Quantification of user experience

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Summary
The course will deliver all the conceptual and technical resources required for managing a user-centered design process that depends more and more on sophisticated quantification methods.

Content
User experience is the target and the resource of the digital economy: provide new valuable experience, get the feedback from traces and tests, trigger the contribution from online communities and reinvent the product, the service, the content. Digital Humanities provide new attractive user experiences. They also design the sensors, the traces, the tests, the metrics and the concepts for understanding user’s behavior. The course will deliver all the conceptual and technical resources required for managing a user-centered design process that depends more and more on sophisticated quantification methods.

Content:
Session 1 “Cognitive dimensions of UX”:
Perception, cognitive bias, gestalt and attention
• Perception and its biases: Illusions, Cue Conflict and Perceptual Distortion, Memory
• System 1 / System 2 (Kahneman)
• Salience, Differential cognition
• Gestalt theory: principles and laws (Wertheimer)
• Distributed cognition approach (Hutchins)
• Attention (Simon, Goldhaber, Kessous, Citton): features, media, dimensions (Ribot), regimes (Boullier), economy and metrics

Session 2 “Semiotics dimensions of UX”:
Graphic semiology, maps, and narratology
• Graphic semiology (Bertin)
• Dynamic maps, GIS, folkmapping, GPS, geolocation
Spatialization of personal experience (Levy)

Structural semiotics. The 3 axes of the actantial model (Greimas)

The foundations of story theory (Propp)

Narratology (Genette)

Interpretative or textual cooperation (Eco)

Transtextuality (Barthes)

Session 3 “Design processes”:
Design strategies and UX

Five generations of industrial innovation models: The networking model (Von Hippel, Cardon, Anderson)

User modeling: Different kinds of design (Norman, Hassenzahl, Tufte, Pine & Gilmore). Differentiate (and combine) interface design, interaction design, information design, experience design

User-centered design: contextual design and design thinking (Brown, Faste). From prototyping to prototyping & agile methods

Session 4 “Feedback of UX”:
Psychometrics and tests

Mechanical Turk methods for testing

Usability testing, calculation criteria and methods: First click testing, card sorting, focus groups, ethnography

Psychometrics methods and metrics. Individual testing of cognitive activity: eye-tracking and other body sensors.

Subjective evaluation. Principles, techniques, Lutin gamelab modeling (case study)

Session 5 “Quantification in Social Sciences”:
Big Data in quantification history (statistics, surveys, polls and social listening):

History of Quantification (Desrosières), premodern history, probability (Hacking), the average man (Quételet). Modern era of quantification – the three generations 3G (Boullier)

Replications, memetics and propagation analysis (Leskovec and Kleinberg, Bauckhage, Lehman et al.). Two-step flow (Katz and Lazarsfeld) and influence

Session 6 “Audience theories, marketing and methods”:
Machine learning, a new era

Conceptual and social models (Domingos)
Audience history and metrics for mass media. From public to audience (Park, Tarde), The phantom public (Lippmann), From metrics to Opinion (Gallup’s method, Lazarsfeld), audience ratings, mediation

- Behavioural features. Statistical Audience and ML audience. Traceability (AdWords case study)

Session 7 “History of cognitive technologies and innovations”:
Historical landmarks in cognitive technologies

- Writing (Goody) history, lists and coding, tables, dashboards, formulas, computational reason (Bachimont)
- Printing (Eisenstein), manipulate, invention and reinvention, looking, writing and reading digital
- From perspective to immersion (Panofsky and Alpers), analytical space, thinking perspective, social immersive practices

Session 8 “History of cognitive technologies and innovations”:
History and sociology of innovations (related to content industry and UX)

- ANT, Theory of translation (Callon, Latour, Law) and diffusion (E. Rogers), The socio-technical graph (Pinch and Bijker), types of innovations, creative destruction (Schumpeter). Telecoms, computer interfaces, internet, photography, music. Technical evolution and business models
- Business models for innovation. The Long Tail (Anderson), Wikinomics, the age of access (Rifkin), The Wealth of Networks (Benkler), Free open source software

Session 9 “Cultural differences in user experience”:
A primer on anthropology and theories of representation

- The patterns of social space and life-styles (Bourdieu)
- Four ontologies (Descola)
- A non-modern anthropology (Latour)
- Sociolinguistic diversity, digital writing
- Smartphone experience around the world: universal device?, habîtèle theory (Boullier)
- Translation and automatization
- Culturonomics (Manovich)

Session 10 “Cultural differences in user experience”:
Diffusion and appropriation of innovations

- Diffusion models. Theory of diffusion (E. Rogers)
- Socialization, a concept: « habitus » (Bourdieu), Primary and Secondary Socialization processes (Berger and Luckman, Mead). Generation gap.
Reinvention beyond needs: desire (Freud, Lacan), demands and consumption, towards a theory of appropriation

Session 11 “Social network analysis and web topologies”:
Methods
- Egonetworks (Barnes)
- Structural network analysis: economic sociology approach “Social Embeddedness” (Polanyi), The strength of weak ties (Granovetter), closed networks and strong ties (Coleman), Six Degrees of Separation (Milgram), Universal small world model (Watts and Strogatz), A Network Threshold Model (Burt), The tipping point (Gladwell)
- Sociology of organizations: strategic analysis (Crozier & Friedberg)
- Social networks topologies (Euler), Hub scores and authority scores (Kleinberg)
- Community management: theory and techniques
- Quantified-self and other communities

Session 12 “Collective engagement in UX”:
Online social networks
- Social listening: an example, Linkfluence (Radarly)
- Metrics on social networks, benchmarking, reach, engagement
- Analyzing content and topics: wikipedia, sentiment analysis (Boullier et Lohard, H. C. Anderson), NLP, from sourcing to dashboards, targeting features, conceptual definitions and experts

Session 13: Methodological notes and discussion, students present their project
Session 14: General discussion, students present their project

Keywords
quantification; networks; social sciences; opinion; digital architectures; digital methods; traces; memetics; attention economy; smart city.

Learning Prerequisites
Required courses
None

Recommended courses
None

Important concepts to start the course
Attention, appropriation, public

Learning Outcomes
By the end of the course, the student must be able to:
Create a user model
• Make a user model by combining data sources
• Design usability tests protocols
• Plan content evolution
• Develop specific metrics
• Elaborate the relevant interpretation of the results

Transversal skills
• Use a work methodology appropriate to the task.
• Give feedback (critique) in an appropriate fashion.
• Take account of the social and human dimensions of the engineering profession.
• Demonstrate the capacity for critical thinking
• Summarize an article or a technical report.

Teaching methods
Highly interactive course including readings and reports, debates, design of methods for small projects.

Expected student activities
Readings every week, documentation for case studies, debates during the sessions, small project in teams of 2.

Assessment methods
- 40% Final Individual report in the form of an essay about one specific method (20 pages and a technical summary)
- 20% Reading report and presentation
- 40% Final Project in teams of two.

Supervision
Office hours Yes
Assistants Yes
Forum Yes

Resources
Bibliography
Press.

**Websites**
- https://sites.google.com/site/dominiqueboullier/
- https://shs3g.hypotheses.org/

**Videos**
- https://www.youtube.com/watch?v=gfsvSdf8SYw