups on Feb 10

You'll get a booking link next week

Again a possibility to refine your essay before the deadline