User Interaction Models

No screens

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Interfaces **display information** in a way that helps users **accomplish a goal**.

Pine text-based email client

GMail
What is the primary goal of this interface?

To read and respond to all email.
What is the primary goal of this interface?

To buy a book.
Users interact with a system to accomplish a goal

To read and respond to all email.

The designer must know the users’ goals to create interactions to help them meet it.

To buy a book.
Goal: Buy a book

**Subgoal:** Search for book

**Interaction:** Type its name, click on the image of it
Goal: Buy a book
Subgoal: Add to cart
Interaction: Click “Add to cart” button
Goal: Buy a book

Subgoal: Checkout

Interaction: Click “Proceed to checkout” button
Goal: Buy a book

Subgoal: Enter payment information

Interaction: Click, type, move cursor, click “Continue”
Goal: Buy a book

Subgoal: If information is correct, place order

Interaction: Click “place your order”
The designer must know the users’ goals create the subgoals and interactions to meet it.

**Goal:** Buy a book

**Subgoal:** Find it

**Interaction:** Type, click

**Add to cart**

**Interaction:** click

**Enter payment info**

**Interaction:** Type, click, point

**Place order**

**Interaction:** Click
The designer must know the users’ goals create the subgoals and interactions to meet it.

But sometimes on Amazon, I don’t have a goal.

I’m just browsing.
Are these sites “just for browsing”? 

No. Although people do browse, the primarily goal is to find or discover something. Browsing is secondary.
The designer must know the users goals and create interactions that them meet it.
Low-level Interactions
What are interactions on this page?

Move
Click
Type
Interaction: Moving + Clicking
Which button is faster to click?

A

B
Which button is faster to click?
Which button is faster to click?
Fitts’s Law

Time to move your pointer to a target

\[ = a + b \times \log \left( \frac{2D}{S} \right) \]
Using Fitts’ law, why is A faster to click?

\[ a + b \times \log \left( \frac{2D}{S} \right) \]

S is bigger. Thus the time is lower.
Using Fitts’ law, why is $A$ faster to click?

$$a + b \times \log \left( \frac{2D}{S} \right)$$

$D$ is small. Thus the time is lower.
Using Fitts’ law, why is B faster to click?

\[ \text{Time} = a + b \times \log \left( \frac{2D}{S} \right) \]

S is bigger (infinite).
Thus the time is lower.
Why did iOS move the menu for applications?
Fitts’s Law: What are $a$ and $b$?

$$\text{time} = a + b \times \log \left( \frac{2D}{S} \right)$$
Time to move the pointer: Fitts’s Law

Buttons on the edges are fast to get to because they have infinite size.

Time to move your pointer to a target

\[ T = a + b \times \log \left( \frac{2D}{S} \right) \]
More moving + clicking:
Tunneling Menus
More moving + clicking: Cascading Tunnel Menus
More moving + clicking: Cascading Tunnel Menus fix
What are all the low-level interactions are needed to accomplish this subgoal?
Every interaction takes time and effort, and is a potential source of error.
How could you improve this?
Low-level Interactions take time and effort. Minimize them because you do them a lot.
The Interaction Loop
Establish a goal: Buy a book.
What happens after you place an order?

To accomplish a goal, users must **execute** an operation and **evaluate** the result.
The Seven Stages of Action

1. Form the goal
2. Plan the action
3. Specify the action sequence
4. Perform the action sequence
5. Perceive the state of the world
6. Interpret the perception
7. Compare the outcome with the goal
Goal Execution Step 1:

Plan the action

Specify the action sequence

Perform the action sequence
Goal Execution Step 2:
Plan the action
Specify the action sequence
Perform the action sequence
Goal Execution Step 3:
Plan the action
Specify the action sequence
Perform the action sequence
Goal Evaluation Step 1: Perceive the State of the world

Interpret the perception

Compare the outcome with the goal

Order Confirmation

Hello,

Thanks for your order. We’ll let you know once your item(s) have dispatched. Your estimated delivery date is indicated below.

Arriving:
Wednesday, January 4 - Monday, January 9

Your order will be sent to:
Olayemi Osonuga
2B HERBERT ROAD
LONDON, SE18 3SH
United Kingdom

Order Details

Placed on January 02, 2017

EFFORTINC Vintage Chandelier Deer Horn Resin 6 Lights, Rural countryside antler chandeliers, Study Room/Office, Dining Room, Bedroom, Living Room Chand Condition: New
Sold by EFFORTINC Tiffany
Delivered by Amazon

197.99 GBP
Goal Evaluation Step 2:
Perceive the State of the world
Interpret the perception
Compare the outcome with the goal
Goal Evaluation Step 3:
Perceive the State of the world
Interpret the perception
Compare the outcome with the goal
What does The 7 Stages of Action remind you of?
What’s the users goal?  Post a tweet
What does the execute?

Put cursor in box
Type message
Move mouse to button and click

Knicks vs. Celtics tonight!
What does the user evaluate?

Did it get posted?

What's happening?

Lydia Chilton
Knicks vs. Celtics tonight!
How does the user know?

It’s my face.

It’s my text.

It has new options.
Goal: Perfect DDR score.

What's the users subgoal? Step on the correct arrow at the correct time.
Execution 1:
How does the user plan the action?

Look at the screen to see the correct arrow/timing
Execution 2&3: How does the user execute the action?

Lift your foot, move over arrow, Place it at the right time
You can see the arrow flash. It tells you a grade.

Evaluation: How does the user evaluate the action?
What’s the users goal?  To set the alarm for 9:07am
Execution?

Move the wheel to the time
Switch it to “on”
Evaluation?

Turns to an alarm screen
Next time:

Programming interactions in JavaScript?

HTML

```html
<body>
  <button id="counter" class="btn btn-primary">Counter (0)</button>
</body>
```

JavaScript

```javascript
$(document).ready(function(){
  $('#counter').click(function(){
    alert('foo')
  })
})
```
Users interact with a system to accomplish a goal

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To buy a book
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Goal: Buy a book

Subgoal: Find it
Interaction: Type, click
Add to cart
Interaction: click
Enter payment info
Interaction: Type, click, point
Place order
Interaction: Click
Time to move to a target: Fitts’s Law

\[ \text{Time to move your pointer to a target} = a + b \times \log \left( \frac{2D}{S} \right) \]

Buttons on the edges are fast to get to because they have infinite size.
Low-level interactions take time and effort. Minimize them because you do them a lot.
Know the users’ goals and design interactions as: execution and evaluation

**Execution**
- Plan the action
- Specify the action sequence
- Perform the action sequence

**Evaluation**
- Perceive the state of the world
- Interpret the perception
- Compare the outcome with the goal
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Fill out participation now!

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