



Università degli Studi di Cagliari  
Dipartimento di Matematica e Informatica

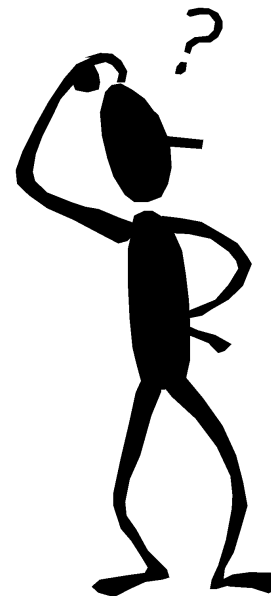
A photograph of a classical building with arches and columns, overlaid with a semi-transparent red rectangle.

# Interaction Design

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# Sommario

- Quali fattori sono coinvolti nel design dell'interazione?
  - Importanza di coinvolgere gli utenti
  - Grado di coinvolgimento degli utenti
  - Cosa è un approccio incentrato sugli utenti?
  - Quattro attività di base
- Qualche considerazione pratica
  - Chi sono gli utenti
  - Quali sono i loro bisogni?
  - Da dove vengono fuori le alternative?
  - Come si può scegliere tra le alternative?



# Fattori dell'interaction design

- È un processo
  - Un'attività guidata da un obiettivo, influenzata dall'utilizzo che si intende fare dell'applicazione, il dominio applicativo, materiali, costi e fattibilità
  - È un'attività creative
  - È necessario un bilanciamento tra diversi trade-off
- Quattro approcci principali:
  - **User-centered design:** l'utente è la guida, il designer progetta una soluzione in base ai suoi *bisogni*
  - **Activity-centered design:** si focalizza sul *comportamento* per l'esecuzione di un task.
  - **System design:** progettazione rigorosa di un sistema che deve risolvere un problema preciso
  - **Genius design:** utilizza solo l'esperienza del designer

# L'importanza di coinvolgere gli utenti

- Gestione delle aspettative
  - Realistiche
  - Nessuna sorpresa, nessuna delusione
  - Apprendimento tempestivo
  - Comunicazione, ma non “vendita di fumo”
- Proprietà
  - Rendere gli utenti delle parti attive nel processo
  - È più probabile che capiscano/accettino i problemi
  - Può essere cruciale per fare in modo che il prodotto venga accettato

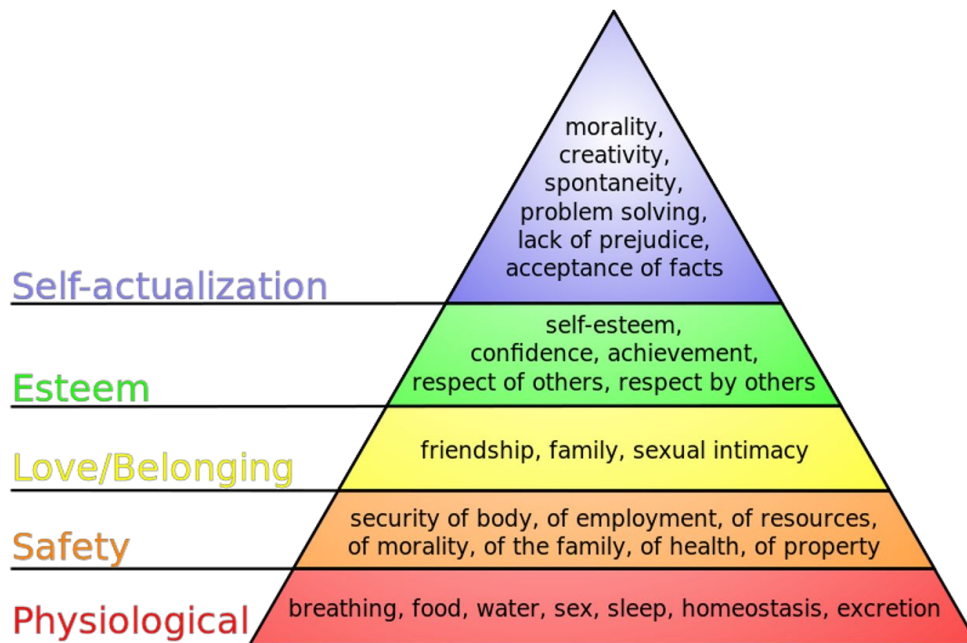
# Cosa è un approccio user-centered?

- Un approccio user-centered ha le seguenti caratteristiche:
- Concentrazione sui task dalle prime fasi dello sviluppo: studio delle caratteristiche cognitive, comportamentali e attitudinali
- Misurazione empirica
  - Prestazioni degli utenti in scenari applicativi
  - Una volta che il prodotto è finito
  - Registrazione delle interazioni
- Design iterativo: quando qualche problema viene rilevato durante un test utente, risolverlo e fare altri test

# Che cosa si intende per bisogni?

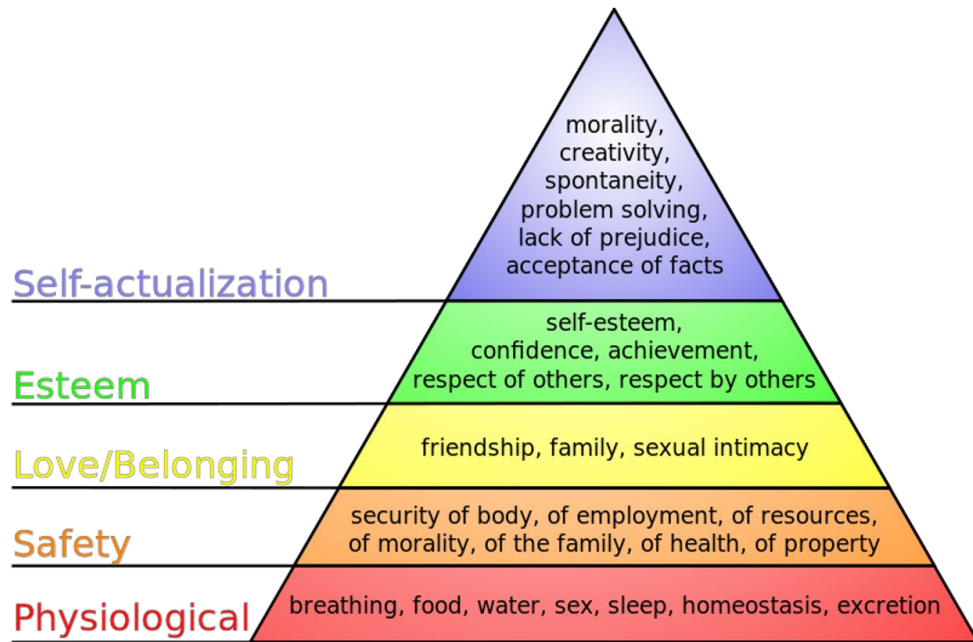
- Gli utenti raramente sanno cosa sia possibile
  - E di conseguenza anche cosa non lo sia
- Gli utenti non possono dirvi cosa sia necessario per aiutarli a raggiungere un certo obiettivo
- Si può però concentrarsi sui task esistenti:
  - Il loro contesto
  - Di che tipo di informazioni abbiano bisogno
  - Chi collabora attivamente all'attività
  - Perché l'obiettivo è raggiunto nel modo corrente
- I compiti previsti per l'applicazione
  - Possono essere radicati sul comportamento corrente
  - Possono essere descritti come scenari futuri

# Gerarchia dei bisogni di Maslow's



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[https://commons.wikimedia.org/wiki/File:Maslow%27s\\_hierarchy\\_of\\_needs.svg](https://commons.wikimedia.org/wiki/File:Maslow%27s_hierarchy_of_needs.svg)

## Esercizio: Posizionate le seguenti app

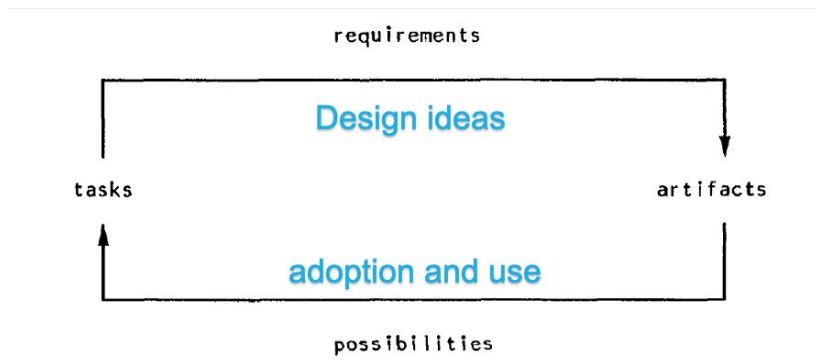


1. Instagram
2. Google Maps
3. Tinder

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[https://commons.wikimedia.org/wiki/File:Maslow%27s\\_hierarchy\\_of\\_needs.svg](https://commons.wikimedia.org/wiki/File:Maslow%27s_hierarchy_of_needs.svg)

# Ciclo Task-Artifact di Carrol (1990)

- Le persone hanno bisogni e preferenze
- Le tecnologie vengono create per soddisfarli
- Nel momento in cui le persone usano le tecnologie, bisogni e preferenze cambiano



John M. Carroll. 1990. Infinite detail and emulation in an ontologically minimized HCI. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '90). Association for Computing Machinery, New York, NY, USA, 321–328. DOI:<https://doi.org/10.1145/97243.97303>

CHI '90 Proceedings

April 1990

## INFINITE DETAIL AND EMULATION IN AN ONTOLOGICALLY MINIMIZED HCI

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### ABSTRACT

By default, we attempt to define practical areas of technological endeavor as "applications." For example, the applied psychology of human-computer interaction has characteristically been defined in terms of the methods and concepts basic psychology can provide. This has not worked well. An alternative approach is to begin from a characterization of current practice, to take seriously the requirements of the domain of endeavor, and to define areas of "science" and "application" as possible and appropriate in that context.

**KEYWORDS:** ontology, theory, hermeneutics, interpretation, task-analysis, design rationale

One of the most appealing aspects of human-computer interaction (HCI), and also one of the most vexing, is the commitment — pursued energetically through the 1980s — to produce an intellectually rich applied psychology that could effectively support the design of usable computer equipment. Appearing chimerical? The general case is that basic science provides uncertain and indirect support to practical concerns [4, 20, 24, 29].

This ambitious project in HCI has unfortunately not succeeded, however, at least not yet. The most sustained, focused and sophisticated attempts to develop explicit extensions of academic information processing psychology for HCI have had no discernible impact on design practice [8, 34]. Indeed, even the more mundane efforts to adapt the laboratory methods of experimental psychology have often foundered: to get clear and statistically strong results, too many investigators have been led to "discover," for example, that organized menus are better than disorganized menus [25].

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The key problem is that both the concepts and the methods of basic psychology have been specialized for simple and abstract situations. Too much attention was paid to applying psychology and too little to understanding what it was that psychology was being applied to.

In this paper, I adopt a framework developed by Pat Wright, John Long and Phil Barnard for understanding applied psychology. I seek to develop this framework to address two difficult requirements in the HCI domain, that I call Infinite Detail and Emulation. The general thrust of my approach is to urge that we take seriously as scientific objects the objects that are of obvious practical importance in the everyday commerce of a domain (hence the term "ontologically minimized"). In HCI, the important objects are user tasks and designed artifacts. This approach meets the requirements that no other approach can, and because it is built out of the practical essence of the domain, it offers unique and direct leverage for the pragmatics of design as well.

### INFORMATION FLOW

How can we do better at coordinating and integrating basic science with practical endeavor? An interesting line of thinking starts with Wright's [41] examination of the relationships between pure and applied work on text. She found "few points of contact" between psycholinguistics and design of text. She suggested an "information flow among researchers ... that starts with applied solutions to practical problems, continues through pure explanations of why these solutions are successful, and so enables the refinement of the original applied solutions."

John Long [27] and Phil Barnard [2] are developing a framework for understanding the activity in HCI as what amounts to an information flow in Wright's sense. (From my standpoint, it is convenient to collapse Long and Barnard's work, though they would clearly want to make distinctions). This is sketched in Figure 1 (based on figures from Long and Barnard). The key idea is that science provides a representation of the real world. To construct and to apply this representation, we must be able to map between it and the world. This mapping involves intermediary, or bridging representations, specialized for the intended domain of endeavor.

## Ciclo Task-Artifact di Carrol (1990)

*"Human activities implicitly **articulate needs**, preferences and design visions. **Artifacts are designed in response**, but inevitably do more than merely respond. Through the course of their adoption and appropriation, **new designs provide new possibilities** for action and interaction. Ultimately, this activity articulates **further human needs**, preferences, and design visions."*

Carroll, John M. (2013): Human Computer Interaction - brief intro. In: Soegaard, Mads and Dam, Rikke Friis (eds.). "The Encyclopedia of Human-Computer Interaction, 2nd Ed.". Aarhus, Denmark: The Interaction Design Foundation. Available online at [http://www.interaction-design.org/encyclopedia/human\\_computer\\_interaction\\_hci.html](http://www.interaction-design.org/encyclopedia/human_computer_interaction_hci.html)

# Task-Artifact Cycle: Mobilità

Necessità di trasporto → auto → cambio nella mobilità e struttura delle città



Image from OpenStreetMap:

<http://www.openstreetmap.org/?lat=48.85154&lon=10.48856&zoom=17&layers=M>

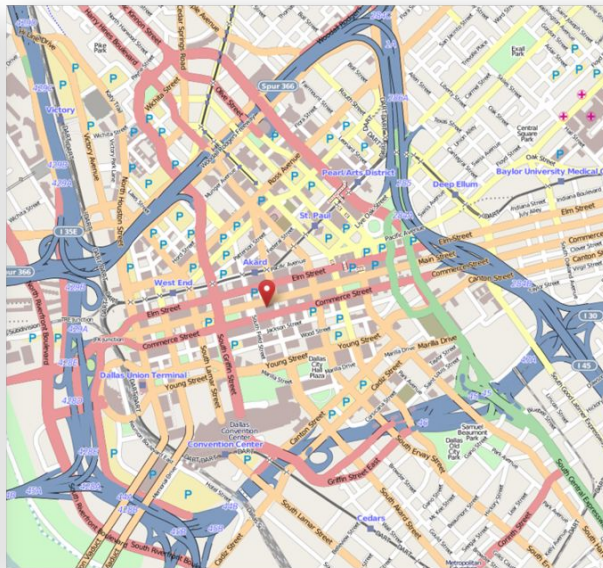


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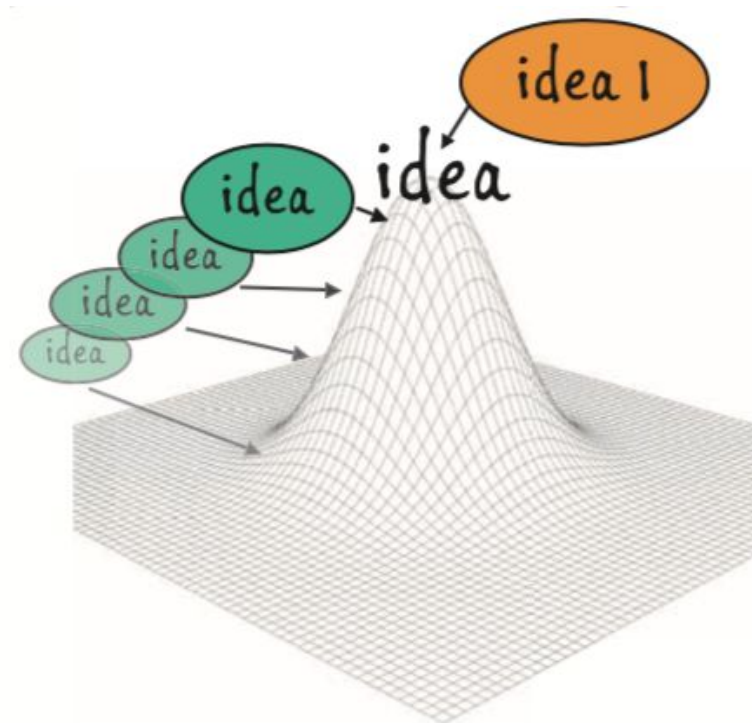
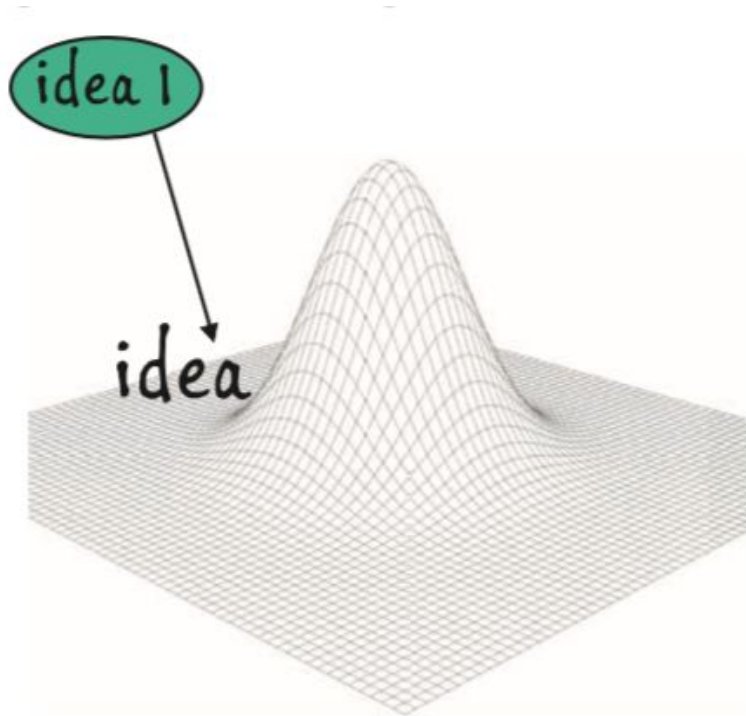
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## Task-Artifact Cycle: Communication

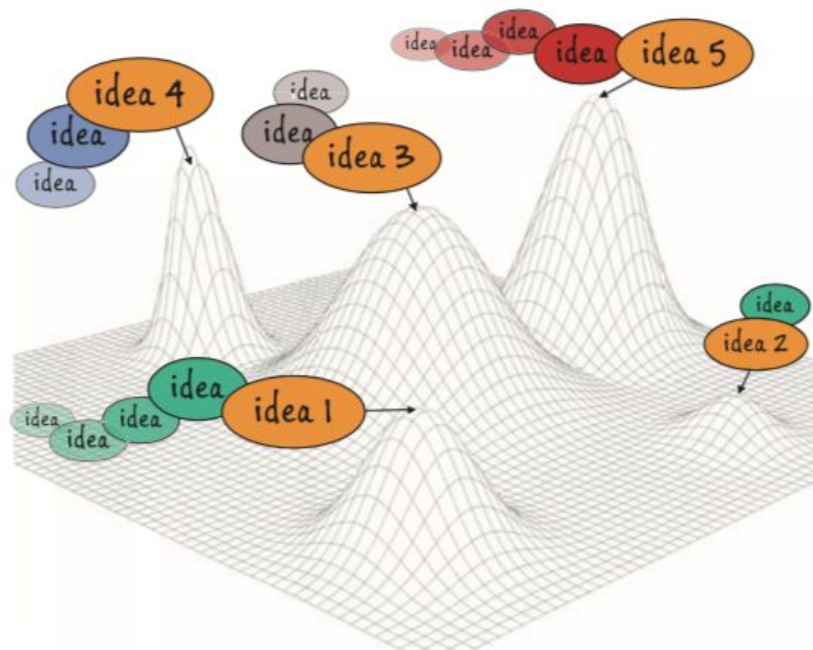
- Mini exercise: Mobile Phone
- Desire to communicate
  - phone
  - changed social behaviour
  - ...

1. Explain the task-artifact cycle in the context of mobile telephony.
2. How did people meet in town 1990? And how in 2020?  
Discuss the impact beyond a single artifact.

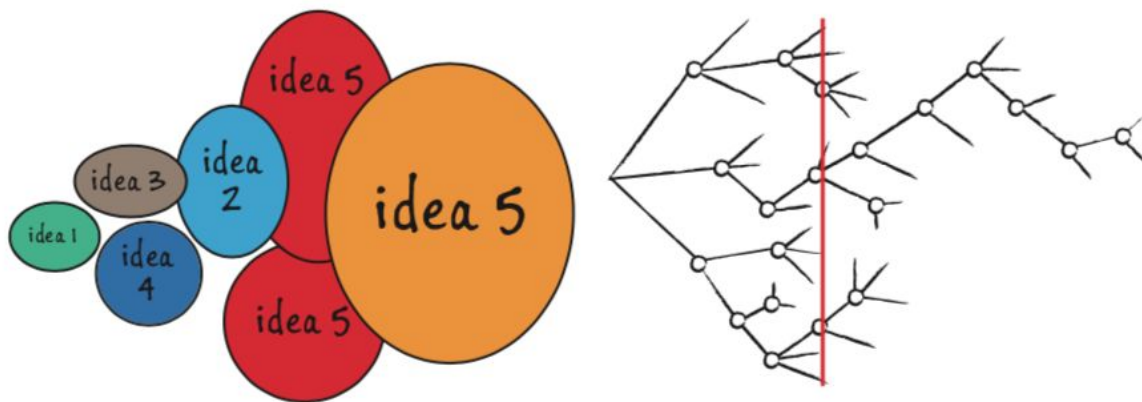
# Iterazioni: miglioramento di un approccio



# Iterazioni: esplorazione

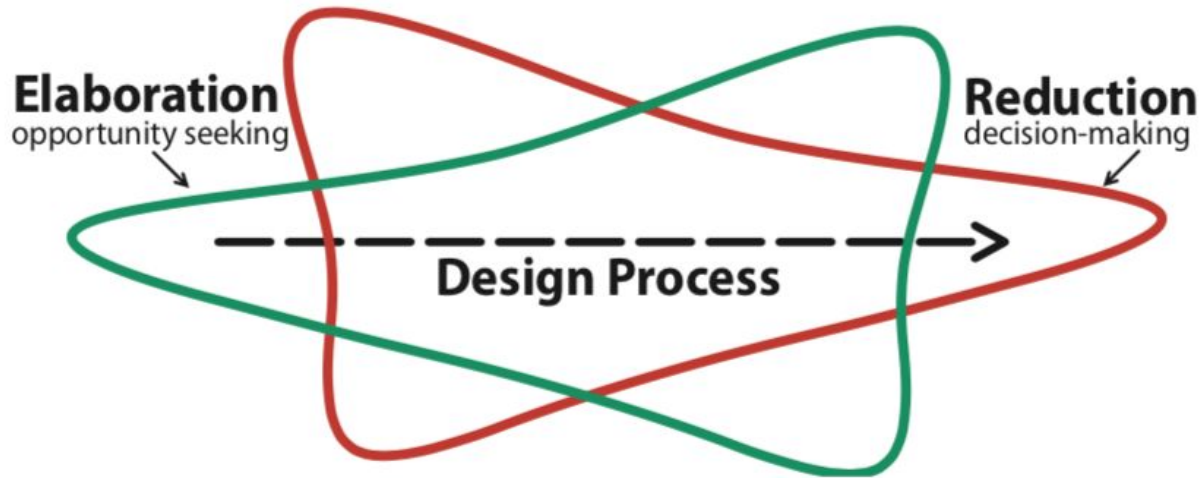


# Elaborazione e riduzione

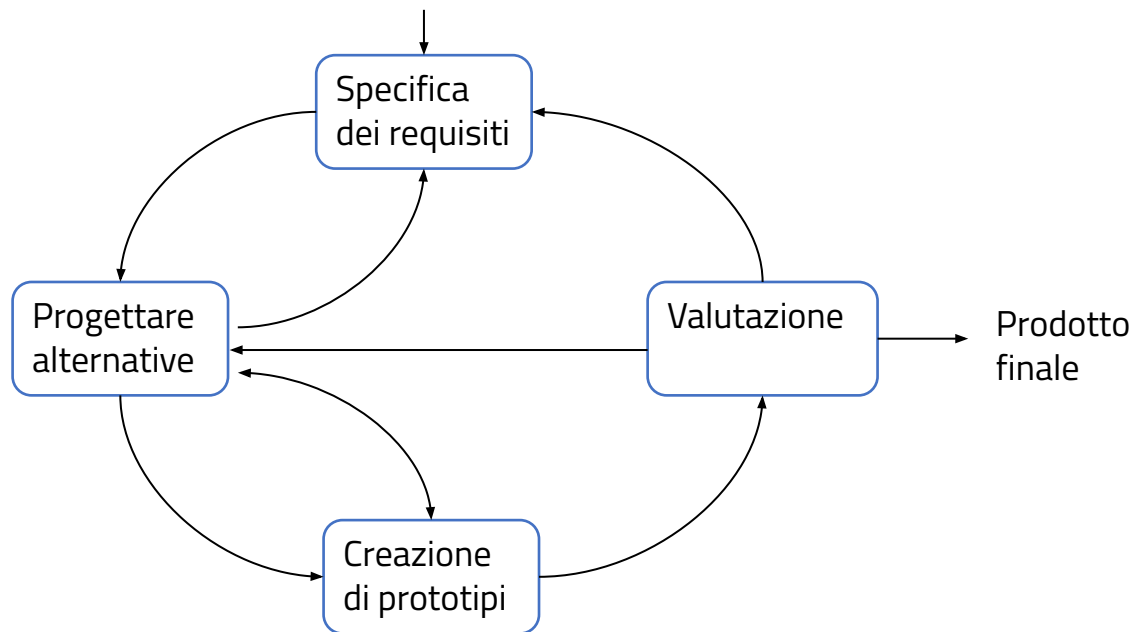


- Si generano diverse idee, nei modi più diversi
- Si riflette sulle idee per migliorarle
- Si selezionano le più promettenti
- In corsa si considerano altre idee quando arrivano

## Elaborazione e riduzione (2)



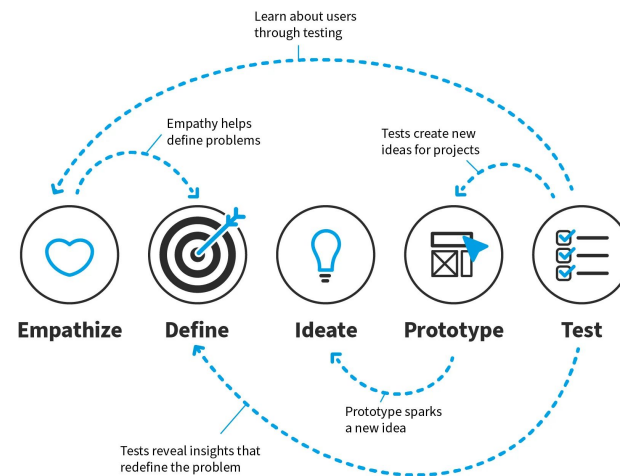
# Le fasi (comuni) del processo



# Definizioni di processo simili

- Il processo in sé ha importanza relativa
- È importante cosa *fate* nel processo

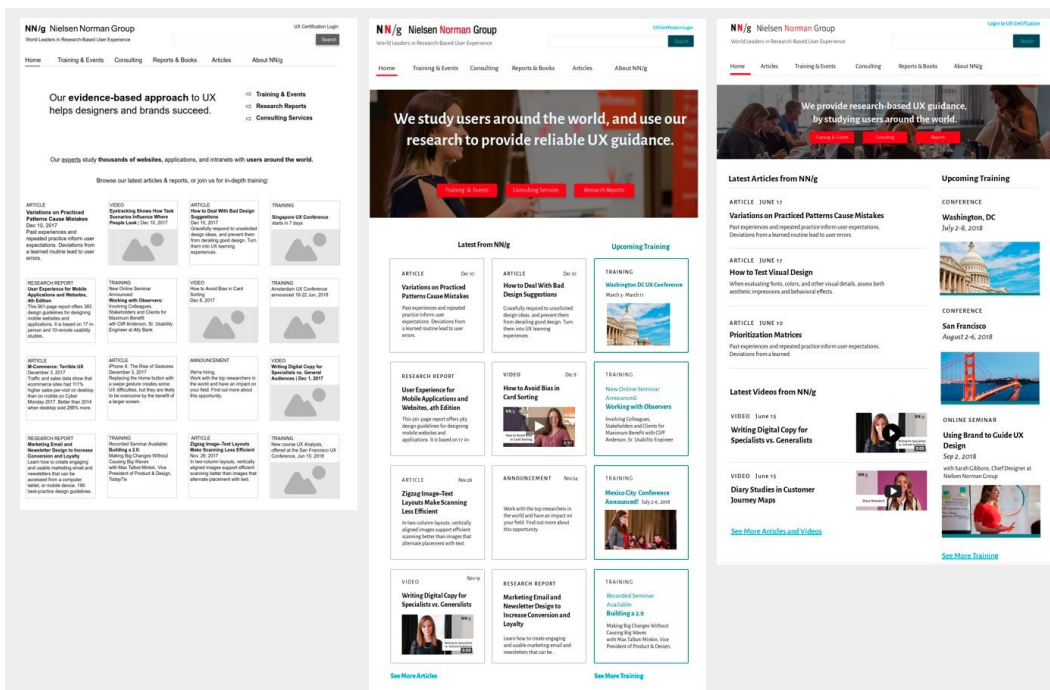
## Design Thinking: a Non-Linear Process



Interaction Design Foundation  
[interaction-design.org](http://interaction-design.org)

# Esercizio: Leggere il report

- Nielsen & Norman homepage redesign  
<https://www.nngroup.com/articles/case-study-iterative-design-prototyping/>



# Riferimenti

- Dix, Finlay, Abowd, Beale *"Interazione Uomo Macchina"*
  - Cap. 5
- Rogers, Sharp, Preece *"Interaction design"*
  - Cap 9-10-11
- Approfondimento
  - Bill Buxton: *Sketching user experiences*

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The part on Task-Artifact Cycle has been imported from Albrecht Schmidt's slides

For more content see: <https://hci-lecture.de>

