



Center for
**LifeLong
Learning
& Design**

University of Colorado at Boulder

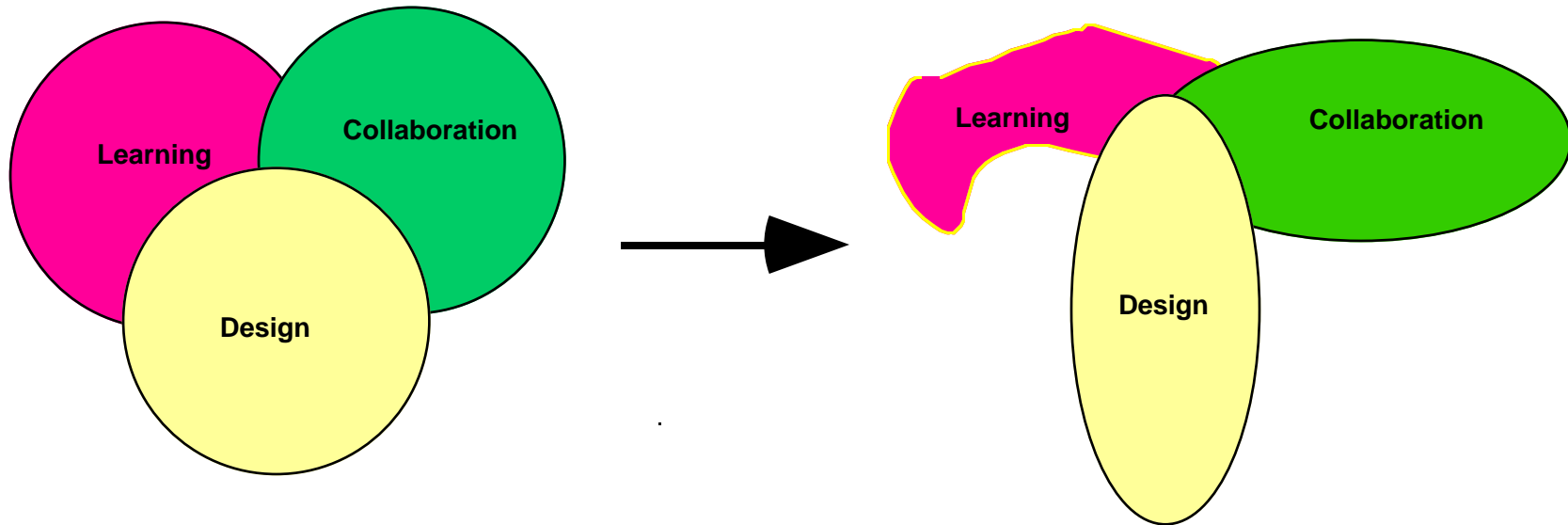
Wisdom is not the product of schooling
but the lifelong attempt to acquire it.
- Albert Einstein

**Design = f{Media}: Revisiting Design from a Learning and
Collaboration Perspective
in the context of
Pull and Push Technologies**

Gerhard Fischer and Leysia Palen
Spring Semester 1999

April 21, 1999

Intersection of Design, Learning and Collaboration and their Changing Nature through New Media



User <----> Listener Role in System Design

- **user in listener role**

- examples:
 - * menu systems (including natural language based menu systems, specification components in DODEs)
 - * push systems
- recognition memory
- specification of information: clicking at information displayed
- advantage: only terms the systems knows can be used
- disadvantage: the information has to be on the screen, user has to understand the system model

- **user in speaker role:**

- examples:
 - * Unix/Emacs style interfaces
 - * pull systems
- recall memory
- specification of information: keyboard input, voice input
- advantage: users can type in whatever they want; can express themselves in their own way
- disadvantage: users may use terms which the systems does not understand

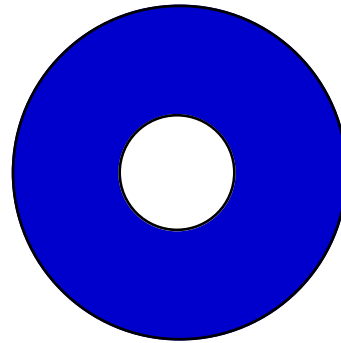
source: Fischer/Nieper-Lemke: “HELGON — Extending the Retrieval by Reformulation Paradigm”, CHI’89 proceedings, pp 357-362

A Challenge for Pull Systems

Articulation of a Query

Situation Model

ring
doughnut
tire
wheel
washer



Application Goals

System Model

- Symbolics:

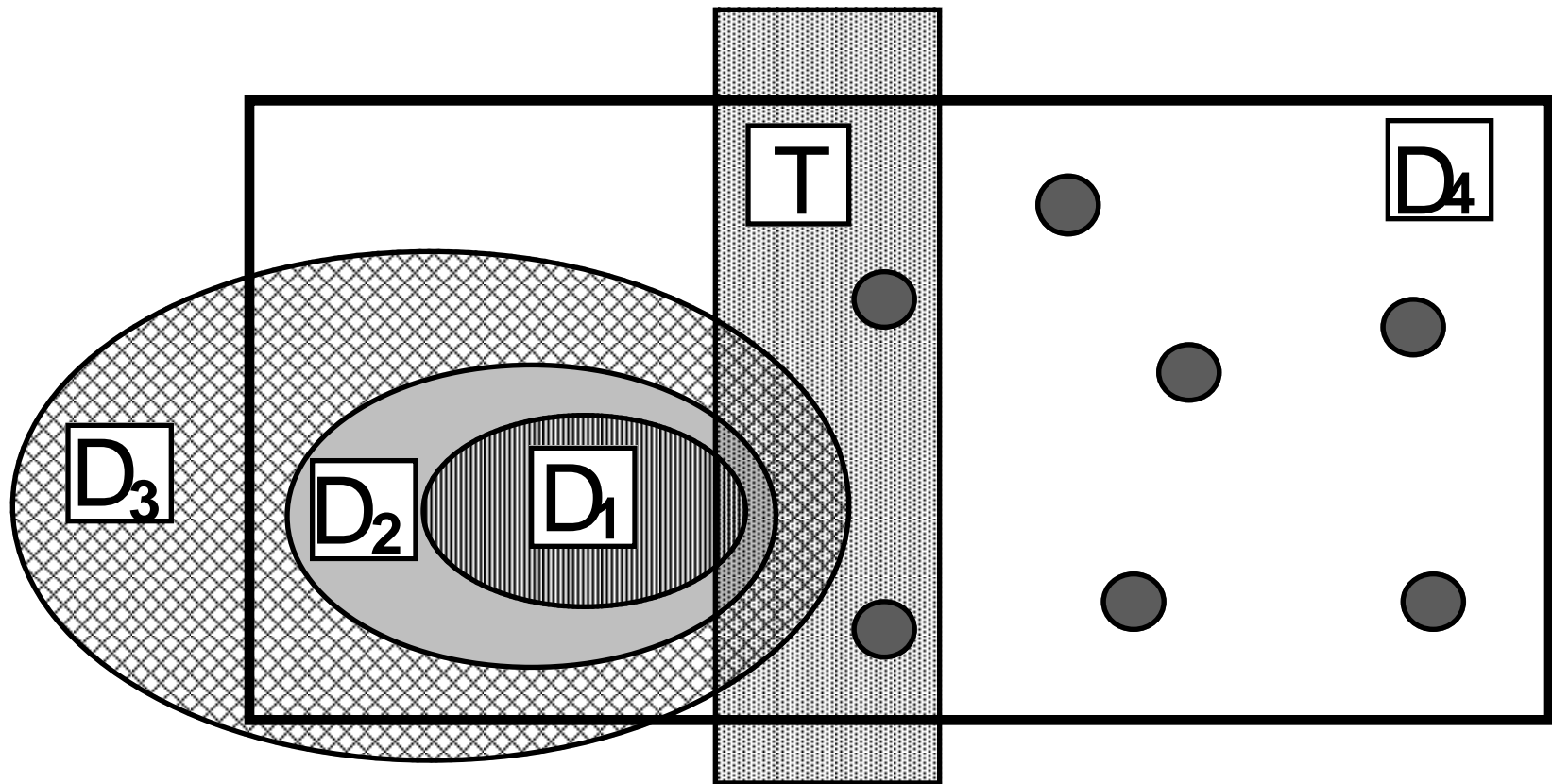
(graphics: draw-circle
x-center y-center radius inner-radius)

- Fortran package:

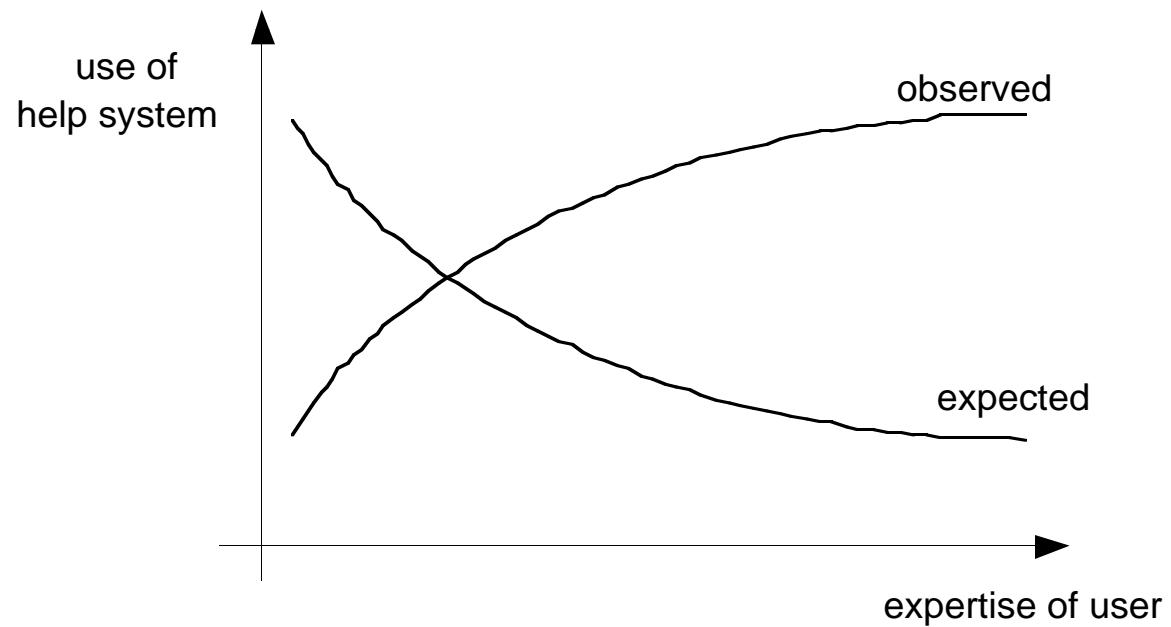
CALL BLCIR (xcntr,ycntr,radius)
CALL SHADE (xcrds, ycrds, npts,angle,
gaps,ngaps,0,0)

Implementation Units

HFAs in the Context of “Push and Pull” Technologies



Usage of Sophisticated Help Systems



User Modeling: Creating Context for Push Technologies

- **different user modeling techniques:**
 - explicit user modeling
 - implicit user modeling
 - observing user performing specific task / tests

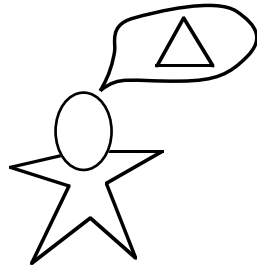
- **examples from general domains:**
 - going to a doctor's office
 - coaching in sports (skiing)

- **examples from computational systems:**
 - "How the West Was Won" (question: what characteristics of the environment simplified the user modeling task in the West system)?
 - Critiquing Systems

Gerhard Fischer: "User Modeling: The Long and Winding Road" to appear in UM'99

Providing Context

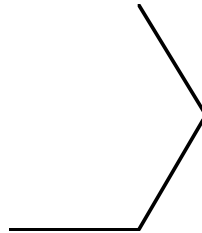
Intention of the Designer:



Procedure Written by the Designer:

```
define triangle  
repeat 3 [forward 100 right 60]
```

Feedback from the Environment:



**"Intent" Articulation and
Communication (communicated to the system):**

```
closed figure
```


Critiquing Supporting Contextualized Push Strategies

- critiquing lets learners see for themselves the usefulness of new knowledge for actual problem situations; users are informed
 - when they are getting into trouble
 - when they are missing important information
 - when they come up with suboptimal solutions
- most of our critic rules state what one may not do; this makes for greater freedom of choice than if the rules were prescriptive
 - “You must not do X!” leaves open a whole range of possibilities in terms of what one may in fact do
 - “You must do X!” reduces the range of possibilities to the scope of X itself
- *unasked-for help* breeds incompetence and is often seen as an intrusion