



The Social Side of VGI

**A brief introduction to qualitative social science,
usability and motivation research**

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Volunteers: It's all about people!

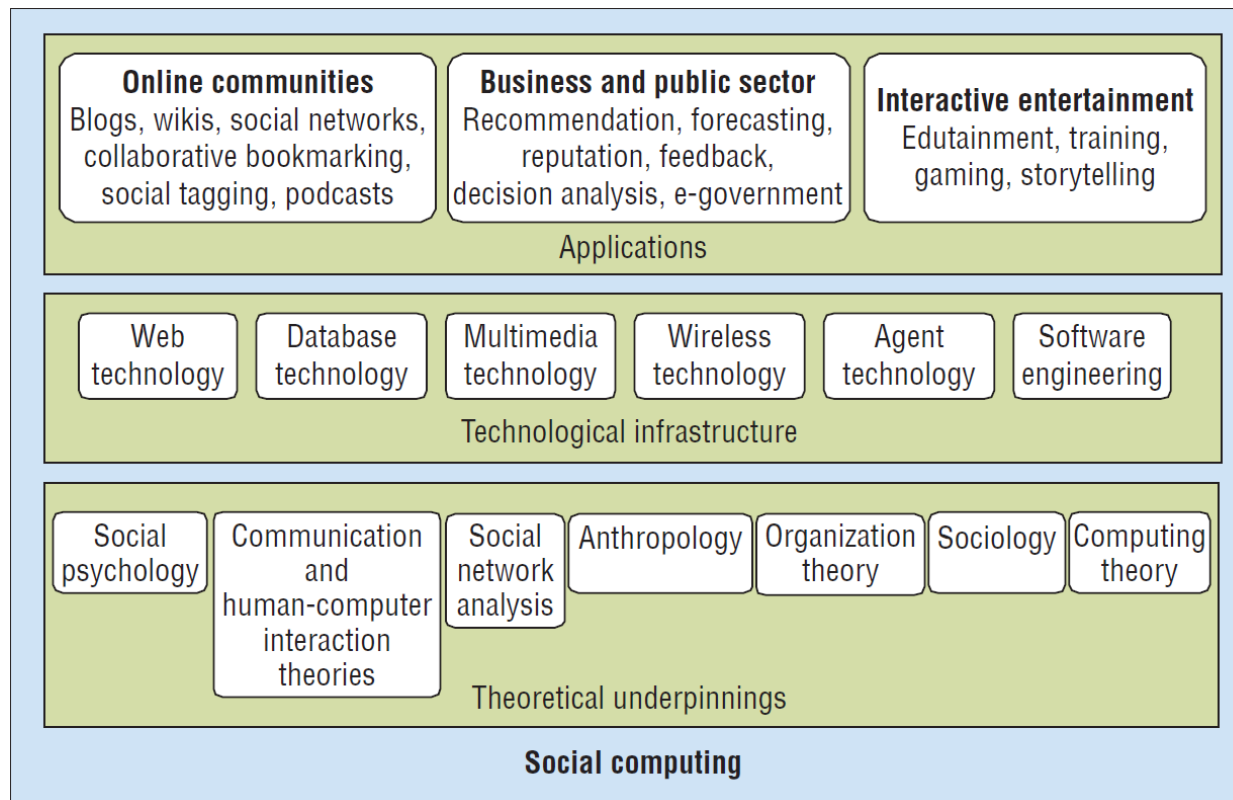


Wuppertal University, Response to Ebola Crisis

What is Social Computing?

- One possible definition
 - „Computational facilitation of social studies and human social dynamics as well as the design and use of ICT technologies that consider social context” (Wang et al. 2007)
- Research Areas
 - Mechanisms of (networked) interaction of people with computational systems
 - How to design systems to enable people
 - How and why people contribute user-generated content
 - Social interaction and underlying mechanisms in „social“ software usage
 - Ethical, legal and societal implications (ELSI), including data protection and data privacy

Social Computing – Systems Perspective



(Wang et al. 2007)

Some possible key questions for you as VGI researchers

I have all these fancy VGI system ideas, but

- Do I really need to interact with humans? I am only developing algorithms and using methodologies... and I love computers
- Who are my users / target groups (data providers, analysts, etc.)
- How can I extract relevant domain related (expert) knowledge
- How can I engage volunteers to use „my VGI system“?
- They still don't use my system... I don't understand why!

Overview

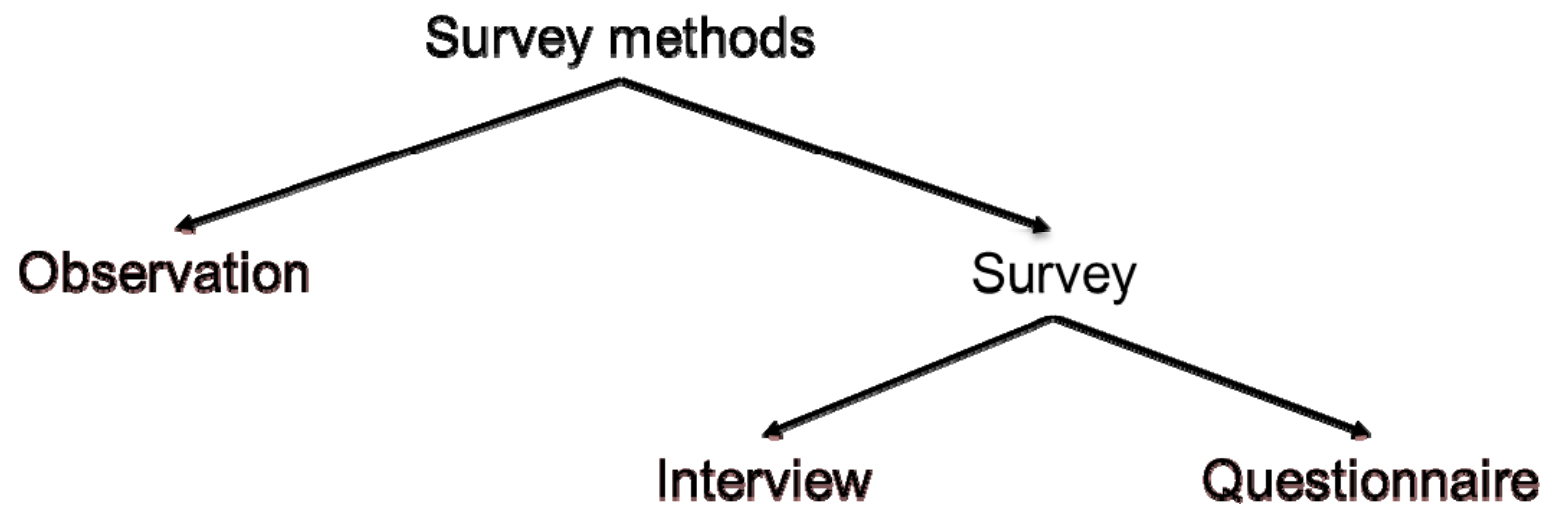
- Qualitative social science methods – How to interact with experts
- Usability testing as important design component
- Motivation and incentives for VGI systems



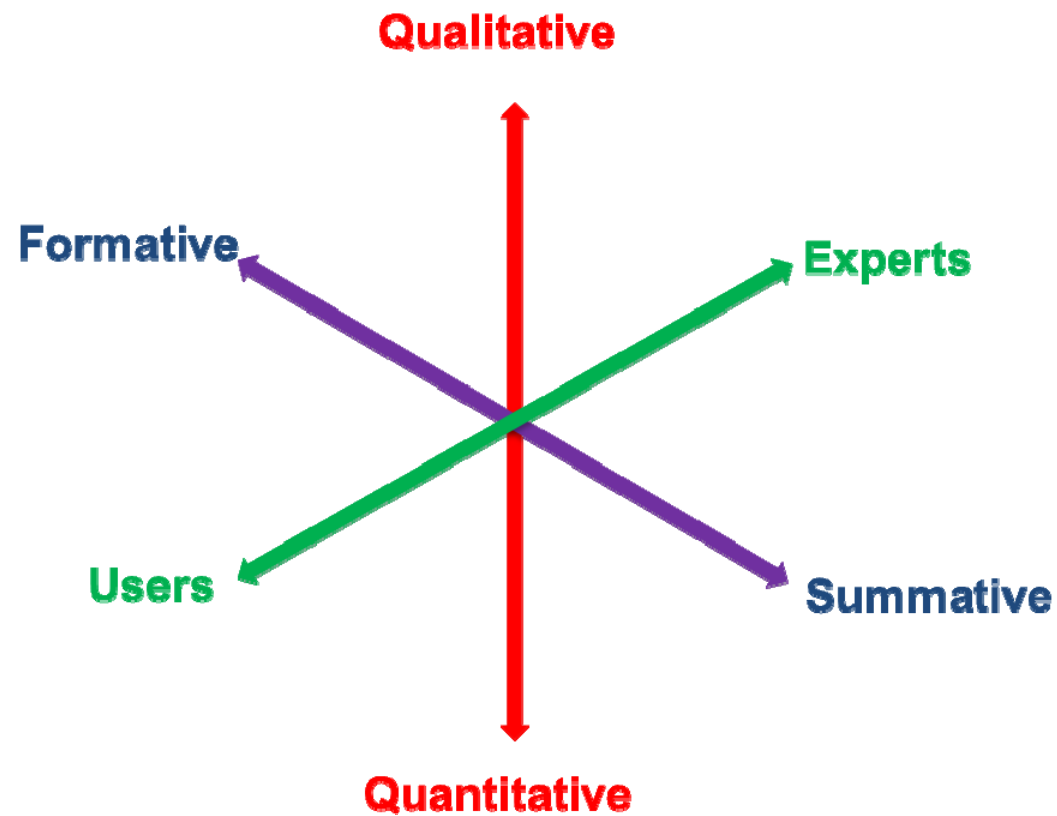
Qualitative Social Science Methods

How to interact with experts

I. Methods of Empirical Social Science – 3 Basic Survey Methods



I. Methods of Empirical Social Science – 3 Measurement Dimensions



I. Methods of Empirical Social Science – 3 Measurement Dimensions

Users ←  **Experts**

- Evaluation with users
 - Evaluation of the research object by way of observation or survey of actual users of the research object
- Expert evaluation
 - Evaluation of the research object by experts in the field
 - Check compliance with predefined criteria or guidelines
 - One or more experts possible

I. Methods of Empirical Social Science – 3 Measurement Dimensions

Formative Evaluation Summative Evaluation

- Evaluation in general
 - (a) Assessment, determination of a value, (b) Assessment of programs, measures, etc.
 - Target / performance comparison
- Formative Evaluation
 - Process-related. During the development of, for example, a project, the goal is to provide information on its improvement
- Summative Evaluation
 - Results-oriented. Summarizes the results of a program, a project, etc.
 - The goal is the final assessment

I. Methods of Empirical Social Science – 3 Measurement Dimensions

Qualitative ←→ Quantitative

- Qualitative research
 - Analysis of verbal (e.g., interviews) or visual data (e.g., video recordings)
 - Objective: detailed description of research object
 - Research object is often not sufficiently known
 - Frequently used in exploratory research studies
 - Time-consuming in execution and evaluation
 - Low generalizability
- Quantitative research
 - Analysis of numerical data
 - Objective: data acquisition and statistical evaluation
 - Research object is clearly defined
 - Less time-consuming in execution and evaluation
 - High generalizability

II. Differences between quantitative and qualitative sampling

| Quantitative Sample | Qualitative Sample |
|---|---|
| Large sample size | Small sample size |
| Random sampling | Deliberate sampling |
| Representative sample | Deliberate sample |
| Method: probability theory | Method: maximum variation |
| Objective: statistical representativeness | Objective: qualitative representativeness |

II. The Limits of Quantitative Science as a starting point

- Focus on the ideal of natural sciences accuracy → Development of quantitative research methods
 - Clear isolation of cause and effect
 - Measurability and quantifiability of phenomena
 - Predictability of measurement structures
- Objective measurability and descriptiveness of reality
- Use of standardized data → every day life aspects and prescientific experiences are ignored
- Orientation on natural sciences methodology: Isolation of processes, reproducibility of results hardly possible in the field of social science
- Today: Widespread qualitative procedures and boom of mixed-methods

II. Qualitative social sciences – Central principles

- Principle of the researchers openness
 - Towards studied persons, situations and methods
 - Towards unexpected information and circumstances
 - Character of exploration → rather generating hypothesis than testing hypothesis
- Principle of communication and interaction between researcher and subject
 - Reconstruction of the “native’s point of view”
 - Acceptance of different world views

II. Qualitative Social Sciences - Methods

- Visual procedures
 - Participatory observation / Ethnography
 - Photo- / Document analysis
- Verbal data
 - Interviews
 - Group discussions

II. Qualitative Social Sciences - Group discussion

- (+) mutual stimulation
- (+) contradictory statements
- (+) group interaction produces data
- (+) cost-effective but time-consuming
- (-) only limited number of questions possible
- (-) individual participants can dominate the group
- (-) lack of clarity when there are too many participants
- (-) harder to moderate
- (-) longer duration

II. Qualitative interview research

- “The” qualitative interview does not exist - different types and procedures
- The research object resp. the target group defines the method choice
- Different interview forms
 - Ethnographic interview: Reconstruction of alien (sub)cultures or (sub)cultural practices
 - Focused interview: Focus on a topic / incentive, e.g. movie, article
 - Narrative interview: Low degree of structuring, spontaneous request of narration (e.g. biography research)

II. Narrative interviews

- Often biographical issues
- Open request of narration or introductory question: "Please tell me how you have been raised in your childhood ..."
- The respondent holds a monologue while the interviewer restrains himself
- Further narrative questions only during the second interview phase
- Less structured, spontaneously, generally no guideline

III. Guideline interviews

- Middle structured (between narrative interview and closed questions)
 - Guarantees that special points are raised
 - Open enough for using the vis-à-vis' narrative potentials
- Great comparability with other interviews
- Condition: good knowledge of the object area
- Guideline should not be too long → set impulses
- No fixed scheme → flexibility
- Reminder → orientation framework

III: Expert interviews

- Version of the guideline interview, addresses a specific target group: Experts
- It is not about the expert as a “whole” person, it is just about him being a representative for the actions and opinions of special expert groups
- The expert interview focusses on the experts advanced knowledge he gained from his privileged position inside his operational context
- The guideline has a strong structuring and controlling function: Direct question about a specific topic
- Necessity of a broad previous knowledge to ask precise questions!

IV. Preparing an interview guideline

Wording of guideline questions (general principles)

- No ambiguity or misleading questions
- No multiple questions or question alternatives
- Simple wording: everyday language, no terminology
- Adapt the wording at the vis-à-vis' vocabulary

IV. Preparing an Interview Guideline

Requirements on the formulation of questions

- Avoid closed-ended questions („Has your childhood gone well?“)
- Avoid indication of expectations („You have been a young woman at that time, did you smoke?“)
- Avoid direct or suggestive questions („You must have had a lovely childhood, right?“)
- Avoid questions of shame or guilt (cultural competence of the interviewer needed!)
- Avoid emphatic comments („great“, „that’s interesting“)
- Exception: „mhm“, „yes“ → keep the conversation running

IV. Preparing an Interview Guideline

Requirements on the formulation of questions

- Avoid interpretations („If I have understood you correctly, you mean that ...)
- Avoid judgements or aggressive questions
- Avoid insisting questions („Were you as a child ..., or later, or how was that now?)
- Avoid close-ended inquiries for your own understanding („So you have felt badly treated as a child?“)
- Treat taboo topics with particular and rather at the end of the interview

IV. A method of guideline development (Helfferich 2011)

| | |
|---|--|
| 1 | In order to generate an interview guideline, it is sensible to collect a lot of questions in an open brainstorming session. [What am I interested in? What do I want to know?] > no “scissors in the head” when collecting questions! |
| 2 | If there is a large stock of many questions, the questions have to be examined for their suitability and all non-suitable ones should be deleted. [Are the questions appropriate, i.e. useful for my research object? What do I already know? Do the questions already indicate an answer? All factual questions will be presented after the interview.] |
| 3 | The remaining questions must be sorted both in terms of content as well as according to open narrative requests (Leading question: „Please tell me how you grew up?”), Maintaining questions (Impulse for further narrative flow: „How did it go on?” “What else do you think of it?”) and precise inquiries (regarding content not previously mentioned). |
| 4 | The examined and sorted questions must then be subsumed into the guide, i.e. they must be classified and subordinated. |

Example Interview Guideline (only question section here!)

Sample Interview Questions

Please note: These questions are to serve as a guide to help you consider how to ask questions in these different areas. These questions are not meant to be read or to be comprehensively covered in an initial interview with youth. You may want to start with a different set of questions to establish rapport with youth, and you may want to develop your own style and technique of discussing these topics. The goal of these interviews are to establish a rapport with youth, identify red flags for further investigation & research as well as patterns/trends, and to ask youth for their analysis and opinions on how they believe the system should be changed.

I. ESTABLISHING RAPPORT

- Tell me a little about yourself. If incarcerated, how did you end up here? Where are you from?
- When you were out, who was the most important person in your life? (a teacher, a mentor, someone you played sports with?) Do you know how I could call them?
- Before you were locked up, what did you do that made you most happy?

II. ADULT SYSTEM

PREPARING TO ENTER THE ADULT SYSTEM

- When did you first find out you were being treated and “tried” as an adult?
- Were you held in a juvenile detention or adult jail during your case? For how long?
- Did you know you were coming here, to this place?
- How did you feel about it?
- How did you prepare for coming here?

V. Options for the recruitment of interviewees

Appropriate interview partners have to be found. This can be very time-consuming.

- Snowballing: someone is addressed, who responds to others, who respond to others
- Gatekeeper: A “gatekeeper” is asked to find more suitable interview partners in his organization
- Targeted search: phone book, internet, advertisements
- Contacting: by telephone, writing / mail, verbally

VI. Conducting Expert Interviews

Beginner's mistakes

- Communication is dominated by frequent inquiries
- Too much hesitation
- Suggestive questions ("This certainly was exhausting for you?")
- Judging and commenting statements (even if they are meant to be supportive)
- Problems with passive listening, let them talk!
- Adhering to the guide, fearing to forget a question (need for memorizing the guideline!)

VI. Conducting Expert Interviews

- Basic tools
 - Interview guideline
 - Paper and pen
 - Recording device, also mobile phone (don't forget your power cord or spare batteries!)
- Recording of interviews
 - Focus on the interview
 - Evidence of scientific research
 - Get consent!!!
- Documentation of interview situation
 - Field journals and self-observation
 - Record your own impressions and emotions

VI. Informed consent sheet

- Should be in writing and be signed by the participant!
- Topics: Information about research and consent to participate
- Information section
 - People / research group conducting this research
 - Research project information
 - Expected duration of the interview
 - Possible risks and benefits
 - Information about how the data is used
 - Protection of personal data, confidentiality and anonymity
 - Information on duration of data storage

VI. Informed consent sheet

- Consent section
 - Understood the information
 - Must be able to discuss the provided information with the researcher
 - Participation is voluntary and free to withdraw
 - Possibility to decline specific questions without negative consequences
 - Provided information will be confidential
 - Publications will not allow the identification of the individuals
 - Grant research team access to the data
 - Data may be used for future research
 - Agree to participation

VI. Conducting Expert Interviews

Some helpful remarks

- Opening the interview:
 - Exercise the opening and introductory words
 - Exercise to operate the recorder
 - Make a friendly atmosphere, appreciate the willingness to participate, present the occasion and the course of the interview, present the topic (but not the research question!)

VI. Conducting Expert Interviews

Some helpful remarks

- Location:
 - Good acoustics, undisturbed attention, at the working place of the interviewee → at the same time, possibility for observation
- Duration:
 - About one hour, not more than 1.5 hours
 - Group discussions can also last > 3 hours
 - (time for transcription in proportion 1:10)

VII. Analysis

Transcription

- Are you interested in “what” your interviewee tells you or “how” he/she tells you?
- Rule of transcription: “Write down most of what you hear and as you hear it.”
 - Simple transcripts: omit paraverbal / nonverbal elements; “smoothen” dialect, etc. (probably “the choice” for VGI related research)
 - GAT (language-analysis-based transcription system): conversation analysis

VII. Analysis

Conversion analysis: detailed transcription

| | | |
|----|--------|--|
| 01 | Alex | ˘ NU:R <<acc>> was ich ˘FRAGen wollte is : : – > |
| 02 | Alex | ↑ ˘COOLio ä: : h <<all> ↓ was weiß ich → (.) |
| 03 | Alex | is=n ˘SCHWARzer ja, [aus] am ˘ERika ja; (.) |
| 04 | Kanen | [ja–] |
| 05 | Alex | un die ˘ONkelz sin: , |
| 05 | | (– –) |
| 07 | Nadine | . hh <<f> ˘DEUTsche.> |
| 08 | Alex | =deutsche die: ↑ ˘ZIEMlich |
| 09 | Alex | rechten ˘ROCK machen, |

VII. Analysis

Objectives of qualitative data analysis

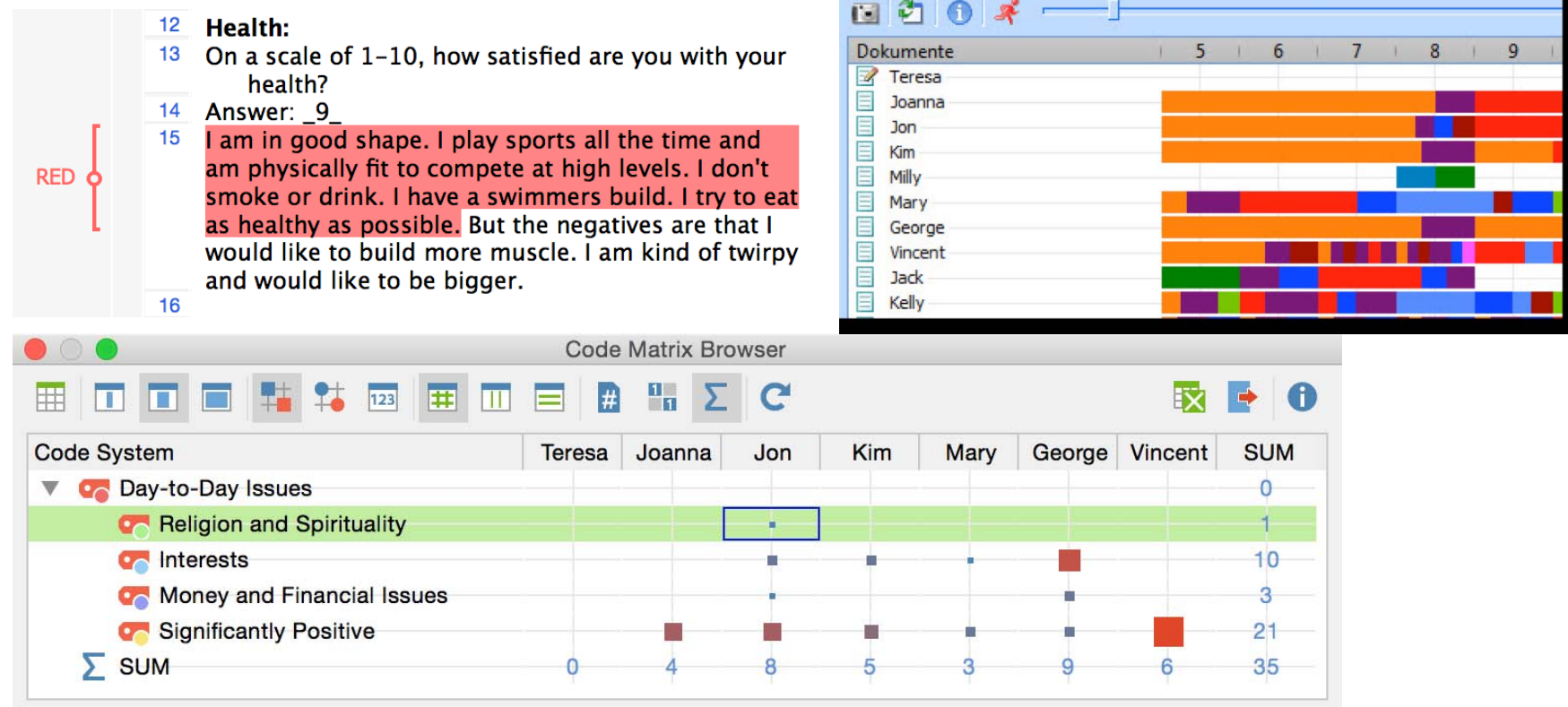
- Comparing the interviews for supra-individual, common stocks of knowledge → similarities (types) and differences
- Interpretation is based on thematic units, on content-related passages scattered over the text

VII. Analysis

Qualitative Content Analysis (Mayring 2010): Reduction of data material

- Clear structure, variety of rules, 3 techniques:
 - Summarizing content analysis: The data material is paraphrased, less relevant passages are deleted and similar ones are summarized
 - Explaining content analysis: For the clarification of difficult text passages, additional material is used (other texts, information outside the text)
 - Structuring content analysis: Search for types and formal structures in the data material (extraction of text material to summarize certain content areas, search for distinctive features)
- Software for qualitative data analysis: MaxQDA, Atlas.ti, etc.

Coding with MaxQDA



(All figures from the MaxQDA manual)

(Quantitative) Example: Twitter Data and MaxQDA

Daten von Twitter importieren

Twitter Login

[Mit Twitter verbinden](#)

Verbunden als: Nicht verbunden

☐ Der importierte Twitter-Inhalt darf weder für Werbezwecke noch für die Personenidentifikation genutzt werden. Mit dem Fortfahren akzeptiere ich diese Bedingungen.

Suchen

Alle diese Worte

Genau diese Phrase

Eins dieser Wörter

Keins dieser Wörter

Diese Hashtags

Von diesen Accounts

An diese Accounts

Erwähnte Accounts

Geschrieben in: Beliebige Sprache

Von: 11.08.2015

bis: 17.08.2015

☐ Retweets importieren

[Suchen](#) [Abbrechen](#)

Daten von Twitter importieren - Vorschau

| Datum/Uhrzeit | Tweet | Hash... | Autor | Rea... | User URL | User B... | Follow... | Follows | Tweets |
|------------------|---|----------|---------|---------|-----------------|-------------|-----------|---------|--------|
| 16.08.2015 19:57 | Leute dazu bringen, wirklich was gegen den Klim... | | mat... | Tord... | http://t.co/... | Ist dag... | 84 | 60 | 537 |
| 15.08.2015 07:08 | schneller und schlimmer als erwartet: der Klimaw... | | pasc... | Pete... | http://t.co/... | | 611 | 112 | 4130 |
| 14.08.2015 06:51 | http://t.co/PnpfTy6avj... http://t.co/BYRkNtdOj1 | | Busc... | Busc... | http://t.co/... | synerge... | 185 | 657 | 321 |
| 13.08.2015 12:17 | Die schlimmsten Vorhersagen treffen ein- der Kli... | | Taci... | Sabi... | http://t.co/... | http://t... | 60 | 197 | 6147 |
| 13.08.2015 06:34 | Die schlimmsten Vorhersagen treffen ein- der Kli... | | ge_... | Peter | | | 202 | 581 | 7609 |
| 12.08.2015 15:40 | Wupp Wupp It's getting hot in here ... So ta... | | aure... | aure... | https://t.co... | | 93 | 861 | 2297 |
| 12.08.2015 14:26 | "UND SIE VERÄNDERT SICH DOCH" EIN WAND... | | Prof... | Wolf... | http://t.co/... | | 21 | 5 | 1828 |
| 12.08.2015 13:05 | Netzfrauen: Die schlimmsten Vorhersagen treffen... | Gesun... | _Ges... | Gesu... | | Für ein ... | 641 | 513 | 7174 |
| 12.08.2015 12:47 | Bitte lesen DAS IST SO WICHTIG!!!!!! Woher ko... | | Don... | Clau... | | Wenn d... | 13485 | 14230 | 24122 |
| 12.08.2015 12:37 | Die schlimmsten Vorhersagen treffen ein- der #K... | Klima... | netz... | netz... | http://t.co/... | Was ei... | 2378 | 815 | 8607 |
| 11.08.2015 09:05 | Berlin will have Mediterranean climate in 2055, c... | | pash... | Pash... | http://t.co/... | #Film, ... | 2449 | 96 | 6540 |

11 Tweets

[Daten importieren](#) [Abbrechen](#)

(All figures from the MaxQDA manual)



Usability testing as important design component

I. The Use of Usability

- In general
 - Easy to learn software applications
 - Low error rate when using
 - Less complaints
 - Reduced training costs
 - Increasing user acceptance
 - Customer loyalty and recommendations
- High relevance when you rely on voluntary use of your software application: Most people don't complain – they just quit

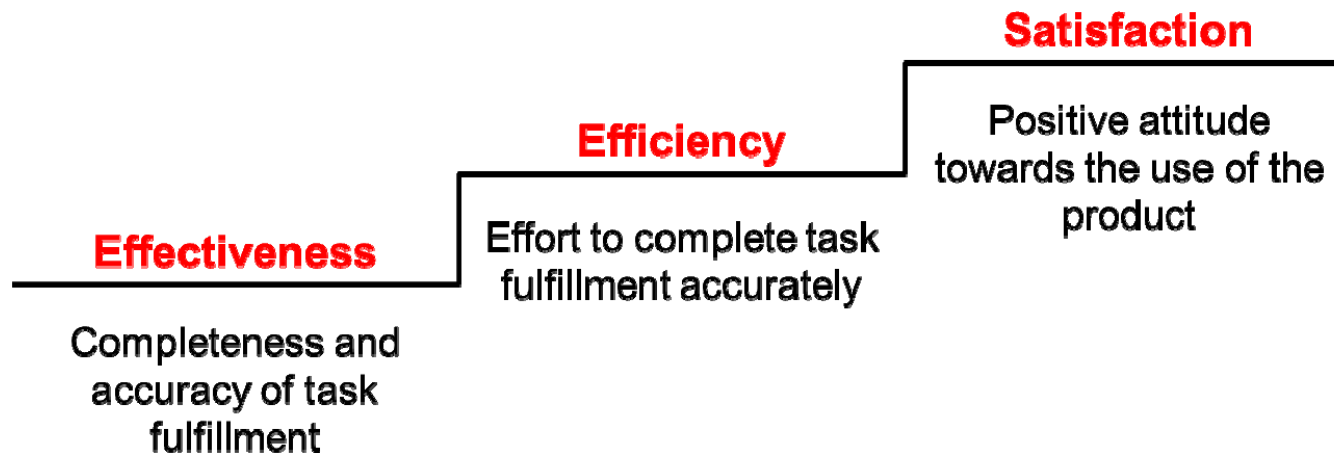
I. The Use of Usability – The Business Case

- In numbers
 - If 10% of the conceptual and development costs of a re-design project are invested in usability analysis and consulting, the success rate of an application increases by an average of 83% (Nielsen 2010)
 - Success indicators: Conversion Rate (Visitors > customers), Traffic Numbers (number of visitors), User Performance (number of clicks, time needed), Target Feature Usage (number of persons who click on important links)

II. Usability

The extent to which a product can be used by certain users, in a particular context, to achieve certain objectives effectively, efficiently and satisfactorily.

→ Hierarchical concept: If effectiveness is not given, efficiency is not achievable.



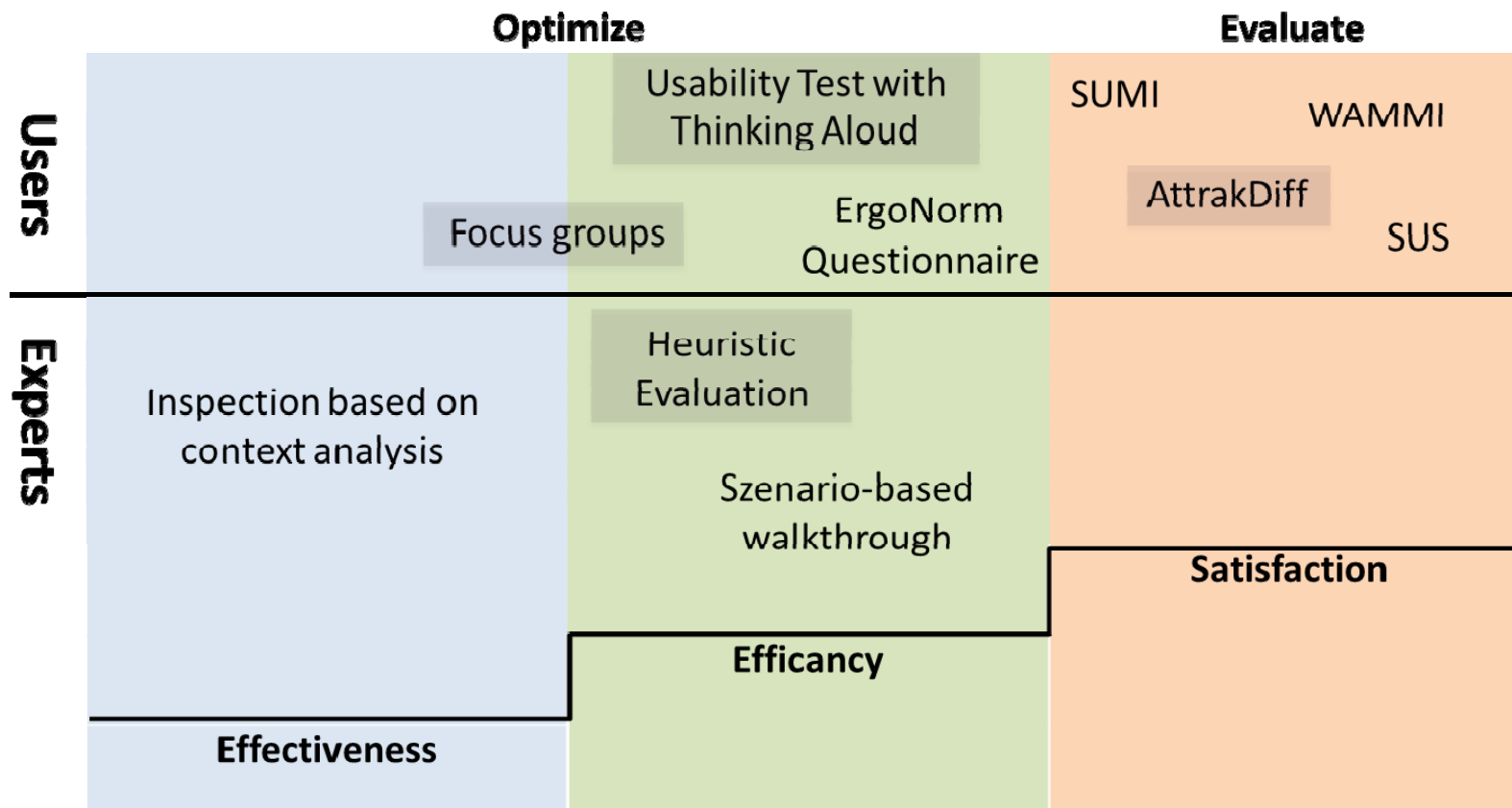
III. Usability Metrics

- Effectiveness:
 - Completeness and accuracy of task fulfillment
 - Metric: All results achieved correctly (yes / no)?
- Efficiency:
 - Effort to complete task fulfillment accurately
 - Metric: Working hours, material, problems of usage
- Satisfaction:
 - Freedom from disturbances and positive attitude towards the use of the product.
 - Metric: Subjective assessment on a scale, willingness to recommend the product; frequency of use

IV. Principles (ISO 9241-110)

- Principles governing the design of software dialogue, as formulated in ISO 9241, part 110 (Ergonomics of human-system interaction)
- Suitability for the task: Easy and direct to the goal
- Self-descriptiveness: When intuition is sufficient
- Controllability: When everything is under control
- Conformable with expectations: When it becomes a habit
- Error tolerance: When unpleasant surprises do not happen
- Individualisation: When everyone works the way he / she needs it
- Learning support: When you get smarter

V. User-Centred Design – Usability Testing



V. User-Centred Design – Usability Testing

Heuristic Evaluation (Jakob Nielsen)

- Several usability experts separately inspect a system according to 10 usability thumb rules (“heuristics”)
- 5 experts find 75% of all usability problems (empirical result)
- Cost effective and effective
- Can be used in the early stages of product development
- Not suitable to identify all usability problems
- No replacement, but useful supplement to usability test

V. User-Centred Design – Usability Testing

Focus groups

- Users discuss draft designs and design themselves
- Main benefits:
 - Testing a product idea
 - Identification of preferences, wishes, dislikes
 - Validation of requirements
- Ideal number of users: 5-9 (empirical value)
- Users must form a homogeneous group

V. User-Centred Design – Usability Testing

Thinking aloud and participatory observation

- In the field or in the lab (if information about the field already exists)
- User will perform typical test tasks on the system
- Usability Engineer prompts users to verbalize their thoughts in task processing (Thinking Aloud: Why-questions)
- For each critical usage situation, a check is made as to whether this is a problem regarding the dialog principles
- Thinking Aloud helps to illuminate the causes

V. User-Centred Design – Usability Testing

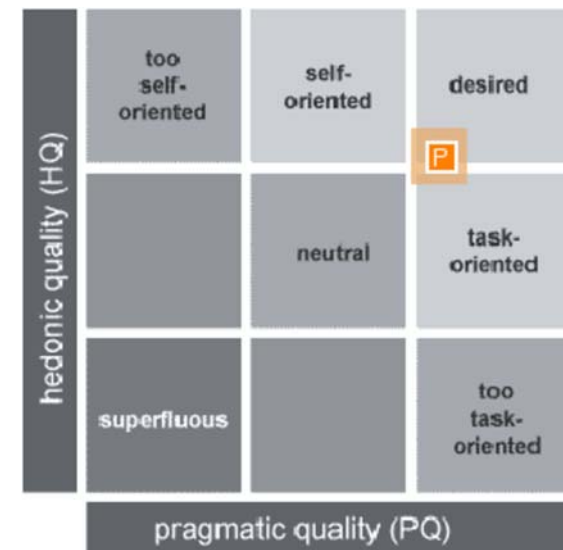
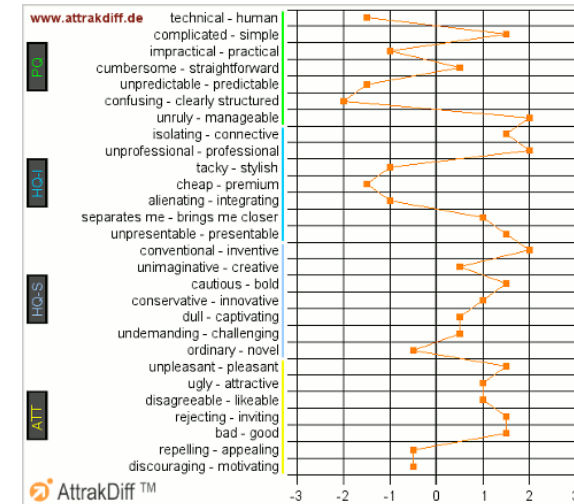
Thinking aloud and participatory observation

| Critical usage situation | Dialogue principle (ISO 9241-110) | Design recommendation |
|--|--|--|
| Mrs. Smith is annoyed. She enters a password with 3 characters when registering. Her mobile phone gives her an error message that the password must have at least 8 characters. She has to create a new password and enter it. | Self-descriptiveness: The user must be able to recognize the minimum length of the required password directly on the system. | The field for password entry should be labeled with “at least 8 characters”. |

V. User-Centred Design – Usability Testing

Quantitative Questionnaires: AttrakDiff

- Free of charge: <http://www.attrakdiff.de>
- Pre- / Post-measurements
- Comparative and individual measurements
- Subjective perception of the usability and attractiveness of an interactive product
- Measures usability (pragmatic quality - PQ) and joy of use (hedonic quality - HQ)



(All figures from the AttrakDiff web site)



Motivation and Incentives for VGI Systems

I. Definition of motivation

Lat. movere = move

Definition:

Motivation is understood as a total of motives and influences, which affect actions or decisions and encourage a certain behaviour.

Distinction in:

1. Intrinsic: interest, curiosity or value driven
2. Extrinsic: driven by external influences like rewards, surveillance or social assessment

II. Volunteer Functions Inventory - VFI (Clary et al. 1998)

- Why do significant numbers of people engage in the unpaid helping activities known as volunteerism?
 - Drawing on functional theorizing about the reasons, purposes, and motivations underlying human behavior, Clary identified six personal and social functions potentially served by volunteering.
1. Protective Motives – the individual uses volunteering to reduce negative feelings, such as guilt, or to address personal problems
 2. Values – the person is volunteering in order to express or act on important values, such as humanitarianism and helping the less fortunate
 3. Career - the volunteer has the goal of gaining career-related experience through volunteering

II. Volunteer Functions Inventory - VFI (Clary et al. 1998)

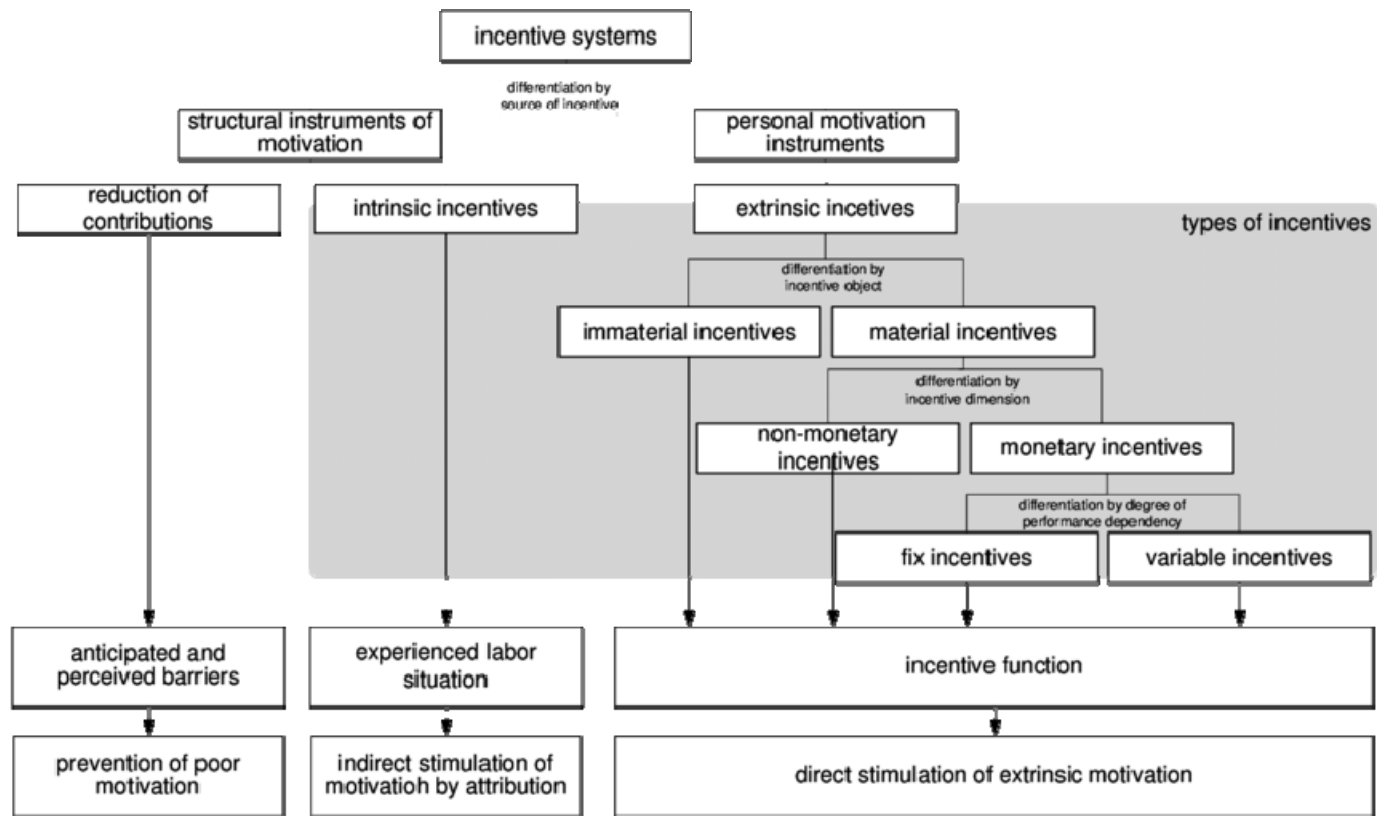
4. Social – volunteering allows the person to strengthen one's social relationships
5. Understanding – the volunteer is seeking to learn more about the world and/or exercise skills that are often unused
6. Enhancement – the individual is seeking to grow and develop psychologically through involvement in volunteering

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Volunteering can help me to get my foot in the door at a place where I would like to work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. My friends volunteer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am concerned about those less fortunate than myself. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. People I'm close to want me to volunteer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Volunteering makes me feel important. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. People I know share an interest in community service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

III. Incentive Systems – The other side of the coin

- Incentive systems are discussed from different perspectives, often in the context of economics
- Incentives are instruments to influencing the behavior of the members of an organization in order to adapt to the organization wide system of objectives (Hormel & Hunert 2017)
- The goal of incentive systems is to motivate the employees to increase their performance by means of a target group-oriented grant of incentive components. (tight correlation motivation <-> incentives)
- Several types of incentives can be differentiated. Best known is the differentiation into intrinsic and extrinsic (Grob et al. 2007)

IV. Incentive Systems – Overview (Grob et al. 2007)



Gamification as Incentive

- Gamification is a concept, which uses elements from digital games in non-game applications (Simões et al. 2013)
- Effective content design is crucial to the success of digital gamebased learning (Hong et al. 2009)
- The gamification model, integrated into educational applications and processes, may include badges, showing different levels of achievement, leaderboards, progress bars and meters, points and other rewards that can be earned (Su et al. 2015)
- Goals of VGI systems determine whether and which gamification approach makes sense

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