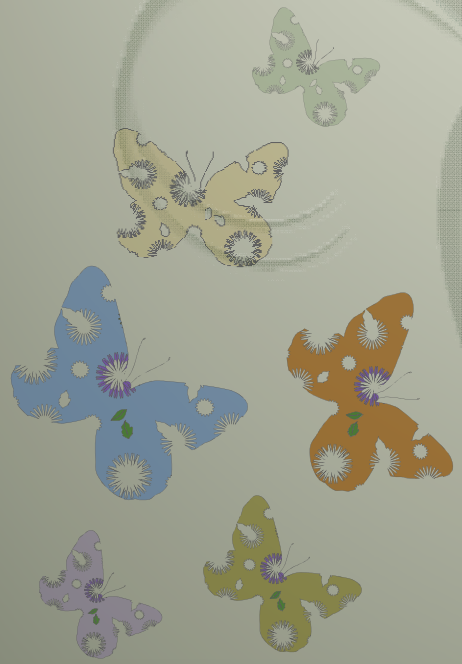
Evolution of User Behavior with New Networking Paradigms and Service Offers



PANEL ICNS

Nirmala Shenoy

Rochester Institute of Technology

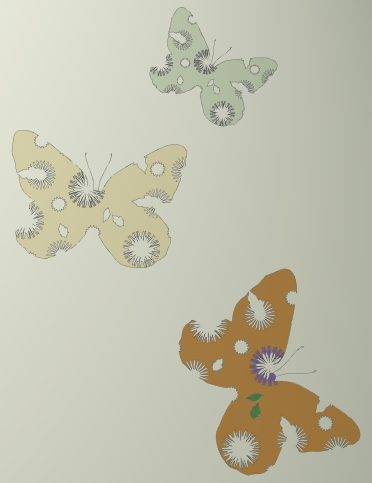
End User Influence

- Ongoing exploration and innovation at the edge
  - Individual users, application developers
- End users – adopt new technologies – creates new demands on the network
- Expectations of end users
  - Dynamic choices
  - Information necessary to make such choices
    - APIs for user choice at the edge

End User – Service demands

- Same application
  - Different quality at different times
  - Different users
  - Dependency on price
- Requires
  - Network service granularity
  - Network modules to support the diverse demand
  - Inter- network ?

End User Demands



- APIs for service selection
  - Performance
  - Security
  - Assurance on privacy levels
  - Negotiate trust levels
    - Transaction based

End User Choices

- Usability dictates
  - Technical measures?
  - more intuitive mechanisms that leverage the natural tendencies and requirements of human beings are needed
  - Binary decisions ?
  - a full spectrum of choices
  - Different categories – trustworthiness, quality

User behavior

- Is it important to service providers
- Is it important to network designer

- IT IS
- Will impact future networks
- Wireless networks – good example

How safe are we in the modern connected world?

Dr. Michael Dixon
Internetworking and Security

Many network security threats today are spread over the Internet

- Viruses, Worms, Trojan horses, Spyware and Adware (**Malware**)
  - Symantec identified more than 286 million Unique Variants of Malware
  - Driven by *Polymorphism* and *Attack Tool Kits*
- Zero-day attacks, also called zero-hour attacks
- **Hacker attacks**
- Denial of service attacks
- **Identity theft**
- Data interception and theft

RSA: Five Top Internet Security Threats in 2012

- Idealistic young 'hactivists' will continue to attack
- 'Big Data' companies are taking control of users while profiting from user information
- Foreign governments will start to target clouds and more types of businesses with APTs
- Attackers will make more use of mobile exploits for hacking into corporate networks
- Company employees, consultants, and business partners can always pose security risks

Selected News Headlines

Murdoch UNIVERSITY
DISCOVERERS WELCOME

- China cyber capability endangers US forces (2012)
- Source code for Cisco's IOS 12.3 operating system was stolen. FBI determined the attack was part of a much larger attack on major US firms controlling significant infrastructure (2004)
- Source code of Symantec Antivirus posted on the net (2012)
- Source code was stolen for Google's unified Single Sign-On service used for Gmail and other Google services (2010)

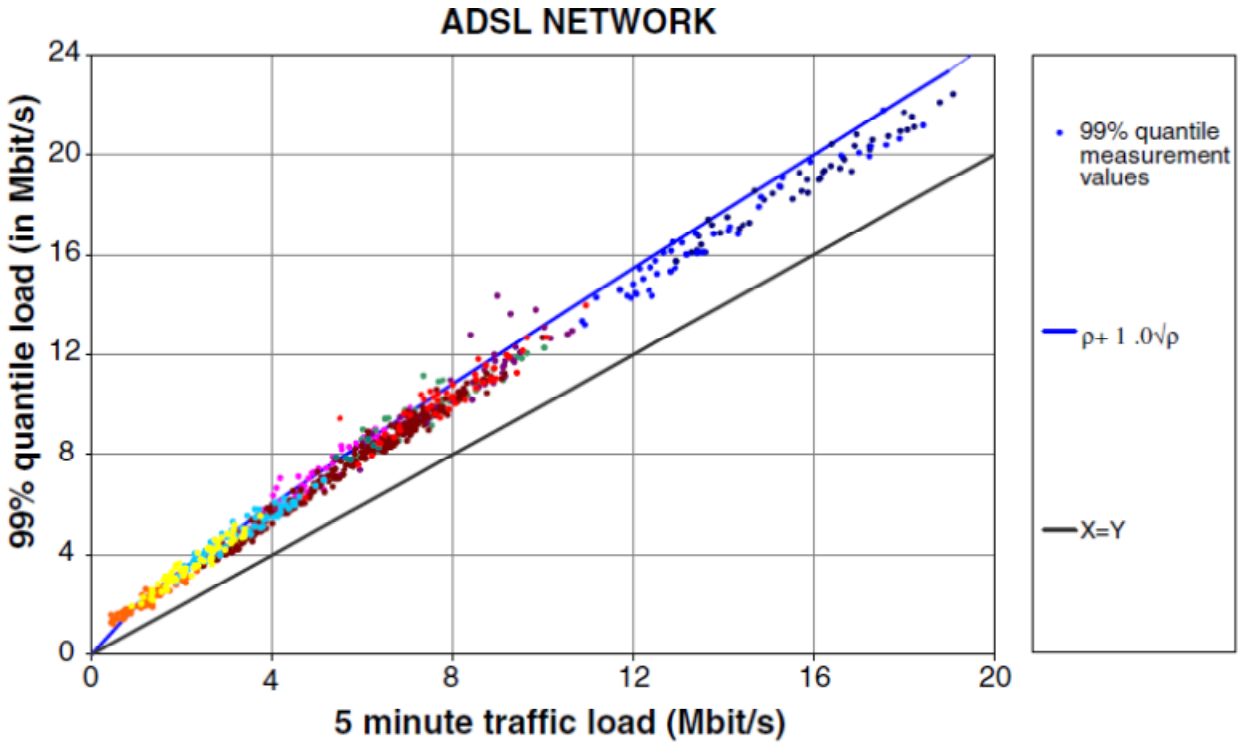
Panel:
Evolution of User Behavior with New Networking Paradigms and Service Offers

Robert Kooij

ICNS 2012

March 26 2012

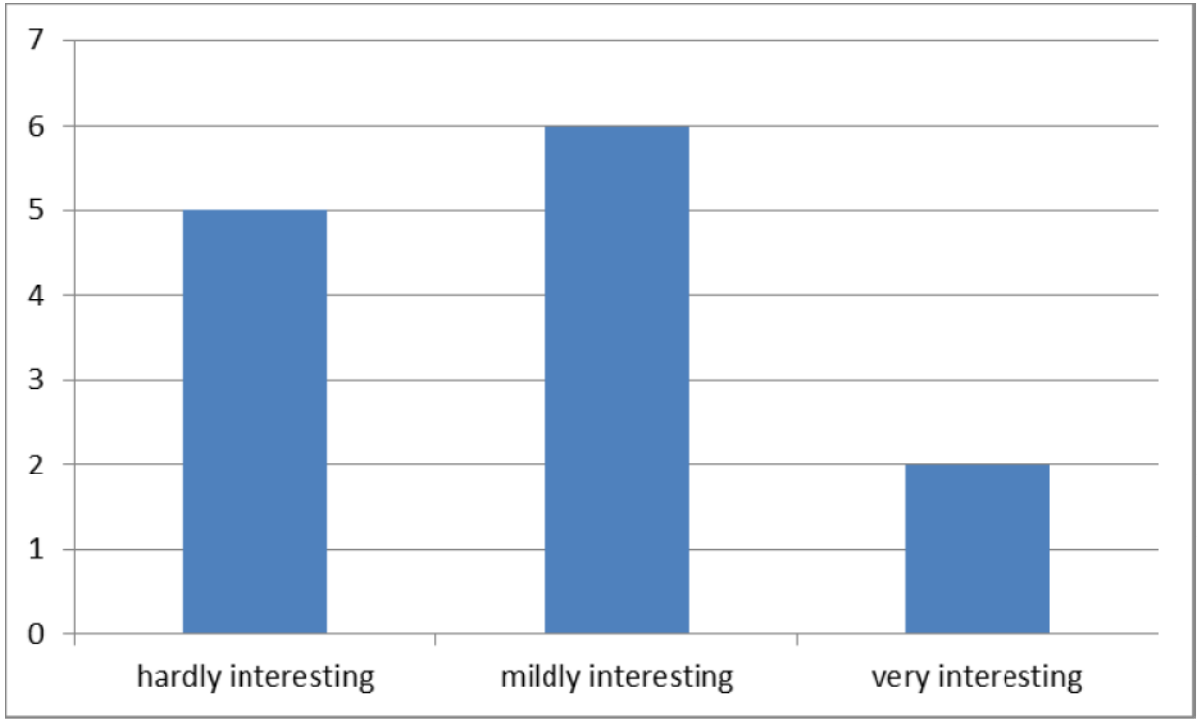
Aggregated statistics of DSL users



TNO innovation for life

TU Delft

Aggregated statistics of DSL users



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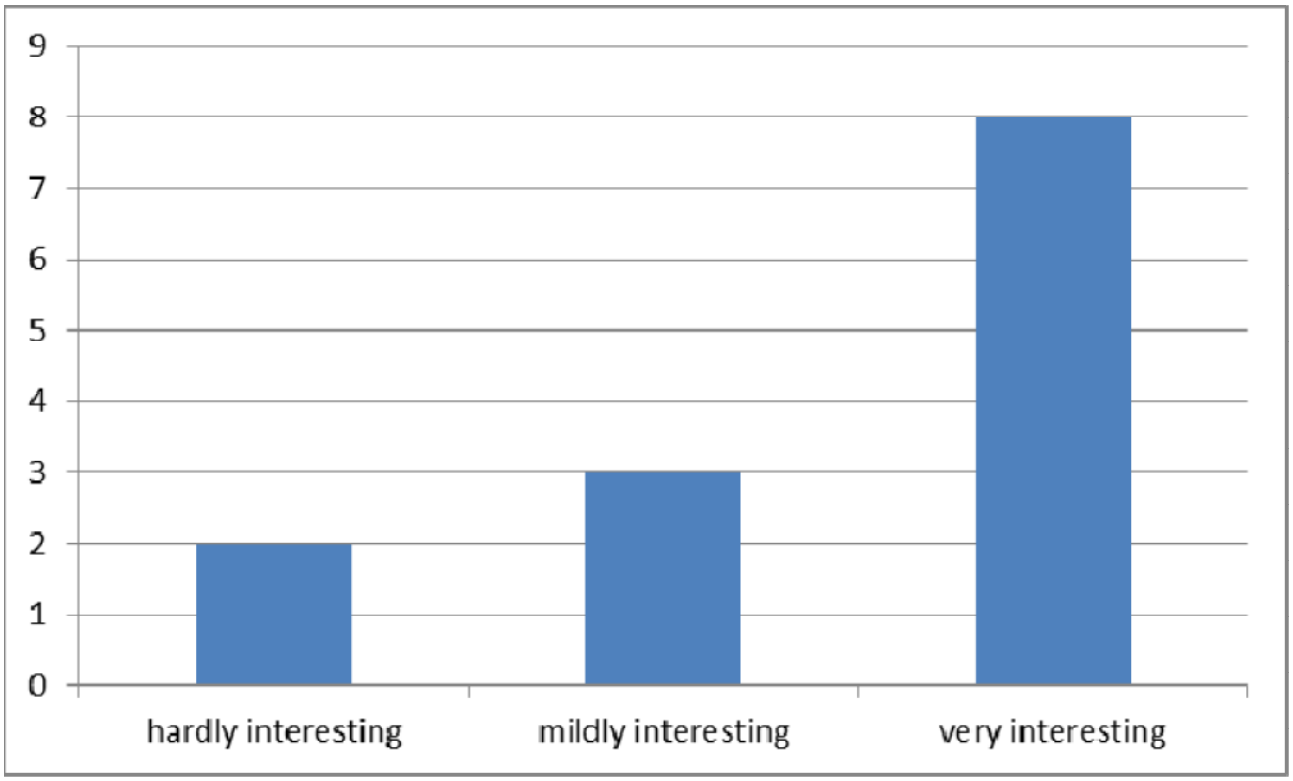
Social media

Social media



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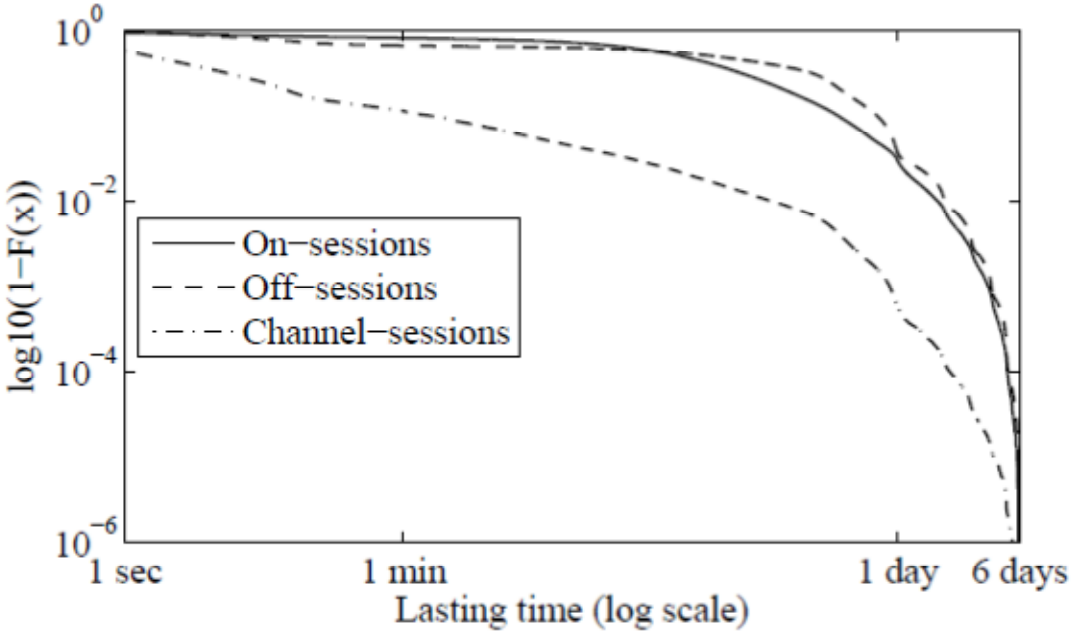
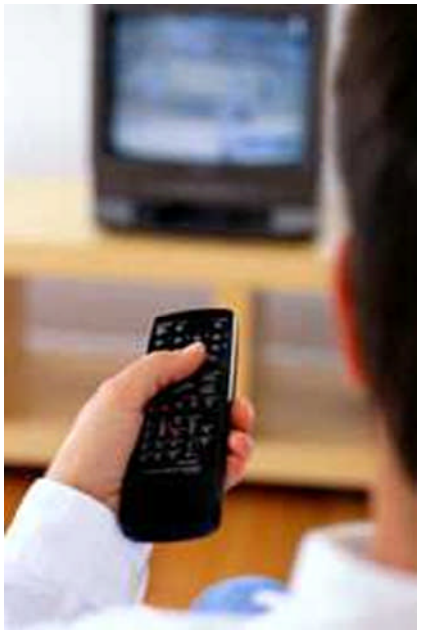
IPTV statistics





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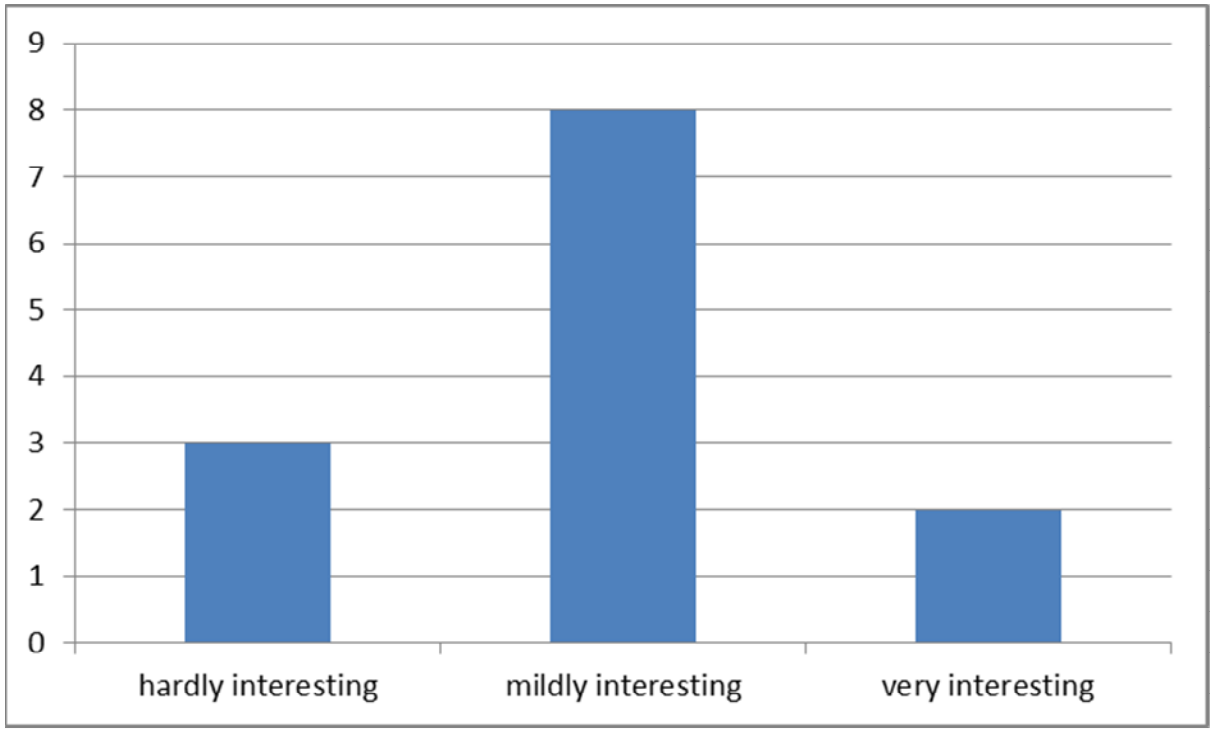

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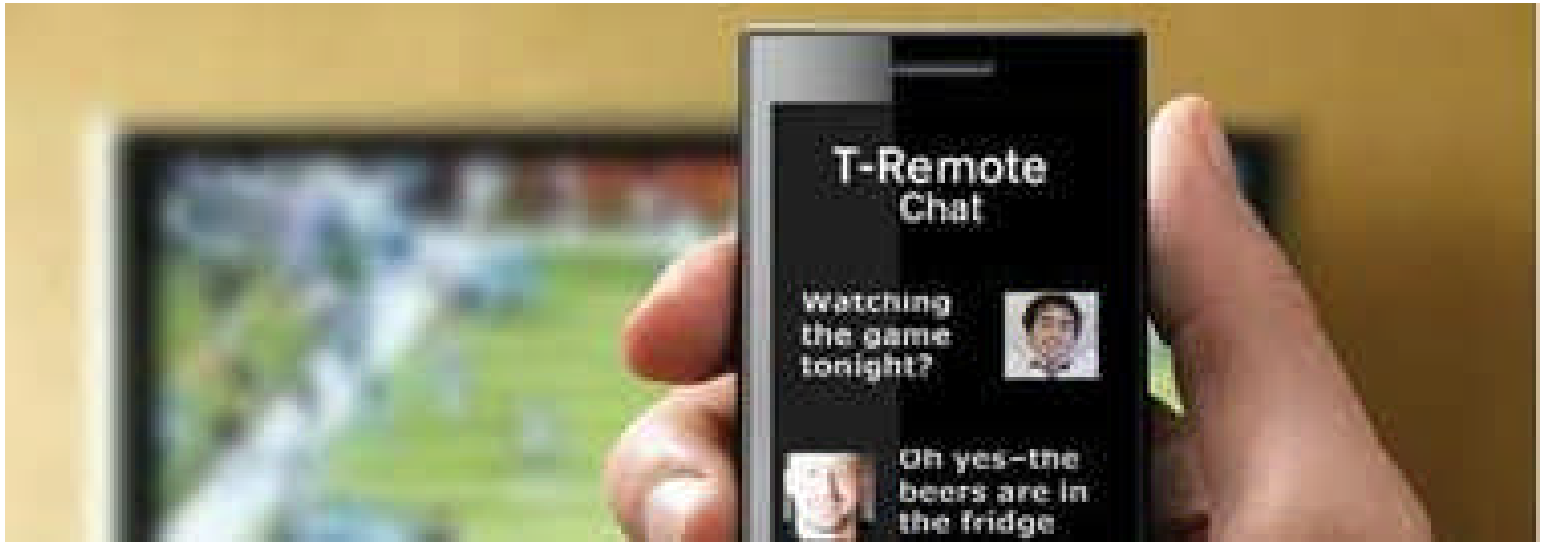
Social TV



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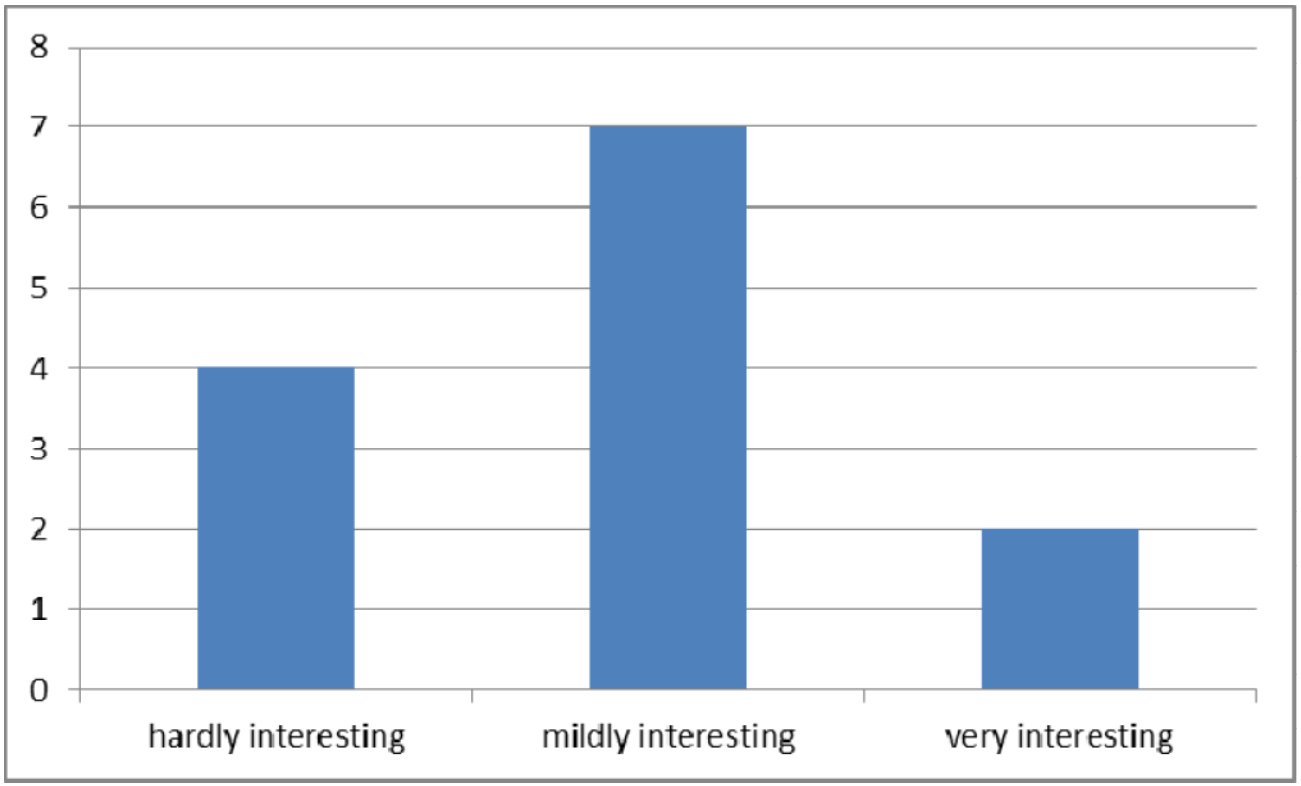

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Evolution of User Behavior with New Networking Paradigms and Service Offers

- Service Development by End Users or Service Designers -

Akira Takura

Jumonji University

Niiza, Japan

Background

- Evolution of network services, such as home network services, mobile services, and so on
  - Confusion about complicated user interfaces
  - Network failure caused by unexpected traffic
- Most network services are ready-made
  - Sometimes do not match users' demands
- Many people have experiences using computers
  - PC lessons in elementary schools and network lessons in high schools

Solutions

- Early validation of user interfaces and system behaviors:
  - Evolution of network services
- Service program development by end users or service designers:
  - Ready-made services

➡ Proposal:

Service program development using a rule-based language

Why rule-based languages

- Match the way of imperfect thinking of human beings
- Even partial specifications can be executed

⇨ We can develop network services observing the behavior of partial services.

ESTR (Enhanced State Transition Rule)

Syntax:

Pre-condition | event : Post-condition , { action }

Pre-condition: conditions for state transition
event: triger for state transition
Post-condition: state after transition
action: procedure accompanied by state transition

(send a signal, retrieve database, and so on)

Example;
stop(x) forward(x): forwarding(x), {Robact(forward,x)}

Application Examples

- VoIP
- Network game
- Network robot

AIBO Demonstration