

CSE440: Introduction to HCI

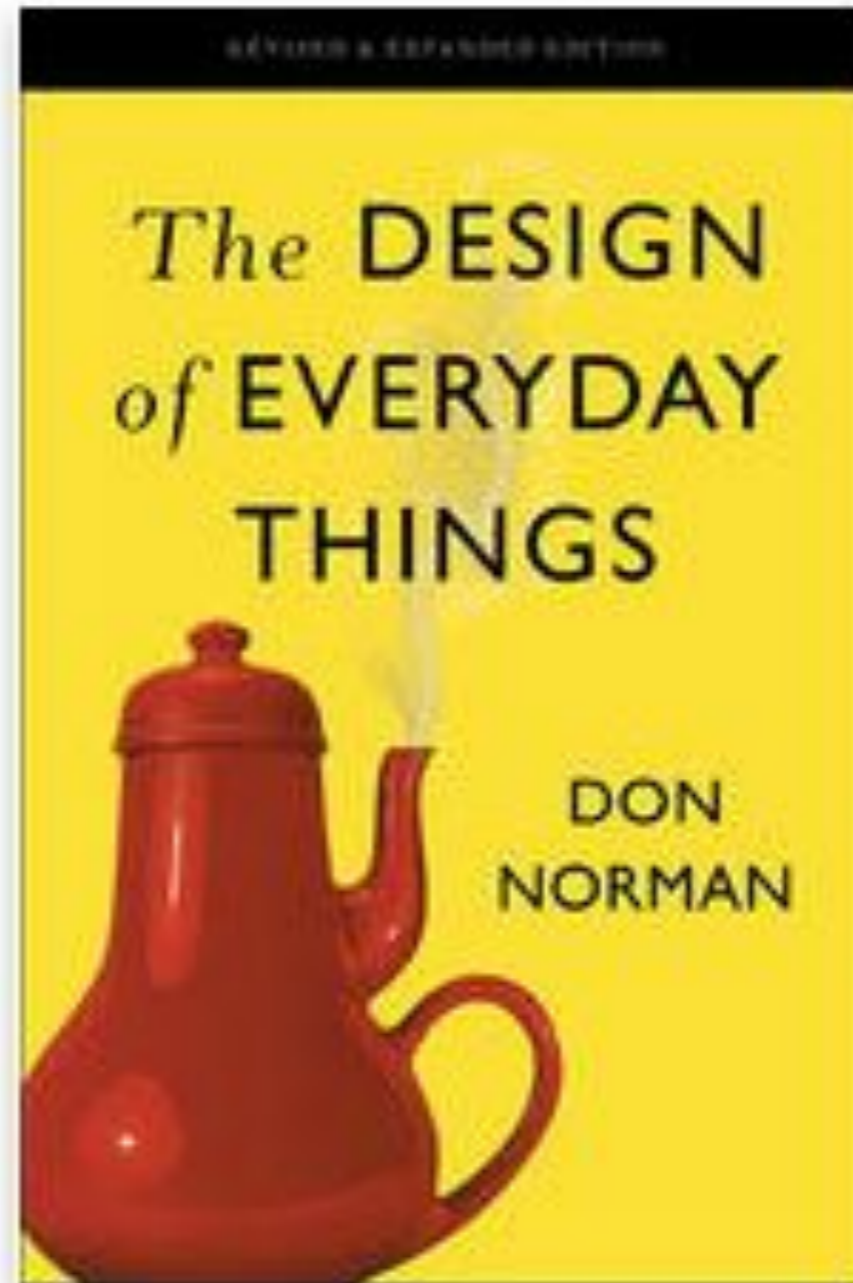
Methods for Design, Prototyping and Evaluating User Interaction

Lecture 04:
Design of Everyday Things

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Jeremy Viny

What we will do today

It is never a user's fault!





[99% Invisible Post](#). (Just read and listen everything there!) =)

snatch



BENICIO DEL TORO DENNIS FARINA VINNIE JONES BRAD PITT RADE SHERBEDGIA JASON STATHAM

SCREEN GEMS PRESENTS IN ASSOCIATION WITH SKA FILMS
A MATTHEW VAUGHN PRODUCTION A FILM BY GUY RITCHE "SNATCH" PRODUCED BY MATTHEW VAUGHN

SKA
FILMS

R RESTRICTED
UNDER 17 REQUIRES ACCOMPANYING
PARENT OR ADULT GUARDIAN
STRONG VIOLENCE, LANGUAGE,
SOME NUDITY

WRITTEN BY GUY RITCHE DIRECTED BY GUY RITCHE

SDDS DIGITAL SURROUND SYSTEM
DOLBY DIGITAL
SOUNDTRACK ON TVT SOUNDTRAX

SCREEN GEMS
FILMS

sony.com/snatch

coming soon

What is Interaction?

Two-Way

One-way is reaction

Communicative

Information is sent

Receptive

Information is received

Effective

There are changes as a result

What is Interaction?

Two-Way

One-way is reaction

Communicative

Information is sent

Receptive

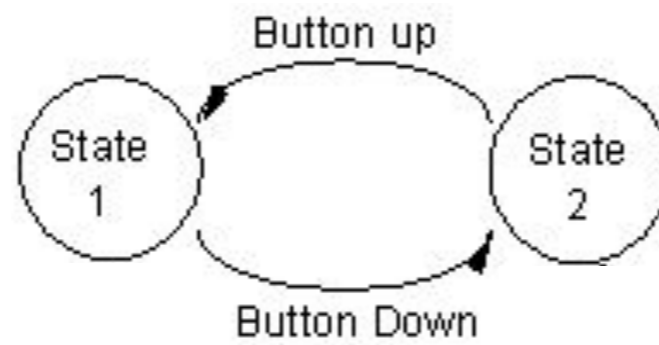
Information is received

Effective

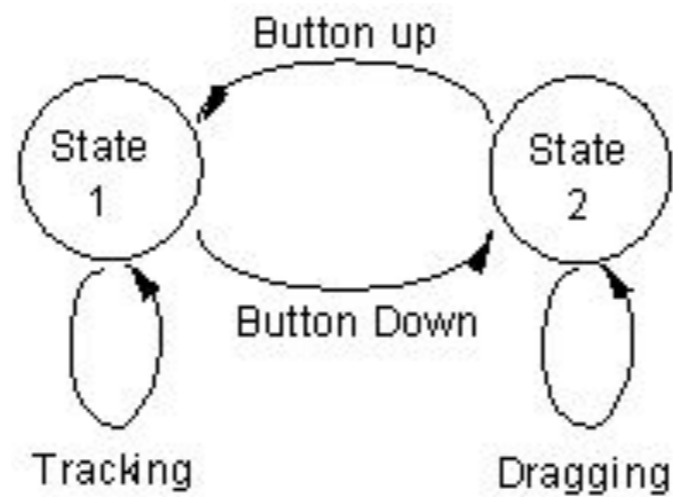
There are changes as a result



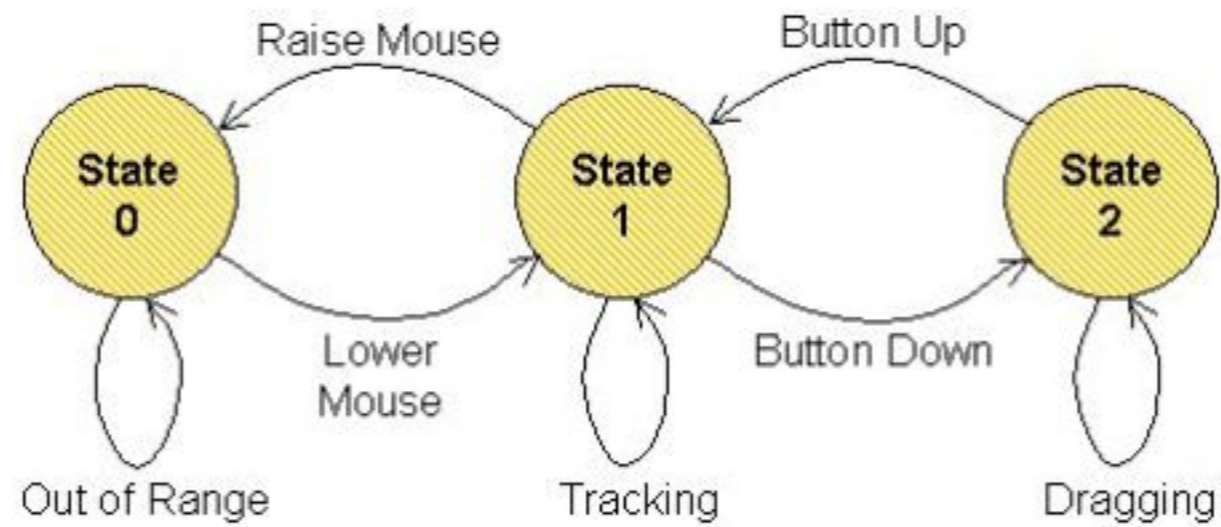
Buxton's 3-State Model



Buxton's 3-State Model



Buxton's 3-State Model



Norman's Execution-Evaluation Cycle

1. Establish the goal

Increase light in the room

2. Form the intention

To turn on the lamp

3. Specify the action sequence

Walk to the lamp, reach for the knob, twist the knob

4. Execute the action sequence

[walk, reach, twist]

5. Perceive the system state

[hear "click" sound, see light from lamp]

6. Interpret the system state

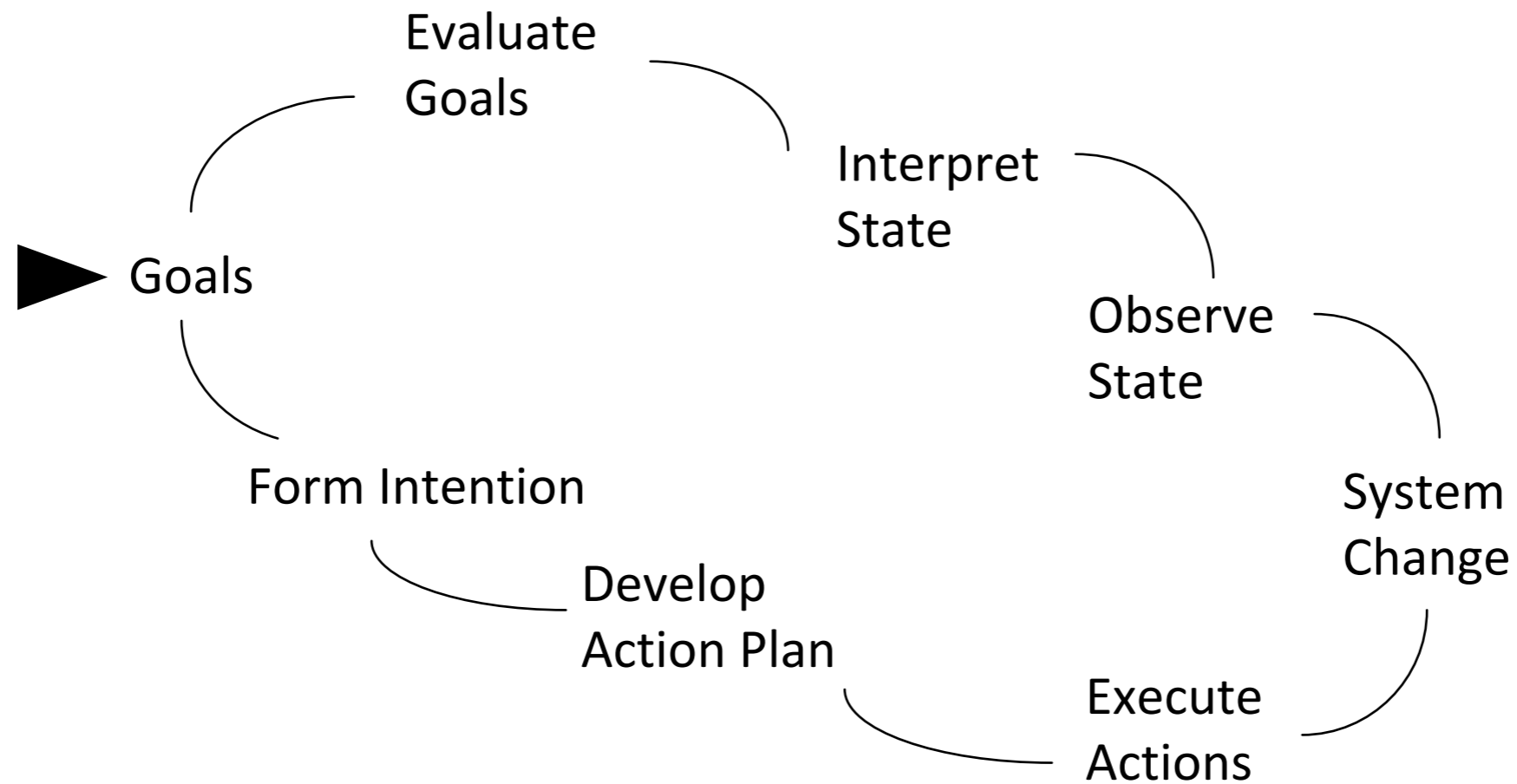
The knob rotated. The lamp is emitting light. The lamp seems to work

7. Evaluate the system state with respect to the goals and intentions

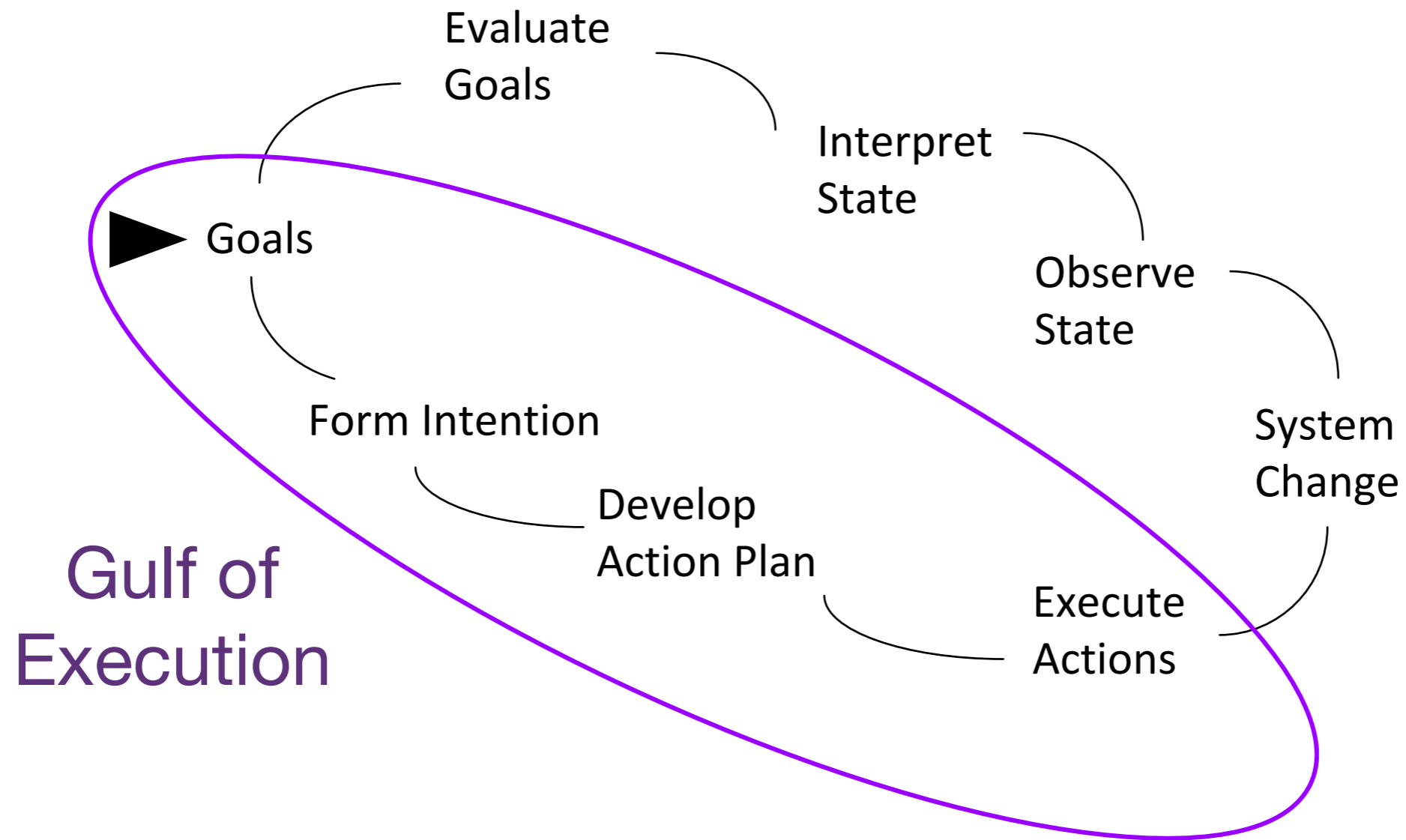
The lamp did indeed increase the light in the room [goal satisfied]

[REPEAT!]

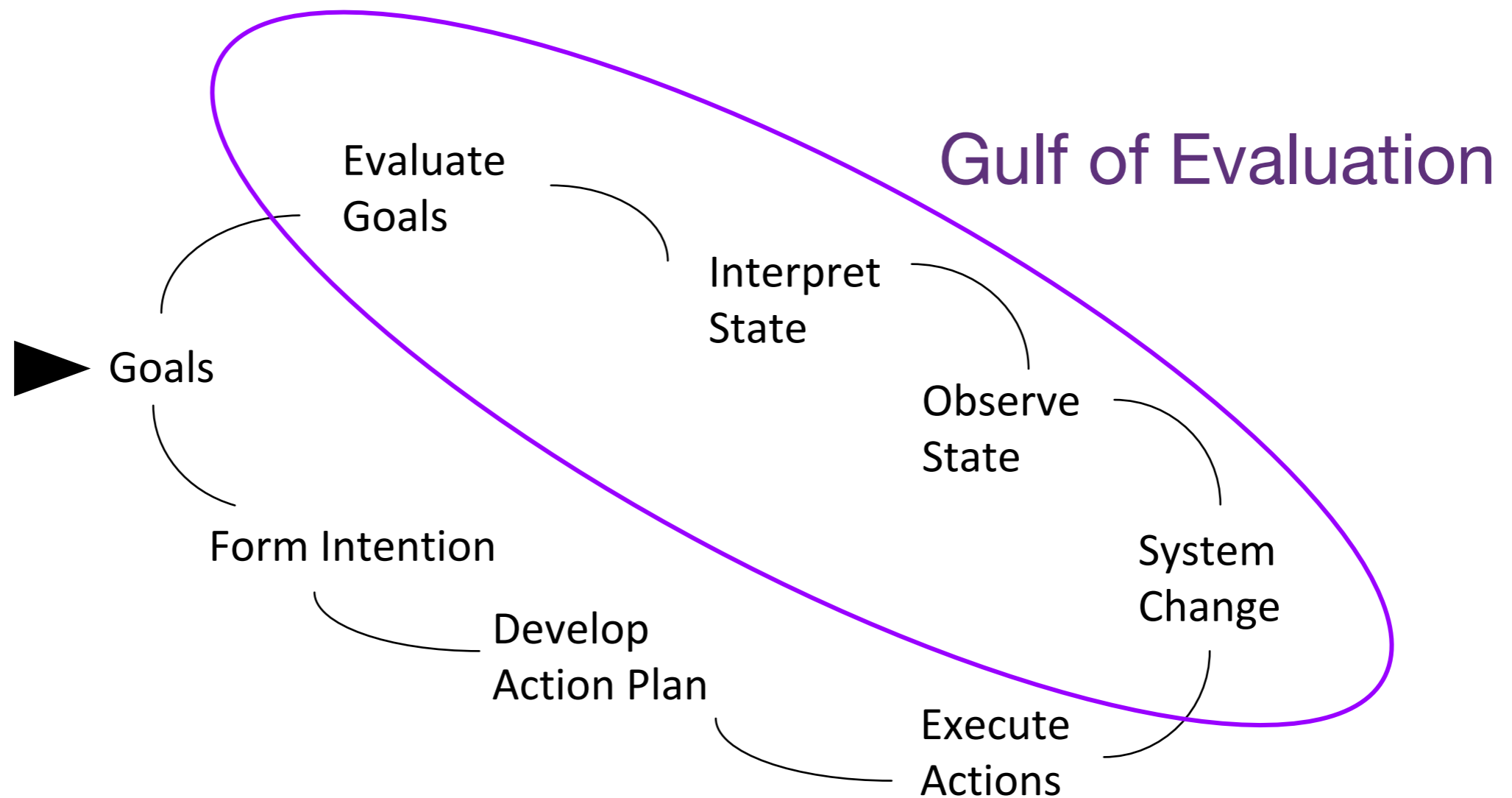
Norman's Execution-Evaluation Cycle



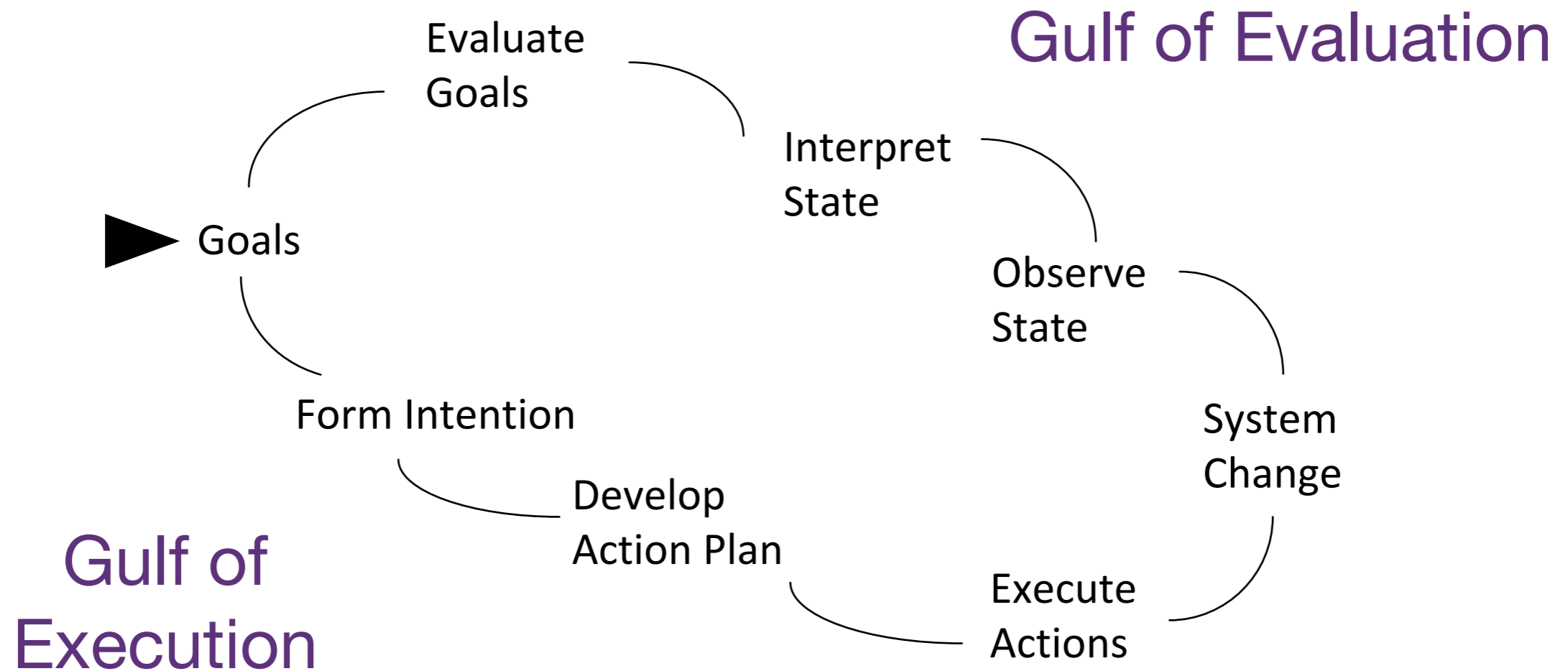
Norman's Execution-Evaluation Cycle



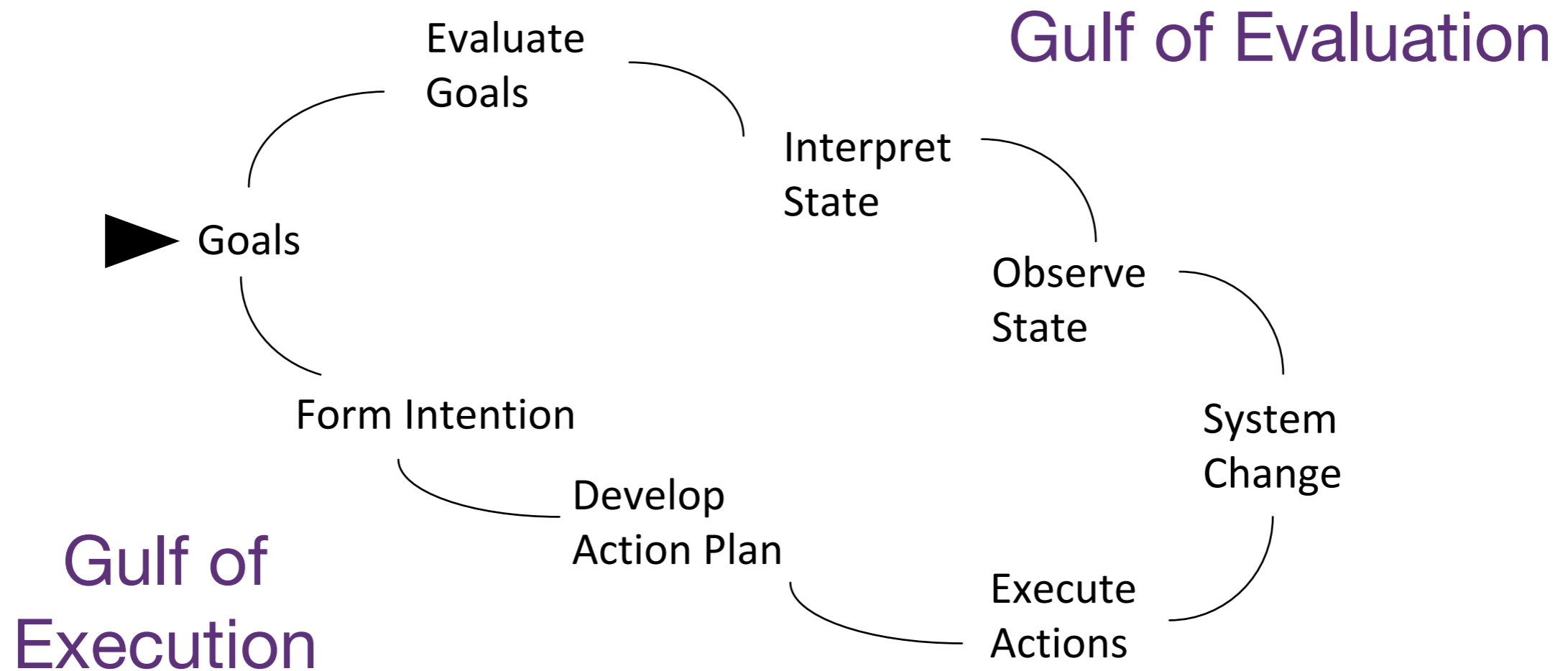
Norman's Execution-Evaluation Cycle



Norman's Execution-Evaluation Cycle

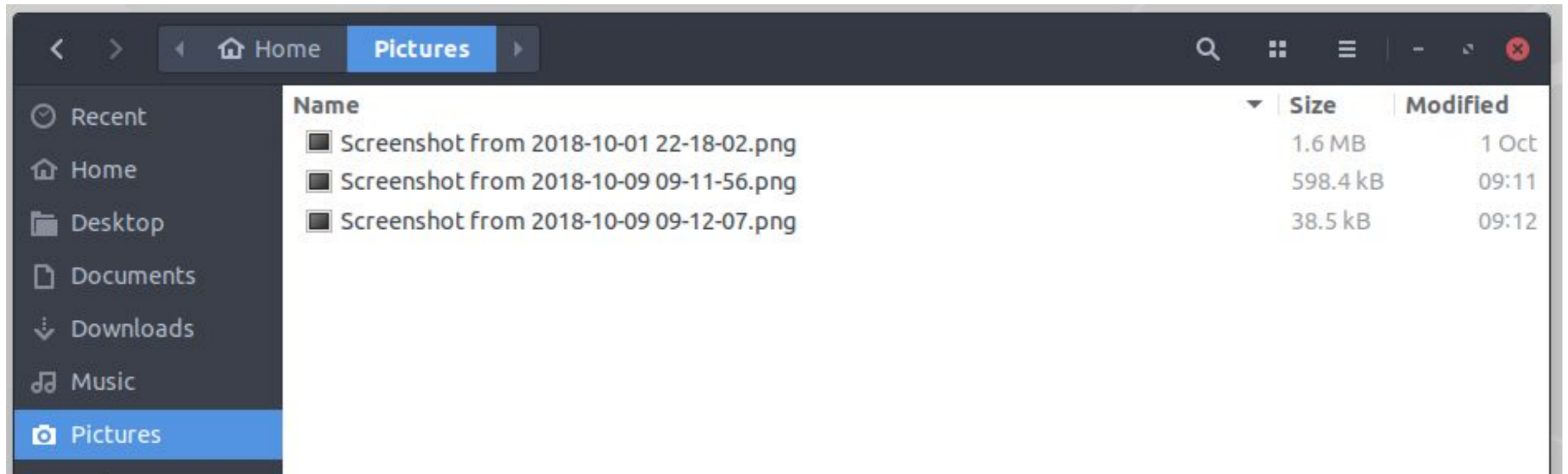


Norman's Execution-Evaluation Cycle

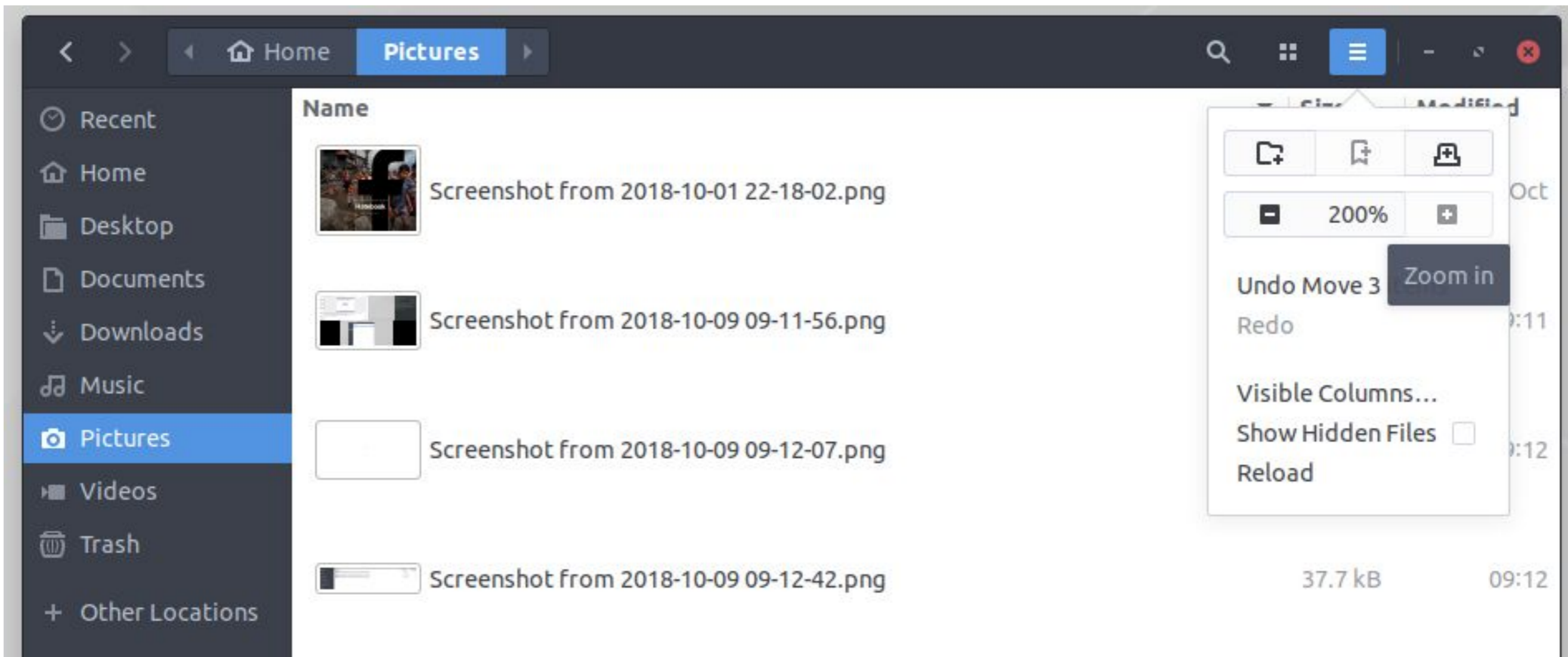


What factors can extend the Gulfs in the example of increasing light in the room?

Gulf of Evaluation: An Example

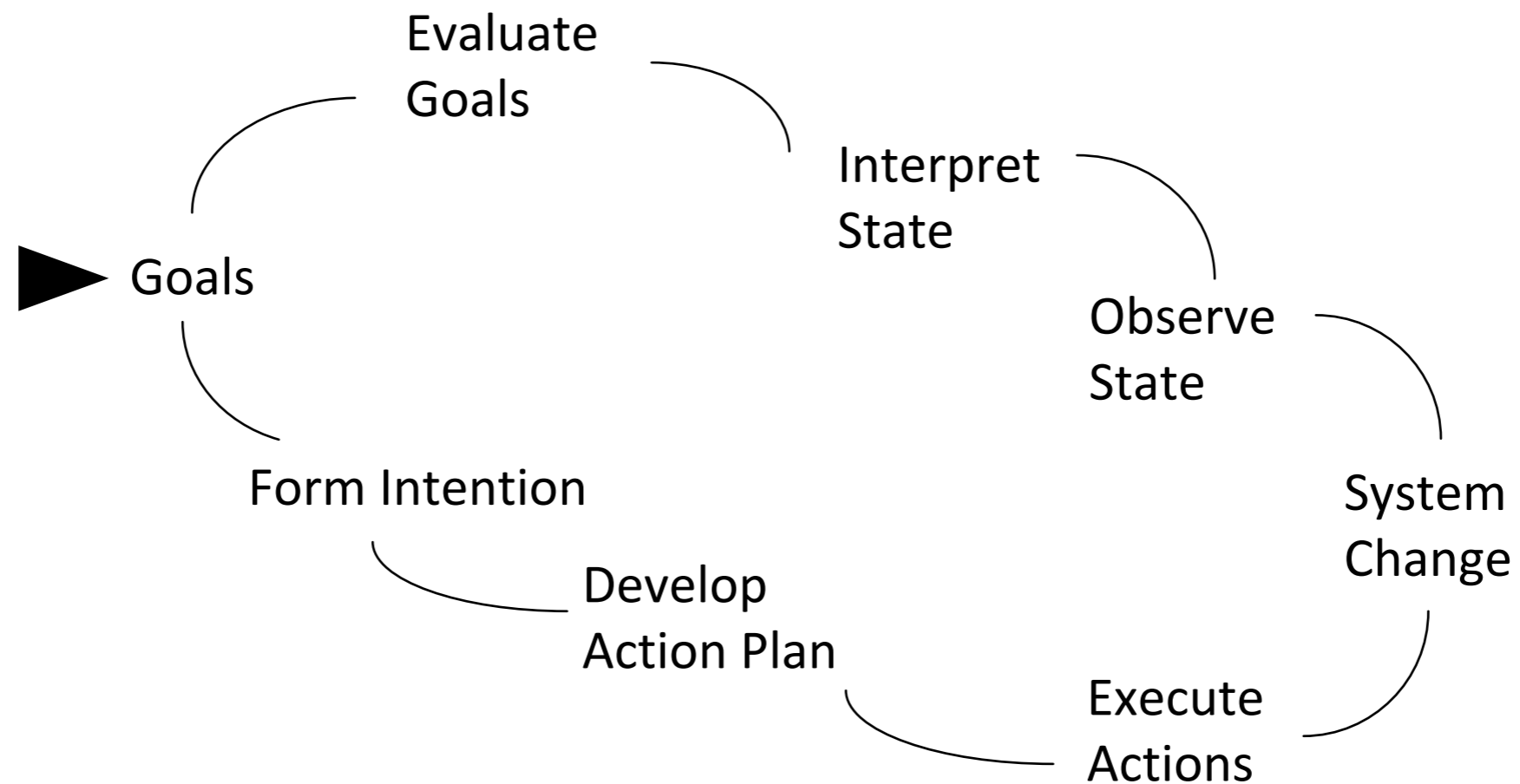


Gulf of Evaluation: An Example



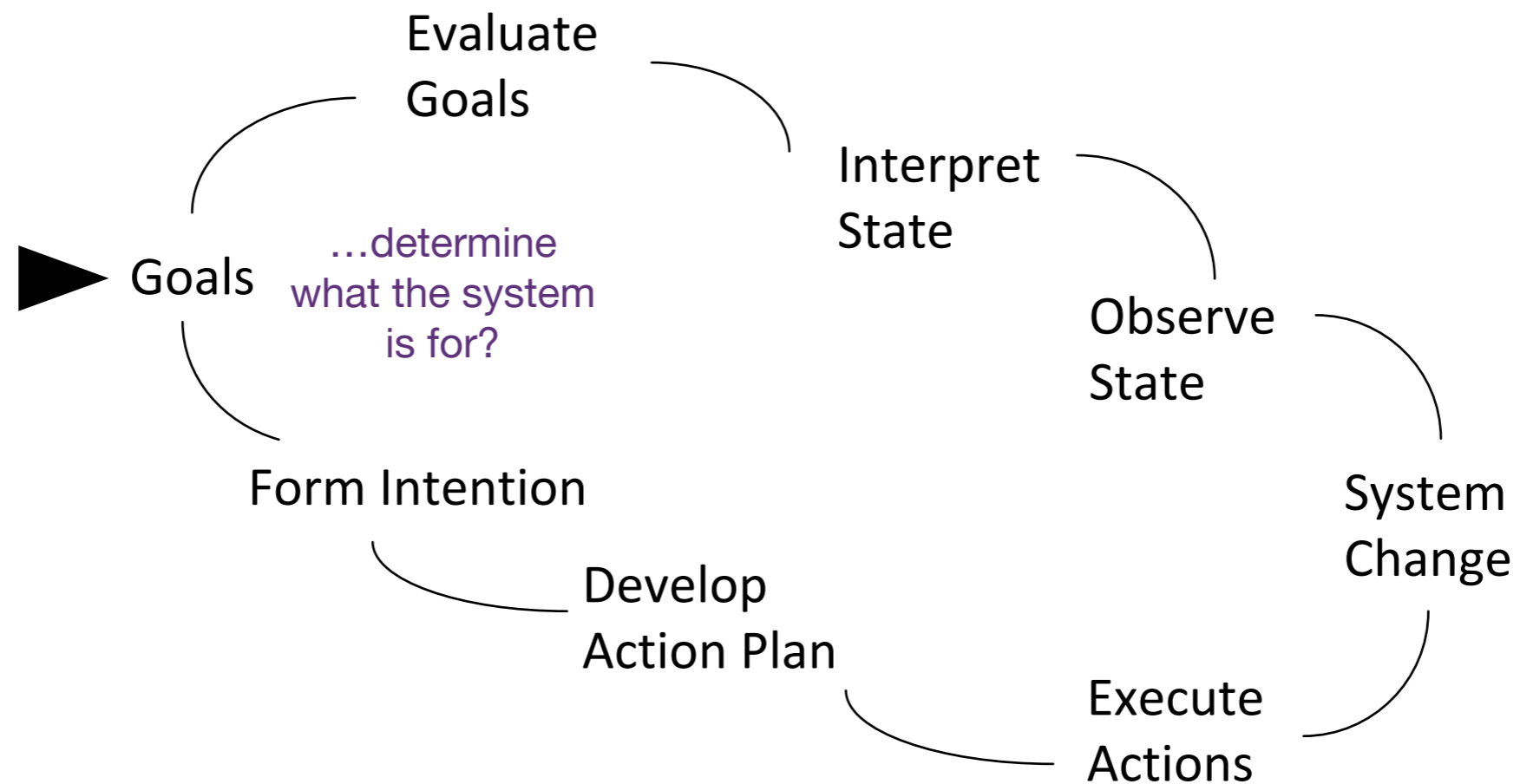
Bridging the Gulfs

Ask yourself: How easily can the user...



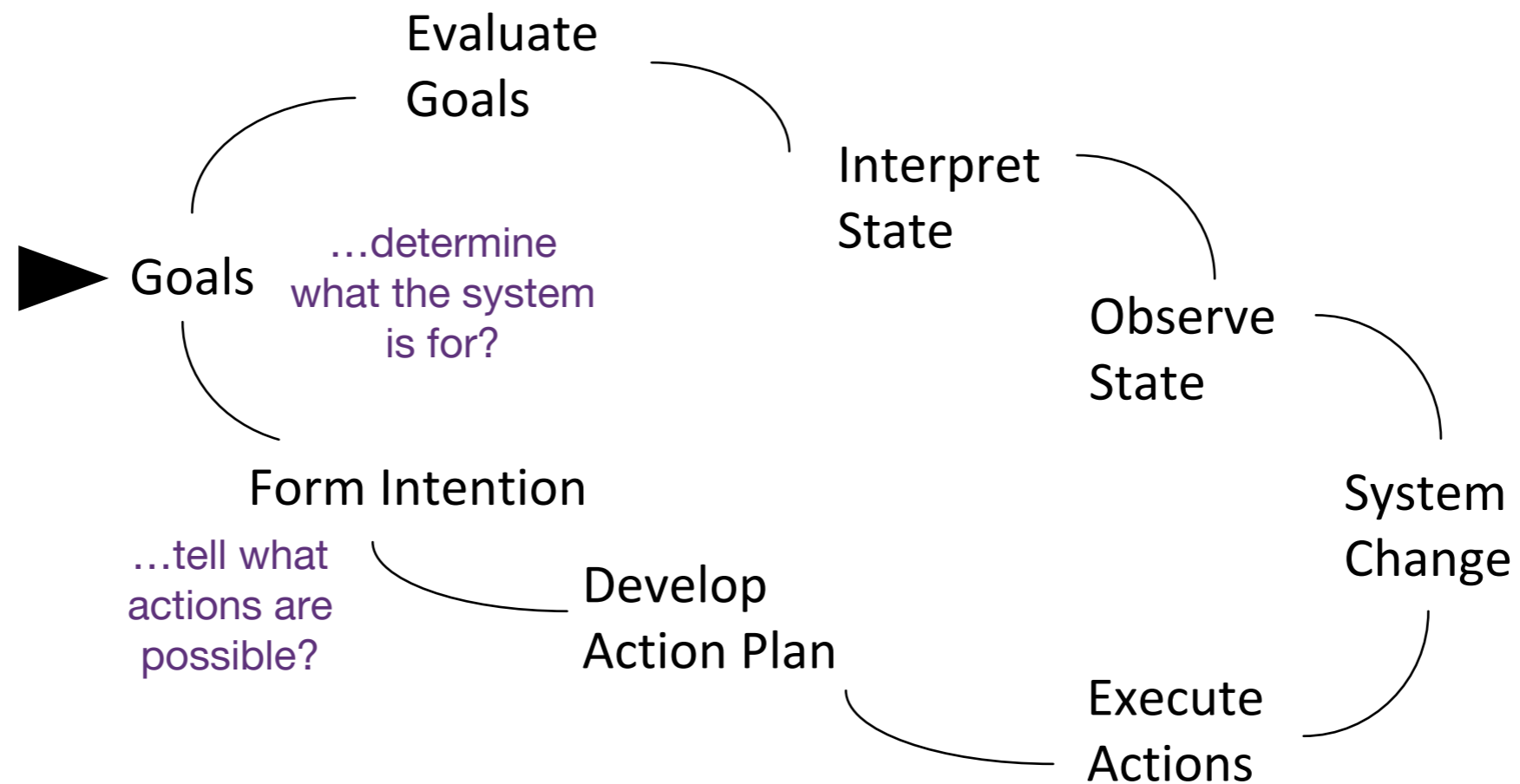
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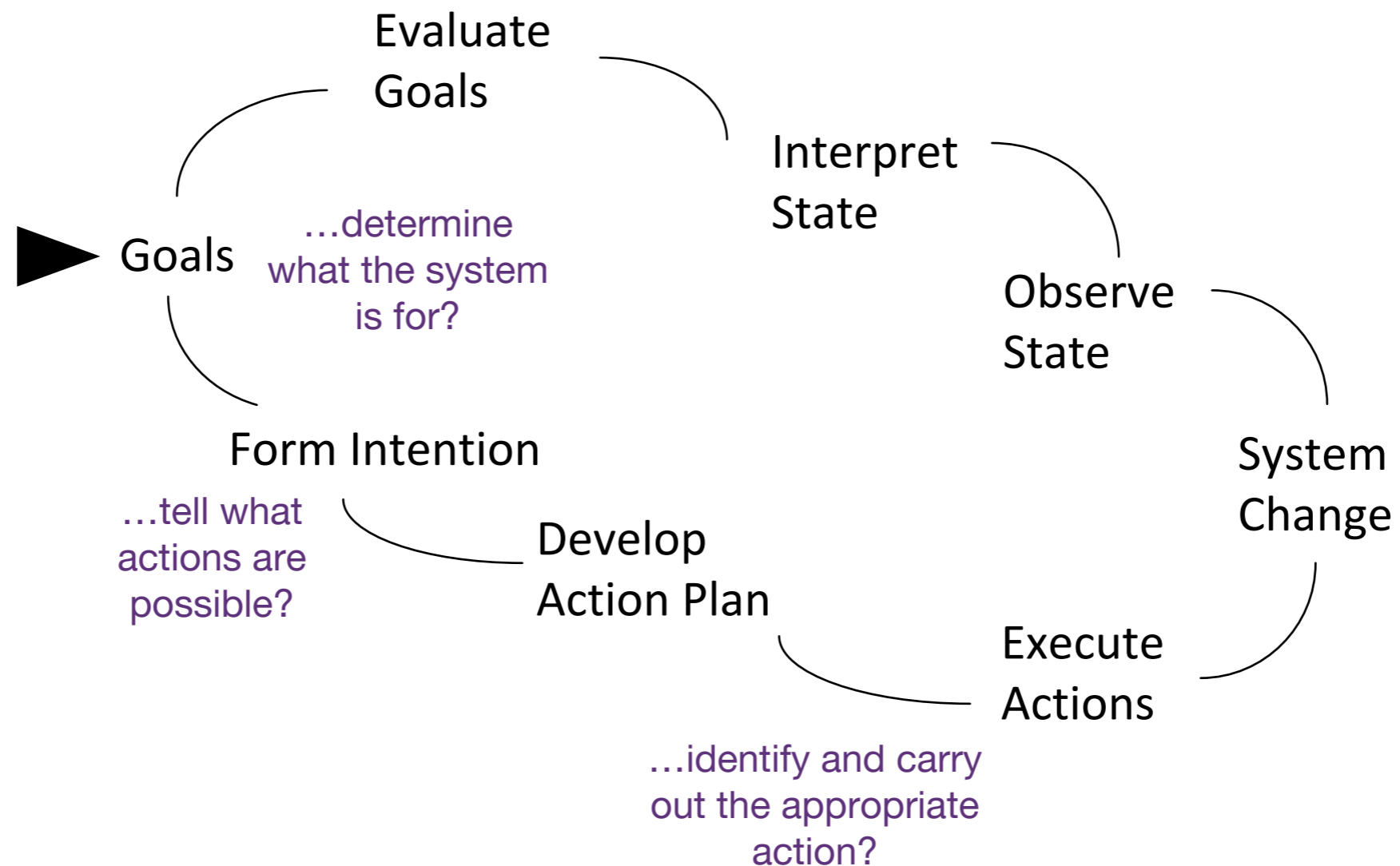
Bridging the Gulfs

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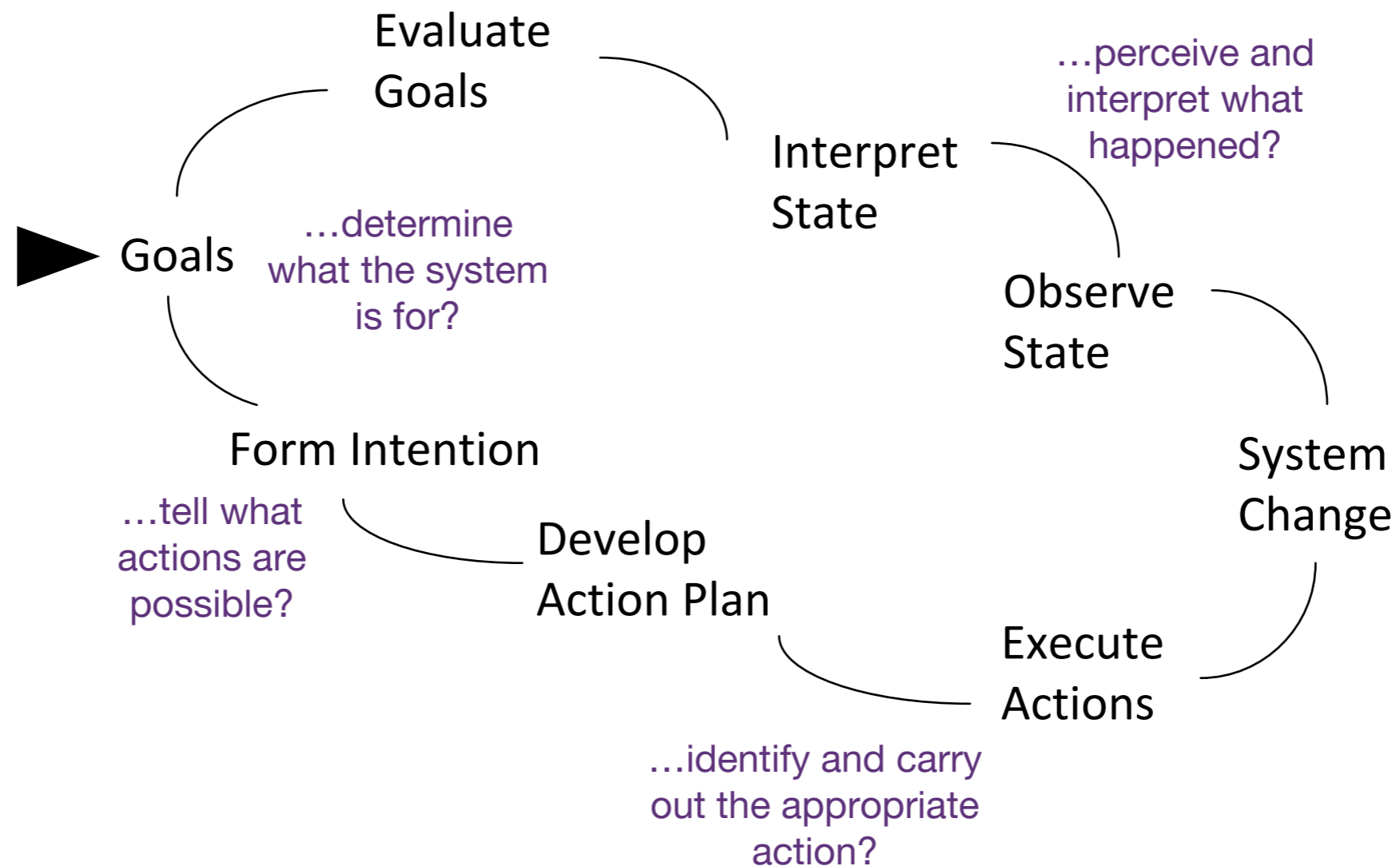
Bridging the Gulfs

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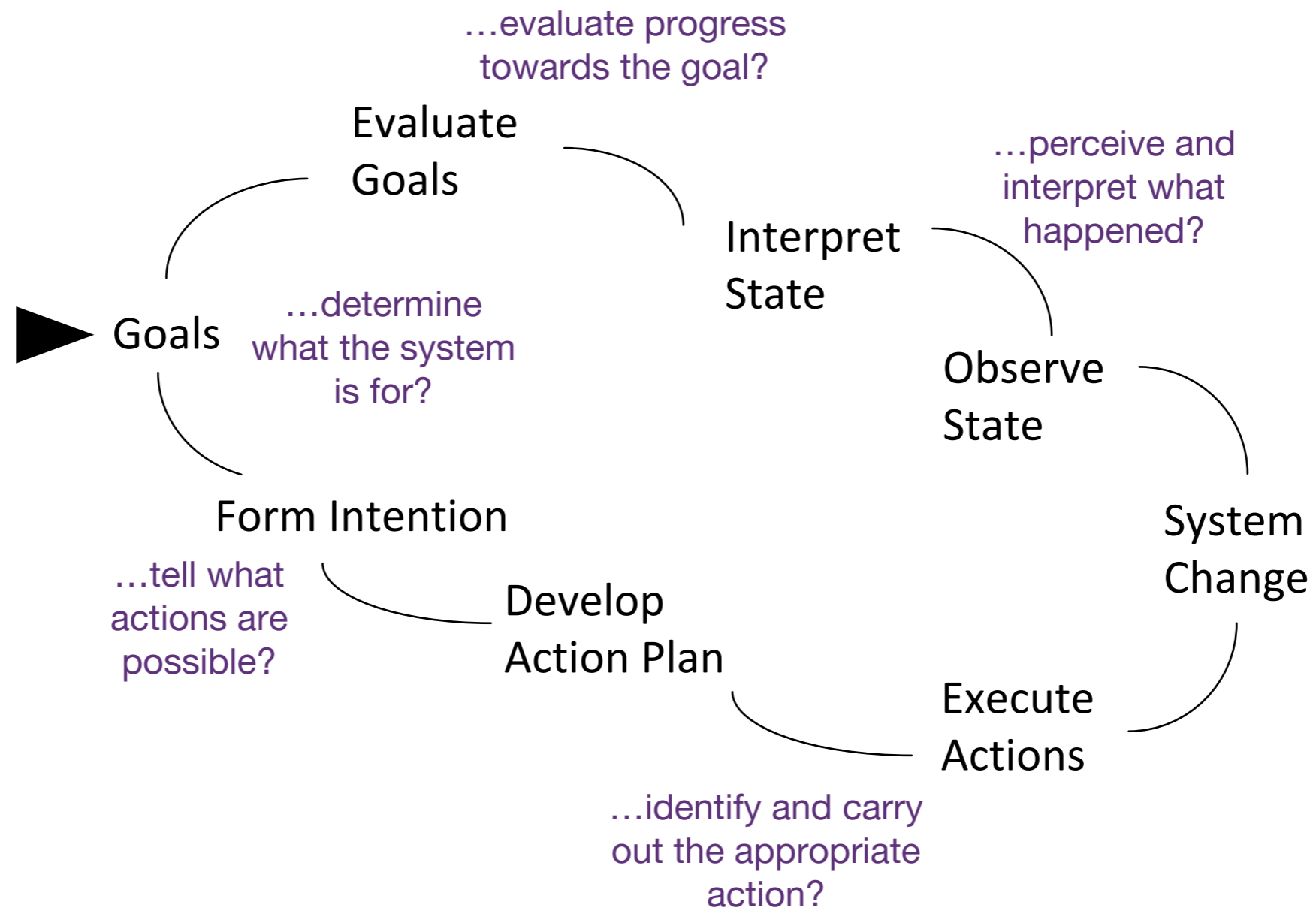
Bridging the Gulfs

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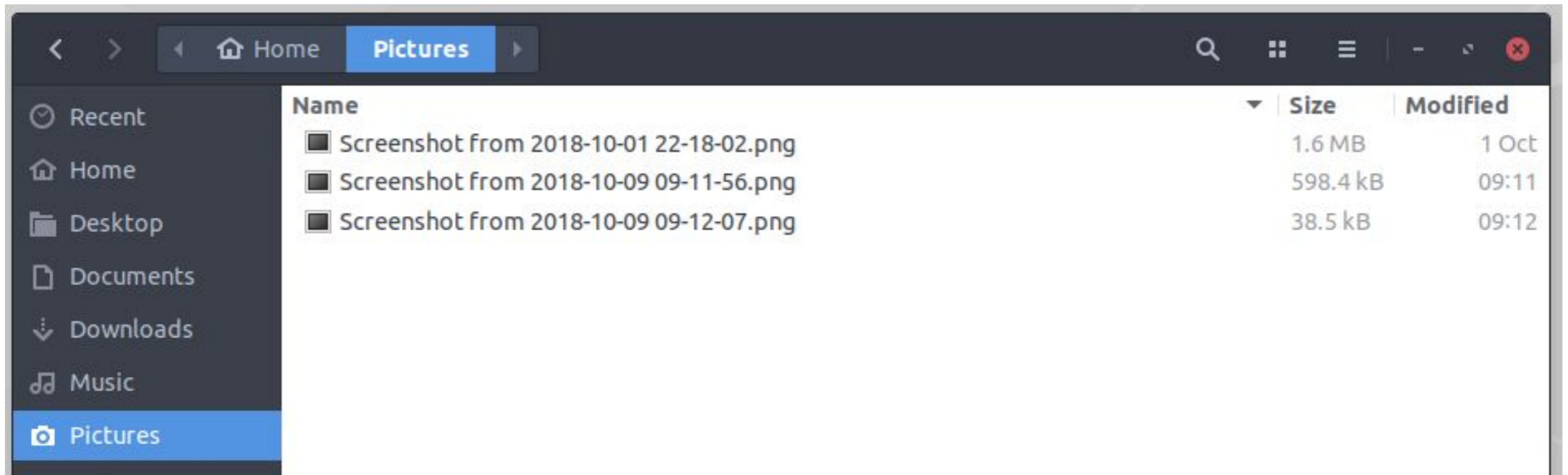
Bridging the Gulfs

Ask yourself: How easily can the user...



Let's Bridge the Gulfs...

... of finding the right Screenshot in my computer!



Design principles help us answer these questions

Affordances

Constraints

Feedback

Consistency

Metaphors

Mappings

Visibility

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Affordances

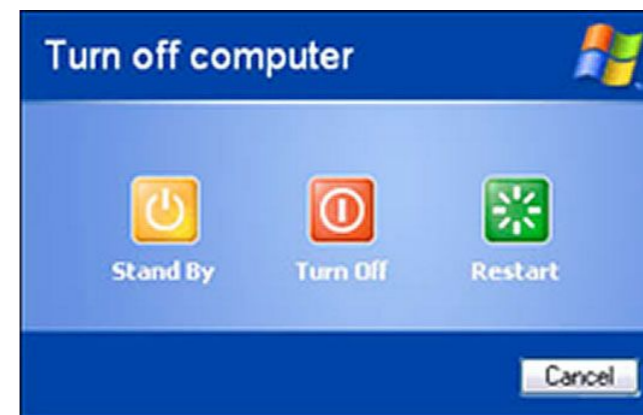
Perceived Possible Actions



What does this chair afford?

Affordances

Technology affordances are often based in affordances from the physical world



Affordances

“In general, when the apparent affordances of an artifact matches its intended use, the artifact is easy to operate. When apparent affordances suggest different actions than those for which the object is designed, errors are common.”

Gaver

False affordances

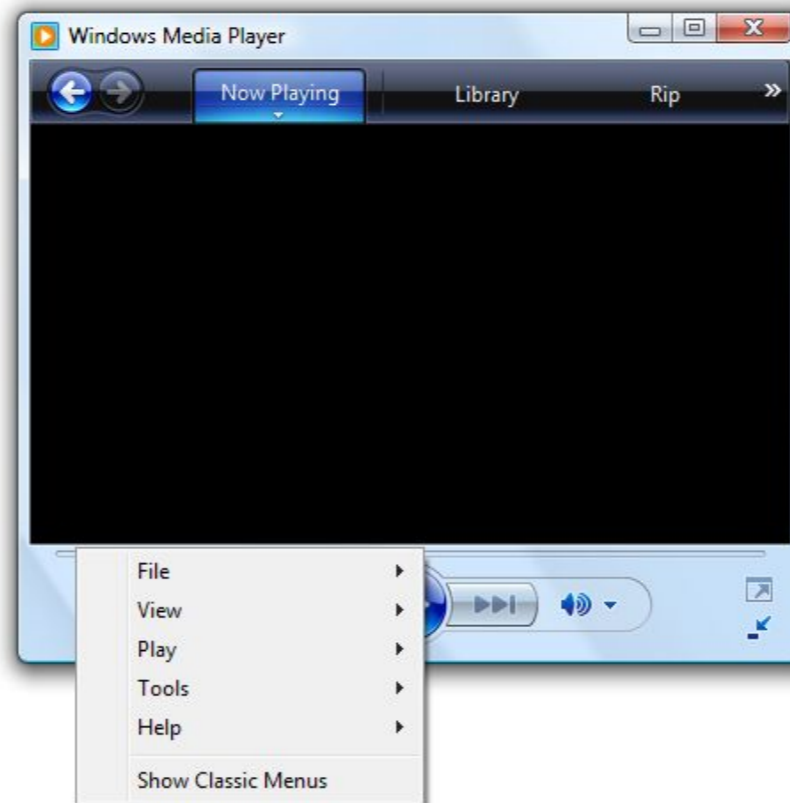


False affordances



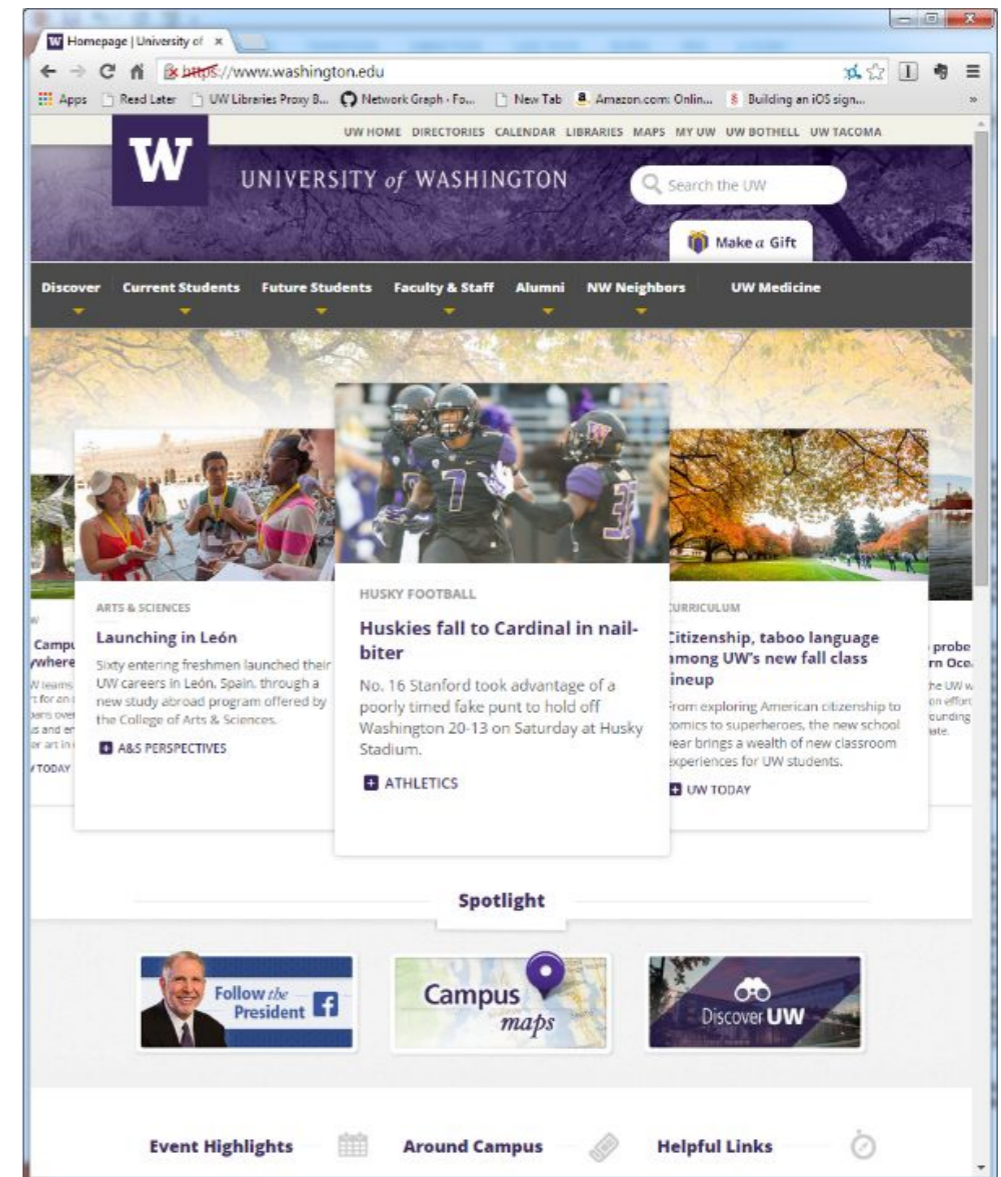
Hidden affordances

When there is no perceptual information suggesting an actual intended use



Hidden affordances

Logos linking to home is a convention, but not afforded by the page



Clarification on Convention

“Designers sometimes will say that when they put an icon, cursor, or other target on the screen, they have added an ‘affordance’ to the system. This is a misuse of the concept. ... It is wrong to claim that the design of a graphical object on the screen ‘affords clicking.’ ... Yes, the object provides a target and it helps the user know where to click and maybe even what to expect in return, but those aren’t affordances, those are conventions, and feedback, and the like. ... Don’t confuse affordances with conventions.” **Norman**

Affordances vs Signifiers

Affordances are the possible interactions **between people and the environment**. (It is not a property of the "thing"!)

Perceived affordances often act as signifiers, but they can be ambiguous.

Signifiers signal things, in particular what actions are possible and how they should be done. Signifiers must be perceivable, else they fail to function.

Norman

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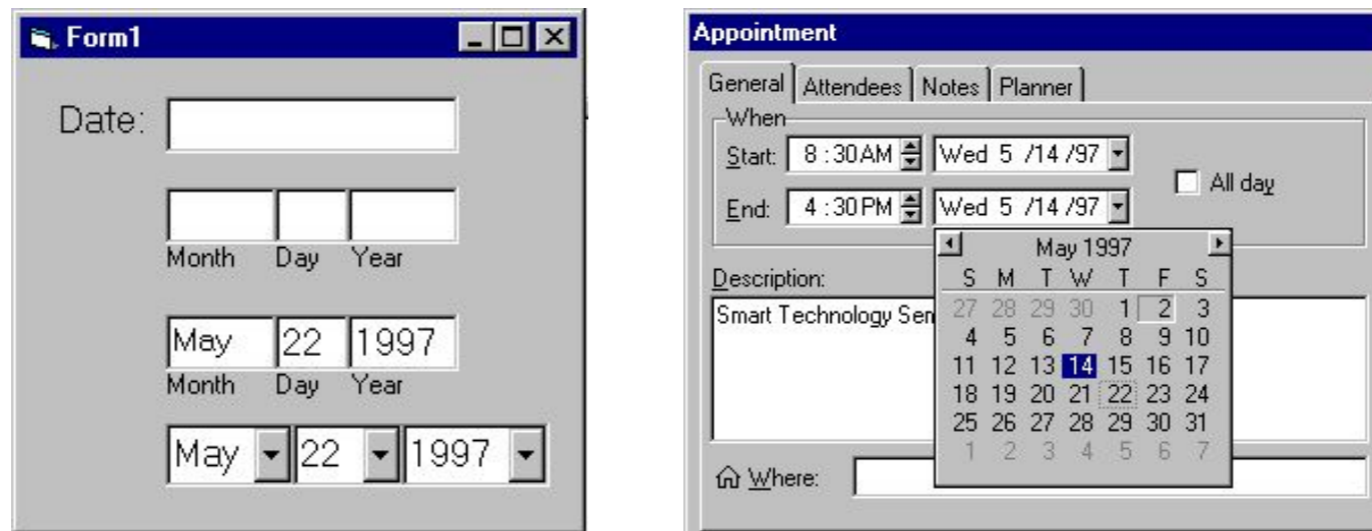
Metaphors

Mappings

Visibility

Constraints

Prevent some actions while allowing others



Prevent errors before they can happen

Disruptive error messages are a last resort

Constraints



Design principles

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Feedback

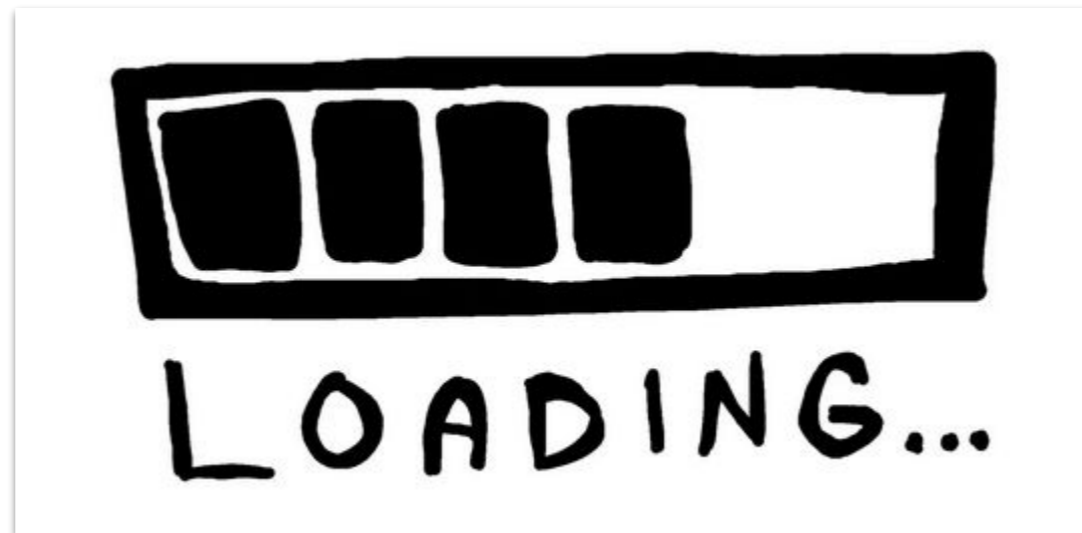
All actions have to be confirmed

Must be immediate

Must be informative

Preferably non-distracting and unobtrusive

Feedback



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Consistency

Interfaces should be consistent in meaningful ways

Ubiquitous use of same keys for cut/copy/ paste

Types of consistency

Internal (i.e., within itself)

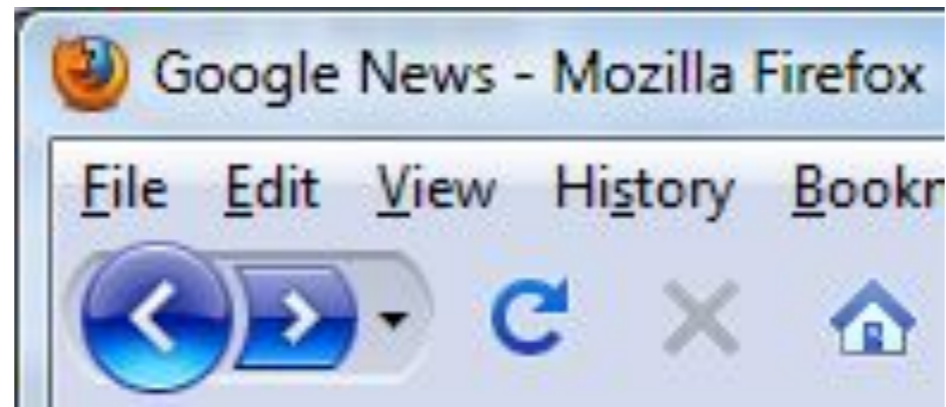
e.g., same terminology and layout throughout

External (i.e., with other applications)

e.g., common widget appearance

e.g., design patterns common across applications

Is consistency always better?



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Metaphors

Suggest an existing mental model

“horseless carriages”, “wireless”

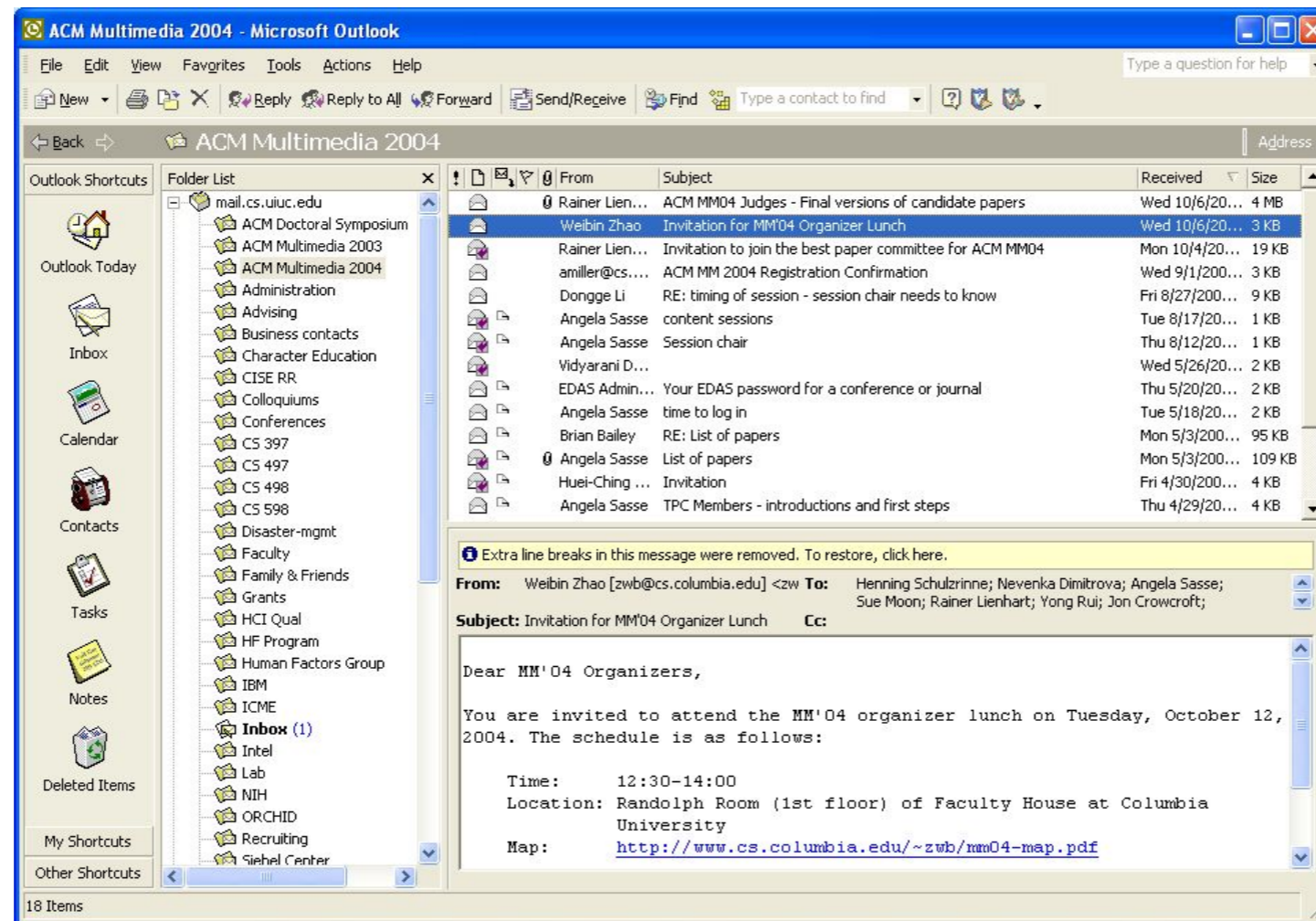
Desktop metaphor

Not an attempt to simulate a real desktop

Leverages knowledge of files, folders, trash...

... and how one object can hide others

Example: Mail Metaphor

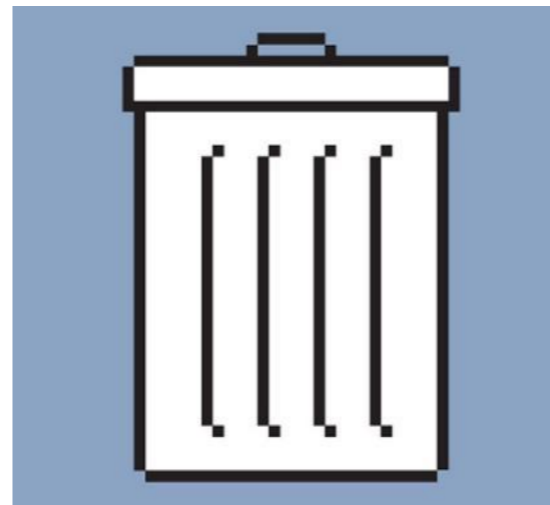
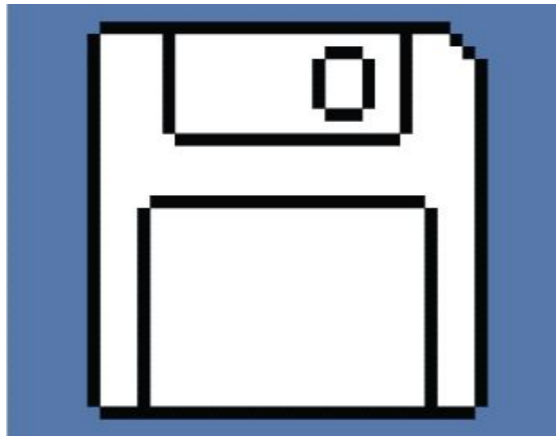


Example: Health Metaphor



Broken Metaphors

Are not consistent, do not operate in every circumstance, or do not uphold things consistent with what the metaphor would suggest



Dead Metaphors

Lost the original imagery of their meaning

- Milk
 - Butter
 - Cheese
-
- Water
 - Beer
 - Wine

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Correspondence between an interface and the corresponding action in 'the world'

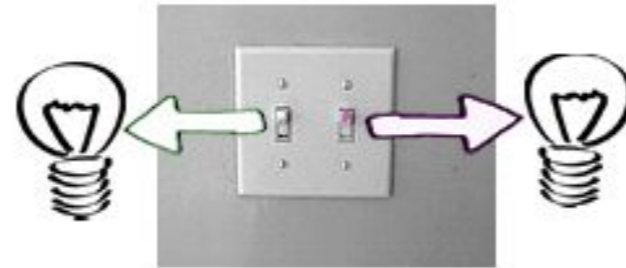
Minimize cognitive steps to transform action into effect, or perception into comprehension (i.e., execution and evaluation)



Mappings



Removing the cover plate, then removing and swapping the switches.

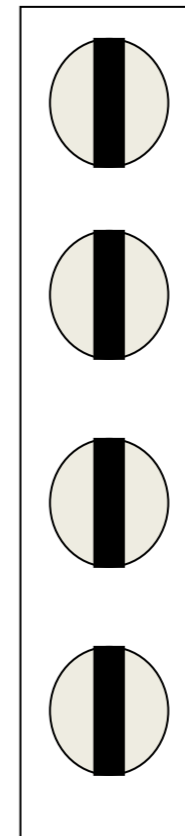
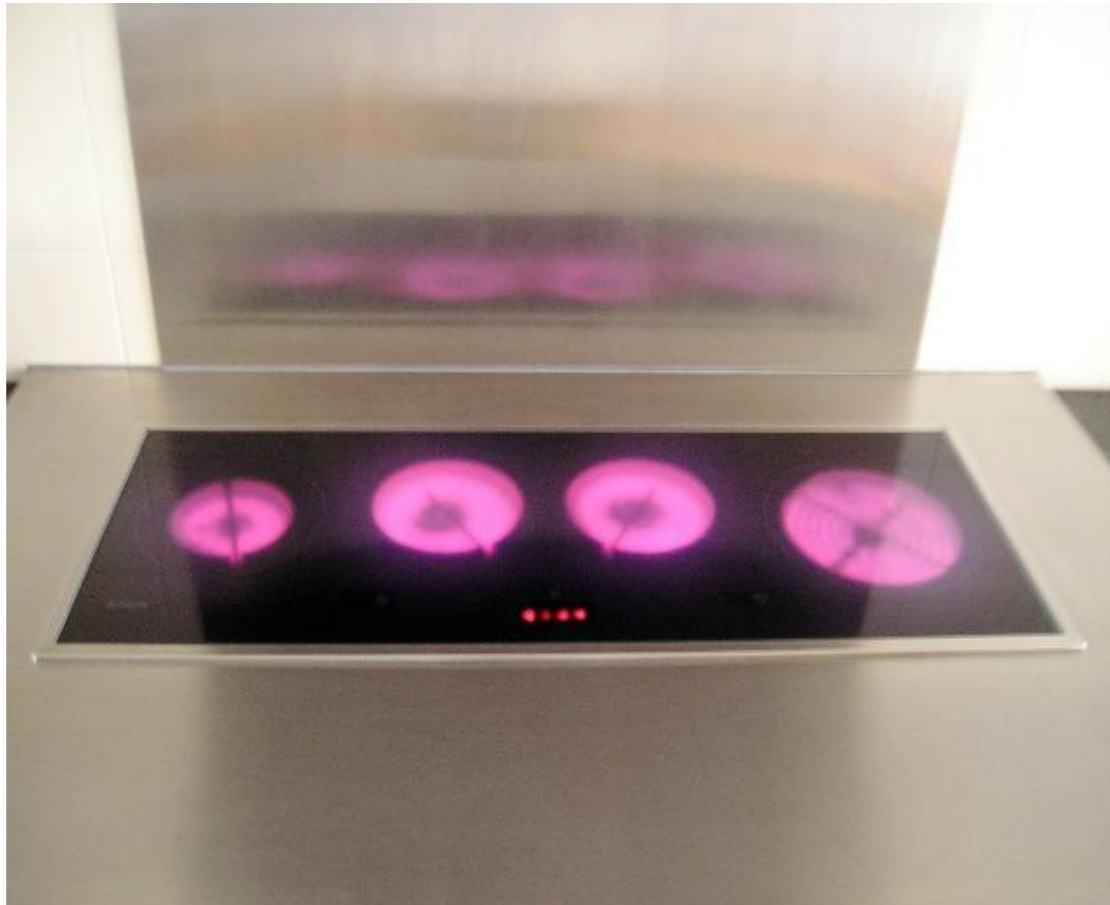


From <http://fivesketches.com/2009/11/natural-mapping-of-switches/>

Mappings



Mappings



Mappings



Design principles

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Visibility



Visibility



Visibility

Differentiate opposing functionality

Use visual function

to confirm the user's mental model of operation

Sometimes sound can be used to make things 'visible'

(e.g. vacuum cleaner clogging up)

Just the right things have to be visible:

excess is as bad as lack of visible clues

Activity: Bad Design Hunt

Can you discover instances of bad design on campus?

False affordances? A lack of consistency, visibility, or mappings?

“Thanks to you, I now constantly notice how badly things are designed.” — anonymous student

Ask me something!

