

# Emphasizing the **Human** side of **Human-Computer Interaction**

*Alternate Title:*

*„Sensemaking in an often Complex and  
Complicated World”*

Tom Allison, MSI & HTA

# “Sensemaking”

(auf Deutsch: „**die *Sinnerzeugung***“)

A set of processes that is initiated when an individual or organization recognizes the inadequacy of their current understanding of events.

Sensemaking is an active two-way process of fitting data into a frame (mental model) and fitting a frame around the data. Neither data nor frame comes first. Klein et al (2006)

*„Leute wissen, was sie denken, wenn sie sehen, was sie sagen.“  
– Karl E. Weick*

Dass bedeutet: Man muss erst was sagen, bevor man es verstehen kann.

Kommisch, oder?

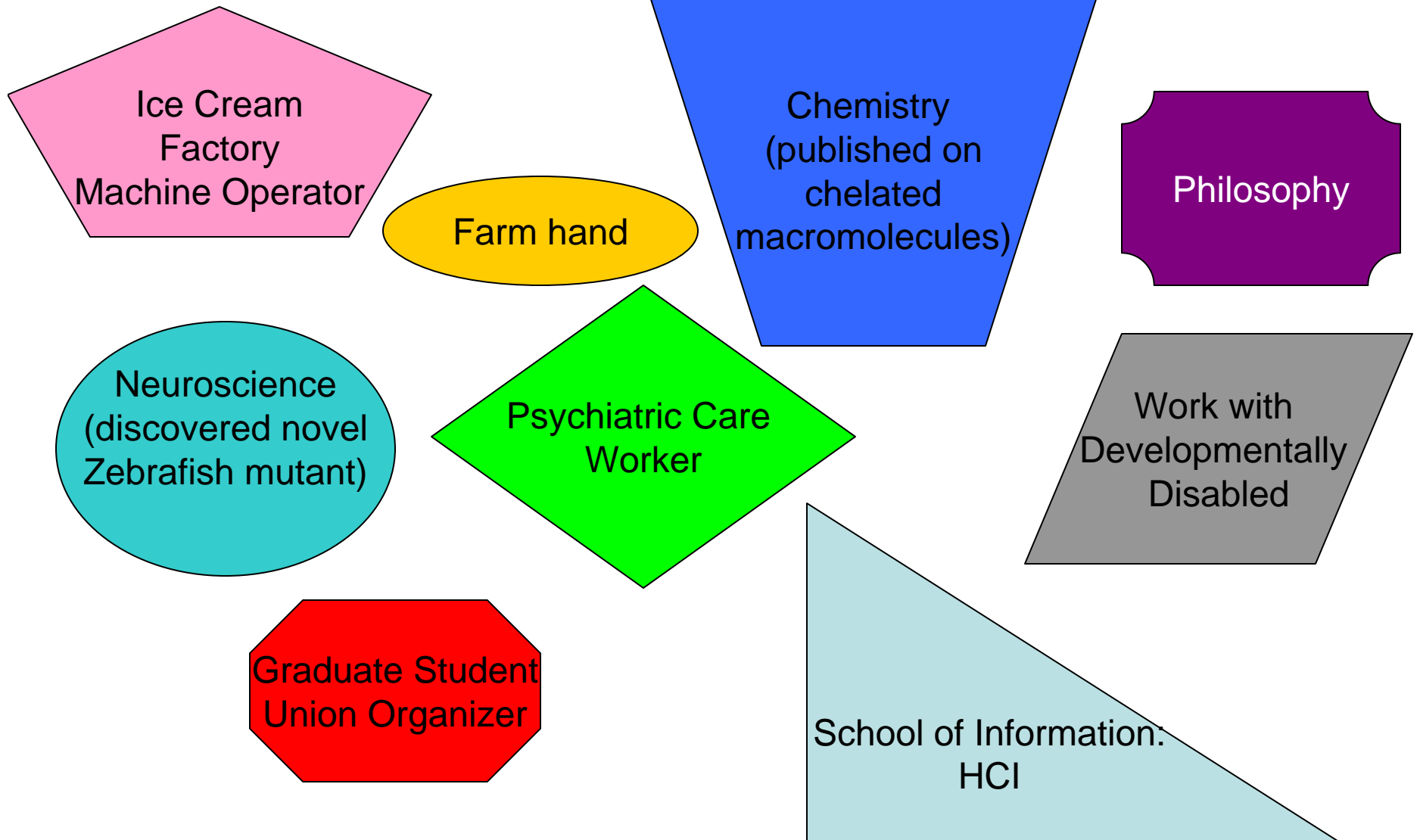
# Stories of **Sensemaking** and **Reflections** on those Experiences

- A Job Fair Survival Story
  - including “die Hauptregeln für Vitamin B”
- What is a “**Menlo Innovations**”?
- Why is **Menlo Innovations** *so cool*?
- Conclusions with respect to Life and Good Software
- Dann sind Sie dran – Questions and Discussion

# Sensemaking I: The Job Fair



# Sensemaking I: The Job Fair



**“Aha! You’re an HTA!”**

- ***Rich Sheridan,***  
*CEO of Menlo Innovations*

# Reflection I: Sensemaking and Job Finding

- A good example of a highly ambiguous situation
- Induces a certain fear of not being able to “make sense” of it all
  - Understand where to go
  - Understand how to explain/present oneself
- Life lesson: Sensemaking is nearly always a collaborative effort.
- Woody Allen got at least one thing right: “Eighty percent of success is showing up.”

**So, what exactly is “an HTA”?**



# Sensemaking II: Menlo Innovations & The Software Factory <sup>TM</sup>



# Sensemaking II: Menlo Innovations & The Software Factory <sup>TM</sup>

- Menlo Innovations is a proprietary software development company in Ann Arbor, MI.
- “The Software Factory” is their idea of how one ought to organize people\* and resources to make software that will be widely adopted.

\*A “High-Tech Anthropologist” – or “HTA” -- is the name for a member of the team that makes up the “Software Factory”.

# The Basic Challenge of Software Development:

- Collect business requirements
- Evaluate stakeholder needs
- Produce a useful solution

# But it's hard...

- Tools, methodologies and technical know-how required for software development are always increasing in number and complexity.
- The range and number of potential applications is increasing, in the same way.

# Almost no one involved is happy...

- **Analysts, Designers and End-users** find their **input & designs ignored** for the sake of technical implementation issues and changes in the project after their work is done and “handed off”.
- **Project sponsors** often feel blind to everything between kick-off and delivery and, frustrated by their **inability to steer**, will either become passive or make **arbitrary decisions**.
- Power generally shifts to **Developers** under the typical project stressors and the **usability suffers** as the technical concerns and preoccupations of Developers come to dominate.
- Meanwhile the Developers themselves feel **embattled** by **unclear communication** from designers and **arbitrary whims** of business sponsors.

# And it doesn't end well...

- Most software projects fail. In fact, the [Standish group reports](#) that over **80%** of projects are judged “**unsuccessful**”.

# Menlo Innovation's Solution:

**High-Tech Anthropology\* + Target Persona  
Exercise\* + Rational Unified Process + Agile  
Programming + XP + Pixie Dust (“Feenstaub”)**

**= The Software Factory <sup>TM</sup>**

# How and Why It Works:

- Co-location
- Paired work (reticular formation)
- Iterative development
- **Project Focus via the Target Persona**
- **Story Cards & Distinct Roles** facilitate control in the right places:
  - Estimation Sessions
  - Planning Game
  - Magic of the Green Dot
- **“Make Mistakes Faster!”** (The battle cry of sensemaking)



# How and Why It Works: **Co-location & Paired work**

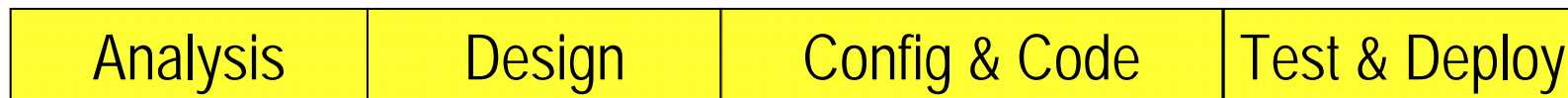


# How and Why It Works: **Iterative development**

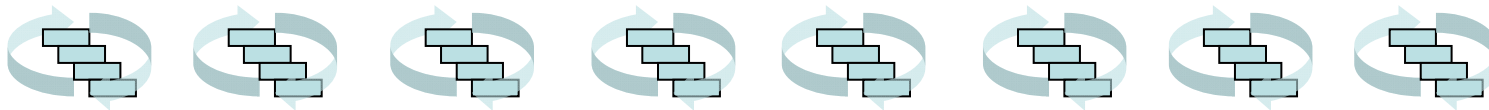
Time fixed



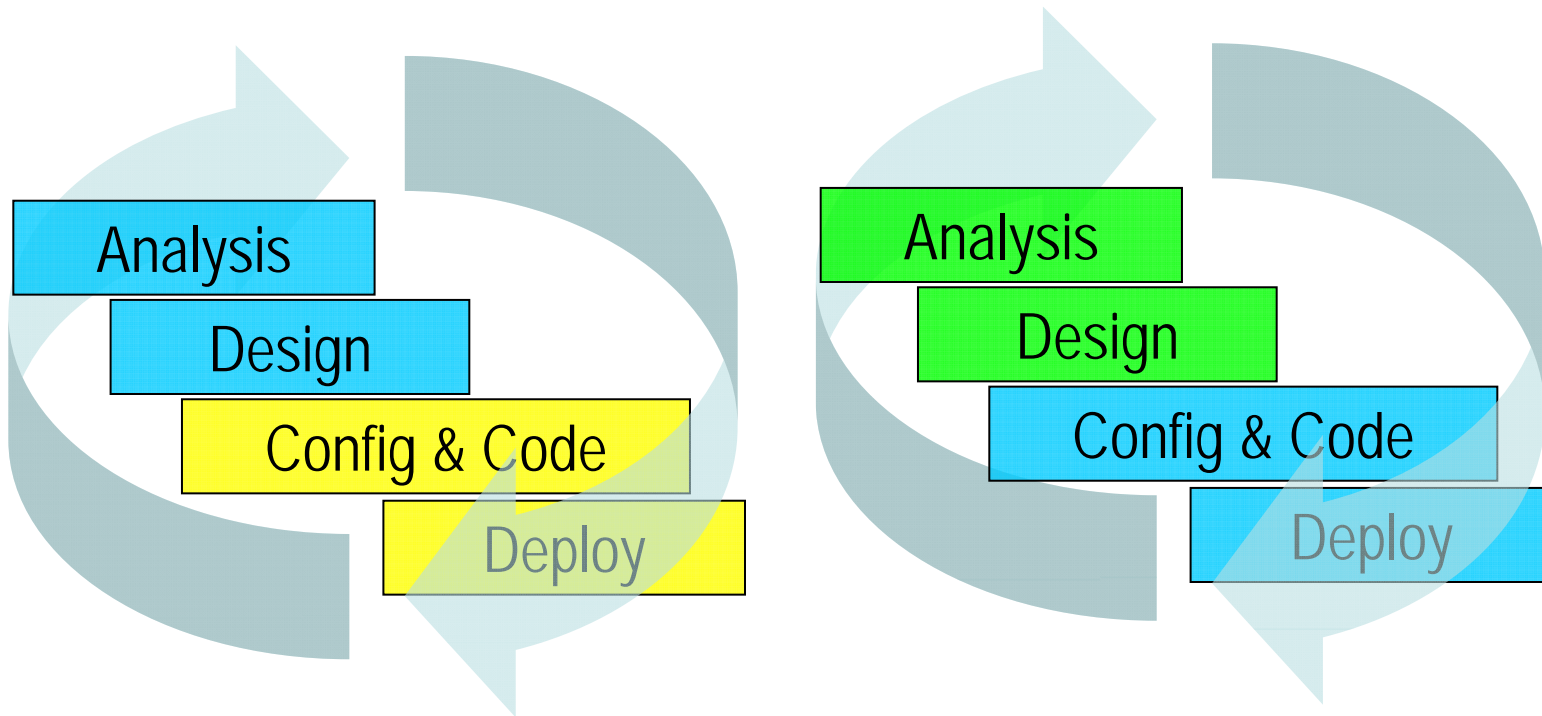
Waterfall approach:



Iterative approach:



# Iterations:



# How and Why It Works: **High-Tech Anthropology (TM)**

## **Building project focus via the Target Persona:**

Example: A company is building a radically new Flow Cytometer and engages Menlo to build the User Interface.

HTAs do initial ethnographic field studies of the potential users and their contexts of use.

# How and Why It Works: **High-Tech Anthropology (TM)**

**Building project focus via the Target  
Persona:**

They then channel the understanding they are building into crafting **Personas** and conduct the **Target Persona Exercise** with the sponsor.



**Brad Shore**  
**2<sup>nd</sup> year Graduate Student in PIBS\* program, Post-qualifying exams University of Wisconsin**

**Goals:** 1) Wants to publish 2 or 3 times in order to finish his dissertation and be in a good spot as a candidate for a prime Post Doc. 2) Wants to “do good science.” 3) Wants to understand FC thoroughly as a tool so that he can confidently design his ground-breaking immunology experiments 4) Wants a short learning curve so he can stop practicing and start collecting data 5) Likes to learn from colleagues, but wishes he could teach himself 6) Wants to get today’s work done quickly so he can leave lab and go home 7) Not really sure how the FC machine works, but is curious

**Level of Expertise:**

Brad is just beginning to learn FC from Xiaowen Li, a senior graduate student in his lab. “This is cool!”. He knows that he must soon use FC independently as a central tool for his dissertation research. He was introduced to FC in his graduate courses that reviewed topics and methods in molecular and cellular biology. He has read multiple articles which report FC results, so he understands in a general sense the utility of FC, but he is *not* a “power user” (yet!).

**Job Context:** Academic, middle-to-upper tier school, middlish funding for research. Bob Glasser’s lab.

\* The graduate Program in Biological Sciences



**Phil Gilman, MD, PhD**  
**Investigator, Howard Hughes Medical Institute and Professor of Immunology, Duke University**

**Goals:** 1) Publish 6 papers this year, in top journals 2) Make it to scientific symposia in Taos, Bethesda and Boston this week 3) Figure out how to make his Blackberry work

**Level of Expertise:** A big shot in his field and a superstar in the department. Does no experiments himself. He travels a lot, communicates with his lab by email, phone, lab meetings and impromptu brain storming sessions. Is dependent on his sr. students and postdocs for equipment acquisition recommendations. Relies on his long time Lab Manager (an SRA) to keep everything running on budget.

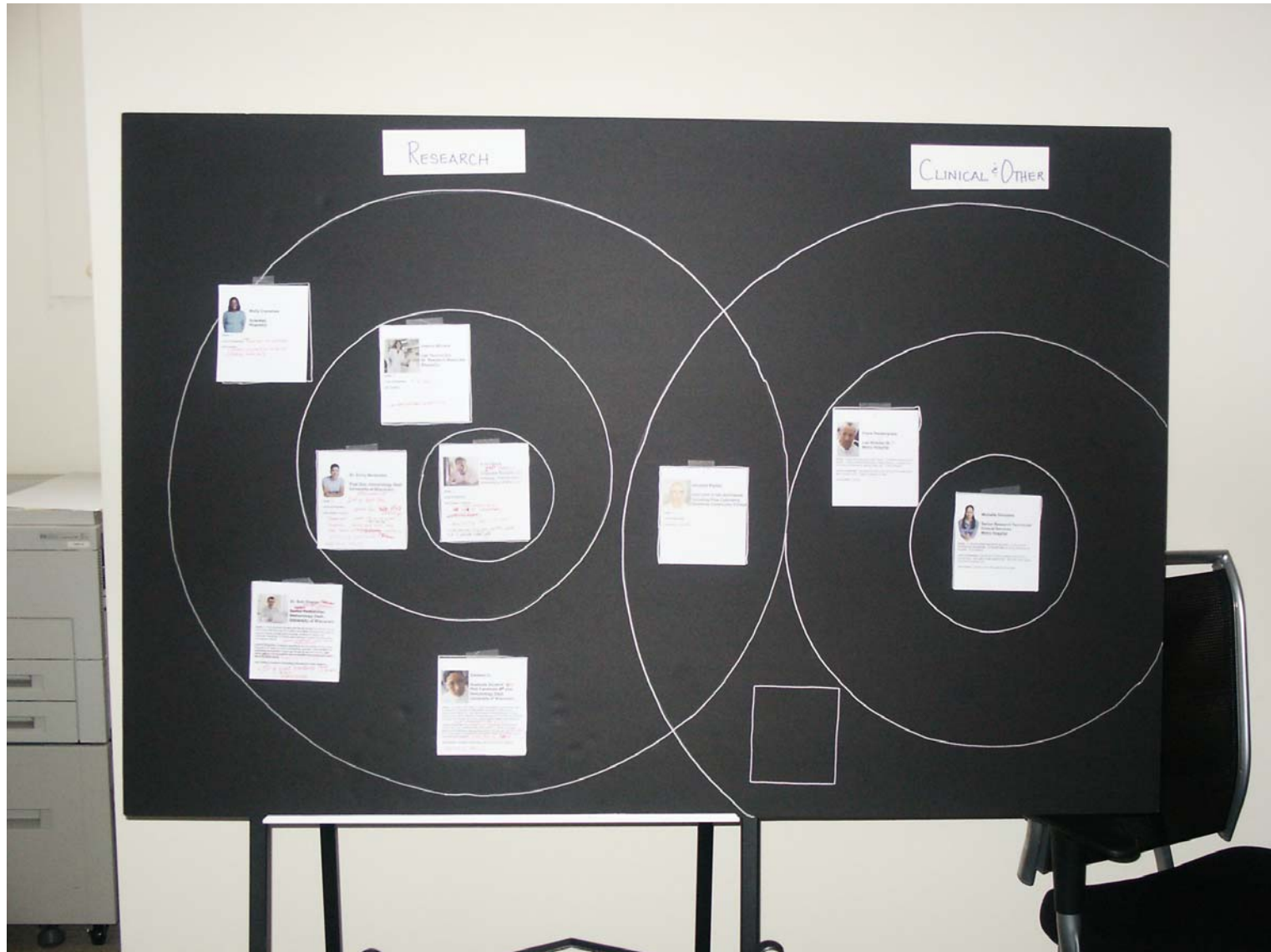
**Job Context:** Director of a large lab, on faculty 11 years. Many responsibilities outside the lab. Lab includes: 1 Research Investigator, 5 talented Post Docs (from USA, Germany & China), 3 graduate students, 2 Technicians, and 2 Undergraduates. People join and leave the lab once or twice per year. Exceptionally well funded, can generally afford most of what he needs. Married, 2 kids



# Building project focus via Target Personas



# Building project focus via Target Personas







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# How and Why It Works:

**Story Cards & Distinct Roles** facilitate the right kind of “**soft control**” in the right places:

- Estimation Sessions
- Planning Game
- Magic of the Green Dot

# Story Cards: *Well-defined* Assignments

TA

Brad can enter up to 5 decimal places

Est: 2 days

When Brad loads his cells and before he sets the run parameters he will also need to enter the estimated range and must be able to use as many as five decimal places to express the needed accuracy.

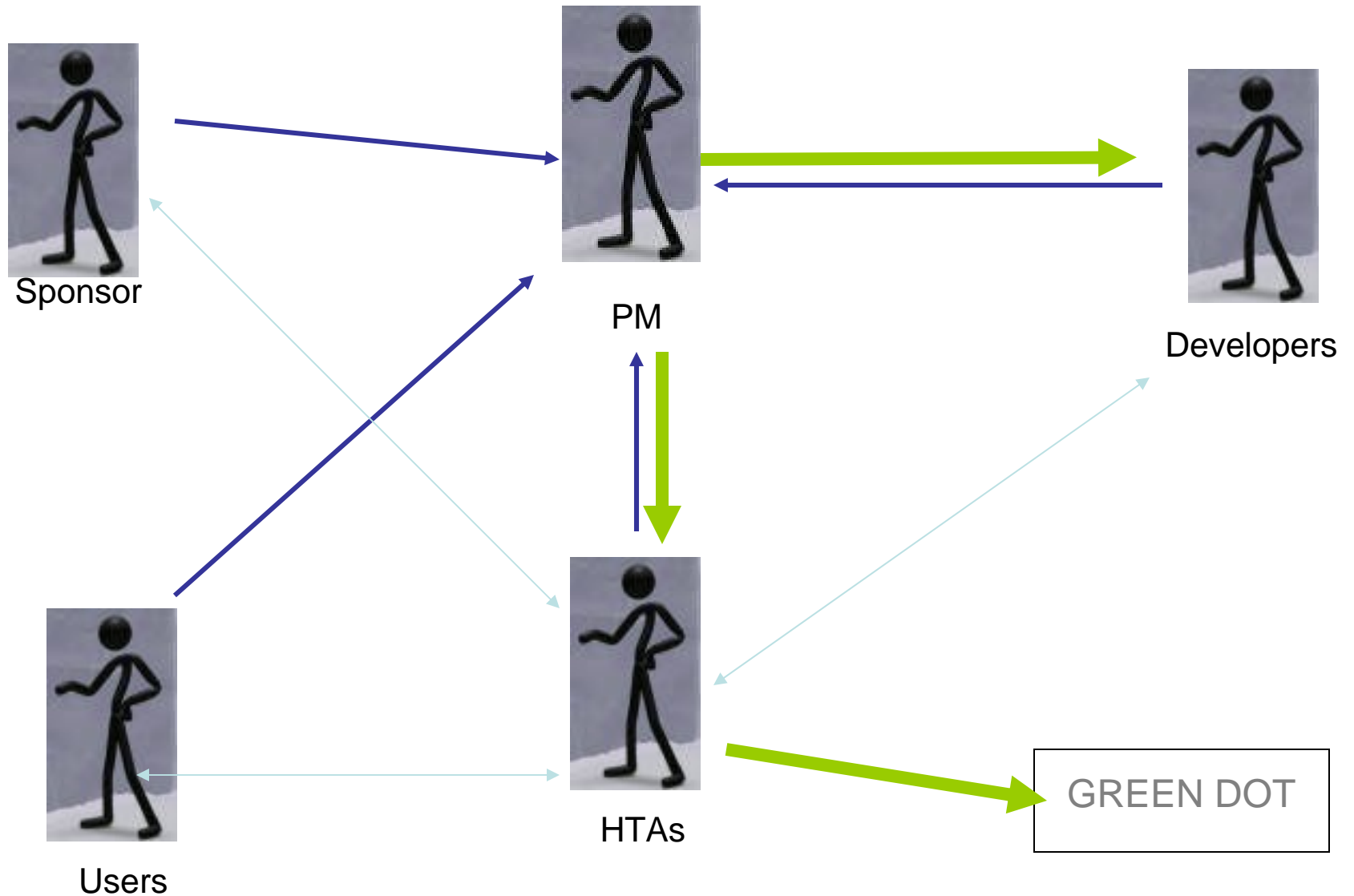
JH

Brad will need to select run rate before start will function

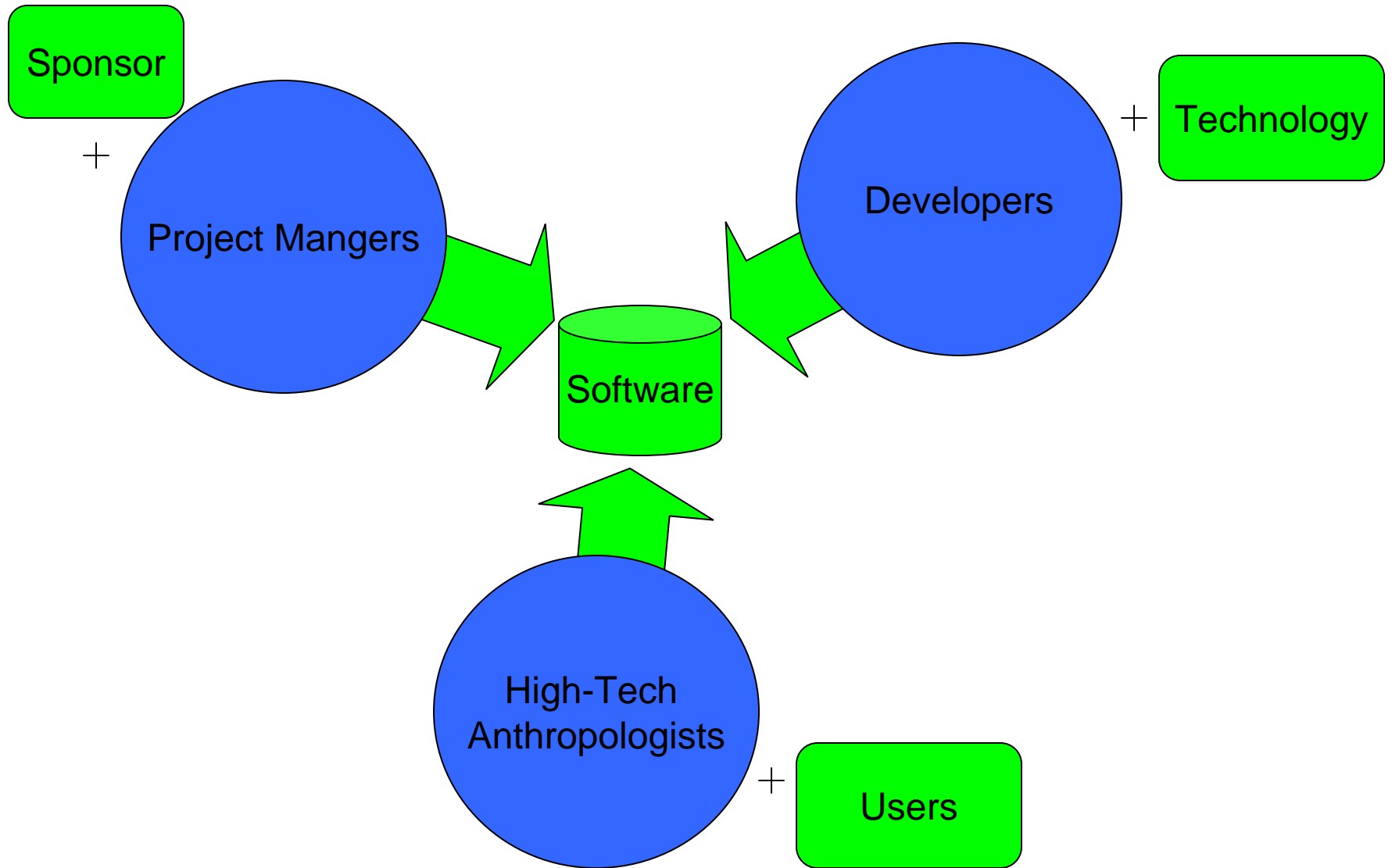
Est 1 wk

Brad must select the run rate before the cytometer will start. If he forgets and tries to start the cytometer before setting the run rate he should be warned with the standard tone provide in sound file <warningtone1.wav>

# Where Storycards Fit into Menlo's Processes



# Distinct Roles:



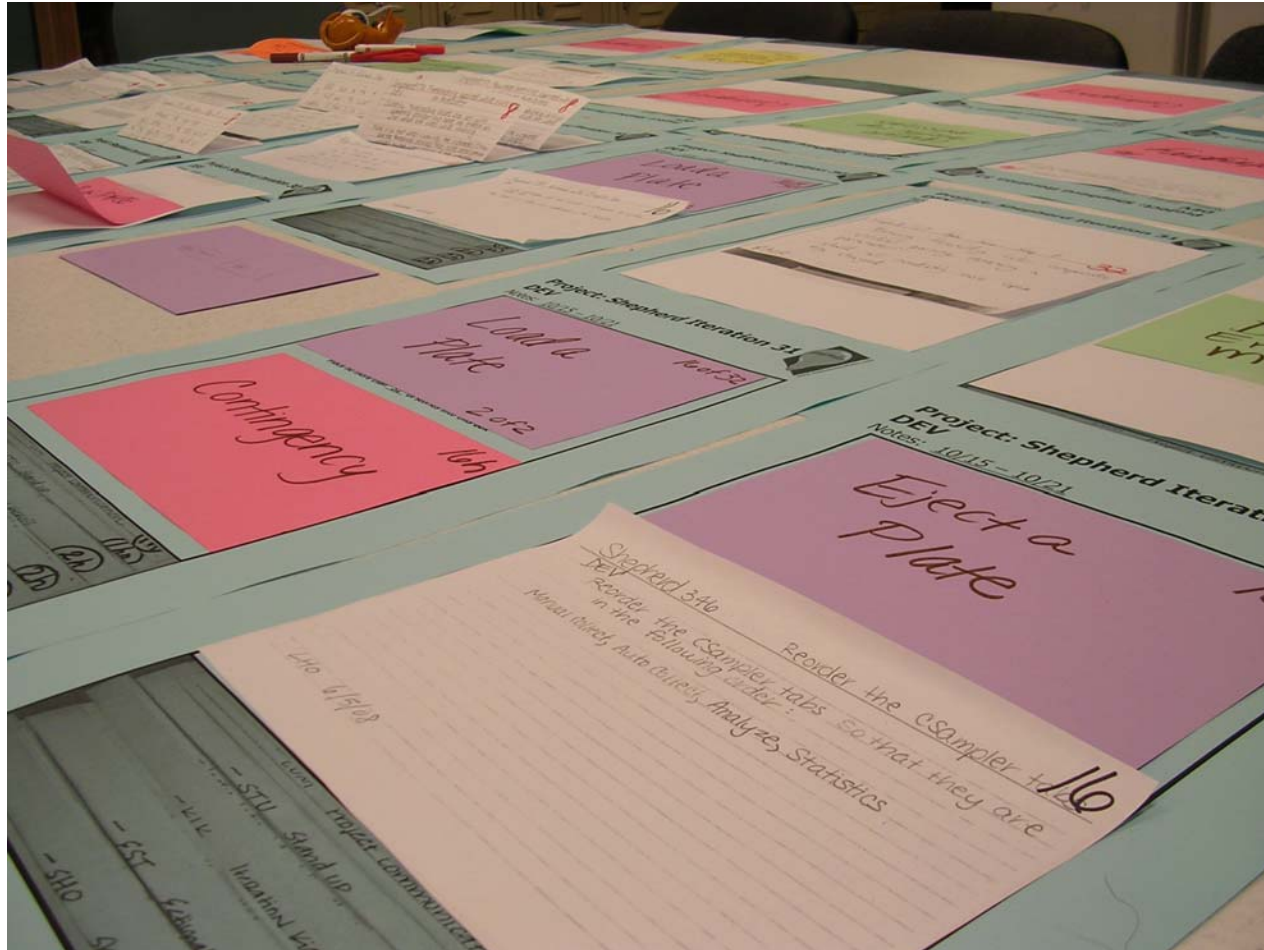
# Soft Control

**“Soft control” can be defined as non-hierarchical modes of coordinated social action.**

# Soft Control: Estimation & Strictly De-limited Work



# Soft Control: Planning Game & Work Assignment





# Soft Control: Design & Green Dot

TA

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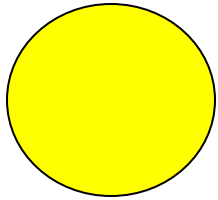
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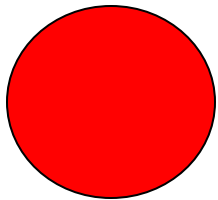
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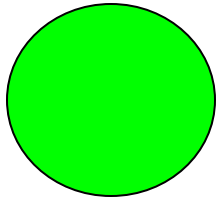
# Soft Control: Design & Green Dot



Yellow Dot = Work in Progress



Red Dot = Work Blocked



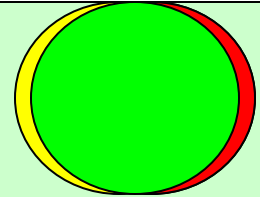
Green Dot = Work Completed  
(HTA-assessed)

# Soft Control: Design & Green Dot

TA

Est: 2 days

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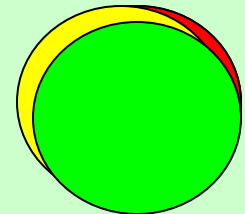


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# How and Why it Works

- **Clear** design and development targets (Story Cards, Target Personas)
- **Division of roles** and responsibilities is highly functional (Estimation, Planning and Green Dotting)
- **Soft Control** and **Parity** for all contributors
- **Lightweight** design artifacts and multiple easy means of communication (white boards, work representations on the wall, story cards and co-location)
- **“Make Mistakes Faster!”** (The battle cry of “sensemaking”)

# How and Why it Works

- The most controversial claim, to the uninitiated, is often that the ethnographic and design group should be kept strictly separate from the programming group. Why can't the programmers simply do it all?
- There are arguments from the standpoint of cognitive styles and task-character – but perhaps the strongest argument that Menlo is on to something with this division is the **self-reported satisfaction** of all involved.

# Basically, the polar-opposite of this:

## “Almost no one involved is happy...”

- **Analysts, Designers and End-users** find their **input & designs ignored** for the sake of technical implementation issues and changes in the project after their work is done and “handed off”.
- **Project sponsors** often feel blind to everything between kick-off and delivery and, frustrated by their **inability to steer**, will either become passive or make **arbitrary decisions**.
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Reflection II:  
“The Software Factory™” is, in the end,  
a “**Sensemaking Factory**”.

The modern speed of commercial and technological change requires exactly that: a willingness to immerse oneself or ones organization in the complexity and complications of the contemporary world and the **sensemaking** skills to make your way forward in the face of ambiguity.



# Conclusions:

- “80% of success is just showing up”, but you’ve still got to do your homework.
- The path to better software is being forged by companies like **Menlo Innovations** which provide environments that support collaborative **sense-making**, and insist on a **division of roles** and series of “**soft controls**” that empower the **Human** side of the **Human-computer Interaction**.

# And what if you found any of this interesting?

## A collection of annotated links:

- Sensemaking (auf Deutsch: die *Sinnerzeugung*): I'm still looking for the best stuff, here. You can start on Wikipedia - <http://en.wikipedia.org/wiki/Sensemaking>, but don't miss this paper either: Russell, D. M., Card, S., Pirolli, P., Stefik, M. The cost structure of sensemaking, Proc. of CHI 1993 (1993) <http://dmrussell.googlepages.com/SM-InterChi-Paper.pdf> (PDF 237Kb) If you have a sense of the definitive or best recent sources on the subject, I'd love to hear from you.
- Two Books worth reading if you're interested in the case for High-Tech Anthropology: "The Inmates are Running the Asylum" and "Design of Everyday Things". You can find these references and other pointers on Menlo Innovations website, as well.
- Menlo Innovations <http://www.menloinnovations.com/> Down to earth guys in Ann Arbor, Michigan. Doing it **the right way** ;).

## A collection of annotated links (cont.):

- Menlo Video: <http://www.enerjy.com/blog/?p=244> Like I said, nothing pretentious, but if you follow what they're saying and are a bit of a software development-methodology wonk, it's delish.
- IDEO <http://www.ideo.com/> Another design-only firm, but a good one and well worth checking out if you're interested in product design and haven't seen them, yet. They are a firm that Menlo points to as inspiring, especially with respect to the HTA practises.
- Jakob Nielson: <http://www.useit.com/> Always worth exploring. Probably the one on-line resource on usability that was regularly useful, years ago, when I was actually HTA-ing on a daily basis.

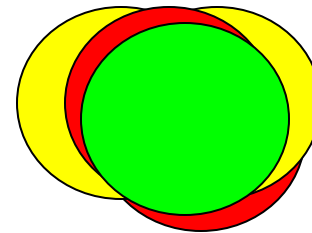
## A collection of annotated links (cont.):

- EPIC2008: <http://www.epic2008.com/> If your interests go in the direction of applying ethnology to the sphere of commerce, this looks very promising. Its the site of a conference started up 3 years ago. I'm really unhappy that I missed it in Copenhagen in Oct 2008, not least because I even have a friend who presented! (I have no excuse, but hey, part of making mistakes faster is that sometimes one does make mistakes!).
- I've posted some thoughts and information related to this talk on [WikiWikiWeb](http://c2.com/cgi/wiki?HumanSideOfHci) here: < <http://c2.com/cgi/wiki?HumanSideOfHci> > Which, if you don't know about , but find the whole idea of Wiki interesting, you'll definitely want to check out, because it's the granddaddy of all Wiki's. Unfortunately, it's also been having problems with vandals from our "IP zone", so you'll need a code to edit (which is the whole fun of Wiki, after all). Email me and I can get it to you:

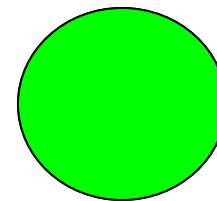
< tallison@gmail.com >

# And if this talk had a Storyboard...

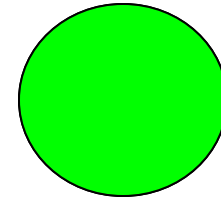
Prepare Talk for IBI



Present Talk at IBI



Offer the opportunity  
for questions and discussion



**END**



# Oh, and I should point out, it actually does work!

... and across multiple activity domains:

- Hands-on Children's' Museum Exhibit
- Novel Flow Cytometer User Interface
- Drug Discovery Phase Data Mining Applications
- Hand-held Tour Guide for a Bahamas Cruise Line
- Blue-sky Application Idea Generation for 3D  
Untrasound Technology (HTA-only project)

Not to mention that Menlo Innovations went into business in 2001 and has been successful under some of the toughest economic conditions in the U.S. All of this innovation \*after\* the “dotcom bubble” - and in an area of the country that has yet to fully recover.

# Reflections IV: How did my education at SI prepare for work at Menlo?

- Working in groups to accomplish definite goals.
- Reflecting a lot on abstractions: how people and organizations generate, use and manage information.
- Studying the technical side of the computerized world enough to be conversant in the technologies and methodological thinking.
- Using the software tools of the modern workplace enough to establish a certain on-going learning habit and comfort with uncertainty in their regard.