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ICT Prosumption Frameworks:

The State of the Art in Multi-disciplinary Production and Consumption

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Agenda

- Information Technology Innovations
- Openness in Innovation Development
- Customers – Innovators
- User Involvement in IT Process
- Advantages of IT Prosumption
- Models for IT Prosumption
- Prosumption in other industries

prosumption

- Production+ consumption

Alvin Toffler (1980)–The ThirdWave:
"We a progressive blurring of the line that separates producer from consumer. We see the rising significance of the prosumer" (267).

Prosumption as inherent feature of **McDonaldization:**
"Instead of having employees do things for consumers, much of consumption now involves consumers doing many things for themselves, and for no pay" (424) = "putting consumers to work" (Ritzer and Jurgenson 2010):
Fast food restaurant: consumer is her/his own waiter
self---service gasoline stations etc.

Innovations

- Innovation is when knowledge from previously separated domains is exchanged and combined in new ways [Justesen, 2004]
- The specific tool of entrepreneurship by which managers exploit change as an opportunity for a different business or service [Zhao, 2006]
- The successful introduction and development of new products and processes that can be clearly isolated and identified and which have a certain degree of radicalism and novelty [Sundbo, Fuglsang, 2006]
- A management discipline involves focusing on the business organization's mission, unique opportunities, the measures for success [Gaynor, 2002]

Oslo Manual 2005 Innovation

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations

- Product innovation (goods and services)
- Process innovation (in making or supplying goods and services)
- Marketing innovation (first use of methods to influence demand)
- Organisational innovation (in specific domains of business)

Innovations

- **Product innovation** – *changes in the things (product or services) that a business organization offers;*

- **Process innovation** – *changes in the ways in which products are created and delivered;*

- **Position innovation** – *changes in the context in which the products and services are introduced;*

- **Paradigm innovation** – *changes in the underlying mental models which frame what the business organization does* [Tidd & Bessant, 2009]

Information Technology Innovations

- Change in a work system
- Process of changing a work system
- Realized in the context of socio-economic institutions
- Perceived from four points of view:
  - The vendor view focuses on product engineering and later focuses on marketing and sales.
  - The diffusion view focuses on communication, awareness, beliefs concerning early or late adoption and individual choice.
  - The work system view is about organizational performance.
  - The organizational view is about how organizations change over time.

Information Technology Innovations

- ***Technological product innovation*** - the implementation and commercialisation of a product with improved performance characteristics
  - Technologically new products
  - Technologically improved products (enhanced, upgraded)
- ***Technological process innovation*** - the implementation and adoption of new or significantly improved production or delivery methods. It may involve changes in equipment, human resources, working methods or a combination of these
  - Technologically new production methods
  - Significantly improved methods of production or product delivery

Information Technology Innovations

- Start in different parts of a business organization:
  - New technology or better use of existing technology make it possible to change work practices into innovative ones
  - Using the different information or providing information in a different form or level of detail lead to innovative use of existing or new technology
  - Changes of the business process or changes of aspects of decision making encourage using technology more effectively for better results
  - Improvement of a work system's products and services by incorporating digitized information or even new hardware provide additional value for customers

Information Technology Markets Trends

- Innovative approach to the planning
    - product-line management approach
    - component-based design
- Convergence of IT, telecommunication and business services
- The increasing part of hardware and software supply chain is outsourced and realized in India, China, Philippines
- Open source software development
- Software companies are involved in co-operation with leading users
- Co-financing of the research projects by governments as well as private companies.
- IT product vendors recognize new competitive advantage opportunities through keeping the loyalty and respect of clients

Information Technology Markets Trends

- Service Science, SLM, SLAs, QoS

- Practice of IT Management : ITIL, Cobit 5, Prince2

- European software markets are very fragmented, although supplier networks play a decisive role in the standardization and consolidation of IT products

- The IT product standardisation supports producing co-operation and interoperability of different applications.

- Software globalisation is exercised through outsourcing, foreign investments, multinational enterprises and trade, international communities of practice

- Technical standards acceptance decrease the product time to market

- Institutional software clients are interested in the reduction of the total cost of ownership by the integration efforts

Virtualization

- The disassociation of the physical   from the logical so that resources can be shared, allocated and used as needed

- Provides a logical view into and control of physical infrastructure assets to ensure optimization, better utilization and simplified management of physical assets

- Decouples users and applications from the specific hardware characteristics of the systems they use to perform computational tasks

Virtualization types

- ***Server virtualization***: refers to uncoupling server operating systems from hardware hosts, allowing multiple isolated operating system environments to share the same physical server

- ***Desktop virtualization***: refers to uncoupling a client operating system environment from underlying hardware, allowing end-user workspaces to be hosted on servers and accessed remotely or for corporate workspaces to be isolated from personal workspaces on client machines

Virtualization types

- ***Storage virtualization***: separation of logical data access from physical data access, enabling users to create large storage pools from physical storage

- ***Application virtualization***: refers to the uncoupling of applications from host operating systems and allowing the virtualized application to run in its own isolated sandbox

Objectives driving Virtualization Initiatives

- More efficient use of server and storage resources
- Server and storage consolidation
- Improve disaster recovery or lower disaster recovery costs
- Easier server provisioning, storage provisioning and software development
- Reduced management costs administrative overhead
- More flexible development and testing environments
- Improved system reliability/availability
- Streamline operational efficiency
- More flexible adaptation to variable workloads and changing business needs
- Automation of load balancing and other data center processes
- Unification of management of heterogeneous systems
- Ability to use inexpensive commodity hardware

Cloud Computing Model

- *On-demand self-service.* provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction
- *Broad network access* (e.g., mobile phones, laptops, and PDAs)
- *Resource pooling* (examples of resources include storage, processing, memory, network bandwidth, and virtual machines)
- *Rapid elasticity of capabilities*, to quickly scale out and rapidly released to quickly scale in
- *Measured Service.* Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts)[NIST, 2009]

Cloud Computing Service Models

- ***Cloud Software as a Service (SaaS).*** The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email)

- ***Cloud Platform as a Service (PaaS).*** The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider

- ***Cloud Infrastructure as a Service (IaaS).*** The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications

Cloud Computing Deployment Models

- **Private cloud.** The cloud infrastructure is operated solely for an organization

- **Community cloud.** The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations

- **Public cloud.** The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services

- **Hybrid cloud.** The cloud infrastructure is a composition of two or more clouds (private, community, or public)

Service Level Management for IT Governance

- Defining an SLA (Service Level Agreement) framework

- Establishing SLAs including level of service, corresponding metrics, monitoring and reporting on the achieved services and problems encountered,

- Reviewing SLAs

- Establishing SLAs improvement programs

SLA characteristics:

- Defining roles, responsibilities, and the chain of accountability

- Managing the customer's expectations regarding a product's delivery on three performance levels; engineered (i.e. construction) level, delivered level, guaranteed level

- Control IT services implementation and execution

- Providing verification of the provided services on the customer side

- Enabling communications for both service providers and customers to address their needs, expectations, performance relative to those expectations

SLA model

- **Agreement definition**: parties, contract terms and conditions, delivery locations and service access points
- **Product definition**: product description, technical description, price/cost
- **Performance metrics** definition:
  - activity (service orders, trouble tickets, routine/preventive maintenance, MTTR)
  - network (availability, reliability, downtime, MTBF)
- **Measurement definition**: start/stop procedure, points of measurement, methods of measurement, frequency of measurement
- **Correction definition**: start/stop procedures, points of correction, methods of correction, time frames for correction
- **Reconciliation definition**: methods of recourse, penalty/incentives formulas, time frame for recourse [Lee & Ben-Natan 2002]

SLA model

- ***Preamble*****: contracting parties, general SLA objectives, mediator responsible for any modification
- **Scope and framework*****: involved departments, users, hardware, operating systems and applications
- **Service descriptions** and the respective performance service level reflecting the customer's demand
- **Respective version** of the service catalogue
- **Reporting** covering agreements concerning accuracy, measuring intervals, measuring tools, measuring methods and recording methods for each service

SLA model

- **Data Security** i.e. the provider's guarantees adherence to laws, rules and guidelines concerning data security,
- **Prices** (for each service)
- **Contractual period**
- **Termination clause**, taking into account that each part is in the position to abandon the contract in specific cases
- **Contract penalty**
- **Organizational settlements**: determining the organizational structuring of the SLA, official reporting and communication channels

Characteristics of Contract

- A specific duty for parties to deal fairly with each other
- Involvement of a general presumption to achieve „win-win" solutions
- Defining the roles and duties of all involved persons
- Separation of the roles of contract administrator, project and lead manager
- A choice of allocation of risks
- Taking all reasonable steps to avoid changes in pre-planned works information
- Express provision for assessing interim payments by methods i.e. milestones, activity schedules
- Providing for speedy dispute resolution if any conflict arises [Eggleston, 1996]

Information Technology Innovation Management

- To be competitive on the market as well as it is an important subject of research work.

- Stages of model:
  - recognition of the opportunity,
  - idea formulation,
  - problem solving,
  - prototype solution,
  - commercial development,
  - technology utilization and diffusion [Roberts & Frohman, 2002]

Information Technology Management

- Service Level Management is a classic managerial approach to IT governance, with organizational globalization and IT outsourcing become prevalent in today's business
- Capital expenditure are minimized and business organizations (also virtual) prefer a renting rather than an owing model for resource management
- IT resources virtualization is to allow for:
  - Centralization of infrastructures in areas with lower costs
  - Peak-load capacity increases
  - Utilization and efficiency improvements

Information Technology Management

- Business organization (also VOs) look for IT governance model ensuring
  - Scalability which meets changing users demands quickly
  - Reliability by way of multiple redundant sites, which makes it suitable for disaster recovery
  - Security, which typically improves due to centralization of data, increased security-focused resources etc.
  - Performance, which is monitored and consistent
  - Device and location independence which enables users to access system regardless of location or what device they are using (e.g. PC, mobiles)

Customer Involvement Forms:

- Customer participation in the new service development process directly

- Co-operation of technology providers and customers on exploration of the use of the technology in a specific industry

- Partnership i.e., a formal relationship between the customers and the IT company

- Prosumption i.e., the dual roles played by the customer as IT provider as well as a consumer

Innovations
Degrees of Novelty

- *New to the firm.*
- *New to the market (firm and competitors)*
- *New to the world (optional for surveys)*
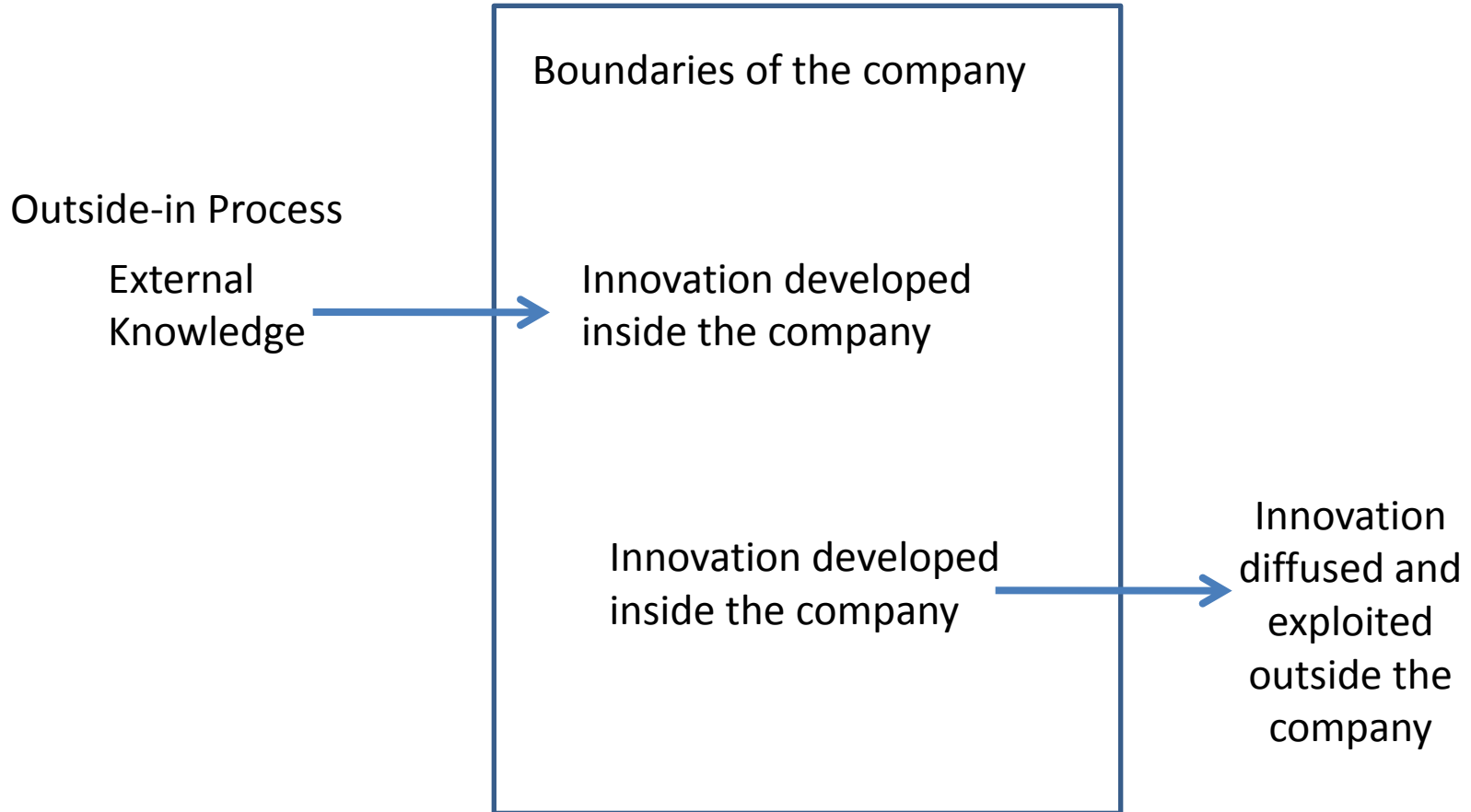- *Radical or disruptive innovation (optional but impractical)*

Customer -Innovators

- **Develop new designs for their own personal use or (in the case of user firms) for internal corporate benefit**

- **Do not anticipate selling goods based on their innovations, although they may later go into business as customer- manufacturers**

- **Subcontract production and parts supply**
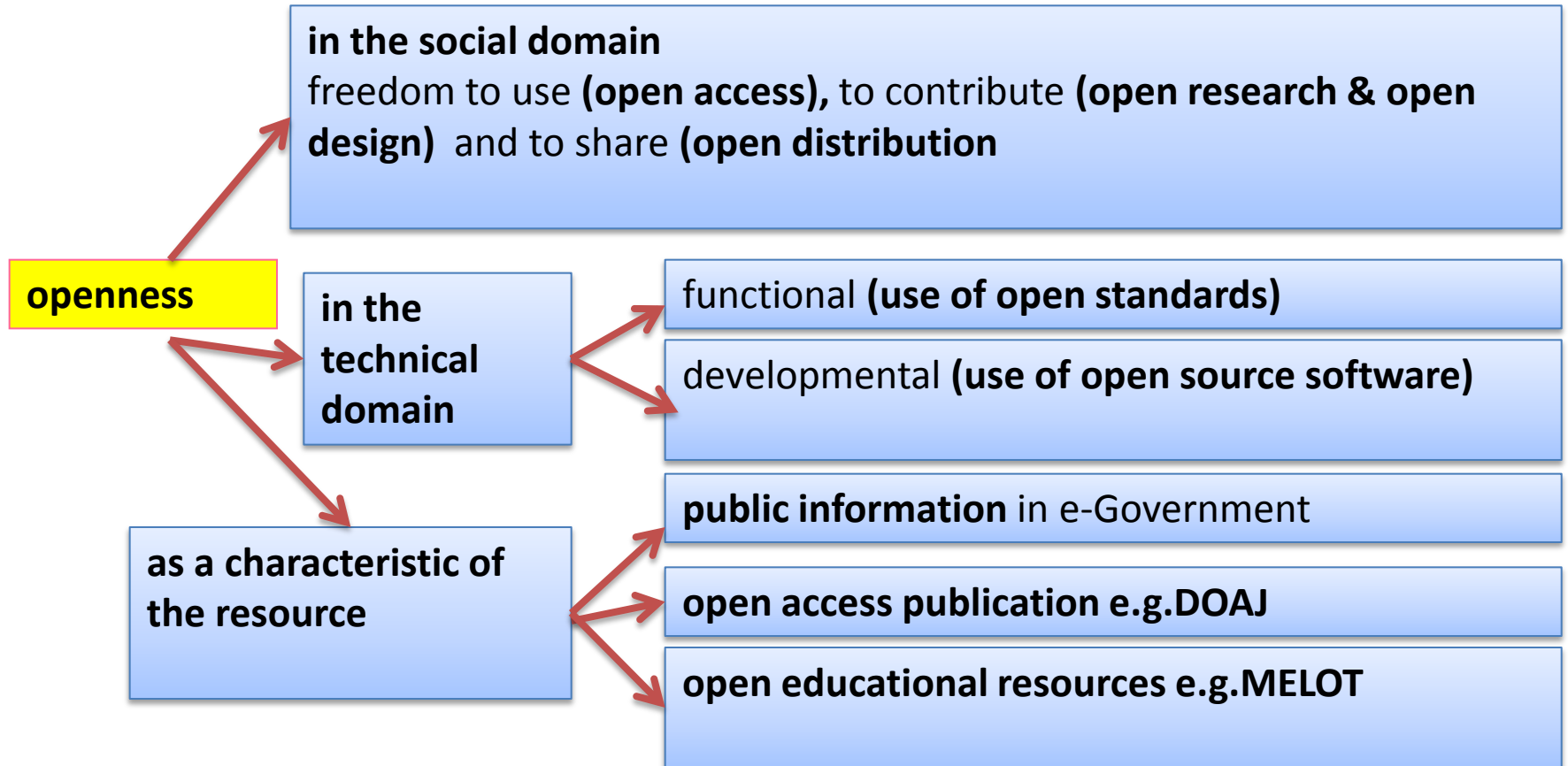
Business Information System Users

- **Lead users**
  - Recognize requirements early, expect high level benefits, develop own innovations
  - Face needs that will be the future trend in the marketplace
- **Normal users**
  - Might provide information about their unmet needs to companies
  - Establish long-term relationships for reduction of the uncertainty and the risk of failure
- **Community users**
  - Have expertise in a specific field,
  - Treated as a decentralized virtual design team
 - Support diffusion of innovations

Open Innovation

Boundaries of the company

Outside-in Process

External Knowledge → Innovation developed inside the company

Innovation developed inside the company → Innovation diffused and exploited outside the company

Terms to describe the trend of the Openness of Innovation Activities

openness

in the social domain
freedom to use **(open access),** to contribute **(open research & open design)** and to share **(open distribution**

in the technical domain
→ functional **(use of open standards)**
→ developmental **(use of open source software)**

as a characteristic of the resource
→ **public information** in e-Government
→ **open access publication e.g.DOAJ**
→ **open educational resources e.g.MELOT**

Customer Profile

	Old reality	Virtual economy
Identity	Consumers, respondents	Creative partners
Role	Passive consumers	Active co-producers
Source of insights	Surveys	Conversations
Relations	Transaction-based	Interactions and experience-based
Influence	Advertising, expert opinion	Peer-to-peer, social media
Concept of value	Company offers	Customer preferences
Source of value	Product attributes	Unique solutions, customer experience

[Bhalla, 2011, p.90]

Customer Involvement
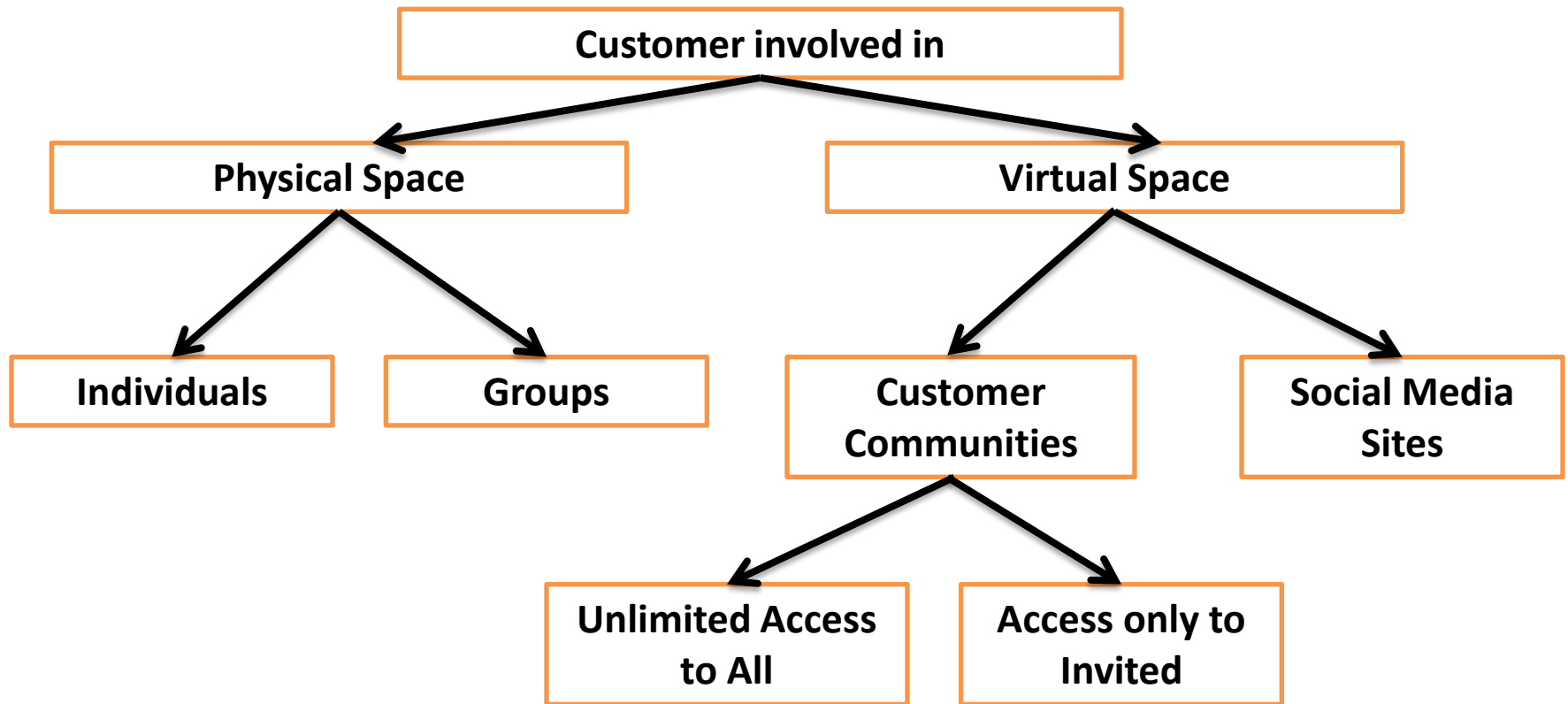
Users' Characteristics

- **Involvement in the information system development process: strongly involved or just watching**

- **Environment: personal (home) users, worker (corporate, organizational) users**

- **Frequency of acting: occassional, frequent, extensive**

- **Software use: word editors, email, graphics, accounting, CASE tools**

- **Educational level: basic, intermediate, advanced**

- **Relationship: internal users (co-workers), external users (clients)**

Openness in Innovation Development

- Ability for firms to integrate others' ideas in their own research
  - Firms, non-profits, universities, **USERS**, customers, amateurs, philanthropists
- Customer innovation – when one or more customer recognize a new set of design possibilities
- Open systems:
  - offering a building block approach to development that makes effective use of commercial products
  - based on open standards providing a foundation for reuse, interoperability and evolution

Open Collaboration Models

- **User-producer model**: centralized model; although real costs can be met with resources other than money, most initiatives need to raise some capital;

- **Co-production model**: equal participation of software application developer and users;

- **Replacement model**: open (i.e., provided by user) content replaces other uses and benefits from cost savings;

- **Foundation, donation or endowment model**, in which funding for the project is provided by external actors [OECD, 2007]

Open Collaboration Models

- **Segmentation model**, in which provider offers value-added services to user segments and charges them for these services;

- **Conversion model**, in which "you give something away for free and then convert the consumer to a paying client";

- **Membership model**, based on fund-raising campaigns or paying members [OECD, 2007]

Leading Questions

- What is the role of consumers in product innovation?
  - It's getting easier for consumers to design and make what they want
  - Business need to organize their product development systems to efficiently accept and build upon prototypes developed by users

New Innovation Paradigm

- Users develop new products for themselves: consumers must pioneer new products for themselves, because producers cannot see evidence for a profitable market

- Most of the innovations developed by consumers are of interest to the originating consumer only. Other users evaluate and reject, or copy and improve

- Small producers enter first, because they are satisfied with smaller markets

[Eric von Hippel, MIT, Sloan Management Review, 2011]

New Innovation Paradigm Implication

- Initial need awareness, product design, prototyping and use testing – users should realize they are developers

- Users should realize that it's getting easier to design and make what they want for themselves

- Consumers can choose to exert to make people aware of their innovation

[Eric von Hippel, MIT, Sloan Management Review, 2011]

Implications for Business

- Lead users who are both ahead of the majority of users with respect to a market trends and have a high incentive to innovate

- The consumer is showing a product prototype that performs a novel function that people have demonstrated that they want

- Companies will have to help their own product developers look at consumer-developed innovations with new eyes

[Eric von Hippel, MIT, Sloan Management Review, 2011]

Implications for Business

- Users shoulder the initial cost for their own reasons
- Question : what users want in exchange for company benefits from their innovations
  - User want support for their user communities
  - Free parts
  - Special access to products
  - Gain sharing

[Eric von Hippel, MIT, Sloan Management Review, 2011]

User Involvement in IT Process

- Participatory design
- User Centered System Design
- Actor Network Theory
- User Centric Management
- User Experience Design
- User Persona
- Customer Knowledge Management

Participatory Design

- Assumes that workers are the best to determine how to improve their work

- Technology should be considered as processes in the context of workplace, not as individual product

- Developers should take active role enabling users to use their knowledge in their decision making within their tasks

- Developers need to be active helping users become involved in defining and using new computer systems

Participatory Design

- An attempt to give users a tool and a voice in the designing process

- Methods: story telling, photograph analyses, games, prototypes presentation, informal description, workshops

- Users are the best at determining how to improve their work, the designers should only be consultants

- ICT considered as a process in the context of workplaces not as an individual product

User-centered Information System Design Principles

- **User focus**: all members must understand the goals of the activity, the context of use, why and how they perform their tasks, how they communicate

- **Active user involvement**: in the entire development process and the product lifecycle

- **Evolutionary system development**: the system development should be both iterative and incremental

- **Simple designs** for validation done by the customers

- **Prototyping**: evaluated with real users in context (contextual prototyping

- **Explicit and conscious design activities**

- **A professional attitude of usability designers**, interactions among designers and users

- **Holistic design** including aspects that influence the future use

- **Process and product customization**

User-centered Information System Design

- Usability expressed by learnability, efficiency of computing, IS reliability, personal satisfaction

- Offered advantages for users: maximization of the ease of use, avoiding unnecessary repetition of information, elimination of useless information and inconsistencies

- Understanding and specification of the context of use

- User activities:

  - Parametrisation or customization. Choices among alternative behaviours.

  - Program creation and modification. Aiming at creating from scratch or modifying an existing software

User-centered Information System Design

- Understand and specify the context of use
- The objective is to know the environment in which the system is going to be used
  - Who is the user?
  - What is the user going to do with the system?
  - The environment in which the system is going to be used. That includes hardware characteristics

User-centered Information System Design

- Understand and specify the context of use
  - The physical and social context of the user is really important. Where the user uses the system and the social context of the user
  - A description of the relevant characteristics that the system should have for the user in the form of report
  - The description may be redone during the life cycle of the software

User-centered Information System Design

- Specify the user and organizational requirements
  - Required performance of the new system against operational and financial objectives
  - Relevant statutory or legislative requirements, including safety and health
  - Cooperation and communication between user and other relevant parties
  - The user's job (including the allocation of tasks, user's well-being, motivation)

User-centered Information System Design

- Specify the user and organizational requirements
  - Task performance
  - Work design and organization
  - Management of change, including training and personnel to be involved
  - Feasibility of operation and maintenance
  - The human-computer interface and workstation design

User-centered Information System Design

- design solutions are produced by drawing of the established state of the art, the experience and knowledge and the result of the context of use analysis

- The process involves:

  - Usage of the existing knowledge to develop design proposal

  - Make the design solution more concrete using simulation models

User-centered Information System Design

- The process involves:
  - Present the design solution to users and allow them to perform tasks
  - Alter the design in response to the user feedback and iterate the process until human-centered design goals are met
  - Manage the iterations of design solutions

User-centered Information System Design

- Evaluate design against requirements
  - Provide feedback to improve design
  - Assess whether user and organizational objectives have been achieved
  - Monitor long-term use of product or system
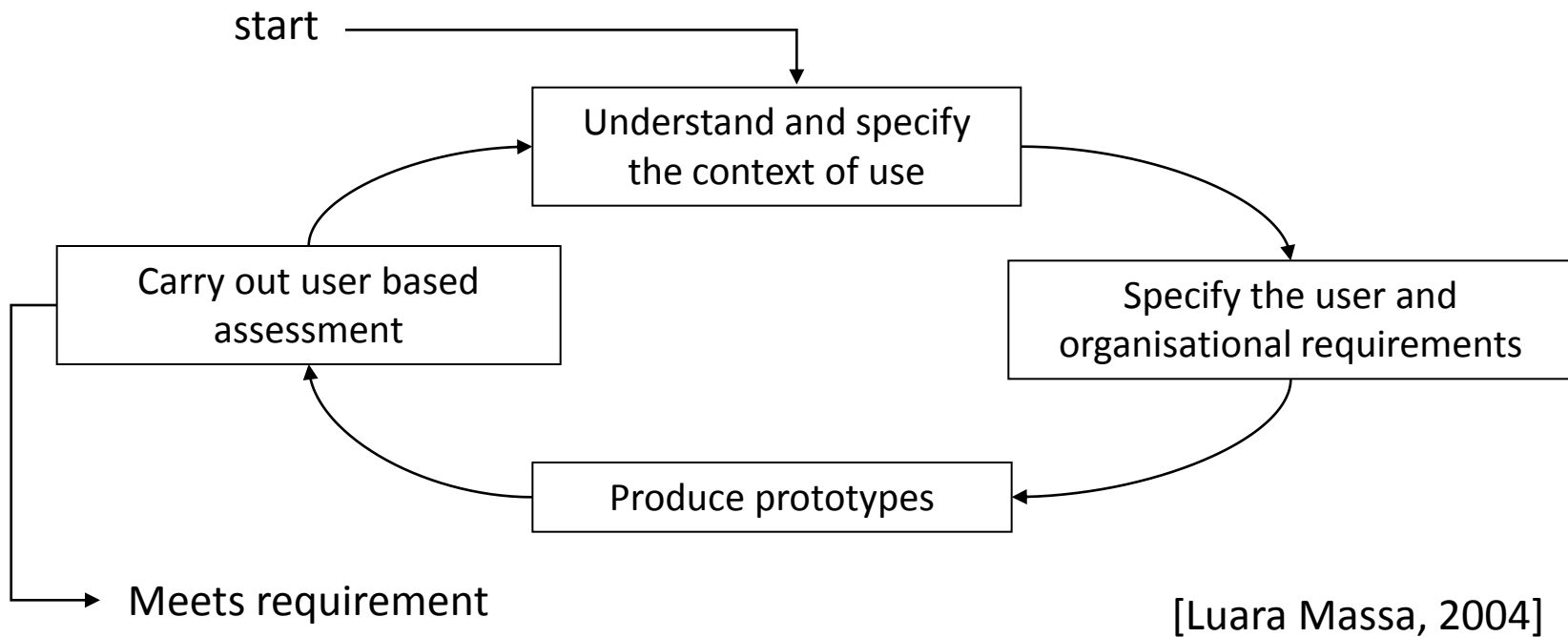 - Price of changes during lifecycle

User-centered Information System Design

- Evaluate design against requirements
  - Evaluation plan- goals, responsible persons, procedures, resources, scheduling
  - Design feedback – output of evaluation – organizational goals, diagnose problems and identify needs in user interface, pick best design option, elicit new requirements from users
  - Expert evaluation, user-based evaluation and cooperative evaluation

Four Essential Activities

- The activities are carried out in an iterative fashion, with the cycle being repeated until the particular usability objectives have been attained

start → Understand and specify the context of use

Understand and specify the context of use

Specify the user and organisational requirements

Produce prototypes

Carry out user based assessment

Meets requirement

[Luara Massa, 2004]

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Understand and Specify the Context of Use for the System

- The quality of use of a system depends very much upon the context in which a system will be used

- In some cases contextual information may already be known; although, where a new product or system is to be introduced, then it will be necessary to collect the relevant contextual information

# Understand and Specify the Context of Use for the System

- At the end the following aspects are understood
  - the characteristics of the intended users
  - the tasks the users will perform
  - the environment in which the users will use the system
- The results of this initial activity are embodied in a document which describes the context of use for the proposed software

Context

- any information used to characterize the situation of entities (i.e., whether a person, place or object) and considered relevant to the interaction between a user and an application [Dey & Abowd, 2004]

- Opportunity of information selection:
  - **Data**
  - **Interpretation**
  - **Media**
  - **Technique**
  - **Source**
  - **Form & Language**

Context
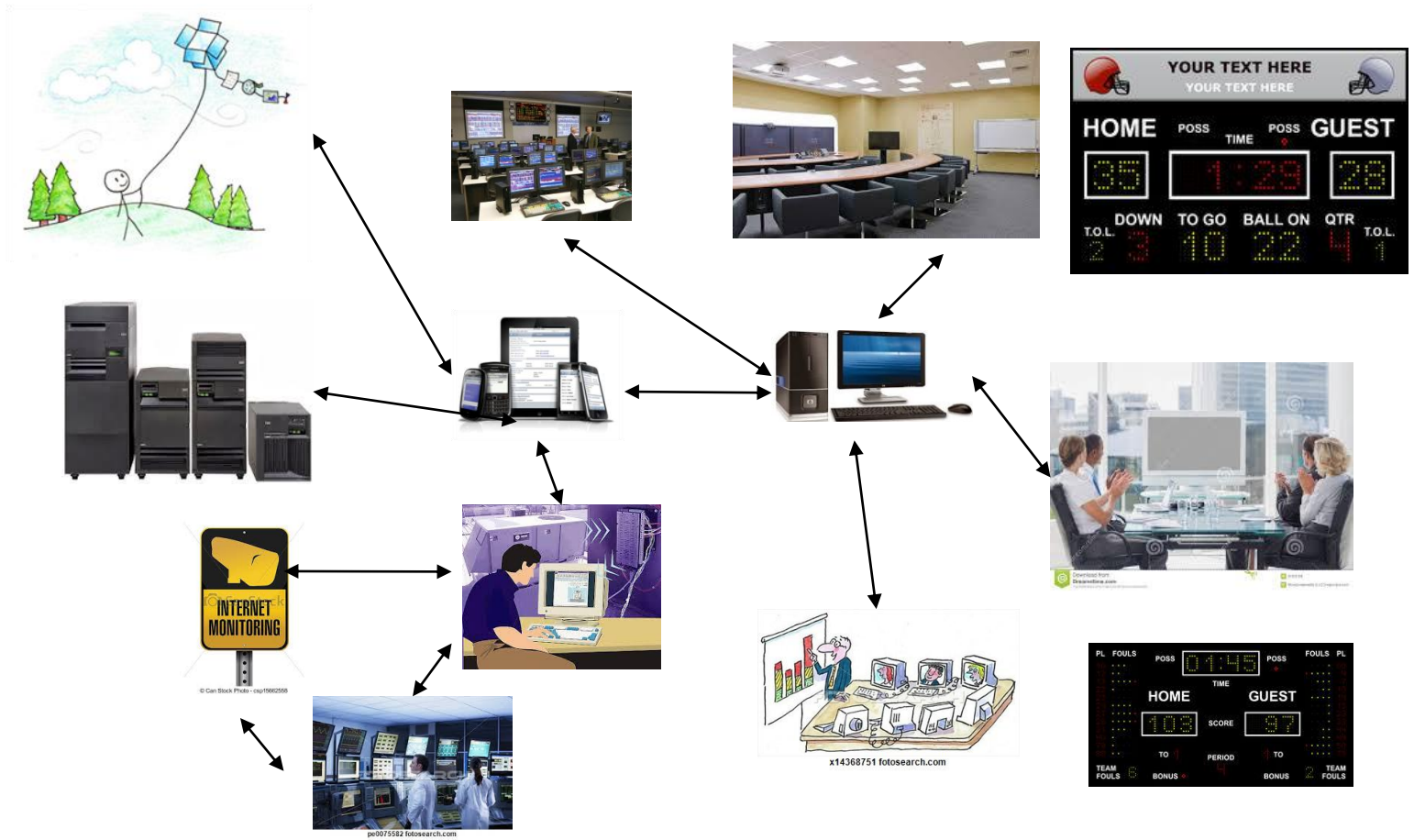
Designs and Prototypes

- explore design solutions by creating simple mock-ups of the proposed system and then later presenting them to a representative sample of users

- the initial design will be refined in light of user feedback

- the key goal is to

  - simulate the design solution(s) using paper or computer-based mock-ups

Avantages of Using Prototypes

- The activity fosters greater communication between the development team and end-users

- Simple prototypes also allow different design options to be explored prior to coding allowing future problems to be identified early on in the development process

Carry Out User-based Assessment of the System or Prototype

- help providing further information for refining the design
- is comprised of the following steps:
  - evaluation plan
  - data collection and analysis
  - reporting the results and recommendations for change
  - iterate this activity until design (and usability) objectives are met
  - tracking changes, maintenance and follow-up

User Involvement
Actor Network Theory

- Organizations: legal entities and constantly changing collections of people, objects, rules, ideas, strategies, legal representatives, and politics

- Actors achieve their significance by being in relation to other entities.

- The circumstances influence the user, and on the other side - the user creates the environment through his competencies

User Involvement
User Centric Management

- A philosophy and an approach to business management that puts users first in all decision making

- The companies are under the strong influence of users critique provided online, therefore they carefully analyze their website content and distribute only what is not harmful for them, and on the other side, they create a certain environment for users to increase their personal satisfaction and software usability

- The approach is to balance user goals, business goals and technical feasibility

User Involvement
Customer Knowledge Mngt

- processes that generate and integrate information about customers,

- processes of generating, disseminating and using customer knowledge within an organization and between an organization and its customers

- the formal and informal meetings and discussions among employees from different departments

User Involvement
User Experience Design

- Creation and synchronization of the elements that affect users' experience with a particular firm

- ISO 20101 User experience: person's perception and the responses resulting from the use of a product, system, or service

- Beccari & Oliveira user experience: emotions, beliefs, preferences, perceptions,

- Calvillo-Gamez et al. User experience both the process and the outcome of the interaction of a user with the ICT environment

User Persona

- Personas as fictitious characters created to represent the different user types, their goals and behaviours

- Personas helps to decide about product features, interactions and visual design

- User research to get information for a persona: contextual interviews, survey, focus groups, usability testing

User Persona

Features

Interaction

Visualization

Selection of the characteristics which are the most representative of the group and turn them into a persona

Persona Implementation Goal

- Guide developer for requirement engineering, system design, marketing team

- User research: contextual interviews, individual interviews, surveys (online), focus groups, usability testing

User Persona

- Finding the Users
  - Capture real user's data from ethnographic or other qualitative studies
- Building a Hypothesis
  - Identify the ways and context when the real user interact with the system
- Verification
  - Improve characteristics of Personas
- Finding Patterns
  - Try grouping candidates, breaking down a candidate into several, and finding new ones from the real user's data
- Constructing Personas
  - Define the physical features, the psyche and the behaviours for each candidate

User Persona

- Defining Situations
    - Identify the needs and situations, and relate them to the Personas
- Validation and Buy-in:
    - Socialize and ensure that all participants agree on the descriptions and the situations
- Creating Scenarios:
    - Describe what happens in a given situation, when a given Persona with certain needs uses the system
- Ongoing Development
    - Validate the Personas, needs, situations and scenarios each time when ne data about the users is captured

User Persona Characteristics

- Name and picture
- Demographics : age, education, ethnicity, language,
- Job title and major responsibilities
- Goals and tasks
- Environment (physical, social, technological)
- A quote that sums up what matters most to the persona

Distributed Cognition Theory

- focuses particularly on how information is propagated and transformed within the system to ensure collaboration.

- research considers how end users are informed of what is going on, e.g., through what they can see, what they can hear and what is accessible to them, how they use their environment to support their tasks, when, how and why information is transformed, which communication channels are useful and how important informal communication is [Sharp *et al.* 2012].

Distributed Cognition Theory

- Simply asking users what they want and how they use a system is complicated by the fact that users are often incapable of objectively describing their experiences with the business information system.

- Distributed cognition is also applied for agent system development, because it is concerned with how knowledge is propagated and transformed by agents within their activity system.
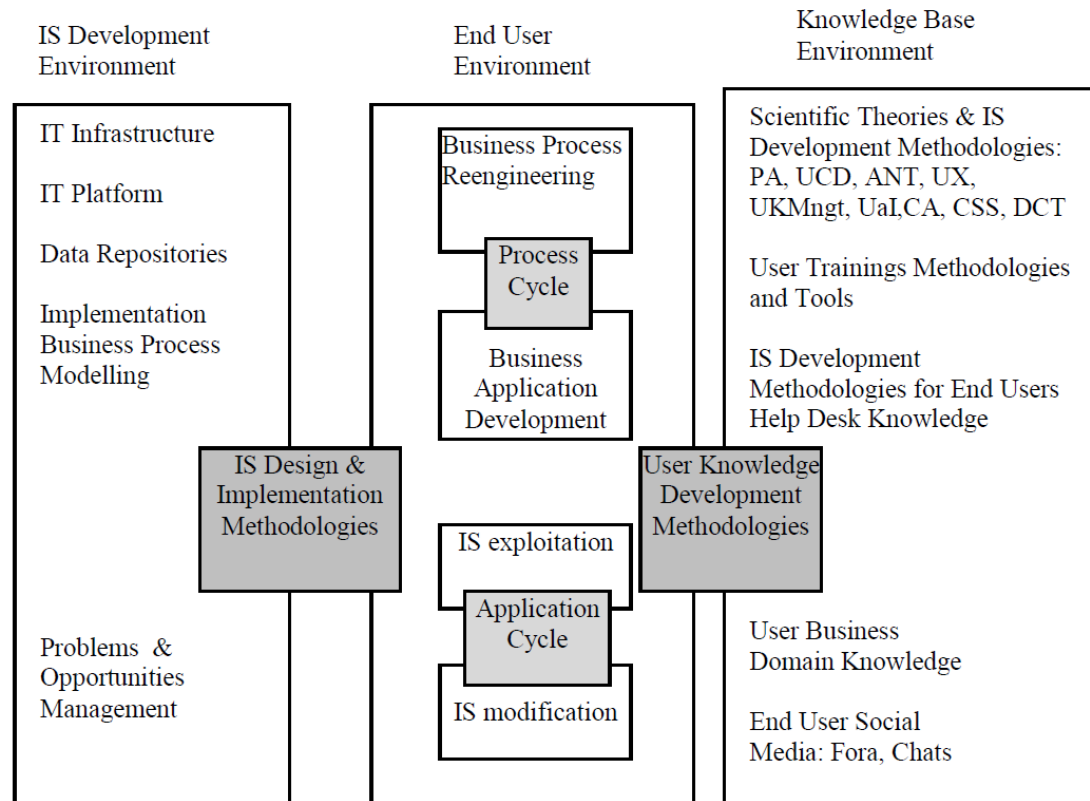
Distributed Cognition Theory

- An agent is any cognitive artifact of the system. Goals of agents, according to distributed cognition theory, are not merely maintained within the mind of a human or machine individual, but rather embedded within the whole system.

- Therefore the individual and shared contributions of agents, their collaboration strategies, communication protocols and languages, nature of agent behavior in the environment are needed for an agent technology system design.
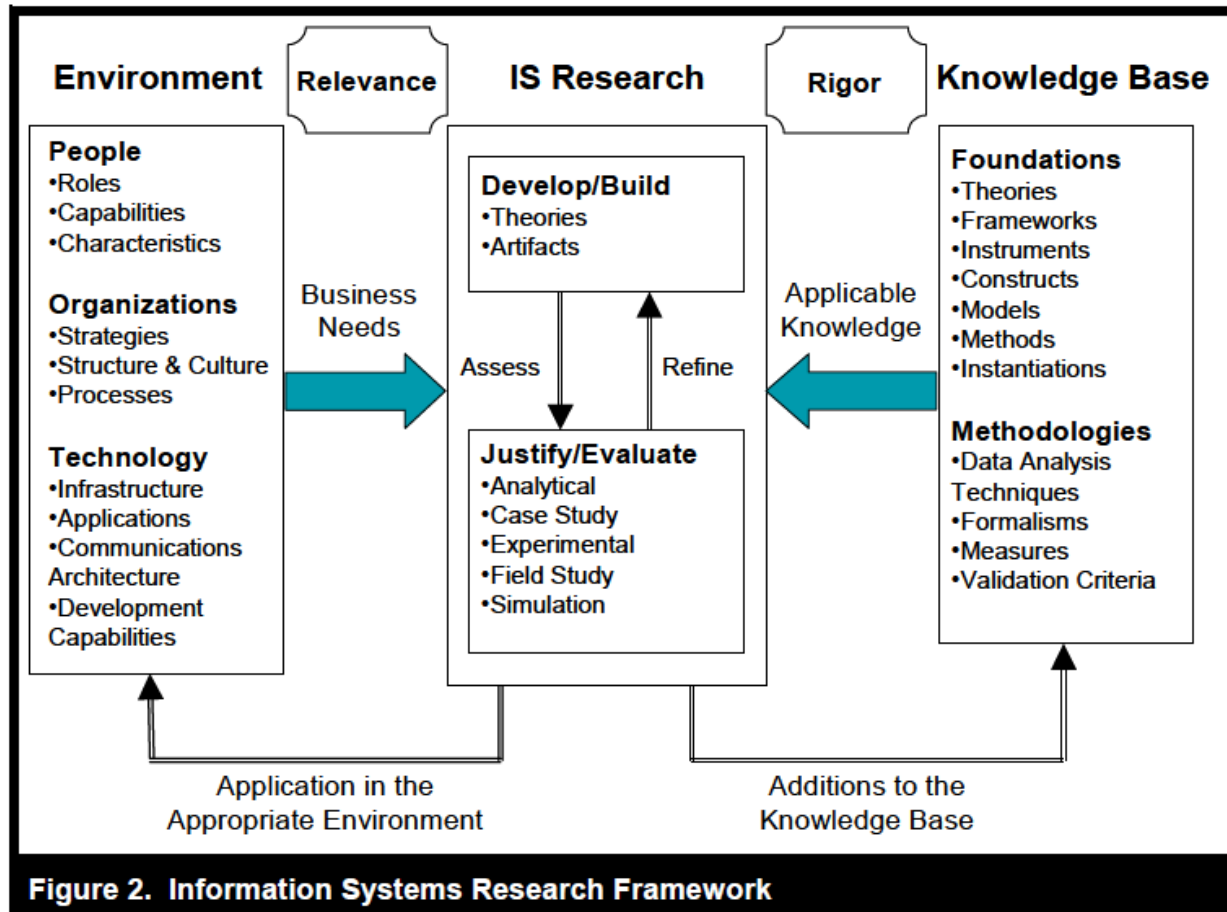
User Role in System Development

- Information Architect focused on creating the navigational framework and identifying the information items processed by the system,

- System Interaction Designer, modeling and creating the new forms of human-computer interactions,

- Business Researcher, able to propose the task improvement and business process reengineering,

- Application Tester

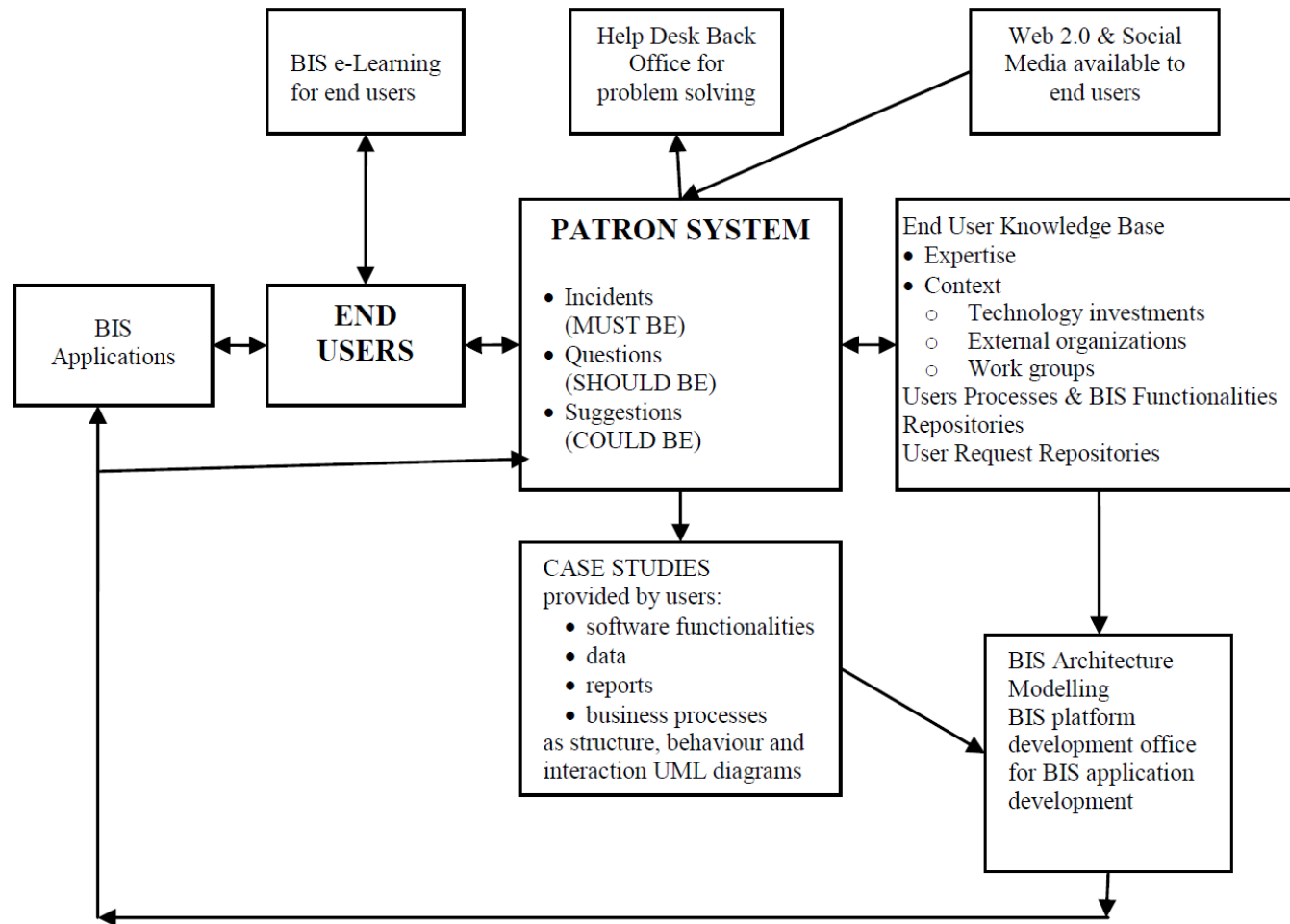# Framework of User Participation in System Development

IS Development Environment

- IT Infrastructure
- IT Platform
- Data Repositories
- Implementation Business Process Modelling
- Problems & Opportunities Management

IS Design & Implementation Methodologies

End User Environment

- Business Process Reengineering
- Process Cycle
- Business Application Development
- IS exploitation
- Application Cycle
- IS modification

User Knowledge Development Methodologies

Knowledge Base Environment

- Scientific Theories & IS Development Methodologies: PA, UCD, ANT, UX, UKMngt, UaI,CA, CSS, DCT
- User Trainings Methodologies and Tools
- IS Development Methodologies for End Users Help Desk Knowledge
- User Business Domain Knowledge
- End User Social Media: Fora, Chats

Framework of User Participation in System Development

Figure 2. Information Systems Research Framework

[Hevner A., Chatterjee S., Design Research in IS, 2010]

System Architecture for User Patron Relationship Management

BIS e-Learning for end users

Help Desk Back Office for problem solving

Web 2.0 & Social Media available to end users

PATRON SYSTEM
- Incidents (MUST BE)
- Questions (SHOULD BE)
- Suggestions (COULD BE)

BIS Applications

END USERS

End User Knowledge Base
- Expertise
- Context
  - Technology investments
  - External organizations
  - Work groups

Users Processes & BIS Functionalities Repositories
User Request Repositories

CASE STUDIES provided by users:
- software functionalities
- data
- reports
- business processes
as structure, behaviour and interaction UML diagrams

BIS Architecture Modelling
BIS platform development office for BIS application development

Reasons of Co-operation with Customers

- Speed of response and learning, reducing the time to market

- Partner fit and opportunity to select partners in the broader market

- Development of commitment and trust

- Development of alliances on mutual goals

Advantages of User Involvement

- Opportunity to reduce R&D costs & increase the probability of success
- Help to provide differentiated services, reduce the development time
- Opportunity to improve market acceptance and establish long-term relationships with customers
- Better understanding of customer needs
- Better understanding the technology by customers
- Customer education opportunities
- Reduce cycle time, rapid innovation diffusion, reduction of time to market
- User training support opportunities
- Improvement of enterprise image

Disadvantages of User Involvement

- Lost of internal business information
- Lost of internal knowledge and research results
- Customer as competitor
- Necessity to reward customers for their ideas and works
- From spontaneous contacts to development formal relationships
- Cost of security and contracts development

Web 2.0 prosumption

- iterative and non-linear practices of users and new media exploitation by them allowing them to be simultaneously producers and consumers in the act of creating, re-mixing and re-distributing media texts, content, information and knowledge in participatory Web cultures:

Web 2.0 prosumption

- Product configuration, mass customization (Dell);
- Product development, design, idea finding (Dell Idea Storm);
- Innovation and design contests (Starbucks Idea);
- Product rating (Amazon);
- Internet-mediated self-service (buying rail or airline tickets);
- Platforms for user-generated content or user activities (YouTube, eBay)

User in cloud computing architecture
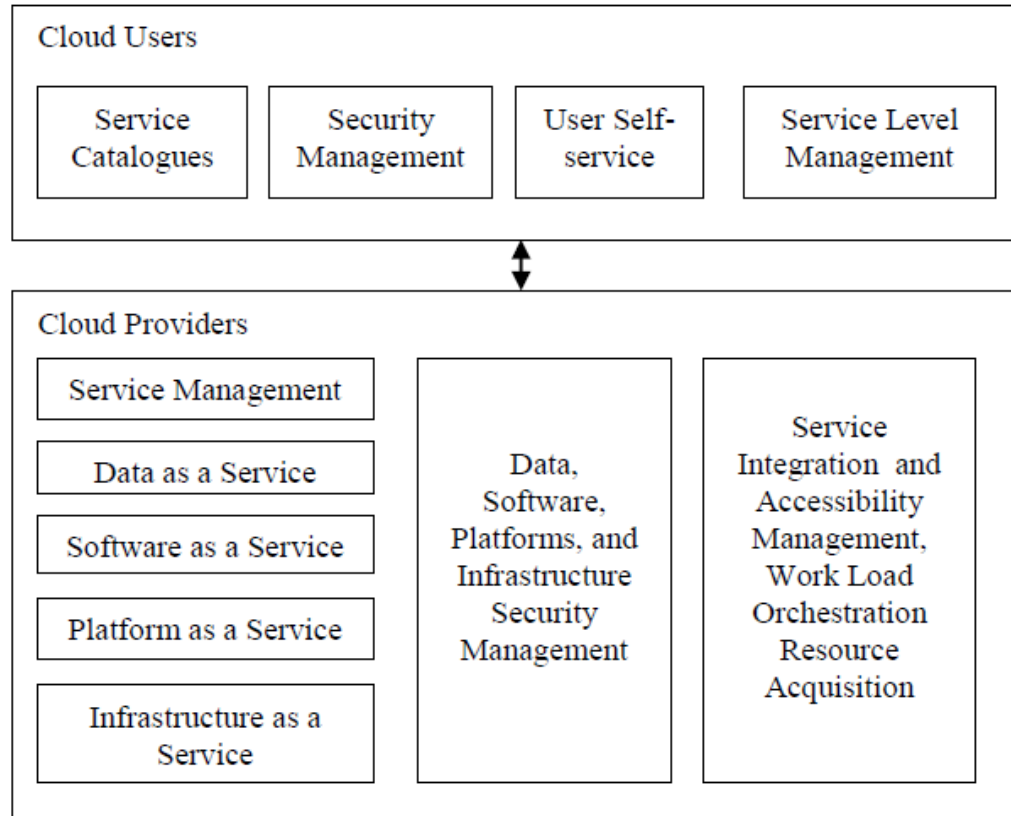
User in cloud computing

- In clouds, service mashups: information and services as building blocks of complex compos

- Dev 2.0:

  - platforms, that aim to bring user's participation into application development, much as Web 2.0 technologies, such as blogs and social networking

  - potential paradigm shift for development of small to medium enterprise applications

Other domains ????

- Agriculture
- Healthcare
- Education
- Electrical energy prosumption:
  - residential energy management system (REMS)
    - Green technology
    - Cost savings
    - Opportunity to re-sell the energy surplus

Examples

- Ikea sells its furniture, encourages the customers to arrange their own transport and assembling services
- BMW's M division offers customisation of the cars
- Samsung created a Virtual Product launch center to enroll customer's help in diffusion of new product information
- YouTube allows users to upload their own content and view other content generated by other users

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