User Interaction Models

No screens

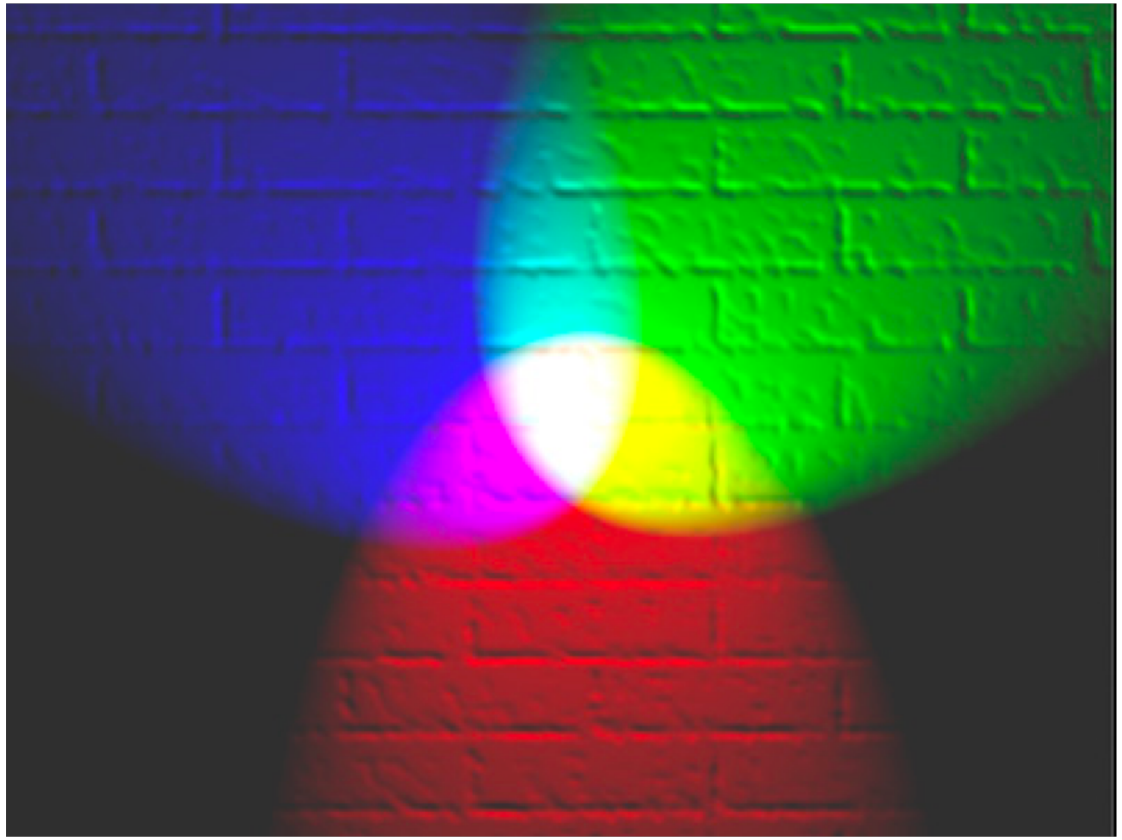
Prof. Lydia Chilton

COMS 4170

6 February 2019

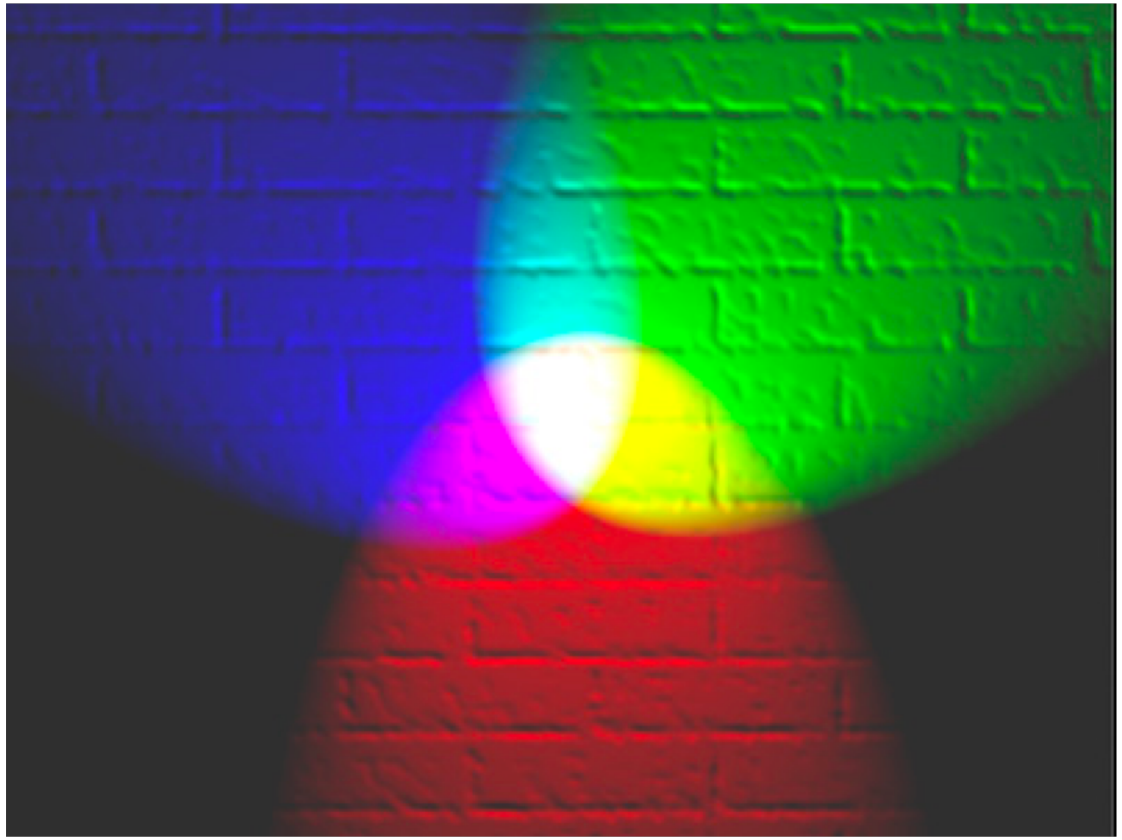
Last time on COMS 4170....

What is this color model called?



RGB

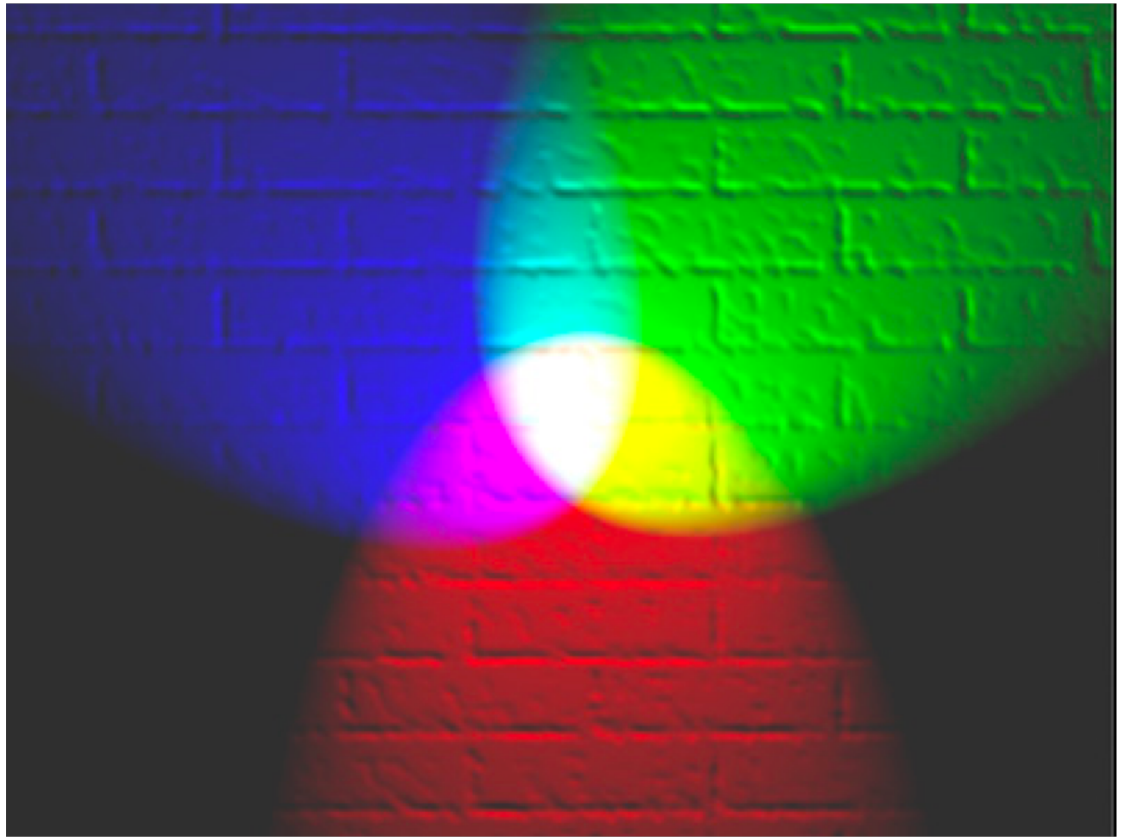
What color will you get?



If you have have
Red: **100%**
Green: **100%**
Blue: **100%**

White

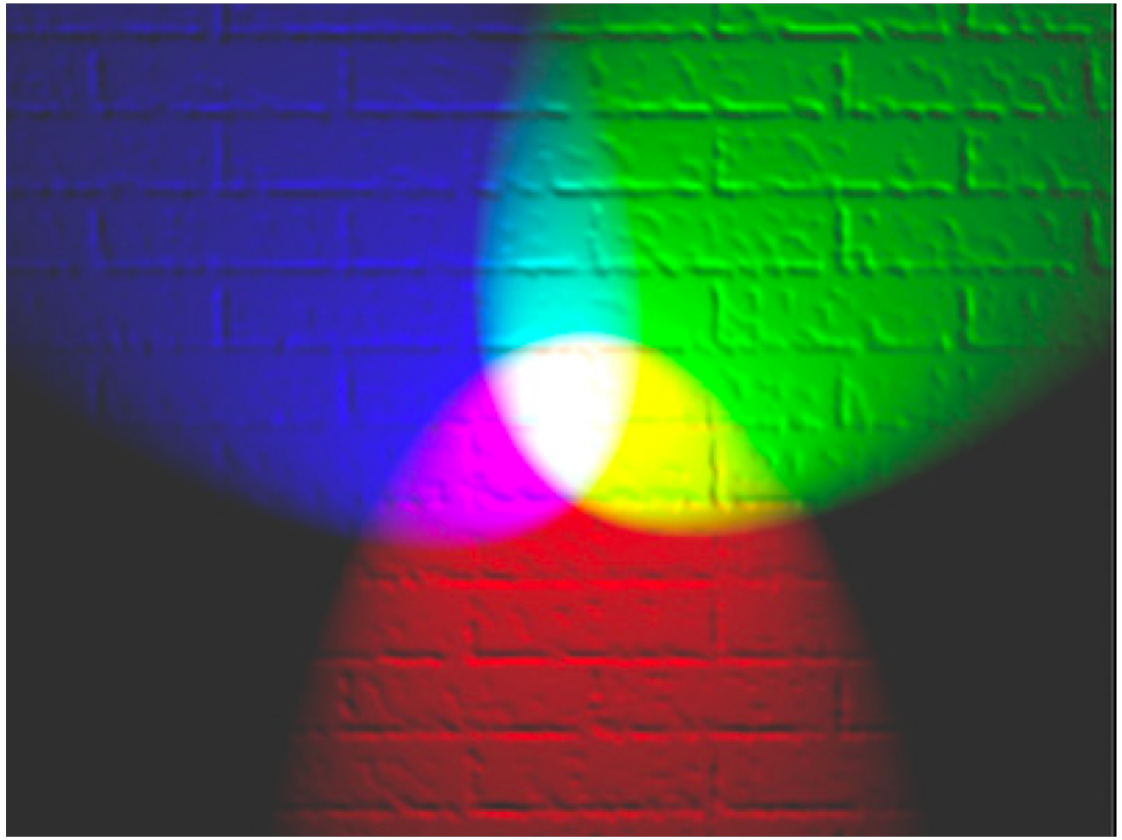
What color will you get?



If you have have
Red: **50%**
Green: **50%**
Blue: **50%**

Grey

What color will you get?



If you have have
Red: **50%**
Green: **50%**
Blue: **50%**

Grey

If you have have
Red: **20%**
Green: **20%**
Blue: **20%**

Darker Grey

What's good about these fonts together?

Contrasting fonts:

San serif + serif

What should you not do?

DUANEreade

Conflicting fonts:

serif + serif

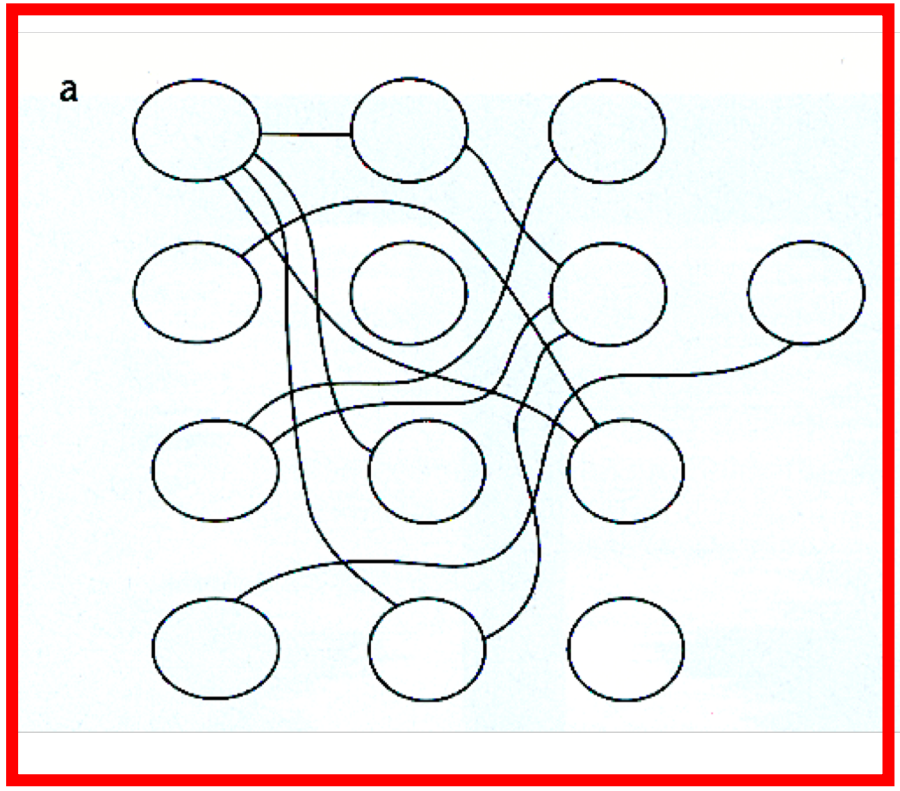
What’s another good way to mix fonts?

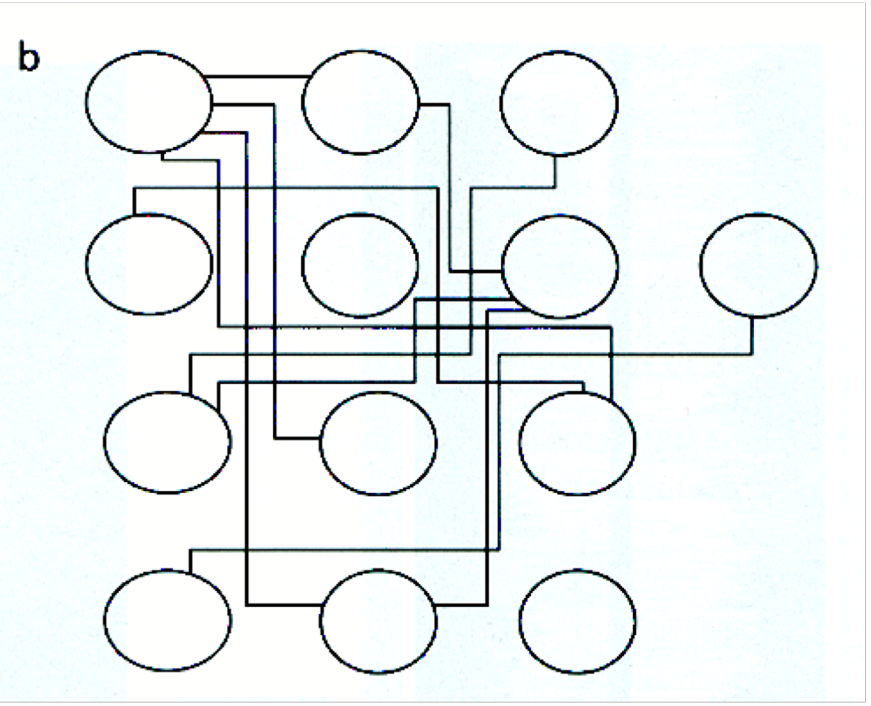
DUANEreade

Concordant fonts:

Gill Sans + Gill Sans MT

Which of these is easier to follow?





Continuity

Our minds perceive lines and curves
as continuing on their trajectory

User Interaction Models

No screens

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Goal 1

Build websites that suit the needs and abilities of users

1. Display information

What's the point of this website?

Users interact with the system to ***accomplish a goal***.

Goal 1

Build websites that suit the needs and abilities of users

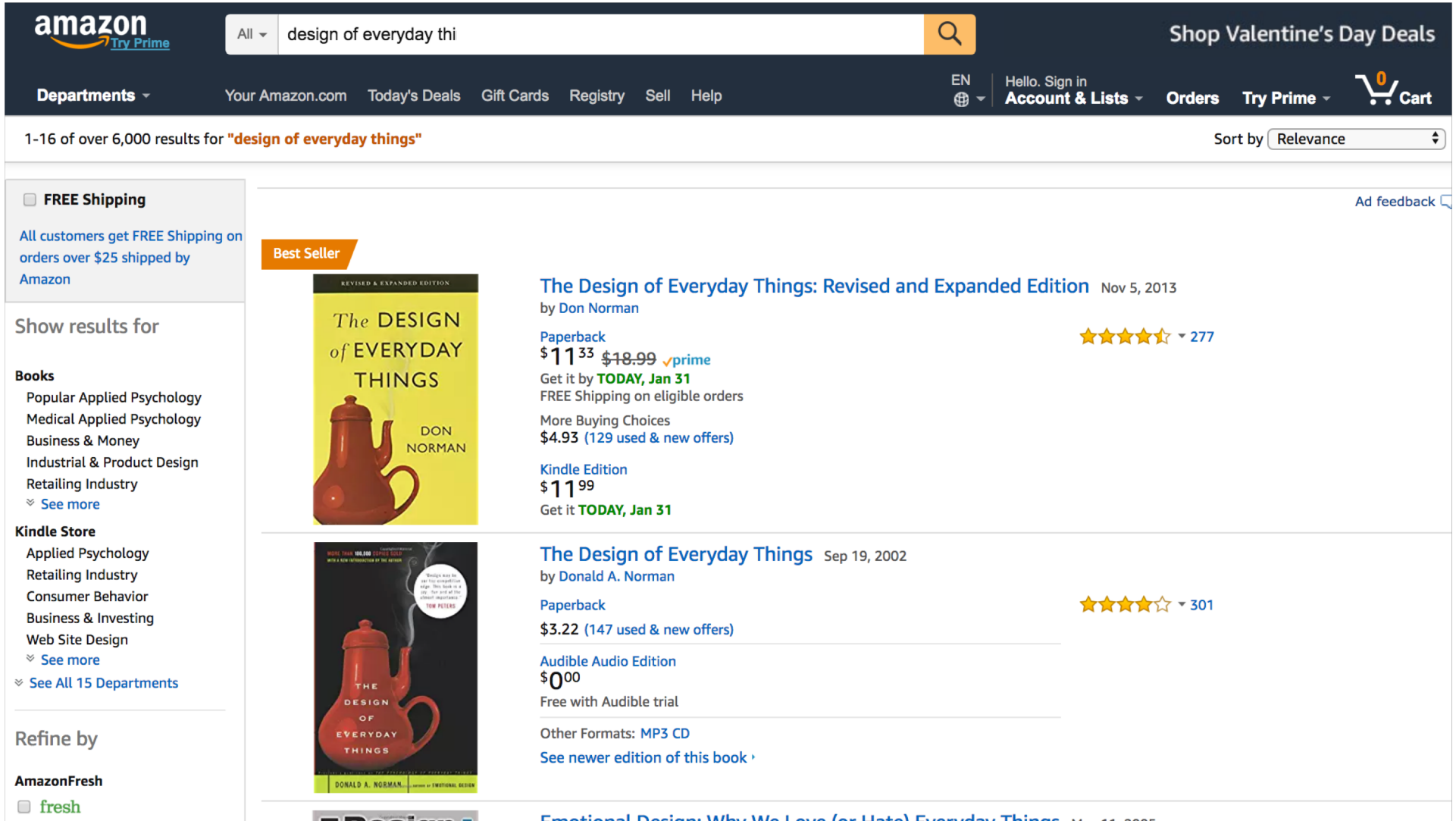
1. Display information

2. Design interactions that allow users to accomplish a goal

Goal: Buy a book

Subgoal: Search for book

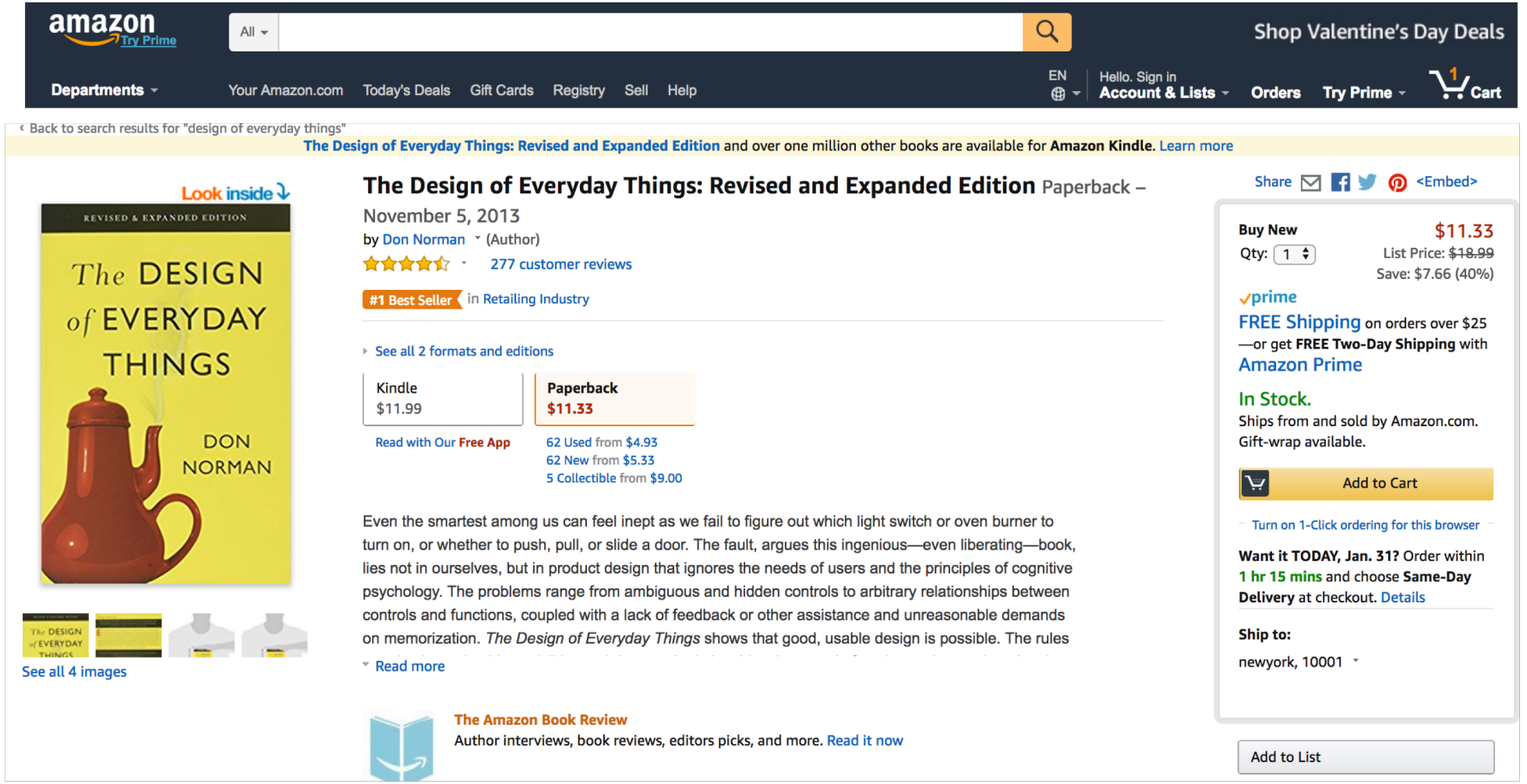
Interaction: Type its name, click on the image of it



Goal: Buy a book

Subgoal: Add to cart

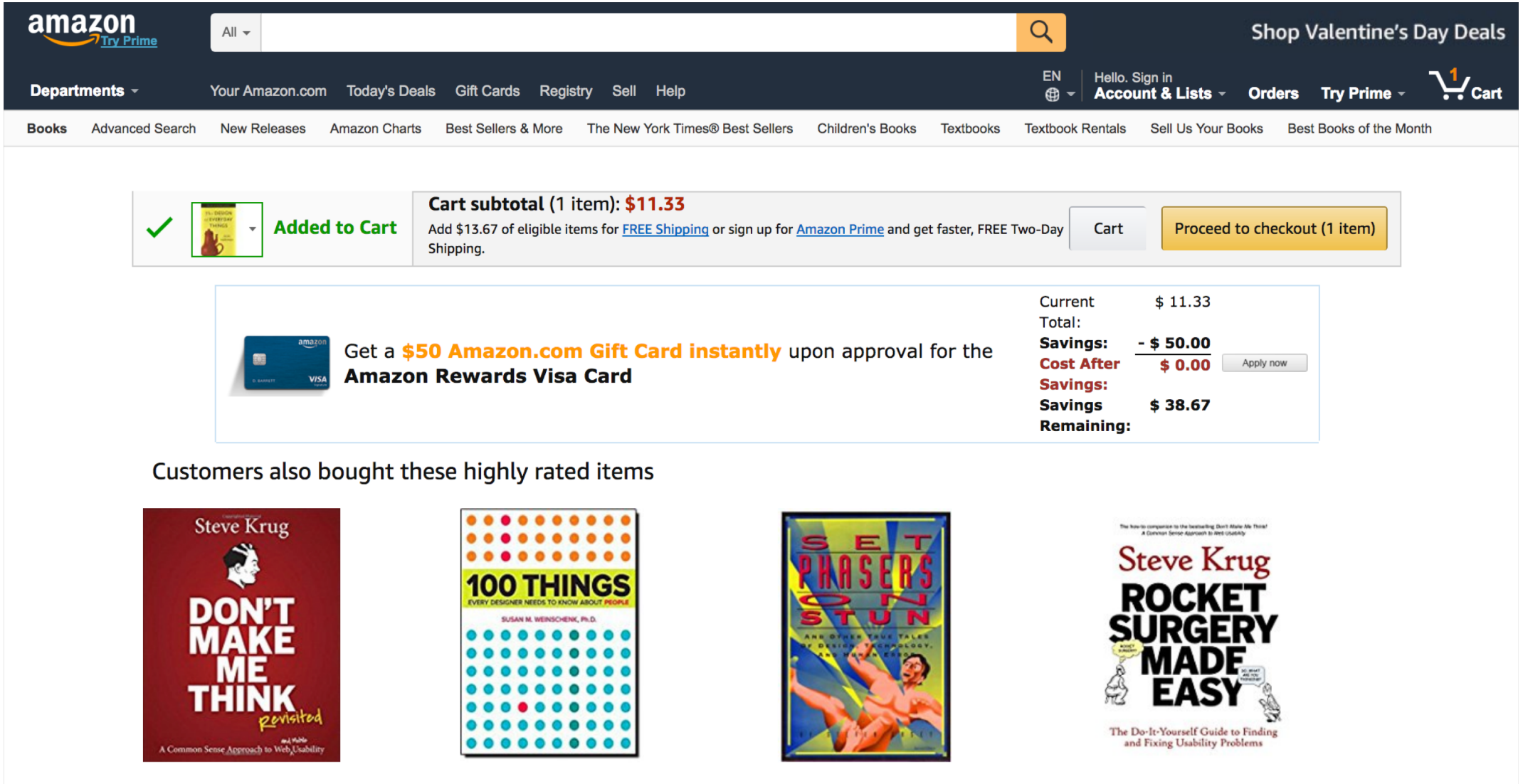
Interaction: Click “Add to cart” button



Goal: Buy a book

Subgoal: Checkout

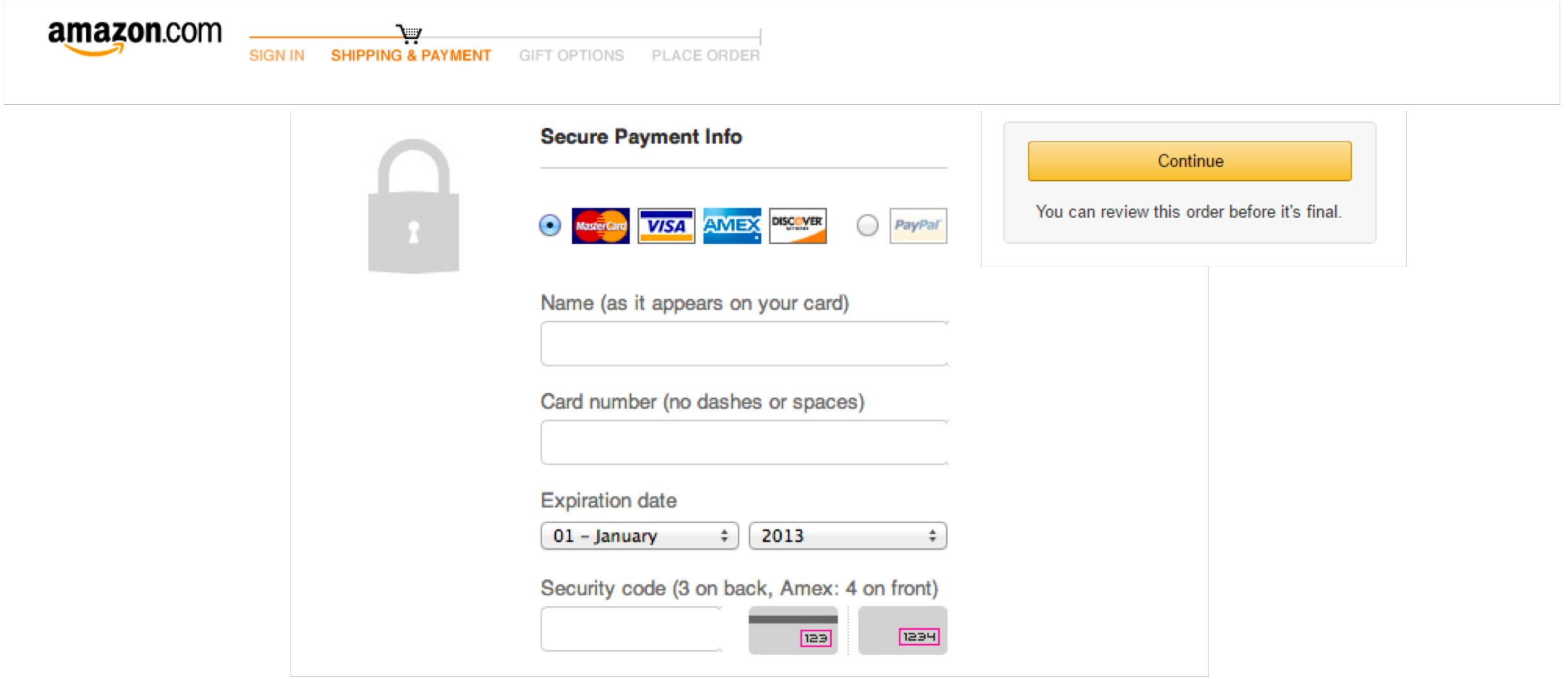
Interaction: Click “Proceed to checkout” button



Goal: Buy a book

Subgoal: Enter payment information

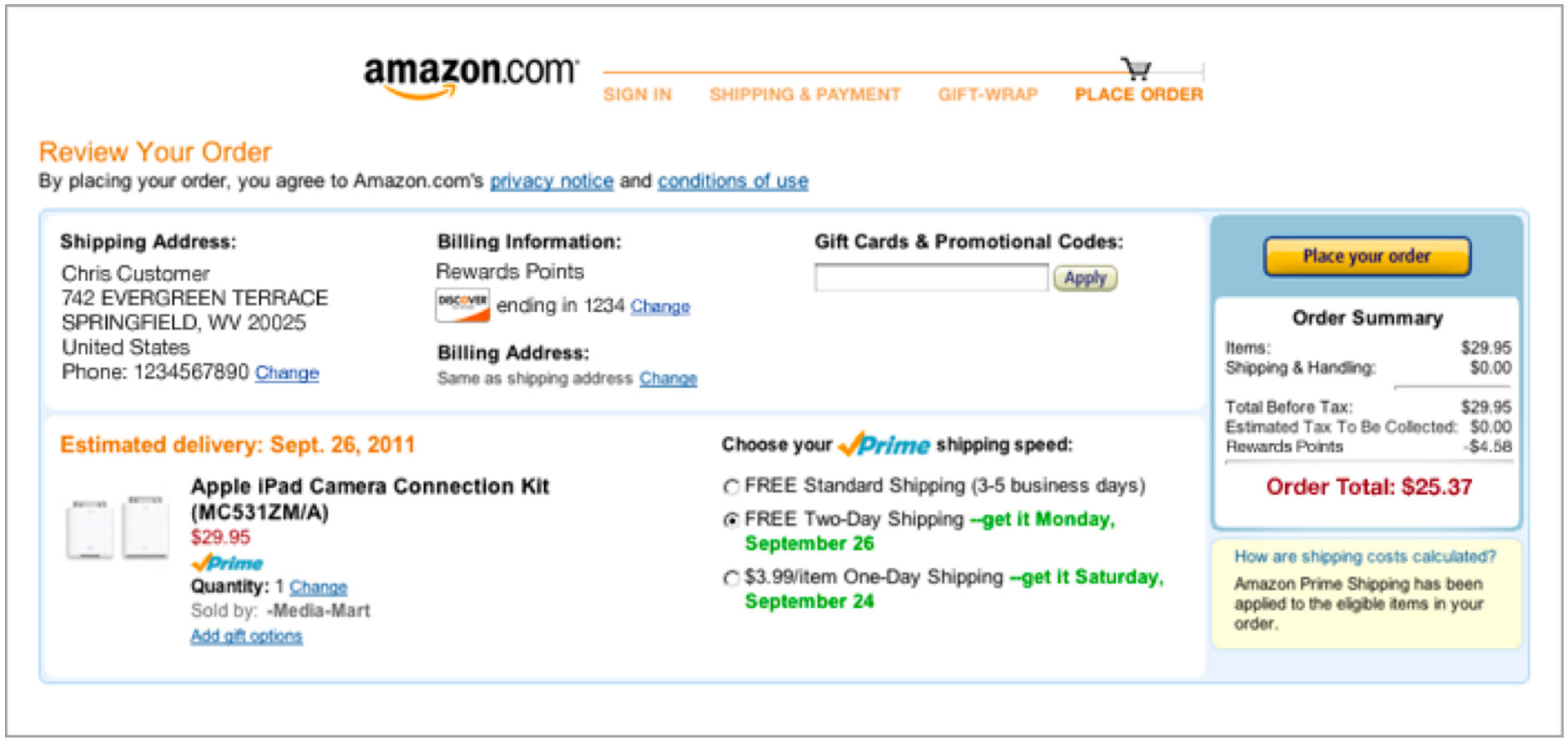
Interaction: Click, type, move cursor, click “Continue”



Goal: Buy a book

Subgoal: If information is correct, place order

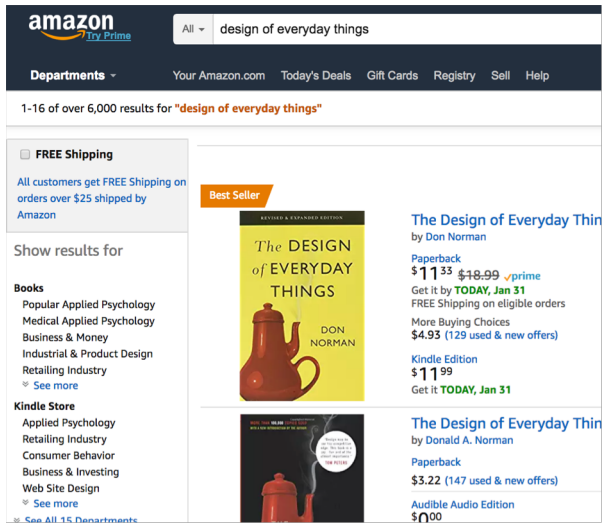
Interaction: Click “place your order”

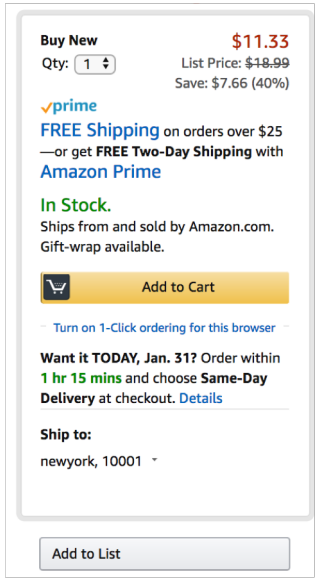


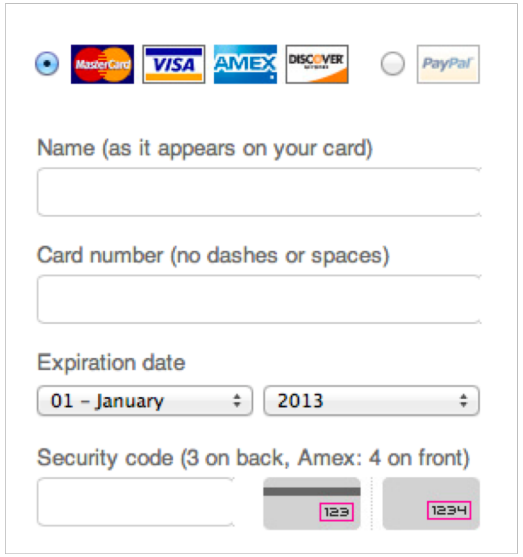
The designer must know the users' goals create the subgoals and interactions to meet it.

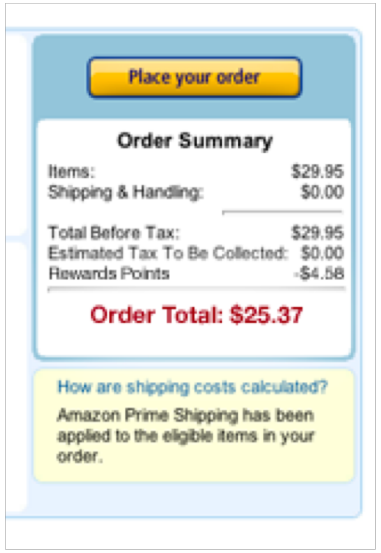
Goal: Buy a book

Subgoal:	Find it	Add to cart	Enter payment info	Place order
Interaction:	Type, click	click	Type, click, point	Click







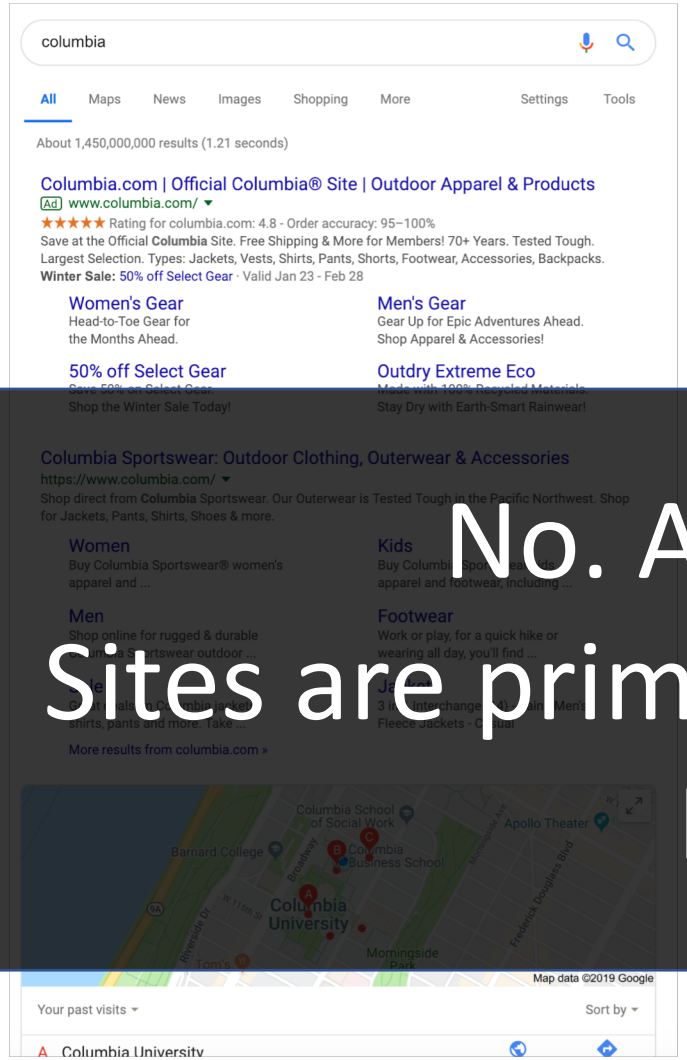


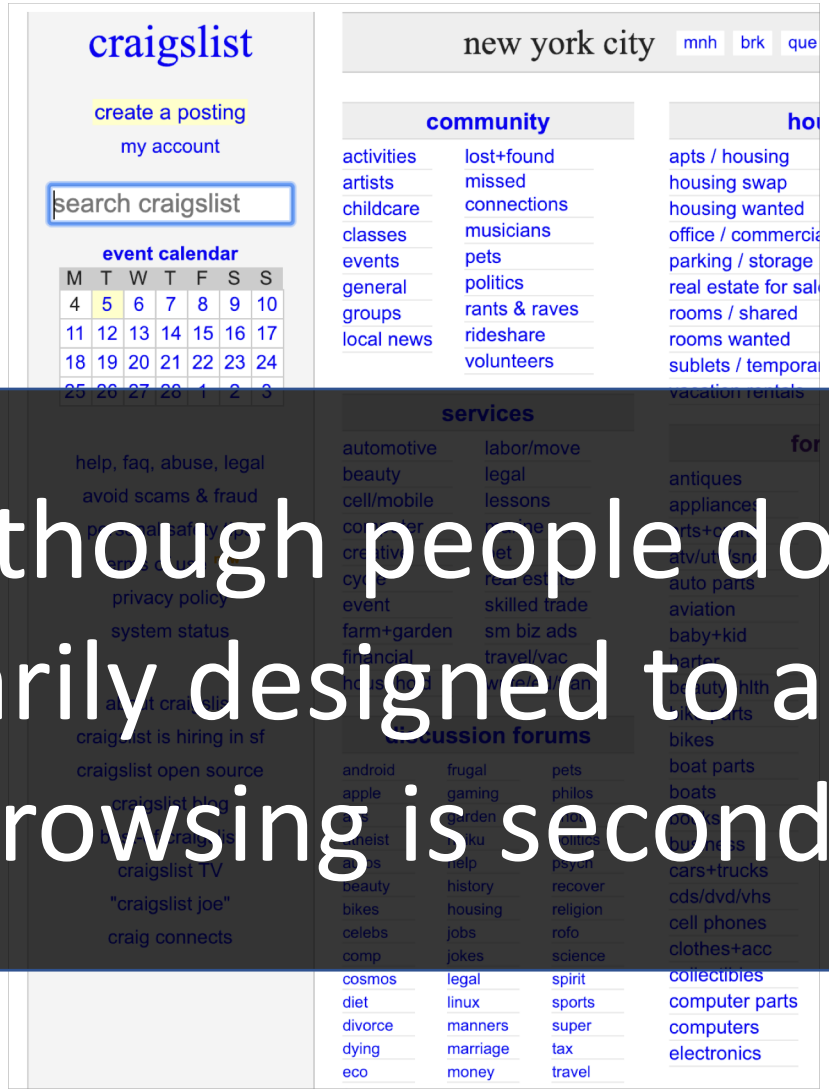
The designer must know the users' goals
create the subgoals and interactions to meet it.

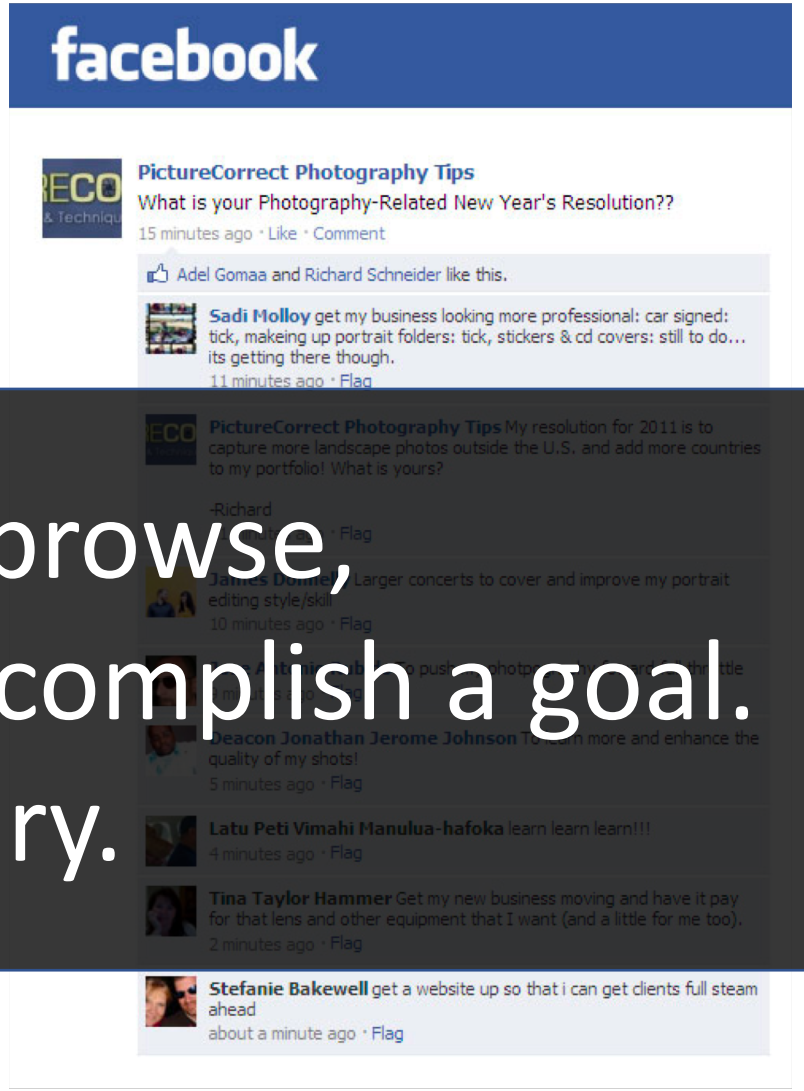
But sometimes on Amazon,
I don't have a goal.

I'm just browsing.

Are these sites “just for browsing”?

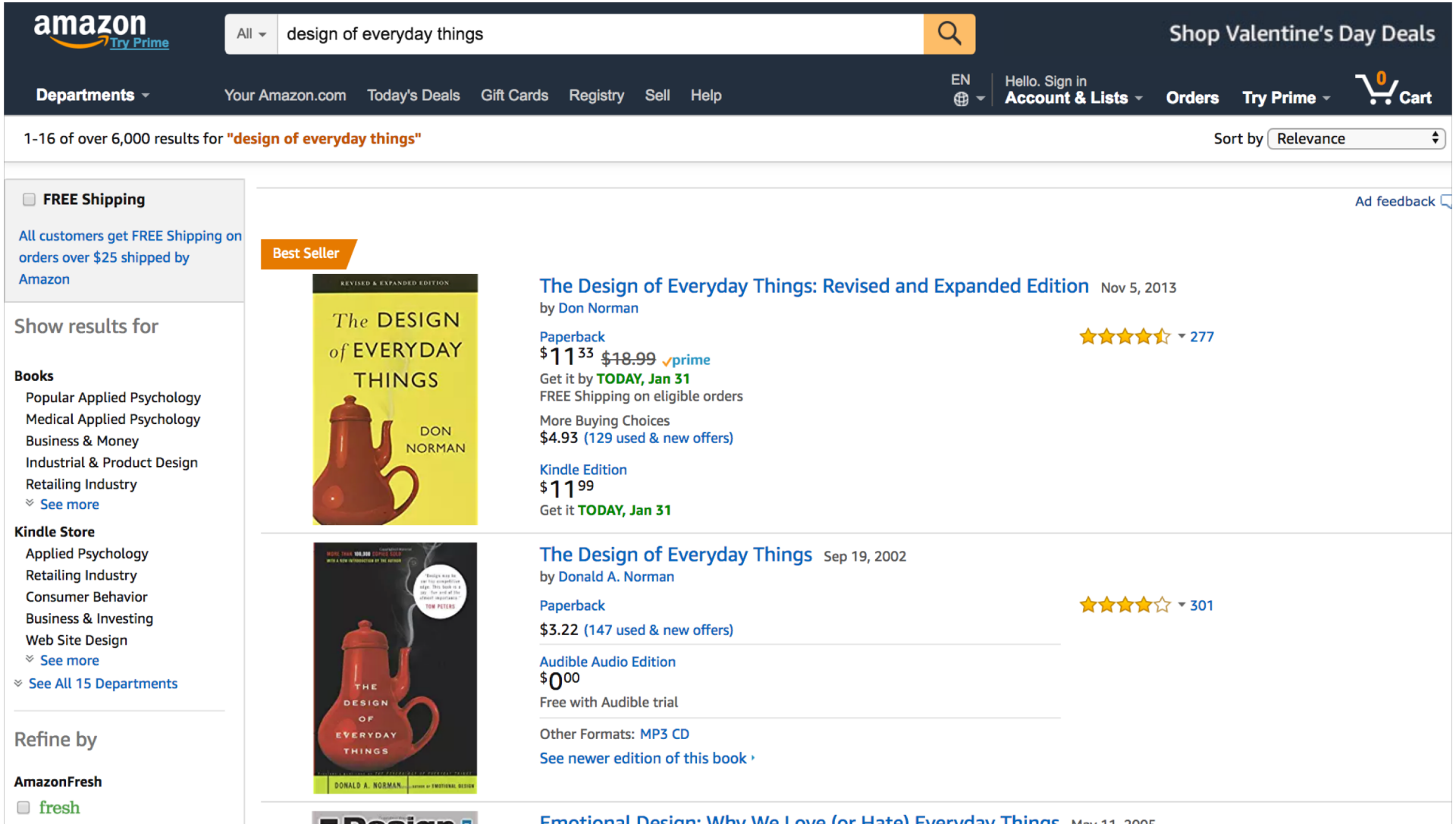






No. Although people do browse,
Sites are primarily designed to accomplish a goal.
Browsing is secondary.

The designer must know the users goals and help them accomplish it.



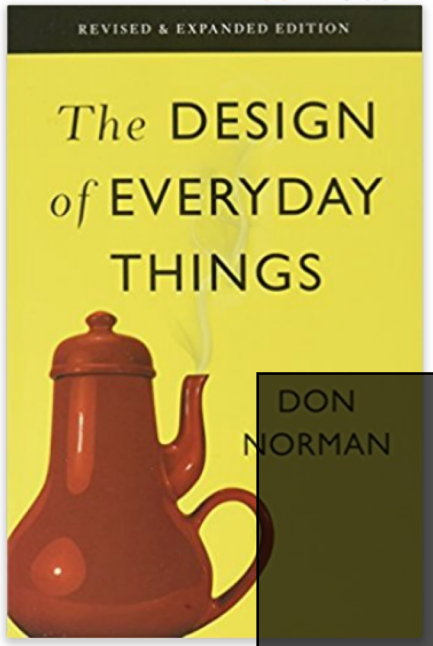
Low-level Interactions

What are interactions on this page?

Move

Click

Type



Look inside

See all 4 images

The Design of Everyday Things: Revised and Expanded Edition Paperback – November 5, 2013

by Don Norman (Author)

277 customer reviews

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Even the smartest among us can feel inept as we fail to figure out which light switch or oven burner to turn on, or whether to push, pull, or slide a door. The fault, argues this ingenious—even liberating—book, lies not in ourselves, but in product design that ignores the needs of users and the principles of cognitive psychology. The problems range from ambiguous and hidden controls to arbitrary relationships between controls and functions, coupled with a lack of feedback or other assistance and unreasonable demands on memorization. *The Design of Everyday Things* shows that good, usable design is possible. The rules

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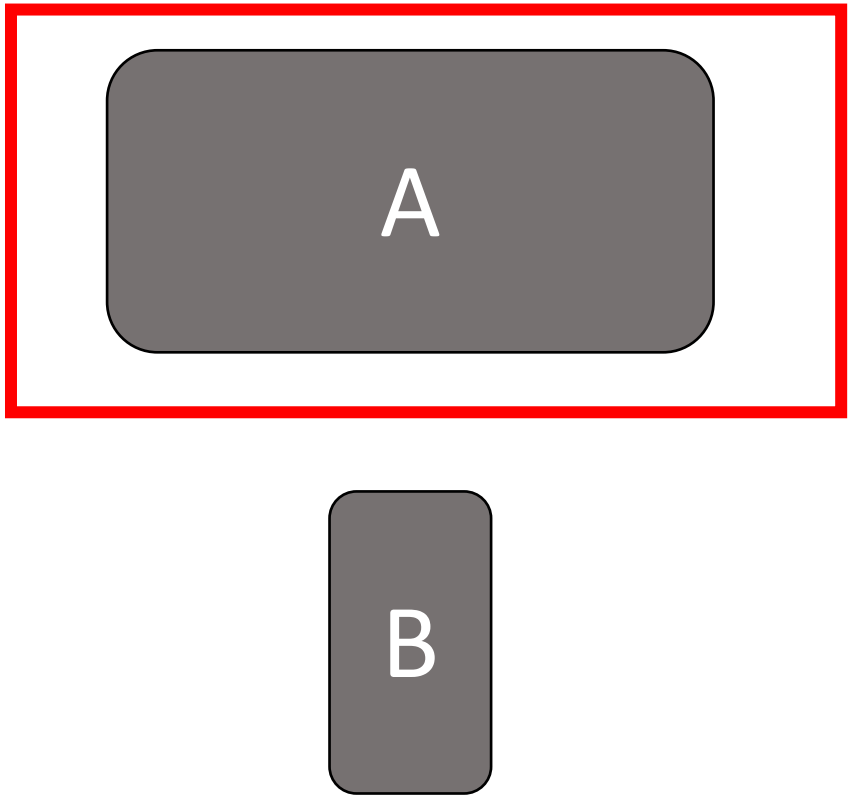
Ship to:
newyork, 10001

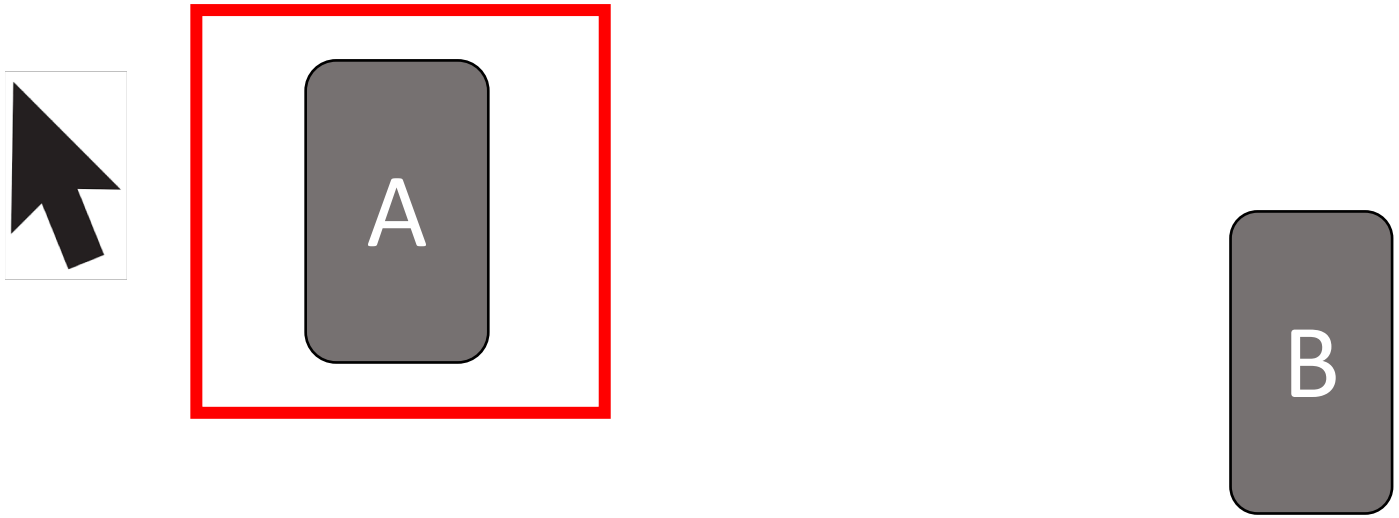
Add to List

Interaction:
Moving + Clicking

Which button is faster to click?



Which button is faster to click?



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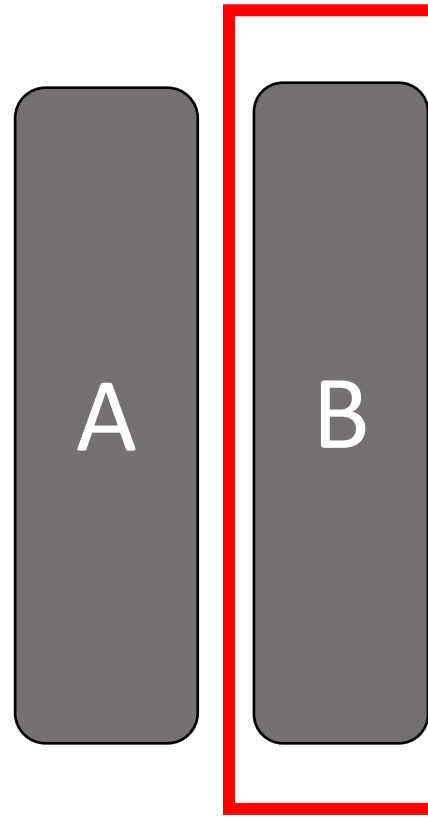
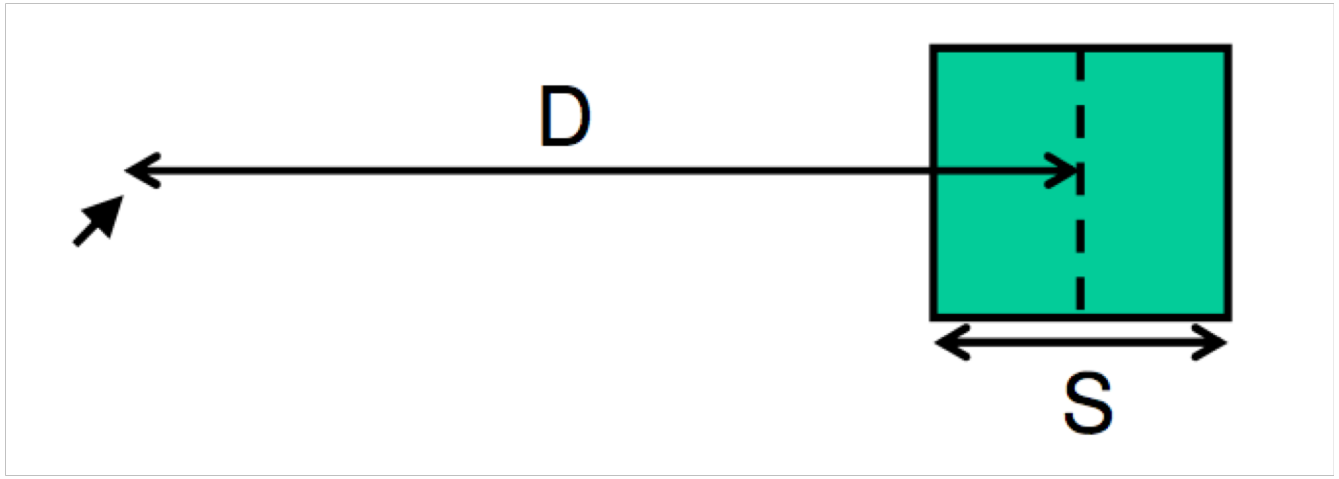
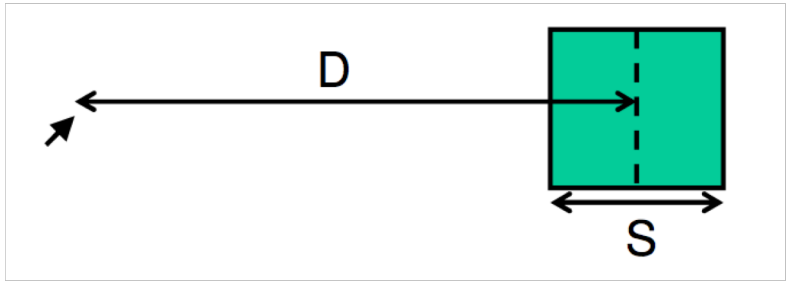


Fitts's Law



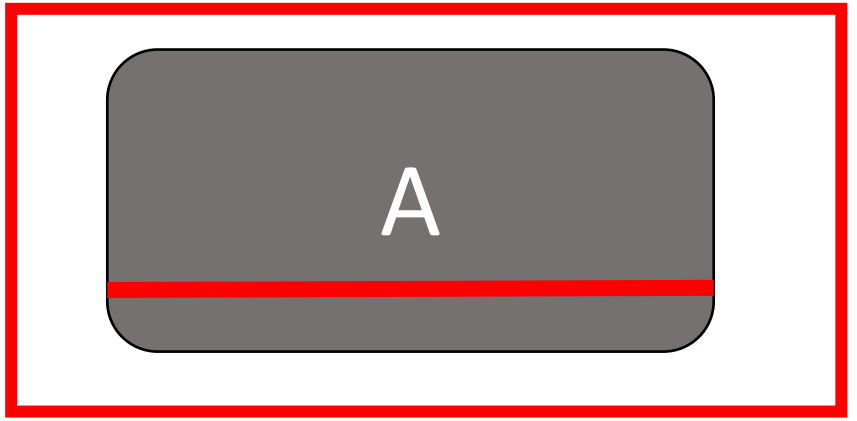
Time to move your pointer to a target $= a + b * \log\left(\frac{2\mathbf{D}}{\mathbf{S}}\right)$

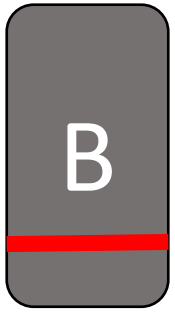
Using Fitts' law, why is A faster to click?



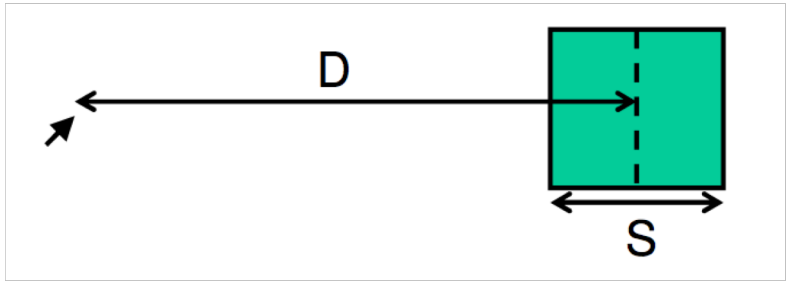
$$= a + b * \log\left(\frac{2D}{S}\right)$$

S is bigger.
Thus the time is lower.



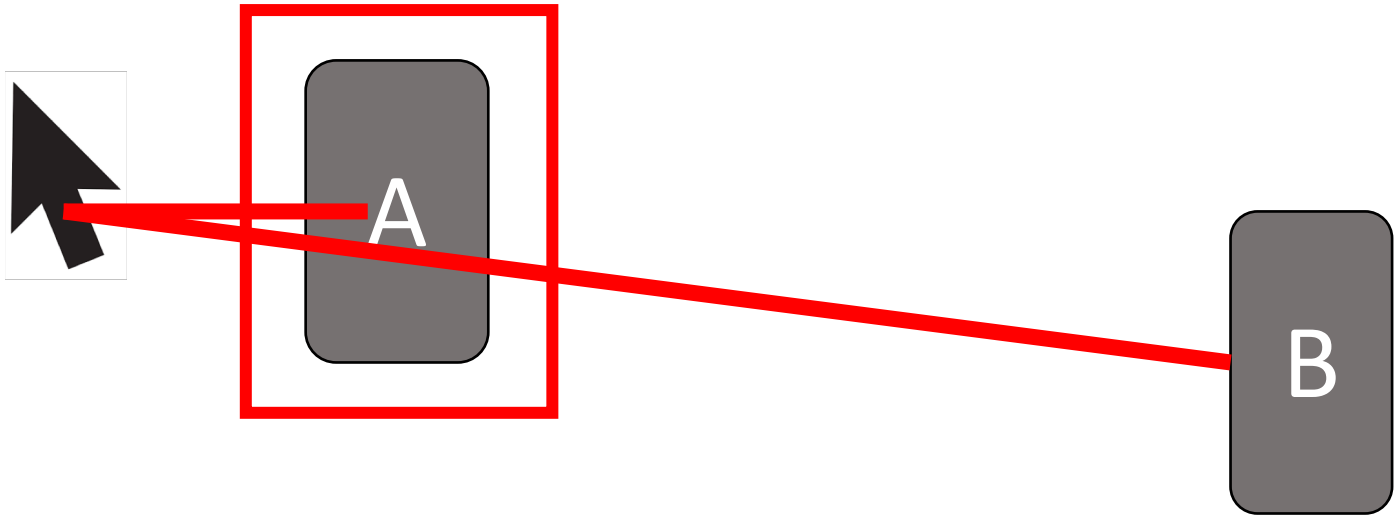


Using Fitts' law, why is A faster to click?

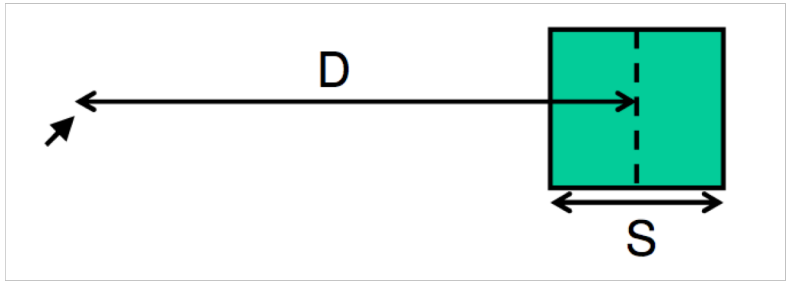


$$= a + b * \log\left(\frac{2D}{S}\right)$$

D is small.
Thus the time is lower.

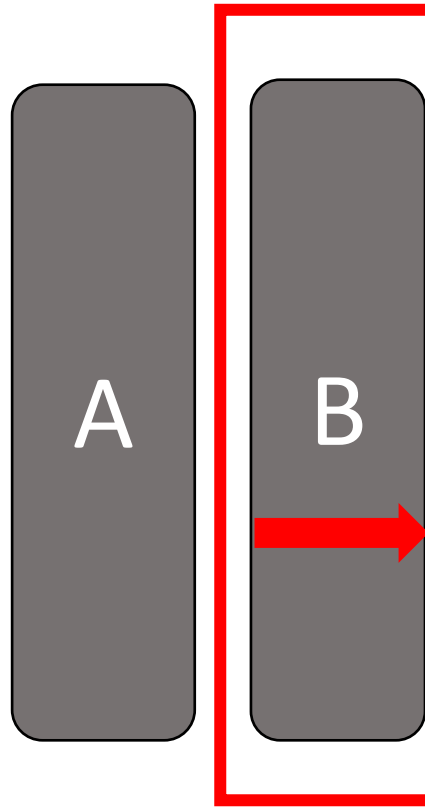


Using Fitts' law, why is B faster to click?

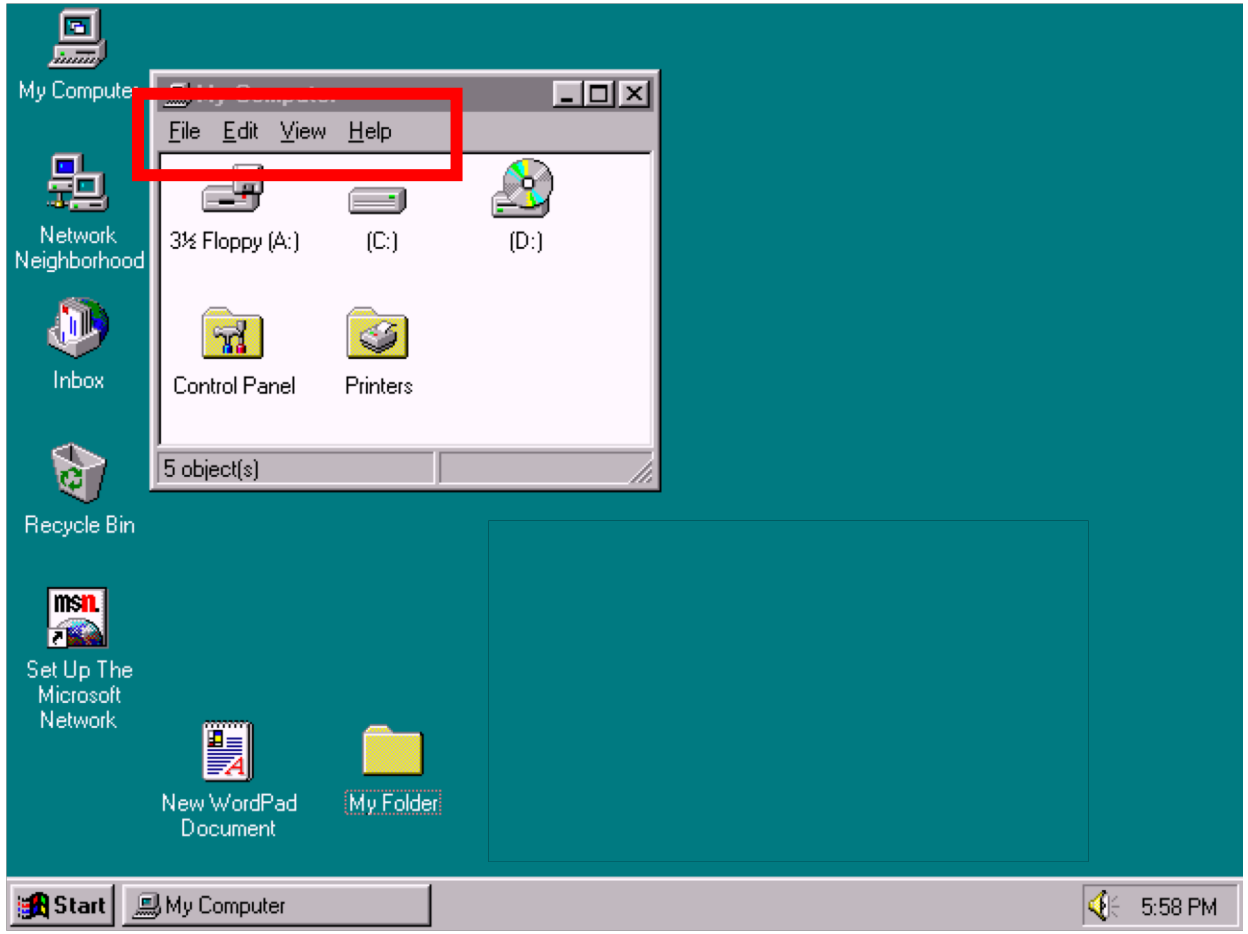


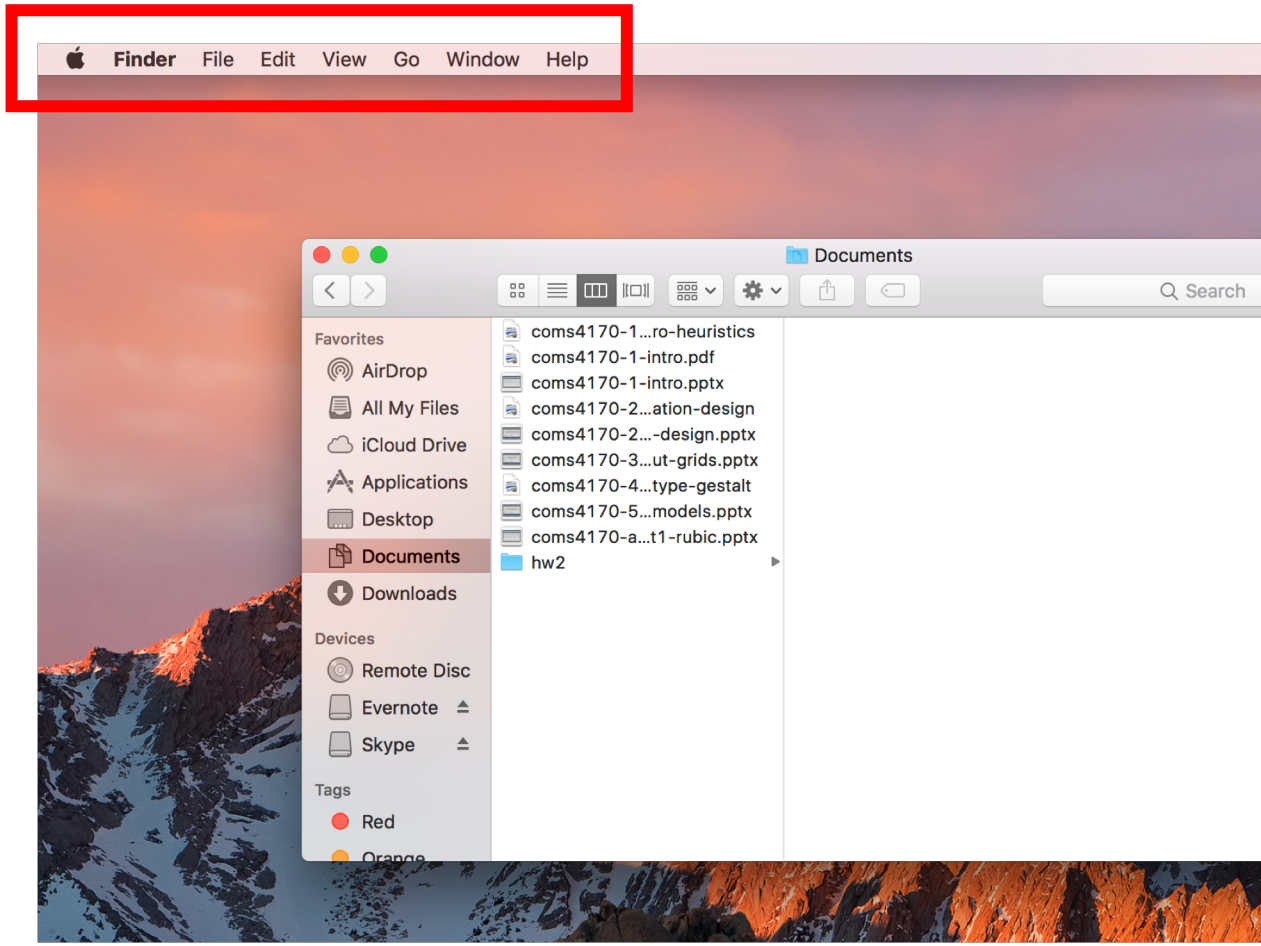
$$= a + b * \log\left(\frac{2D}{S}\right)$$

S is bigger (infinite).
Thus the time is lower.

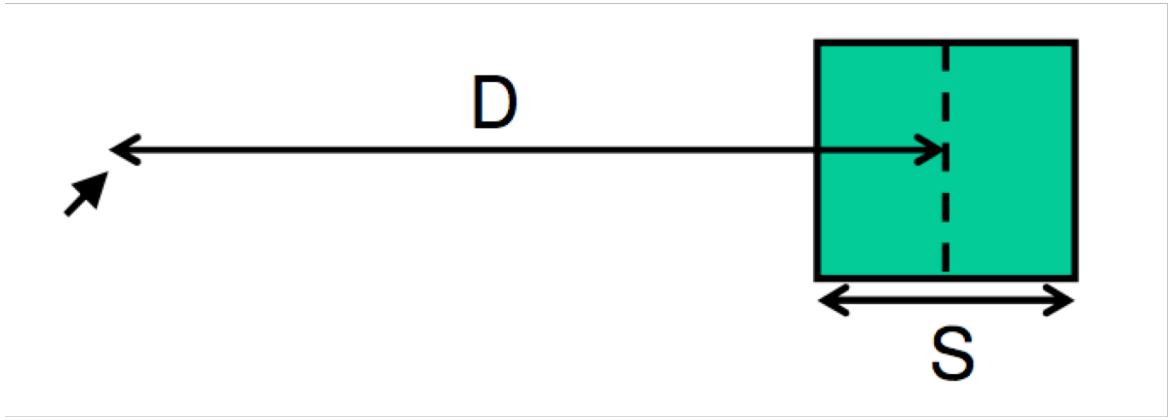


Why did iOS move the menu for applications?



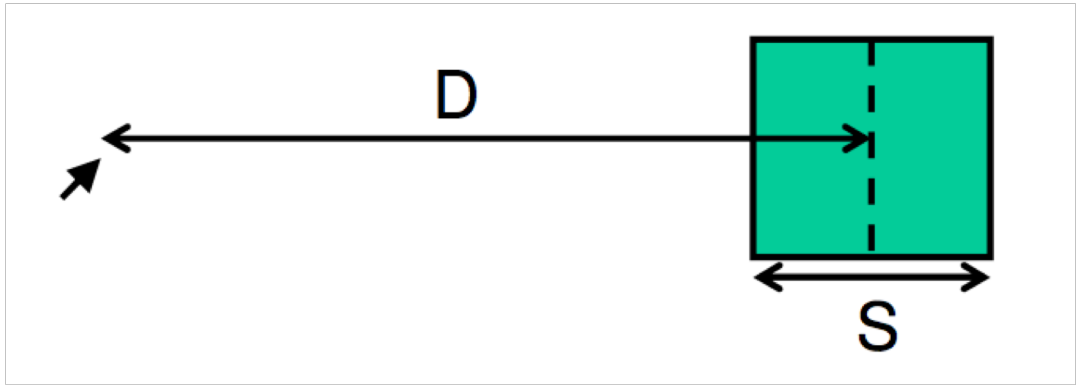


Fitts's Law: What are **a** and **b**?



$$\text{time} = \mathbf{a} + \mathbf{b} * \log\left(\frac{2D}{S}\right)$$

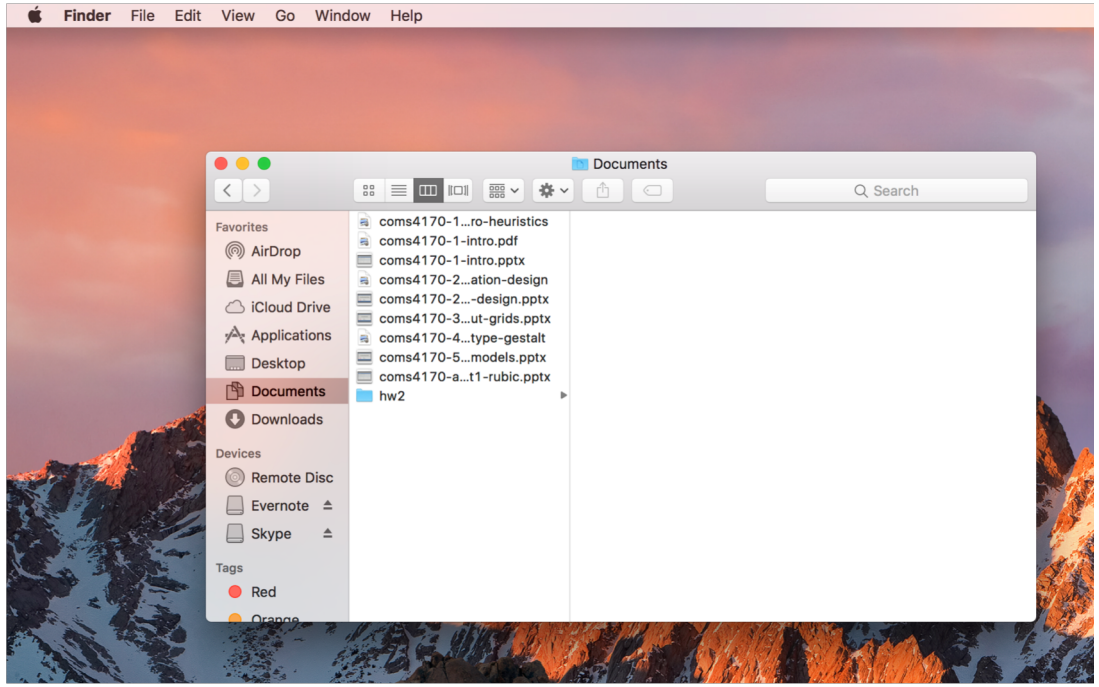
Time to move the pointer: Fitts's Law



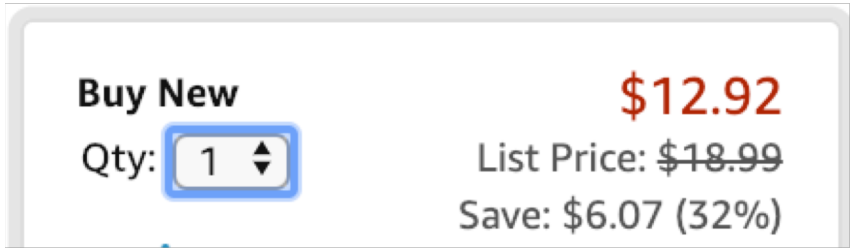
Time to move your pointer to a target

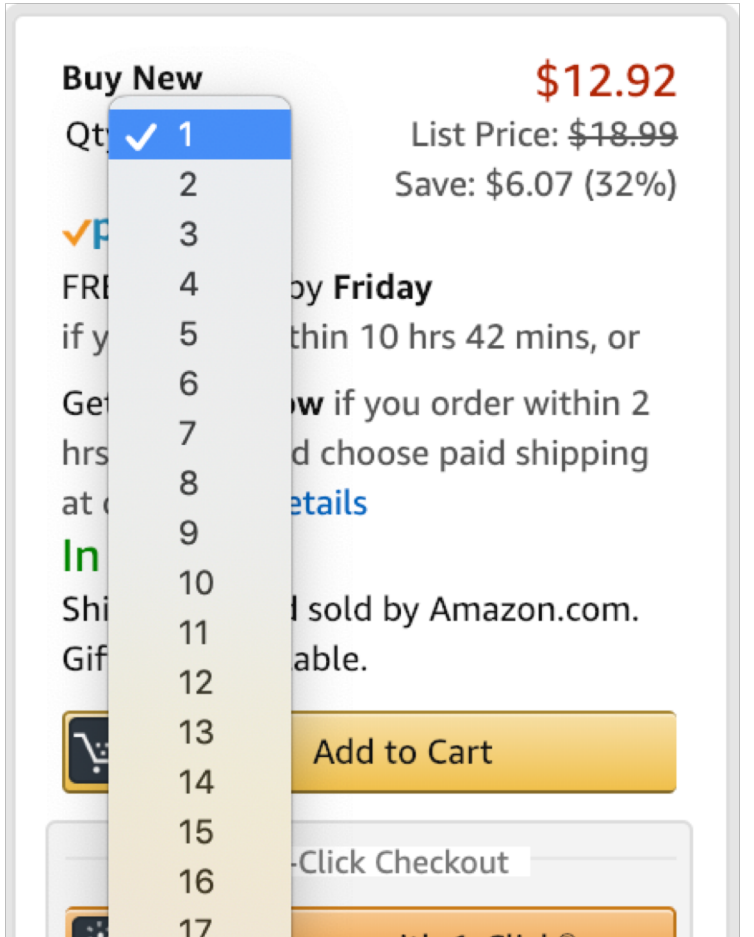
$$= a + b * \log\left(\frac{2D}{S}\right)$$

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

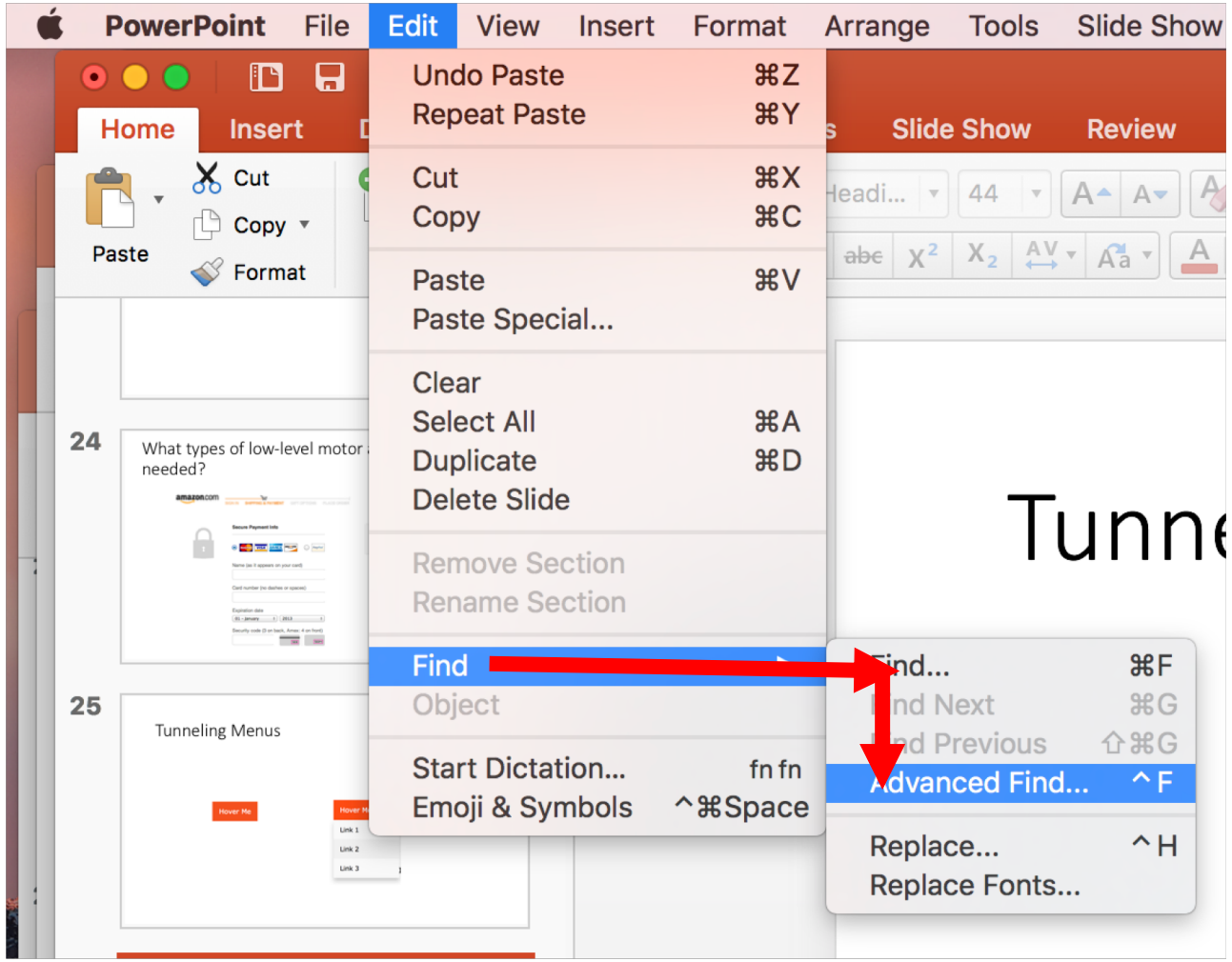


More moving + clicking:
Tunneling Menus

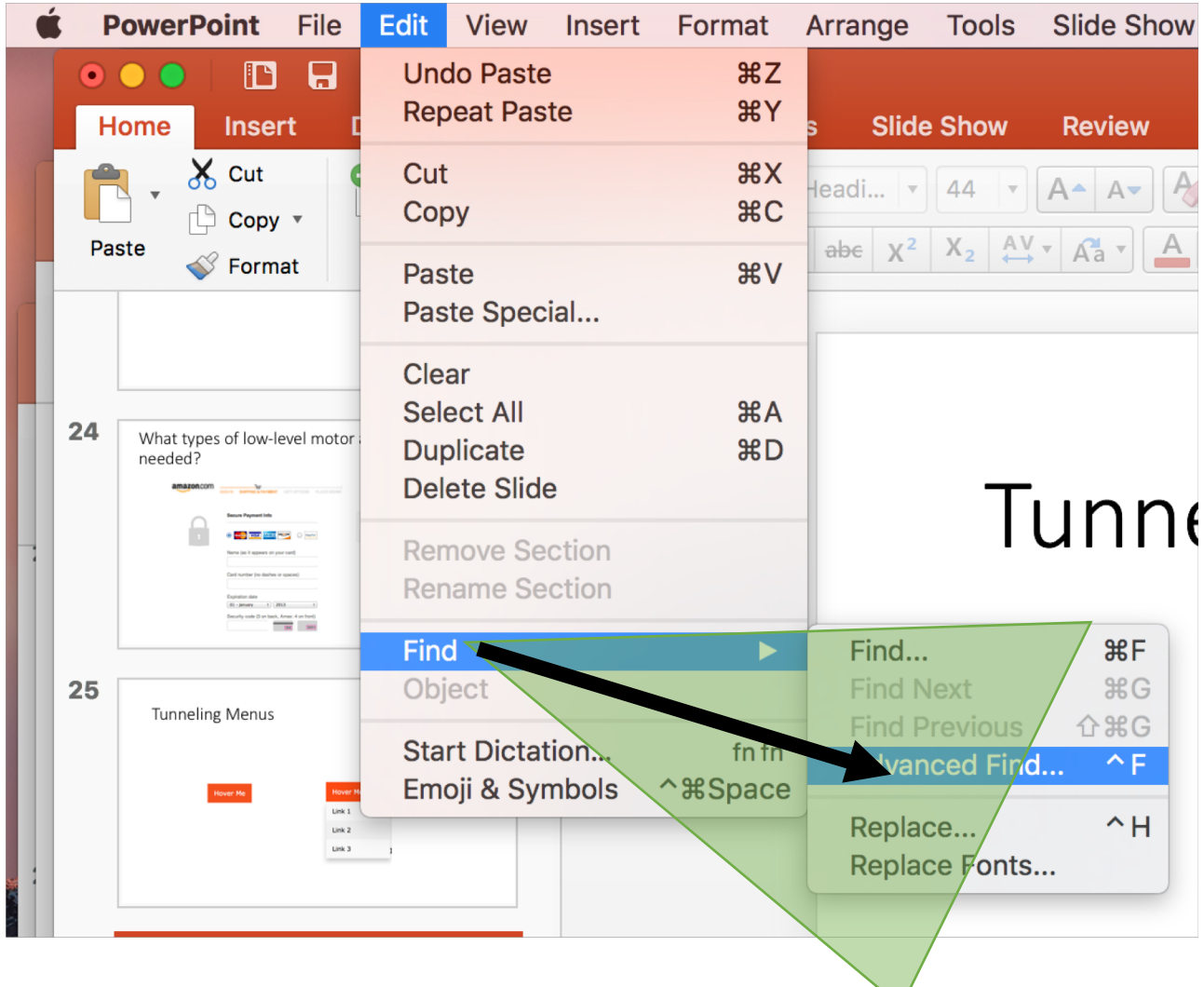




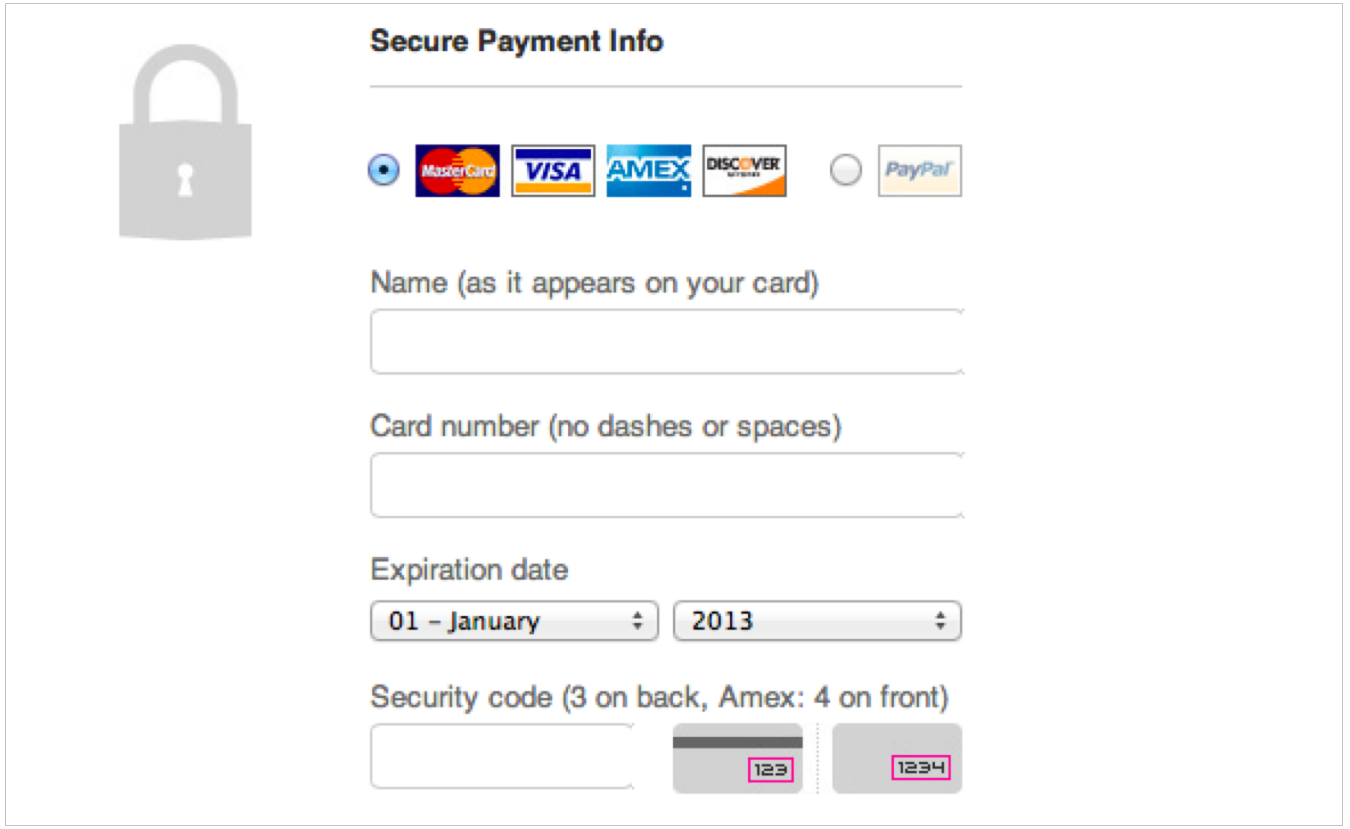
More moving + clicking:
Cascading Tunnel Menus

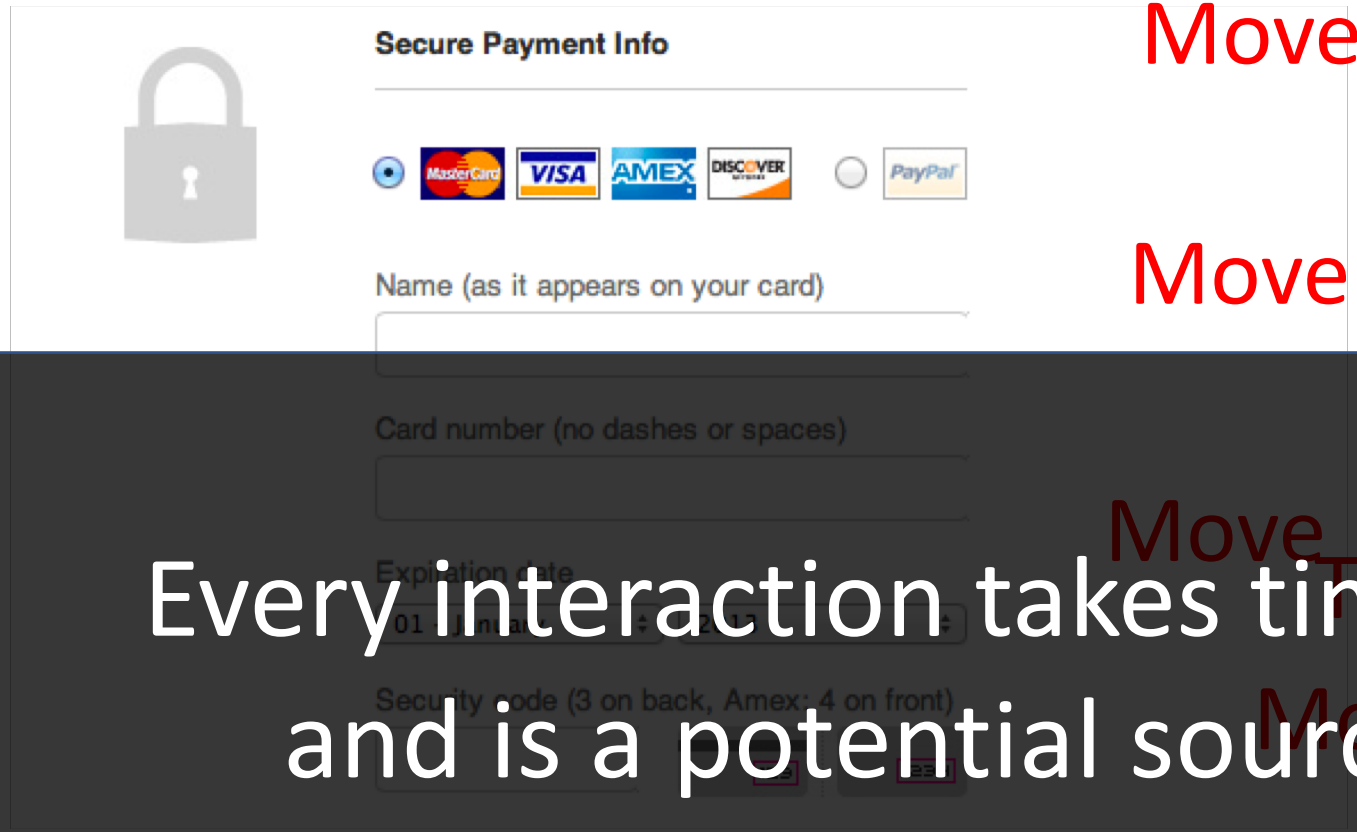


More moving + clicking:
Cascading Tunnel Menus fix



What are all the low-level interactions are needed to accomplish this subgoal?





Move

Click

Move

Click

TypeTypeTypeType

Move

Click

TypeTypeTypeType

Move

Tunnel

Click

Move

Tunnel

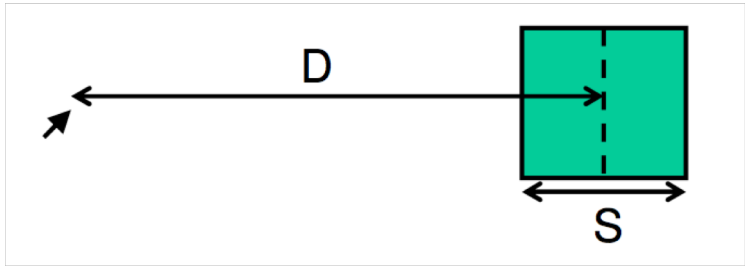
Click

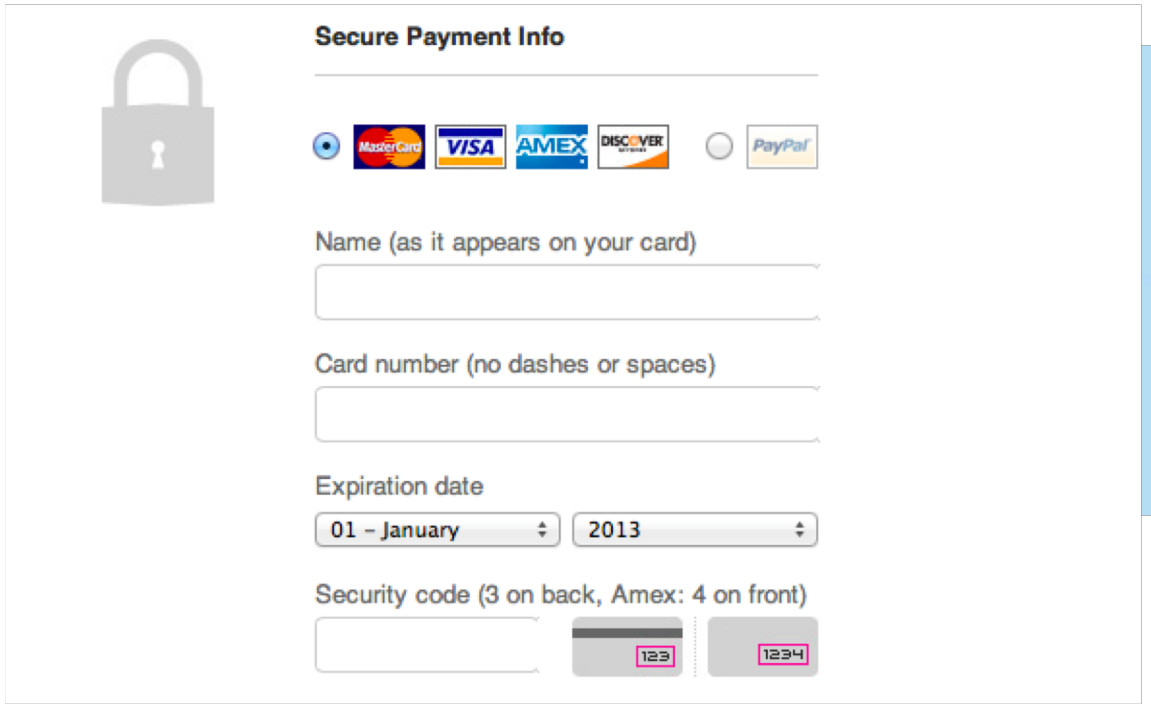
TypeTypeTypeType

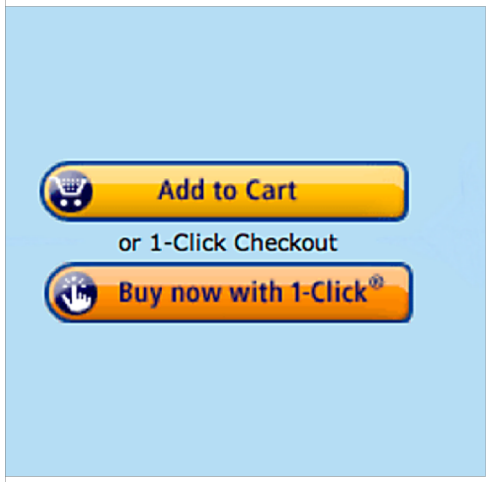
Every interaction takes time and effort, and is a potential source of error.

How could you improve this?

Low-level Interactions take time and effort. Minimize them because you do them a lot.

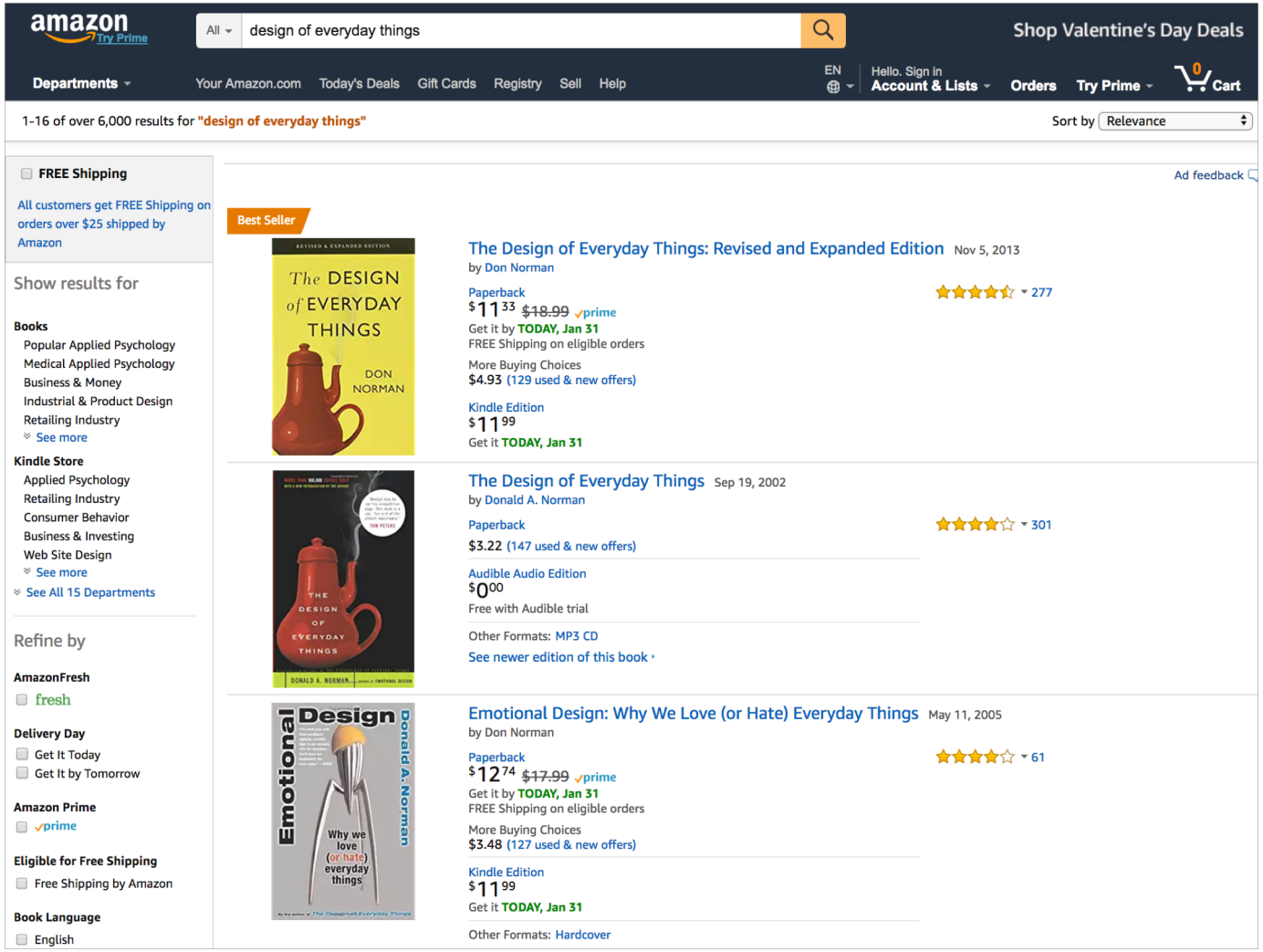




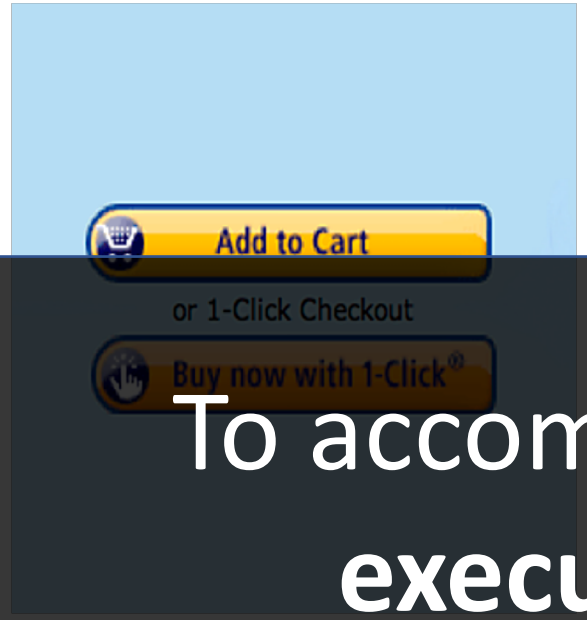


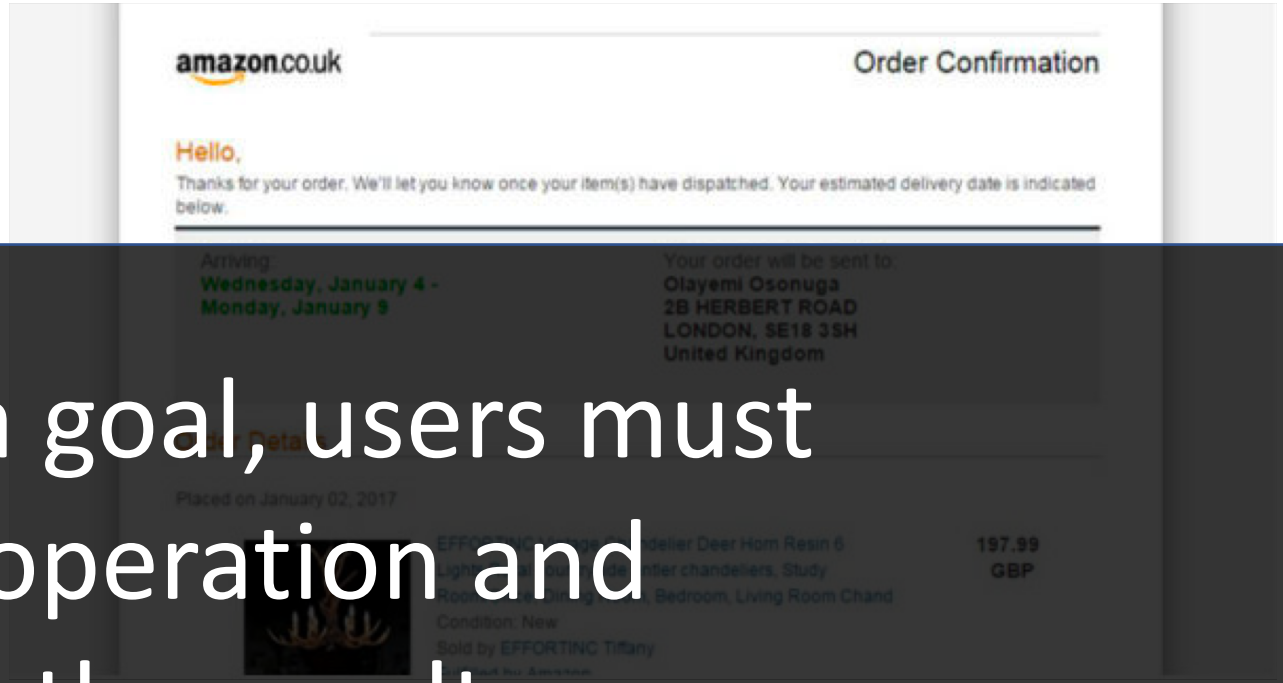
The Interaction Loop

Establish a goal: **Buy a book.**



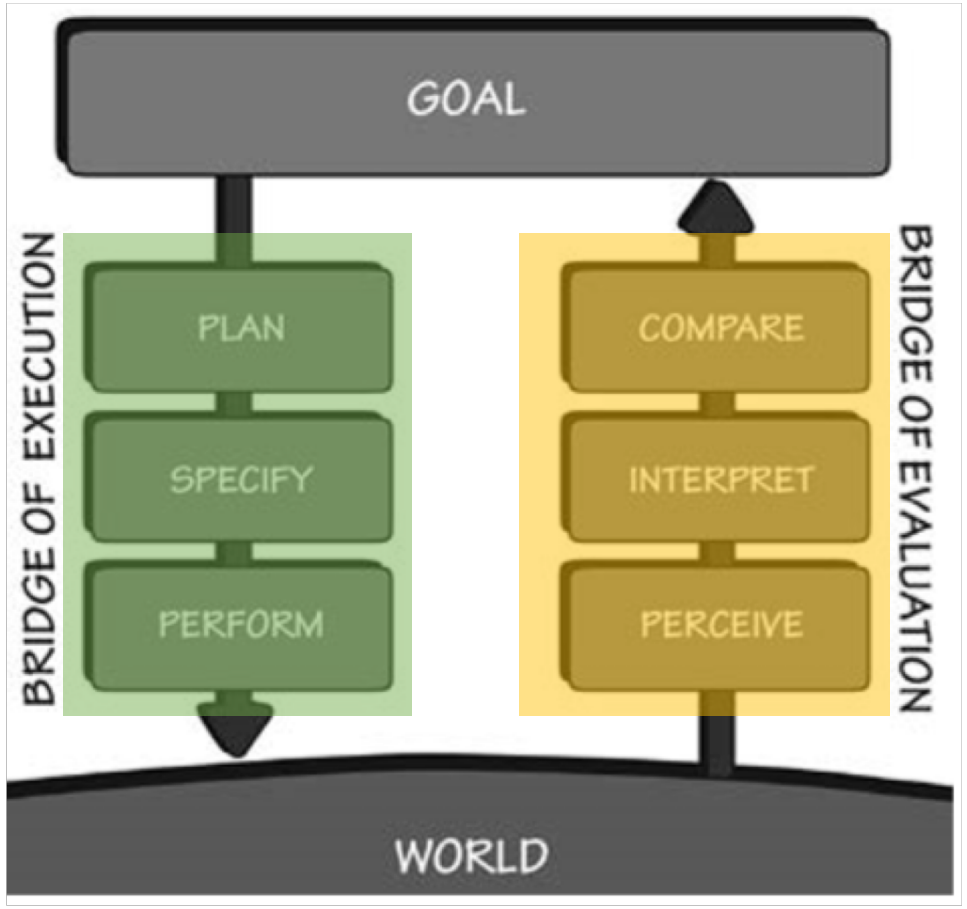
What happens after you place an order?





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

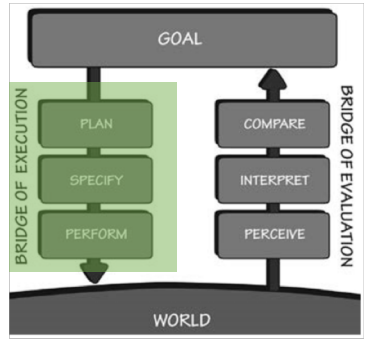
5. Perceive the state of the world
6. Interpret the perception
7. Compare the outcome with the goal

Goal Execution Step 1:

Plan the action

Specify the action sequence

Perform the action sequence

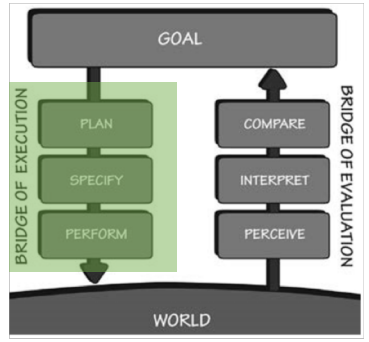


Goal Execution Step 2:

Plan the action

Specify the action sequence

Perform the action sequence

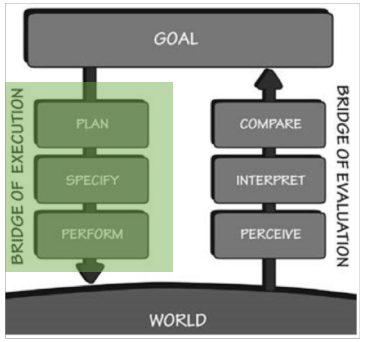


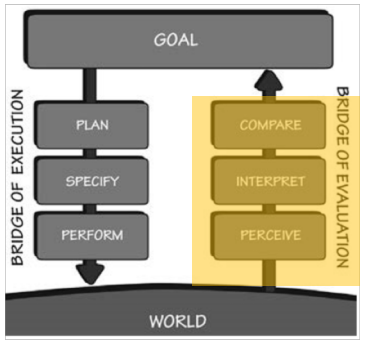
Goal Execution Step 3:

Plan the action

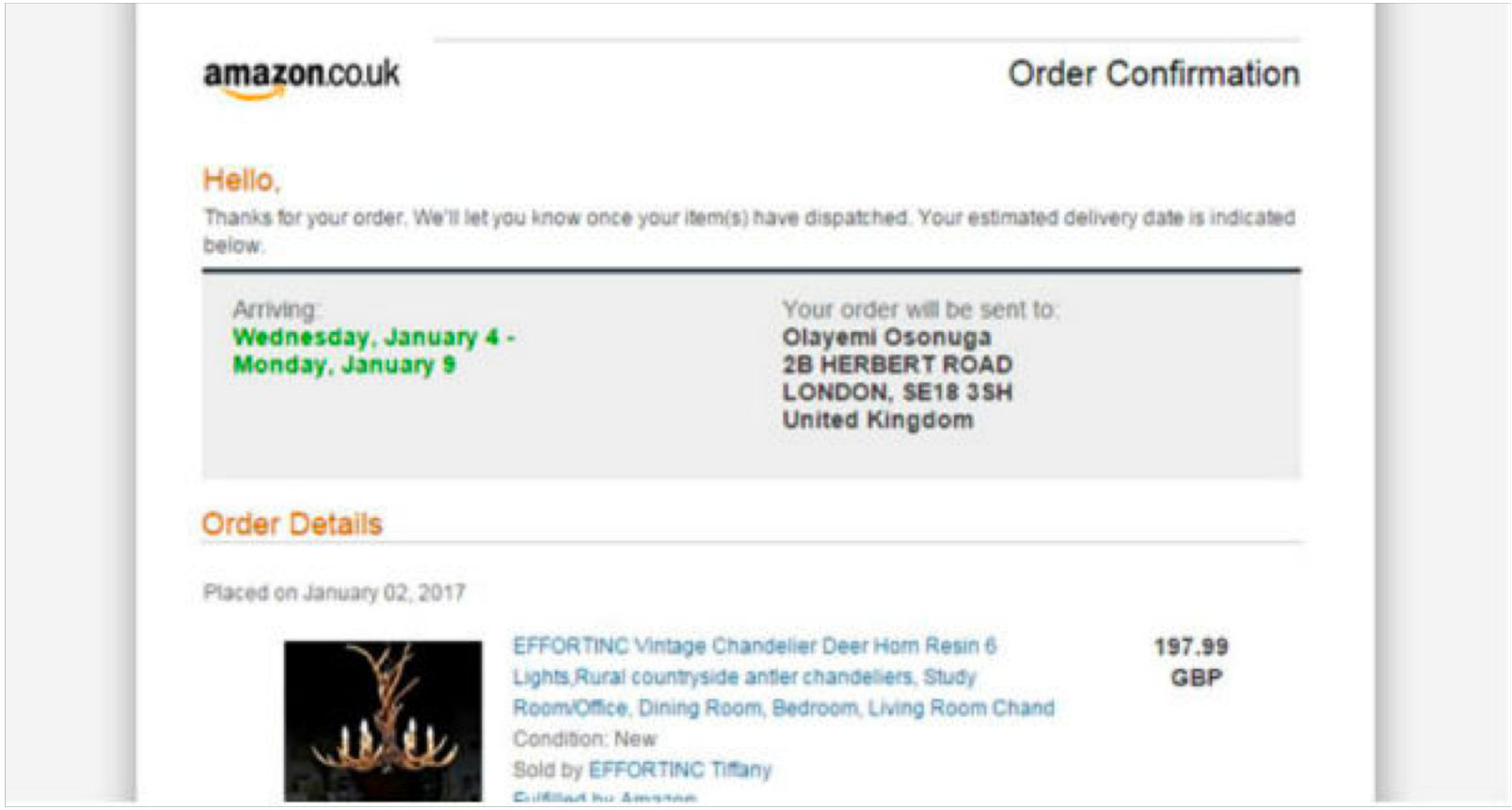
Specify the action sequence

Perform the action sequence





Goal Evaluation Step 1:
Perceive the State of the world



amazon.co.uk

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

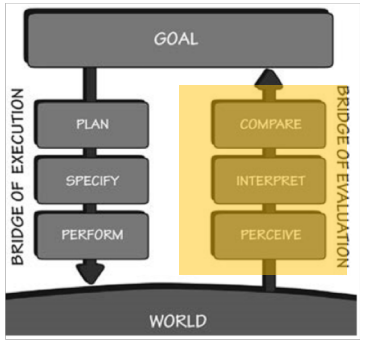
Your order will be sent to:
Olayemi Osonuga
2B HERBERT ROAD
LONDON, SE18 3SH
United Kingdom

Order Details

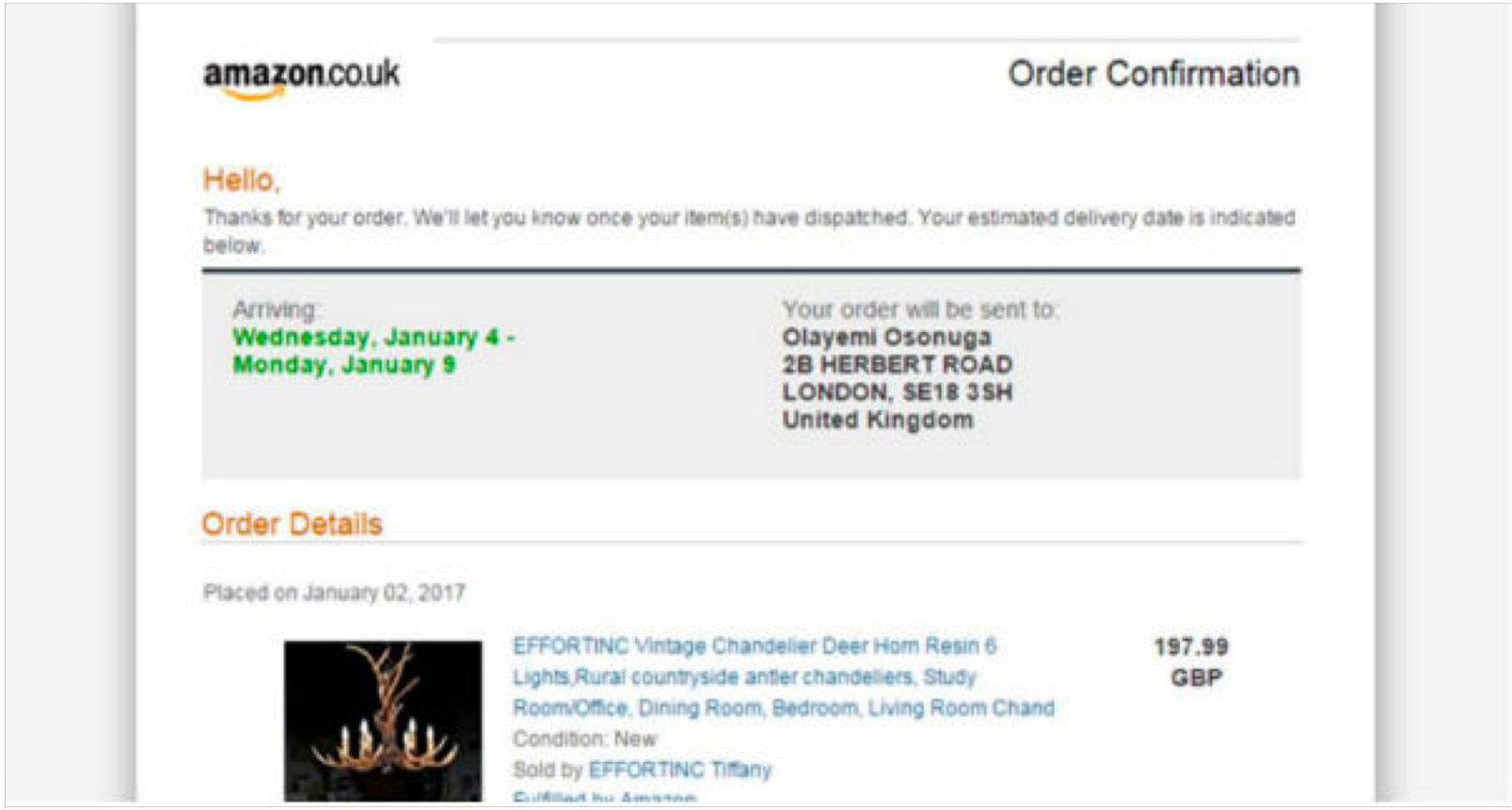
Placed on January 02, 2017

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
Fulfilled by Amazon

197.99 GBP



Goal Evaluation Step 2:
Interpret the perception



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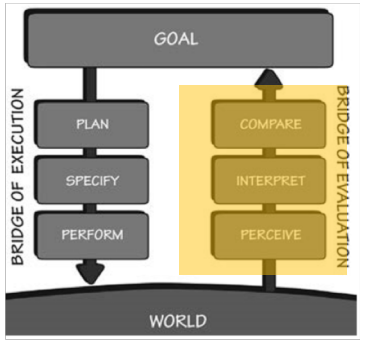
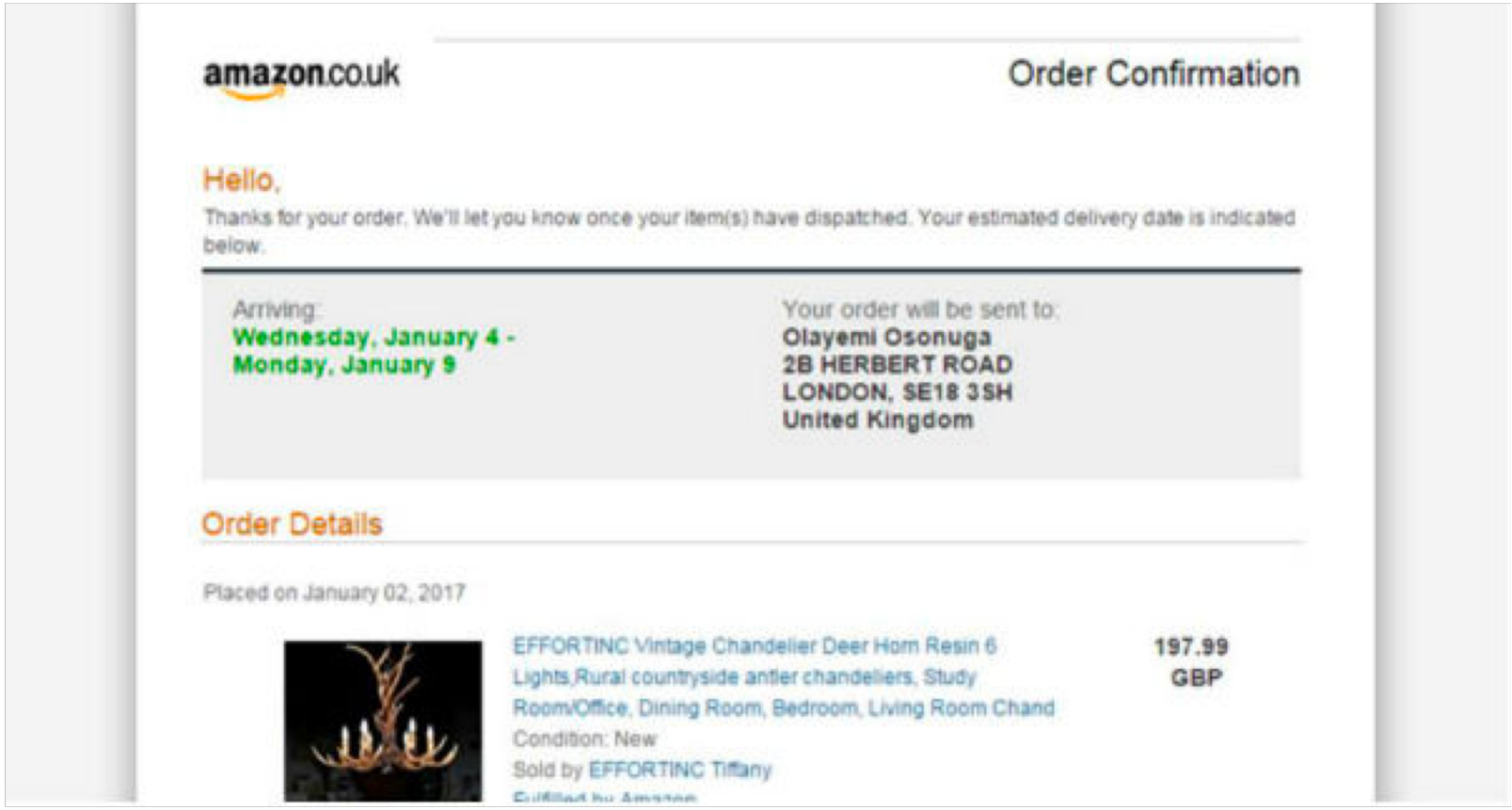


Goal Evaluation Step 3:
Compare the outcome with the goal



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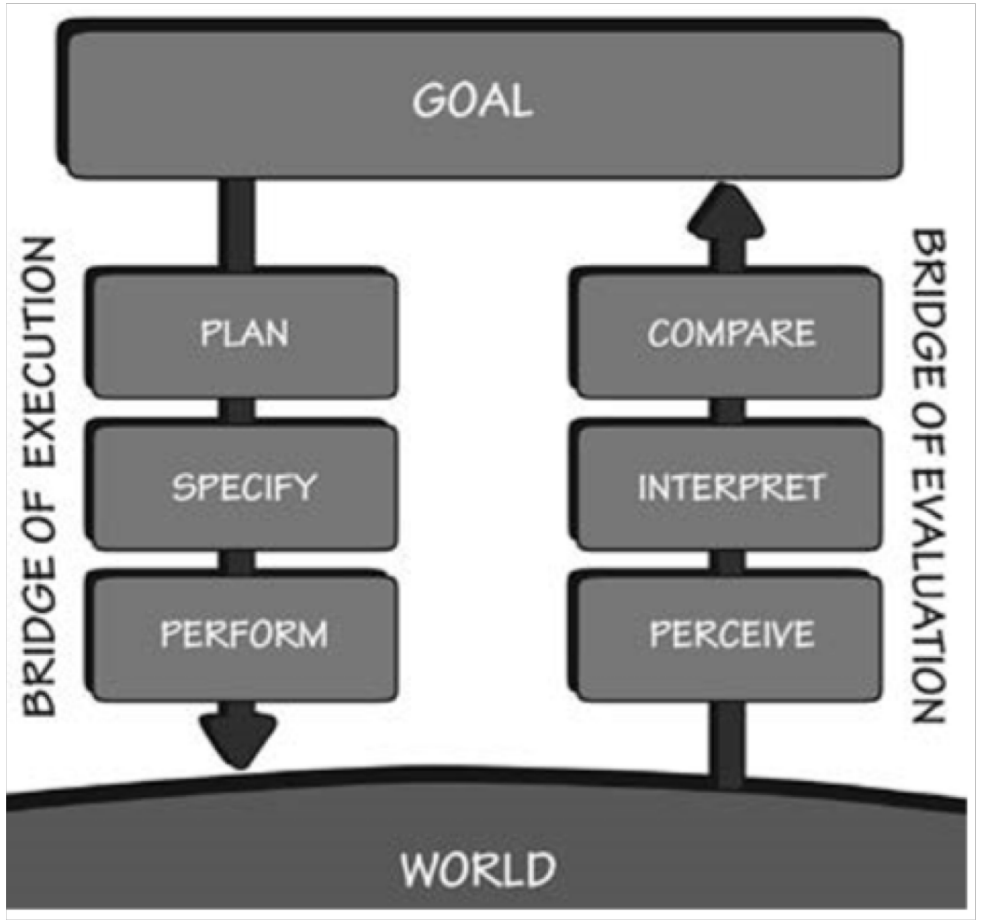
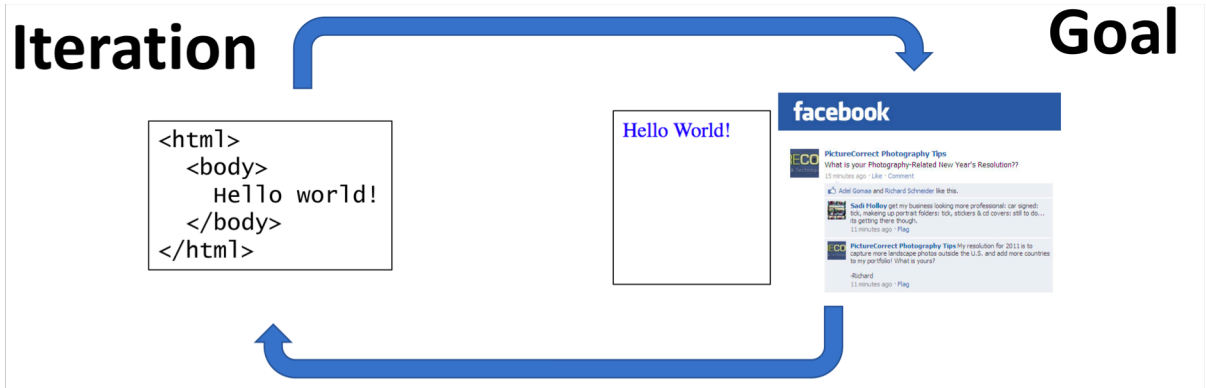
Condition: New
Sold by EFFORTINC Tiffany
Fulfilled by Amazon

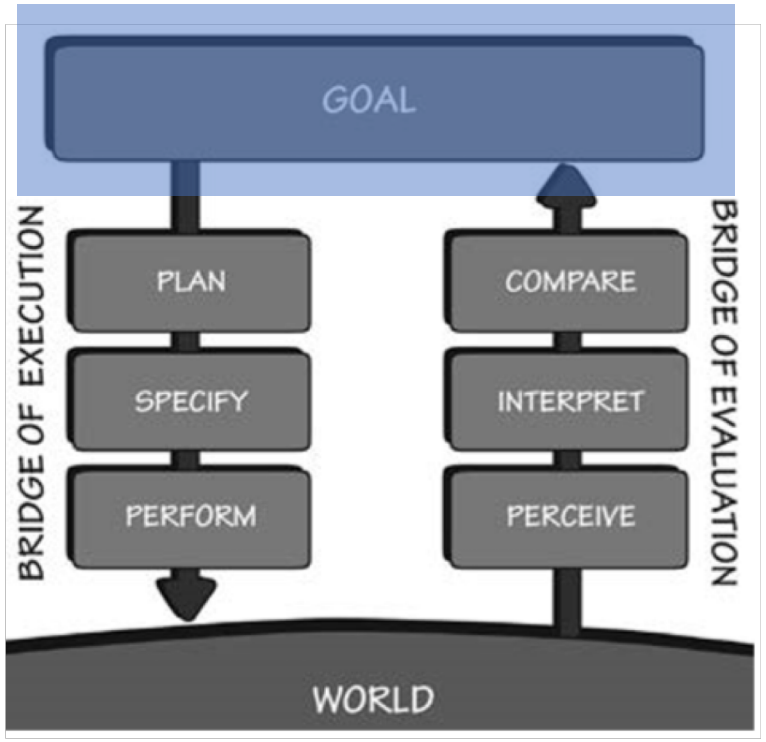
197.99 GBP

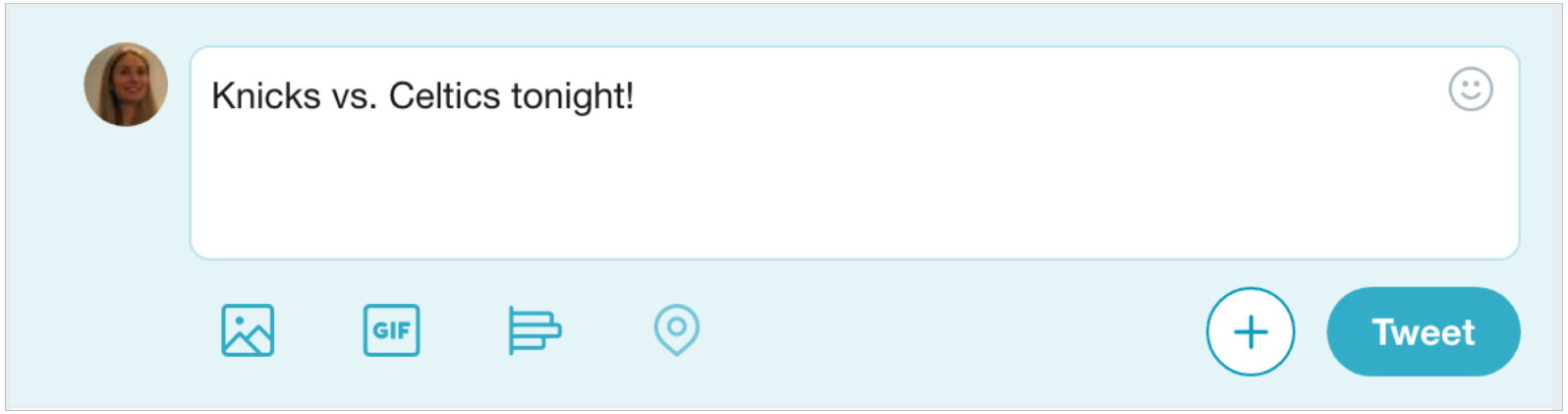
What does The 7 Stages of Action remind you of?





What's the users goal? Post a tweet



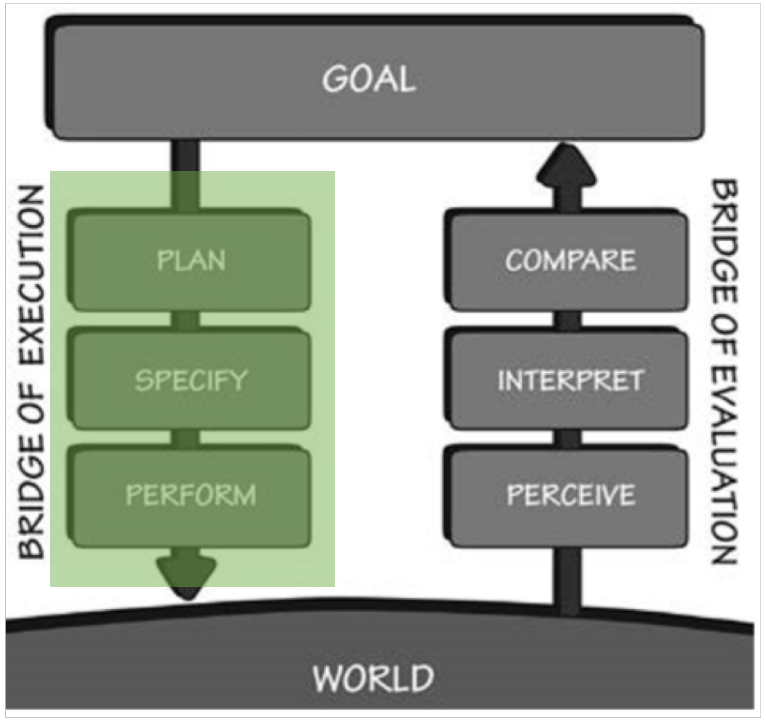


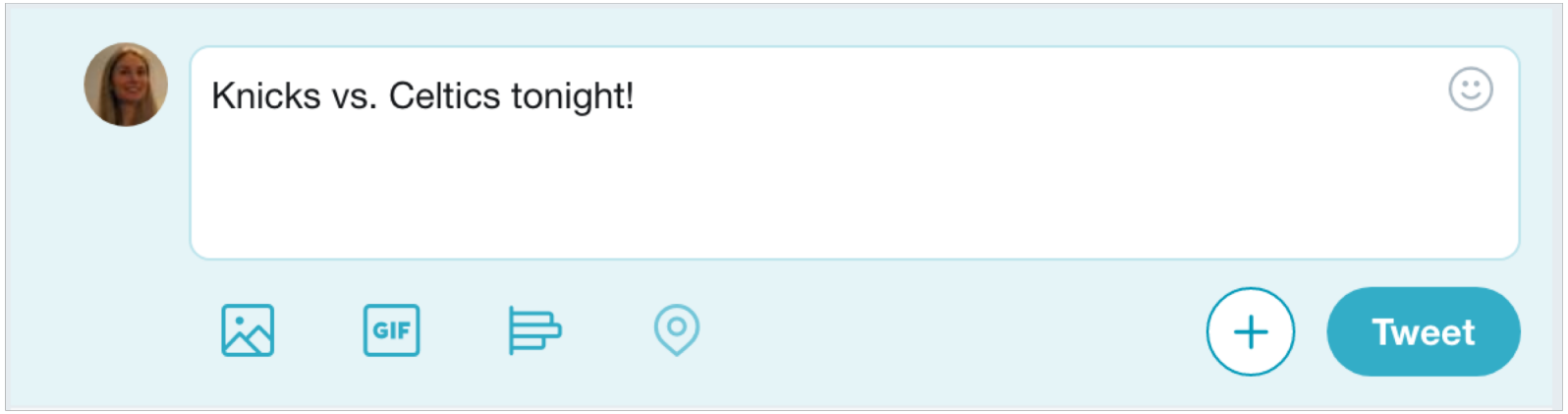
What does the execute?

Put cursor in box

Type message

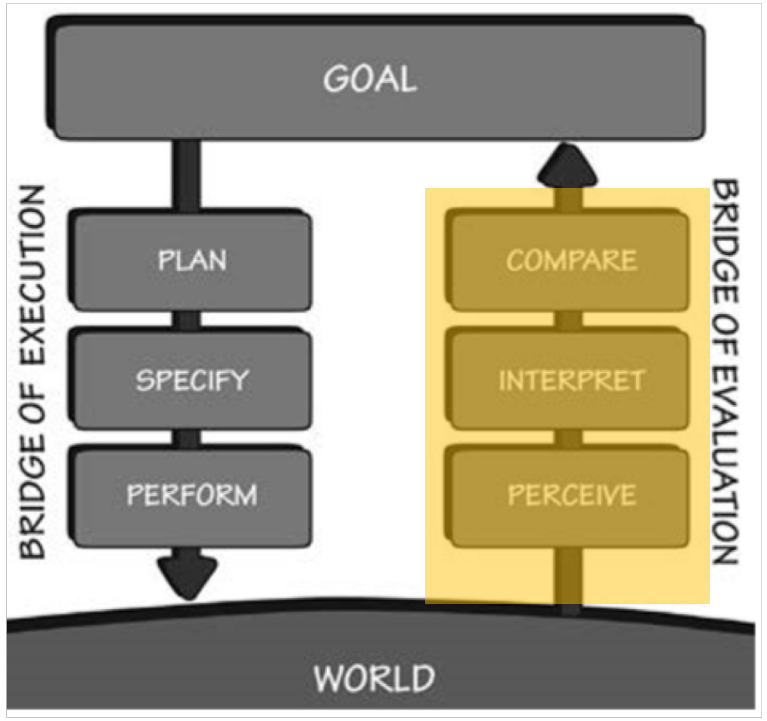
Move mouse to button and click

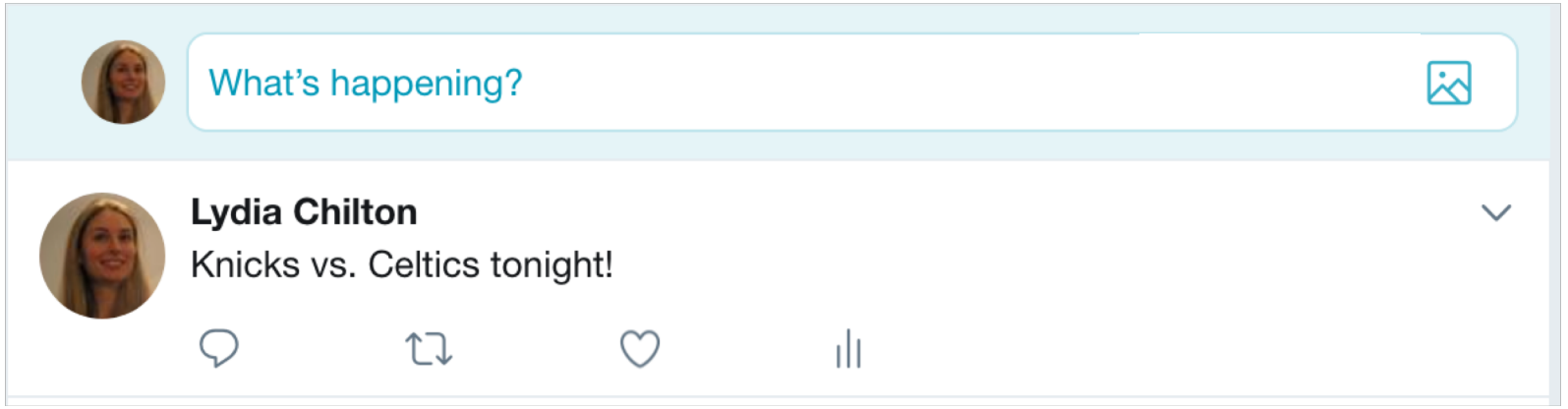




What does the user evaluate?

Did it get posted?



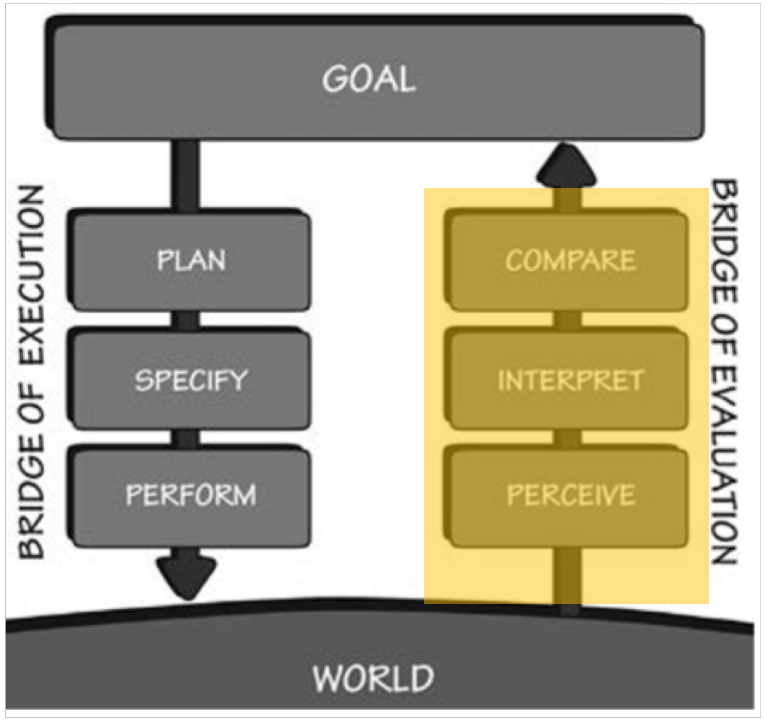


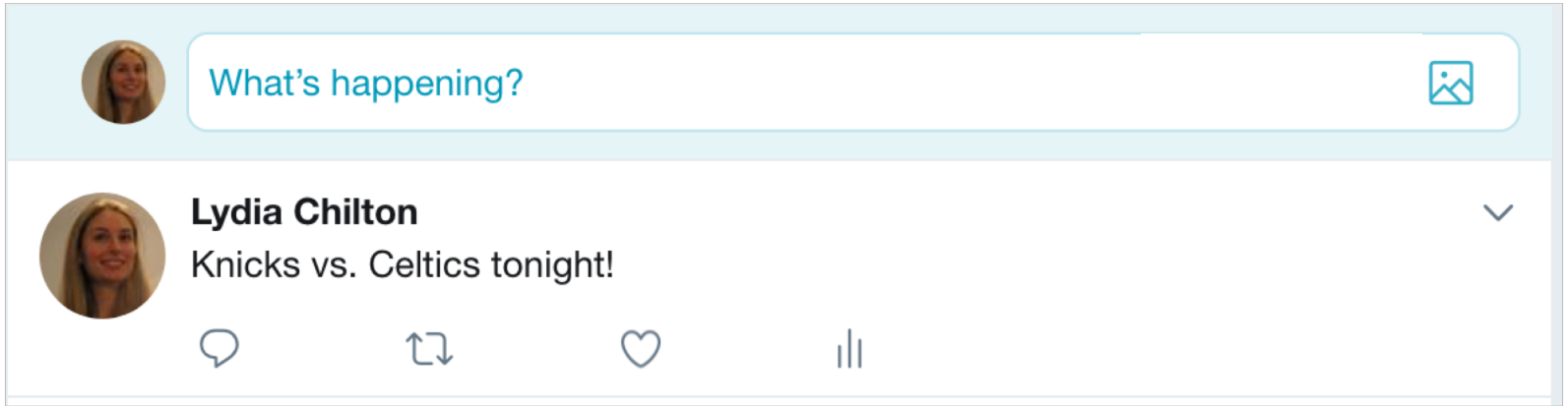
How does the user know?

It’s my face.

It’s my text.

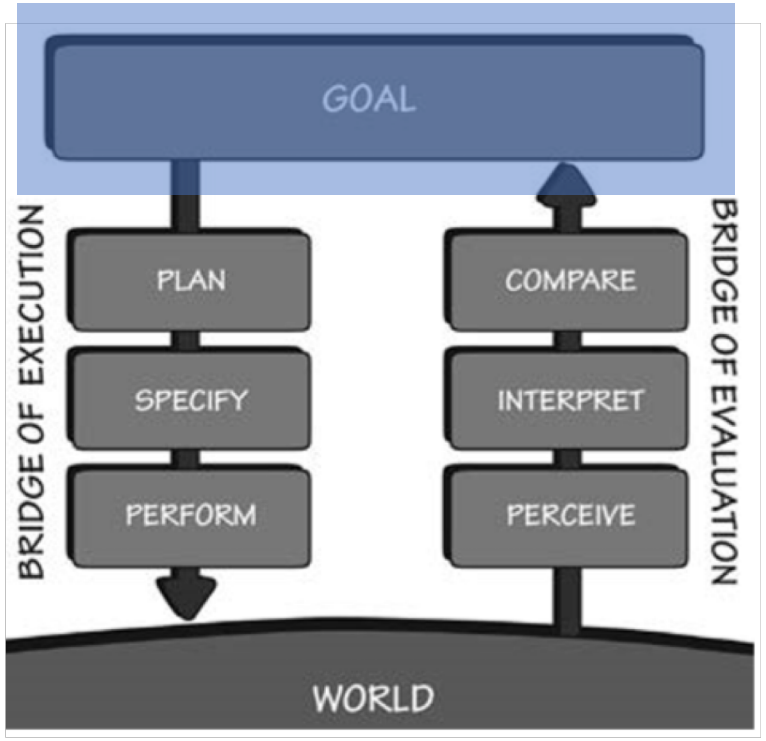
It has new options.



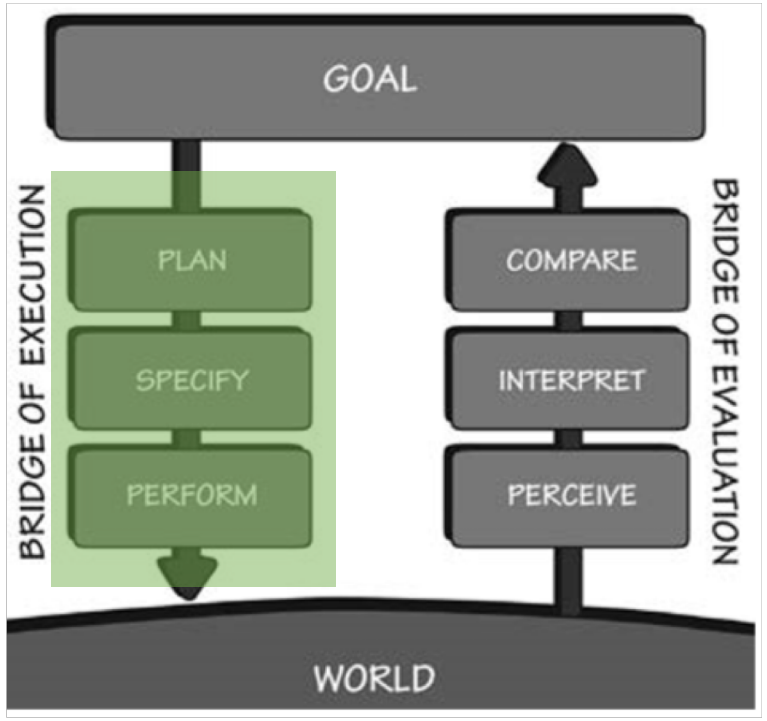


Goal: Perfect DDR score.

What's the users subgoal? Step on the correct arrow at the correct time.



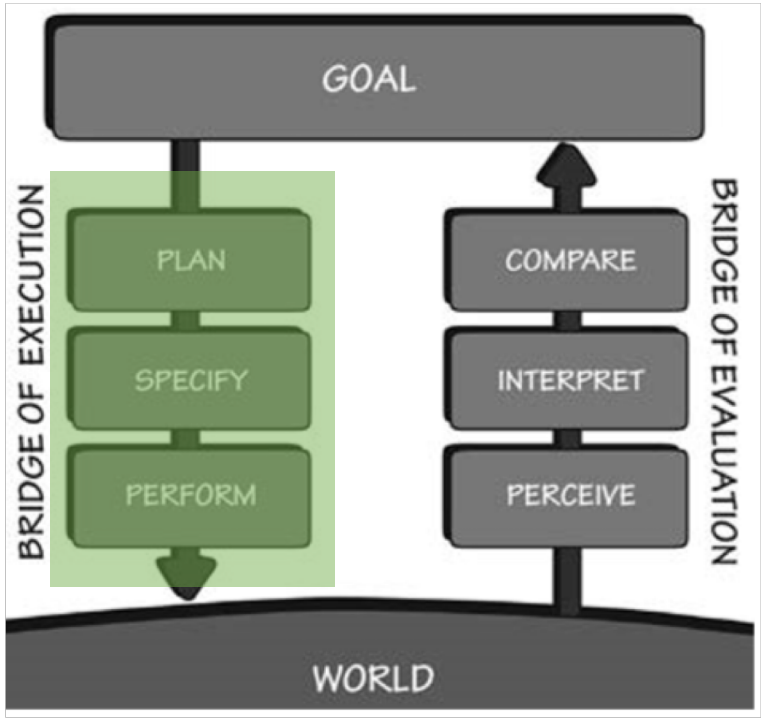
Execution 1:
How does the user plan the action?



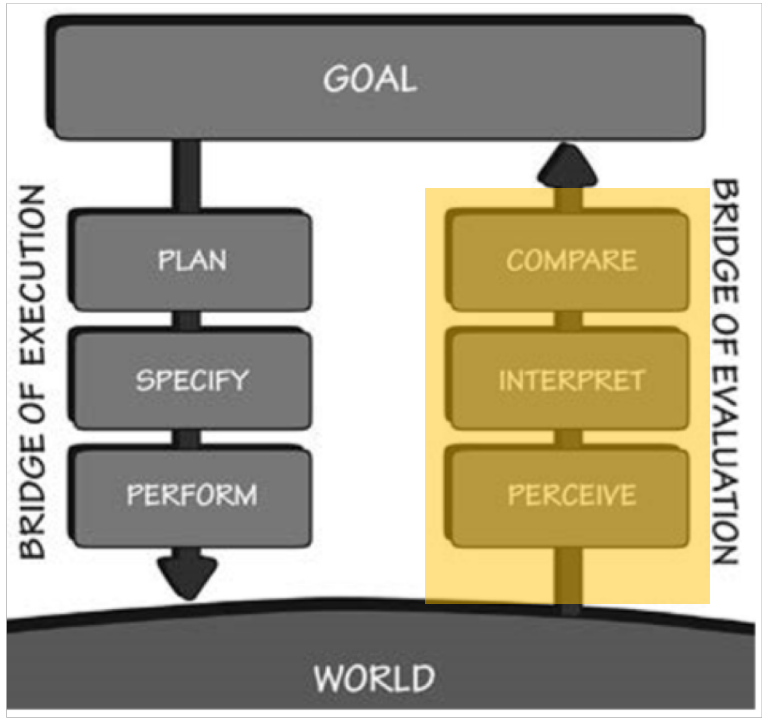
Look at the screen to see the correct arrow/timing

Execution 2&3: How does the user execute the action?

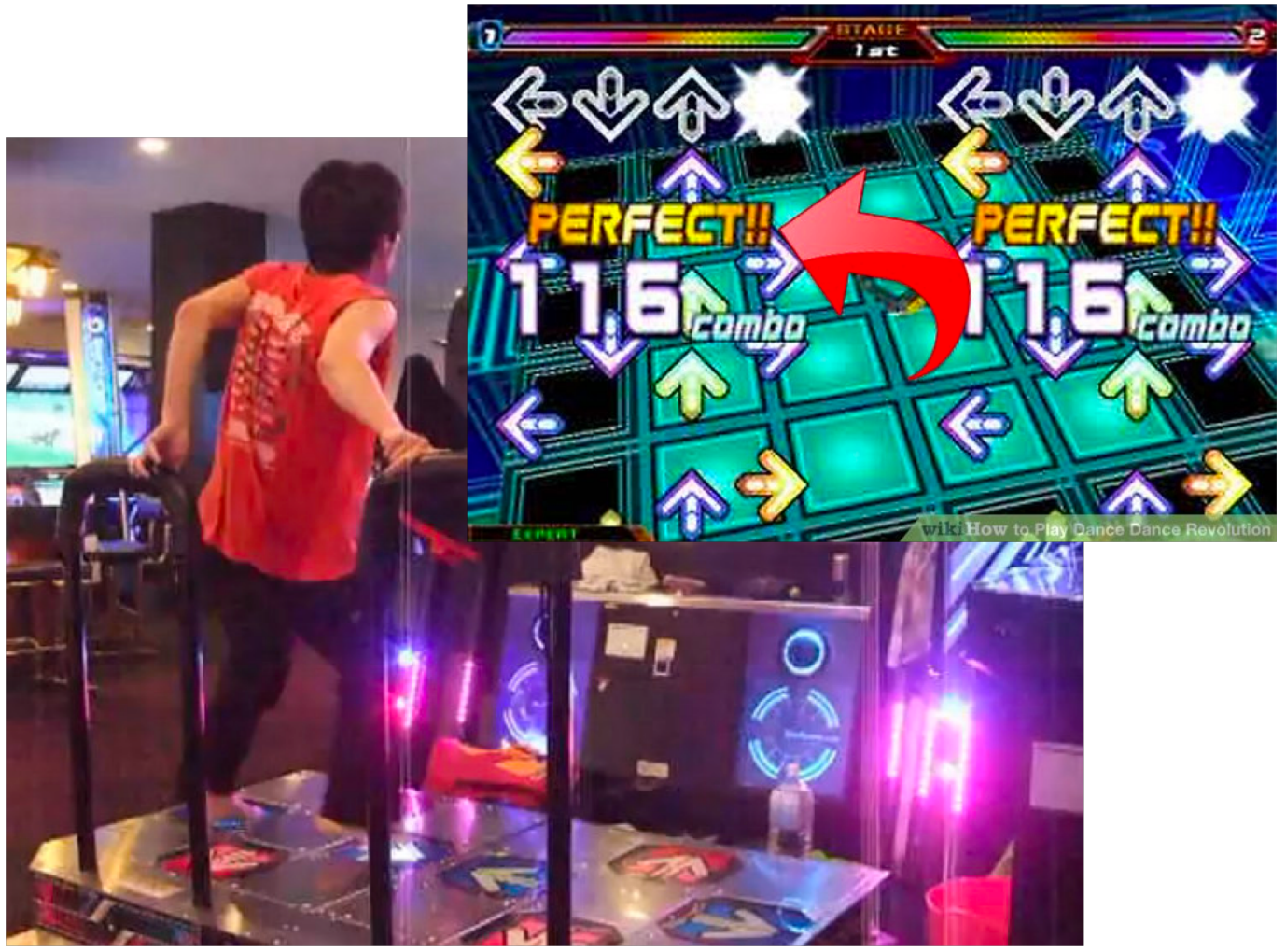
Lift your foot, move over arrow, Place it at the right time



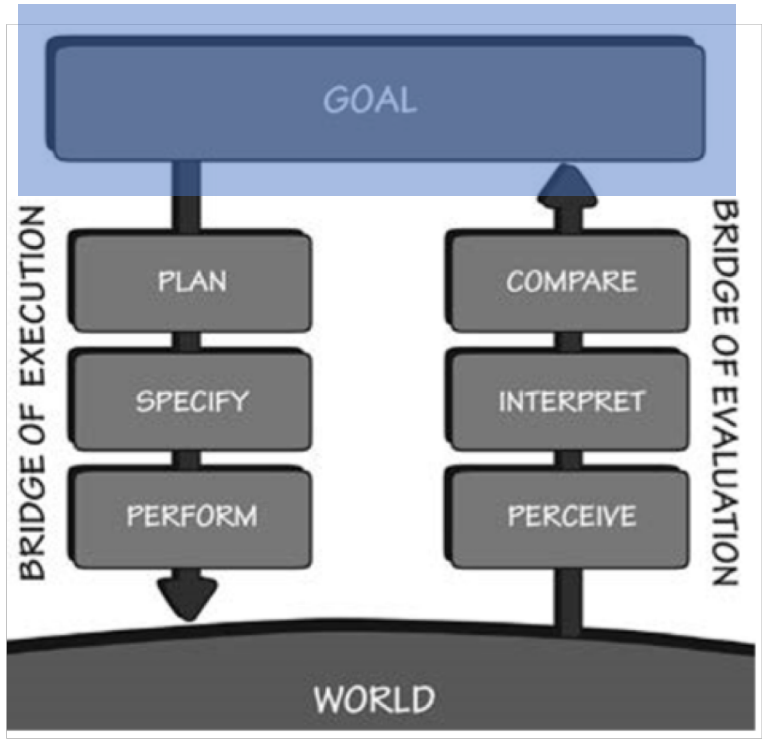
Evaluation:
How does the user evaluate the action?

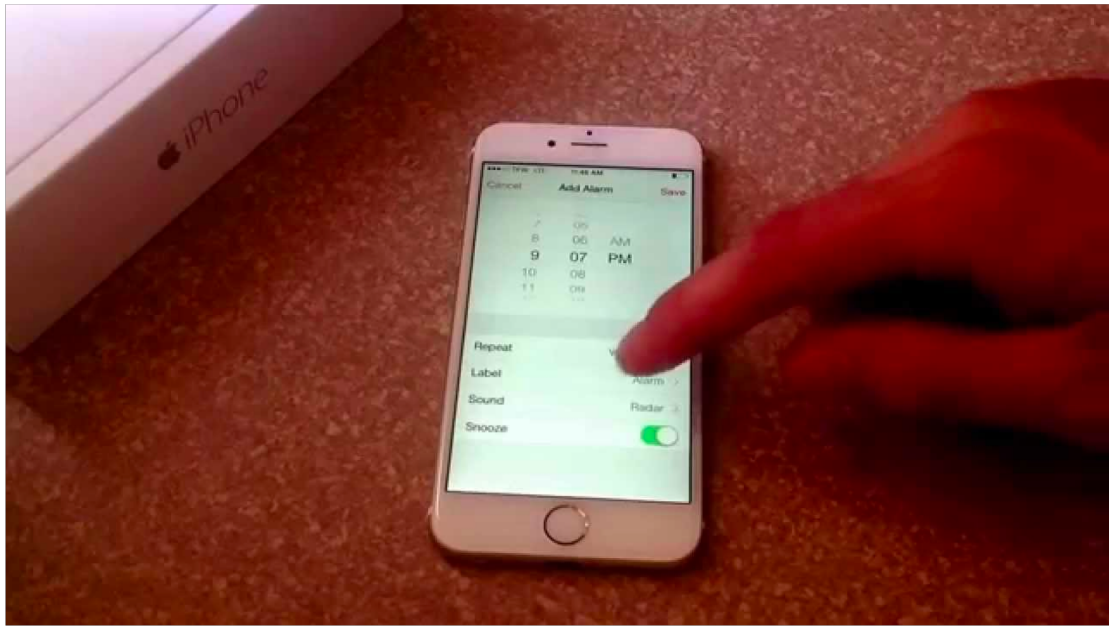


You can see the arrow flash
It tells you a grade



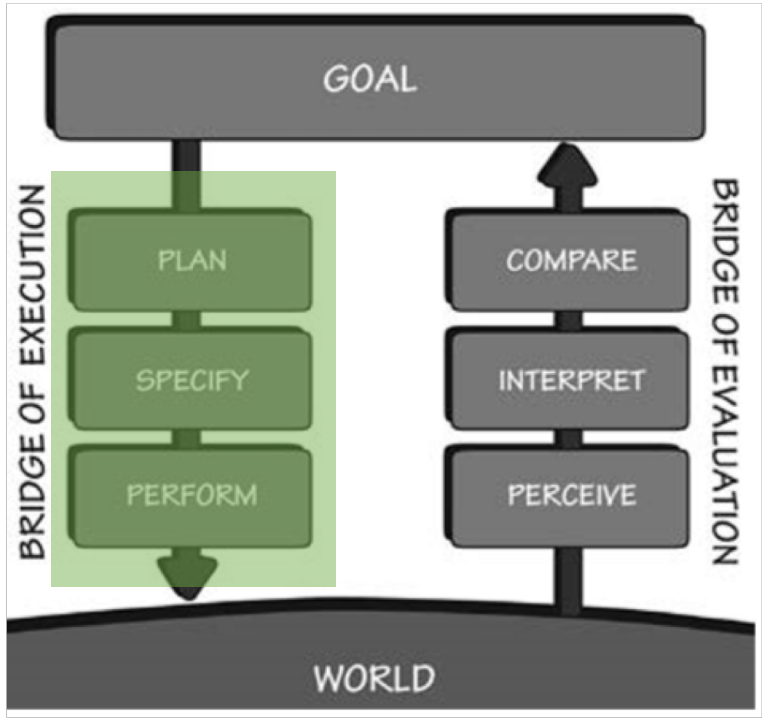
What's the users goal? To set the alarm for 9:07am

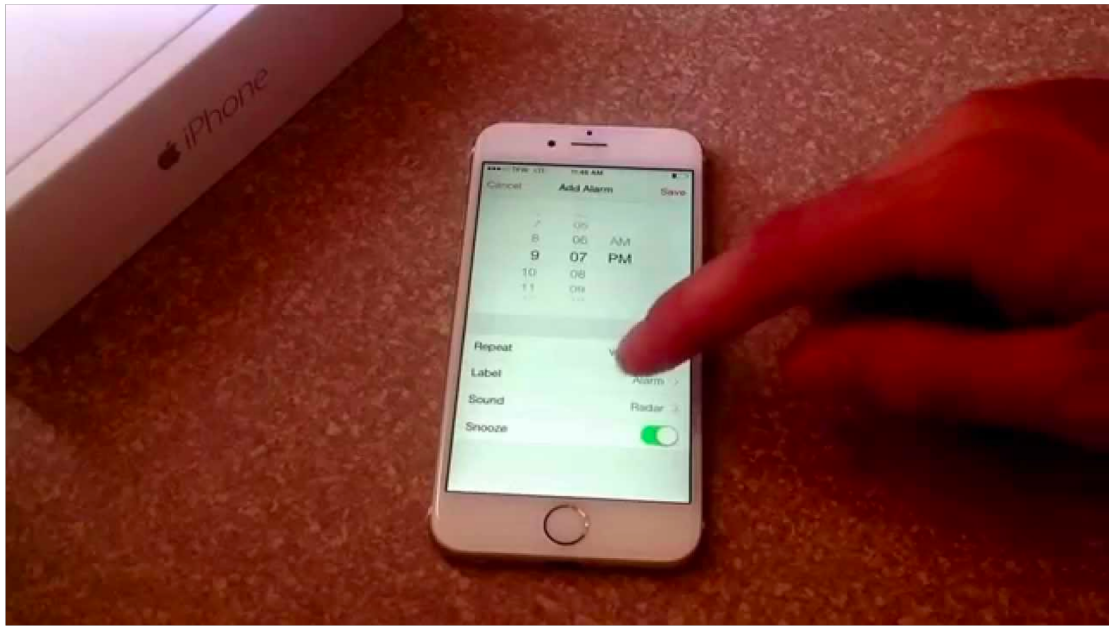




Execution?

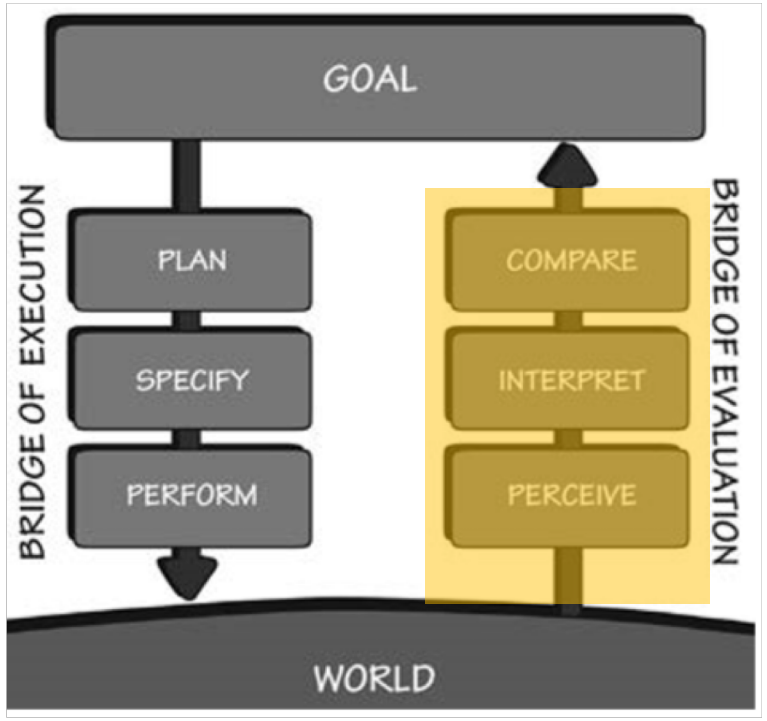
Move the wheel to the time
Switch it to “on”

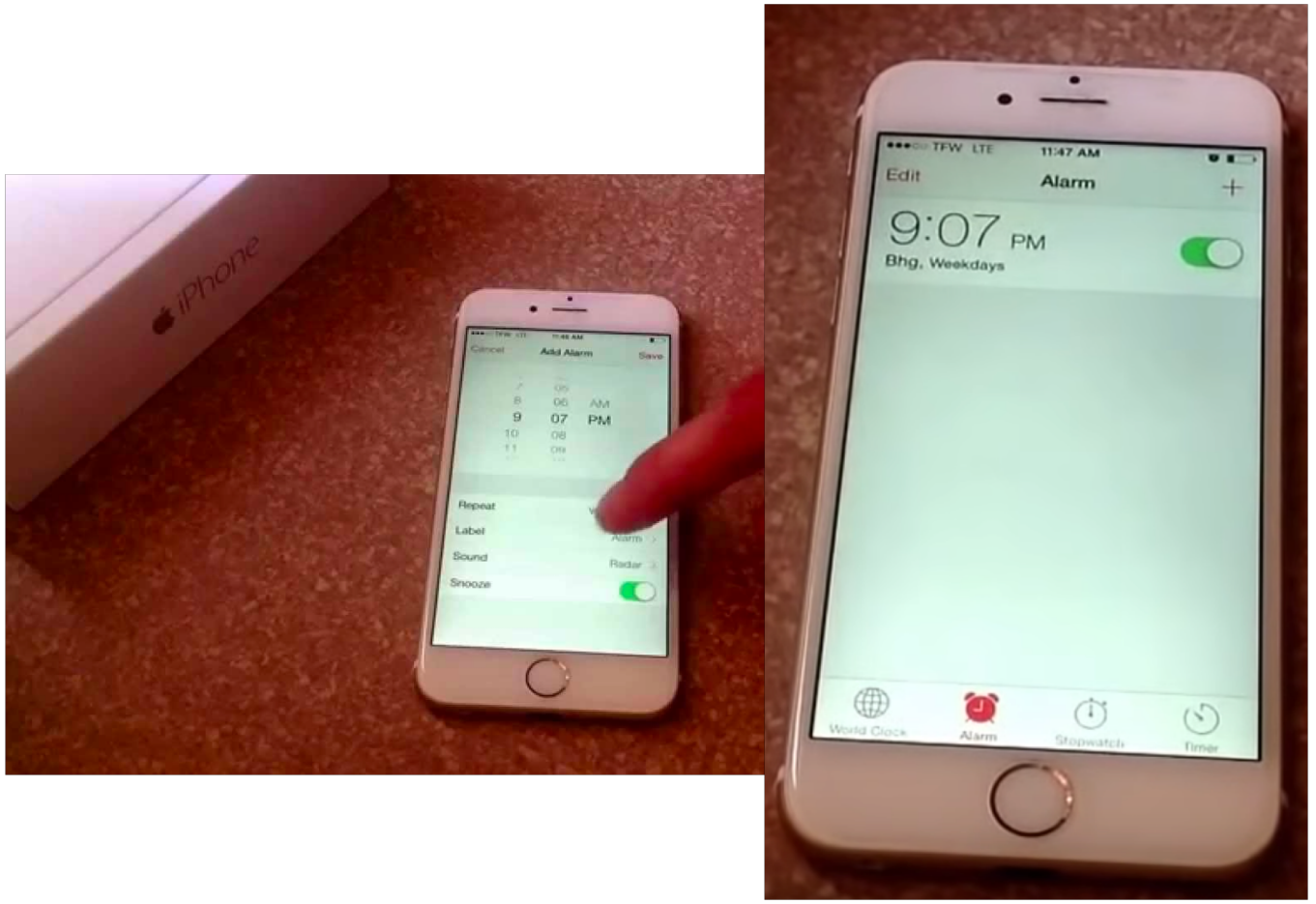




Evaluation?

Turns to an alarm screen



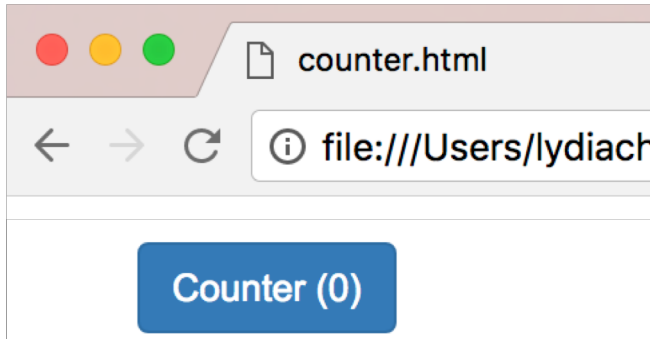


Next time:

Programing interactions in JavaScript?

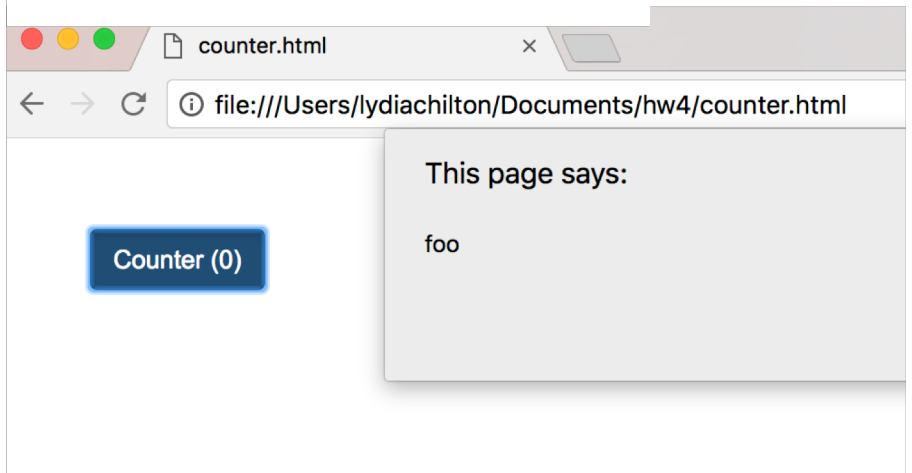
HTML

```
31  <body>
32
33      <button id="counter" class="btn btn-primary">Counter (0)</button>
34
35  </body>
36
```



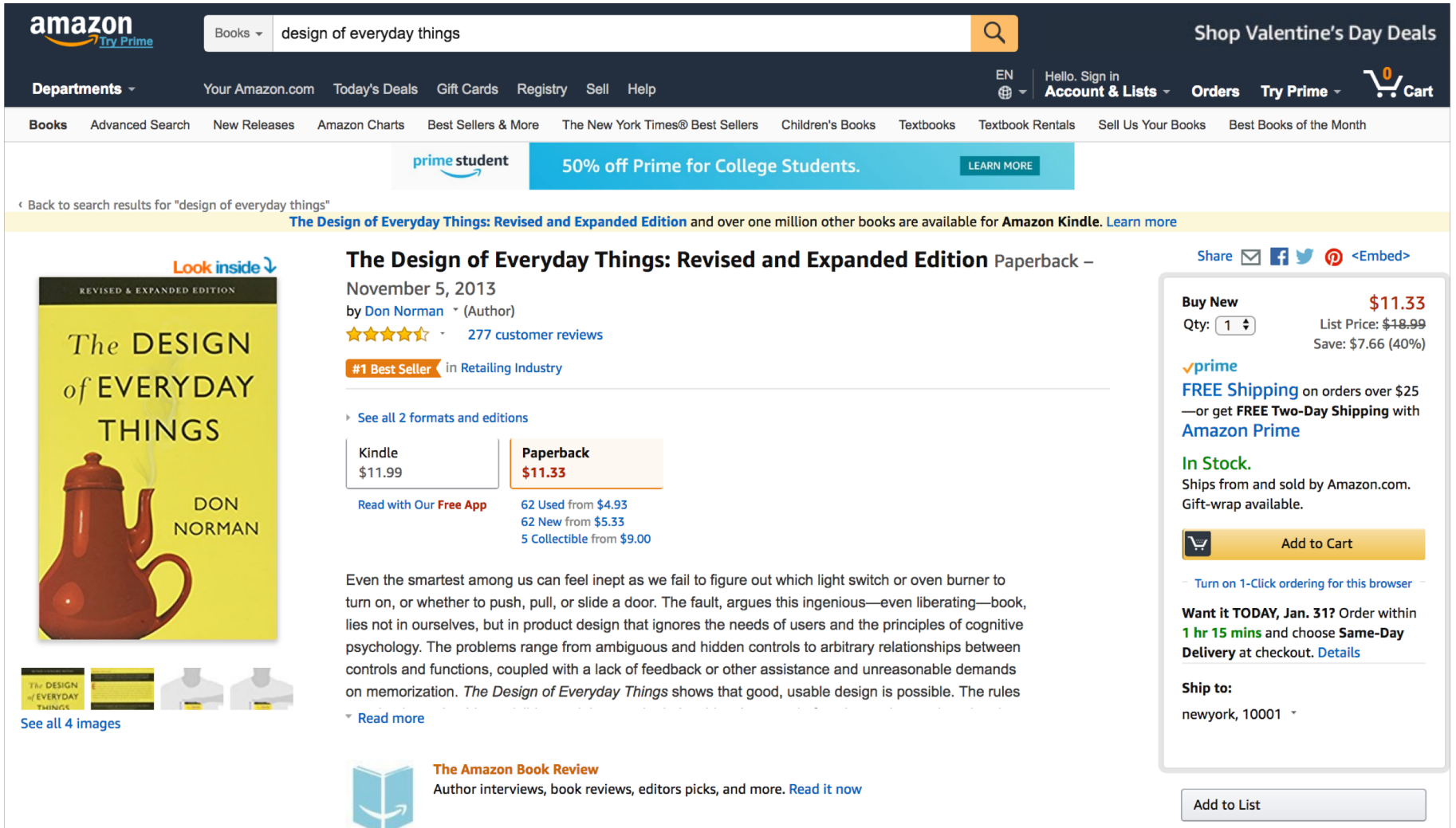
JavaScript

```
25
26  $(document).ready(function(){
27      $("#counter").click(function(){
28          alert("foo")
29      })
30  })
31
```



Summary

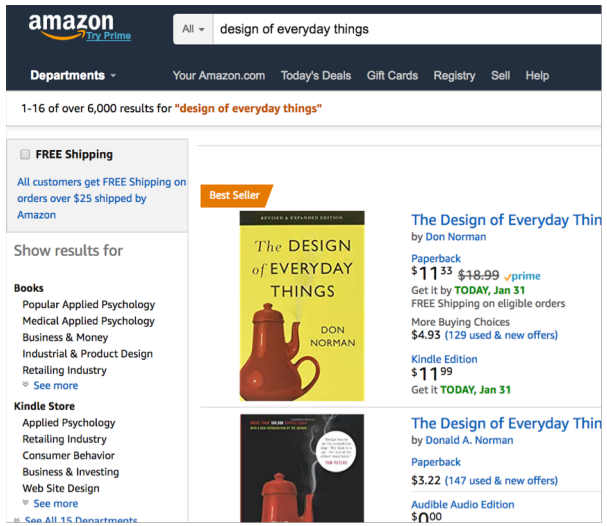
Users interact with the system to accomplish a goal.

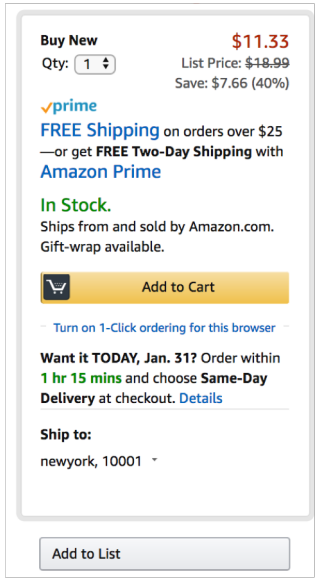


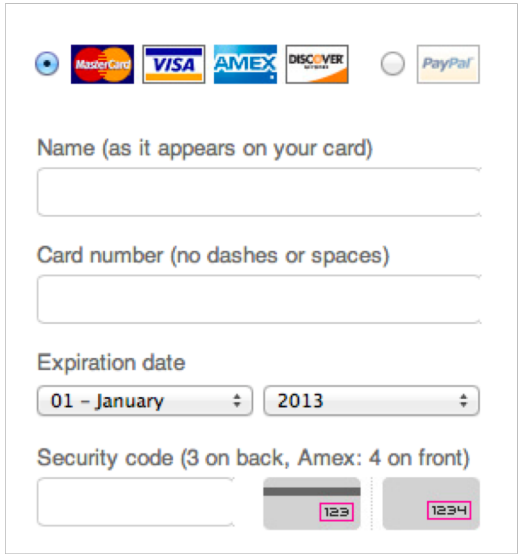
The designer must create the subgoals and interactions to help them accomplish it.

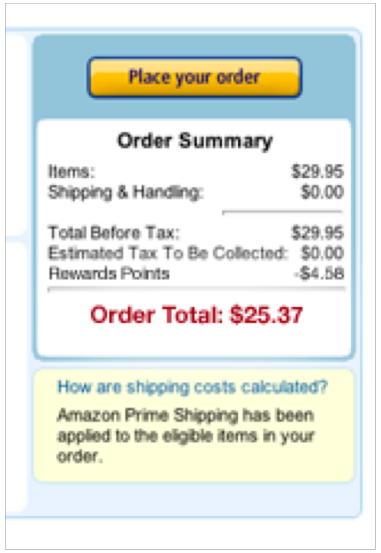
Goal: Buy a book

Subgoal:	Find it	Add to cart	Enter payment info	Place order
Interaction:	Type, click	click	Type, click, point	Click

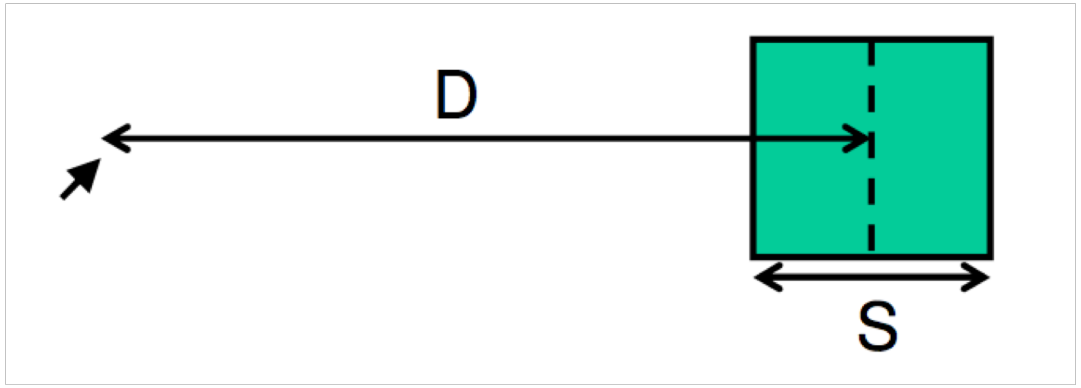








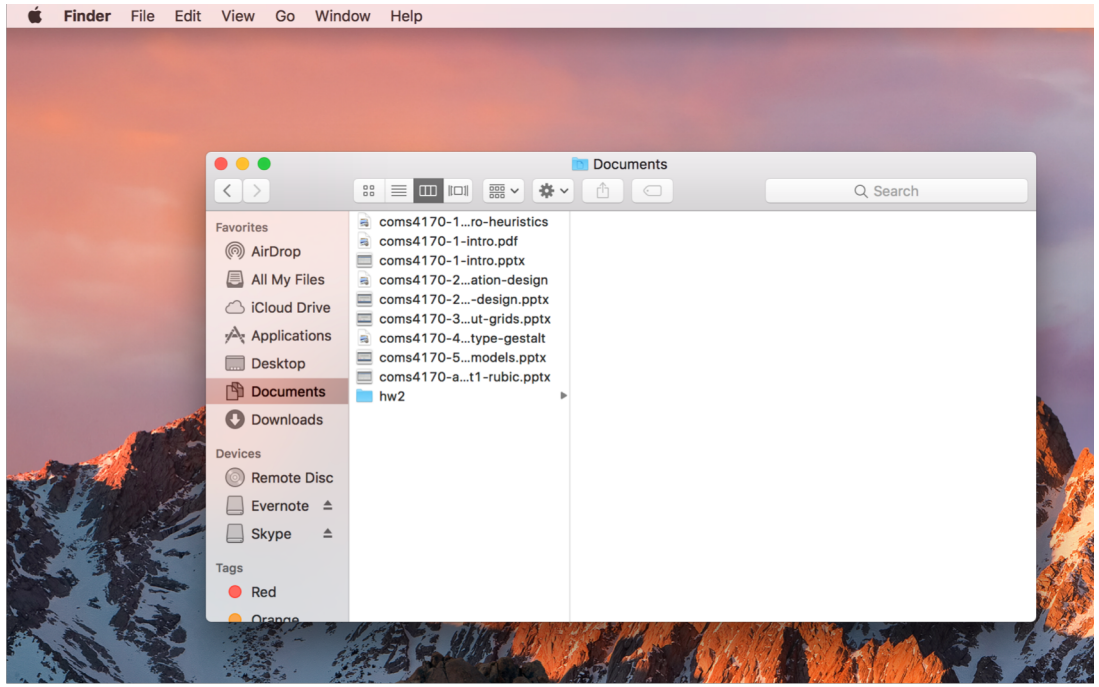
Time to move to a target : Fitts's Law



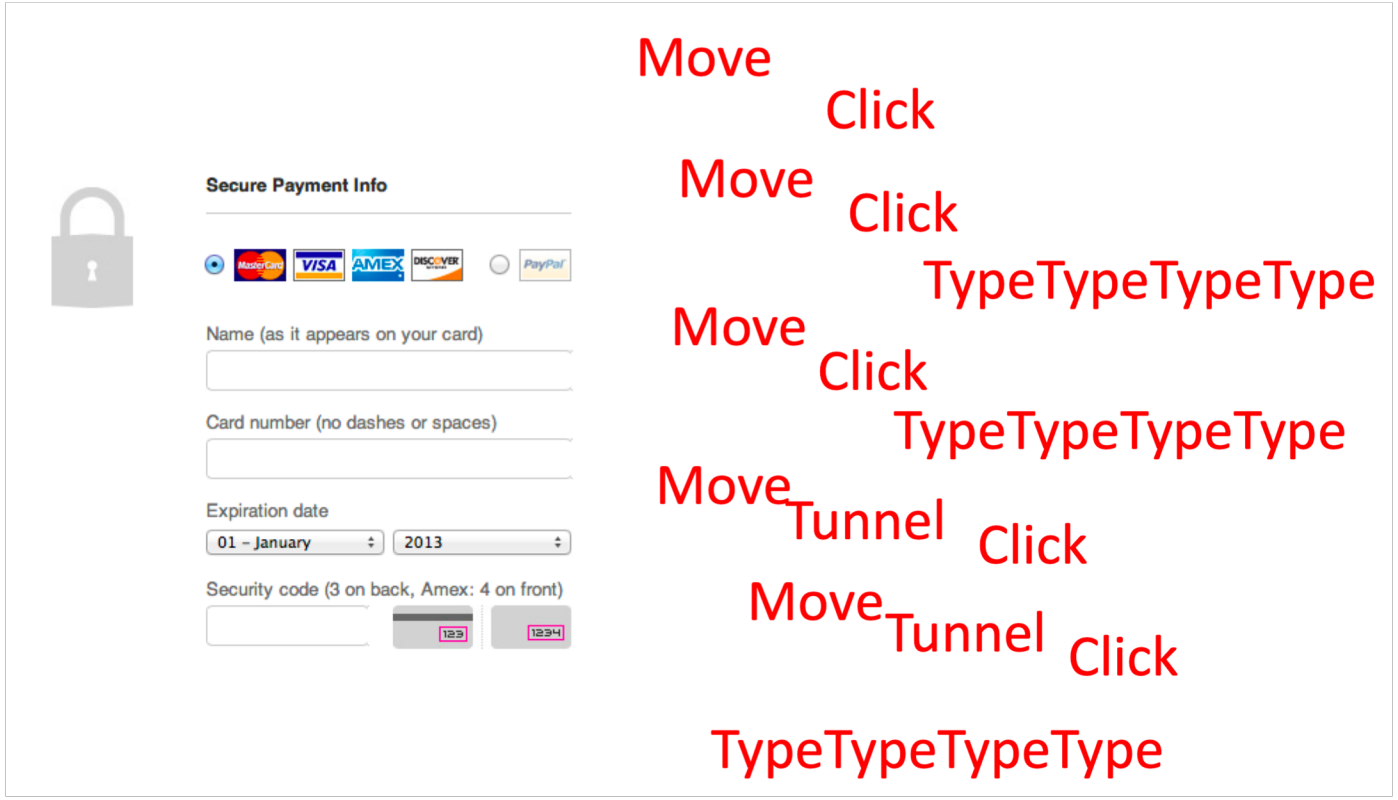
Time to move your pointer to a target

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

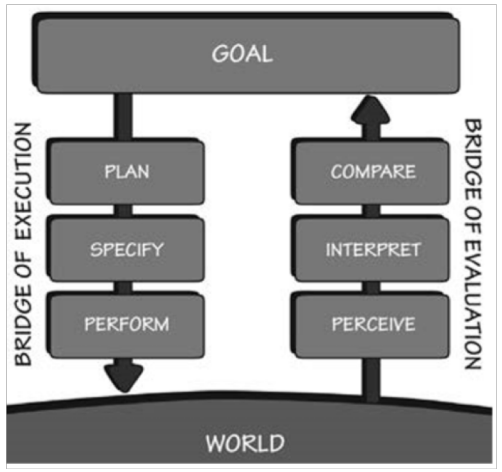
Buttons on the edges are fast to get to because they have infinite size

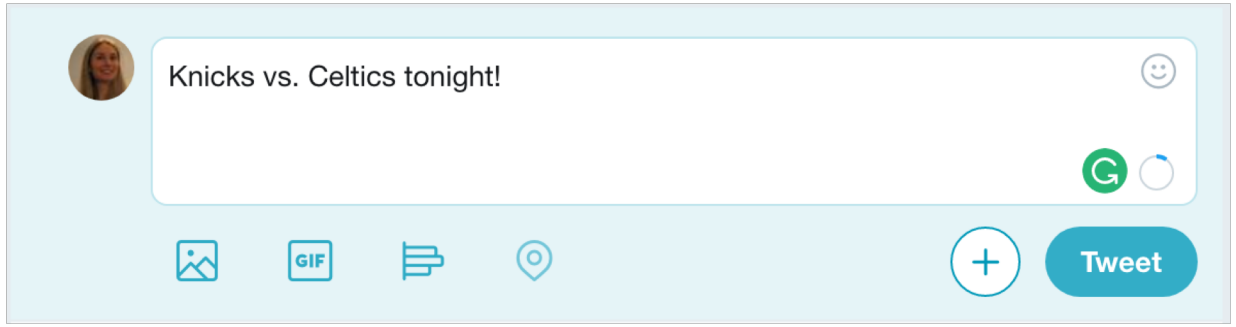


Low-level interactions take time and effort. Minimize them because you do them a lot.



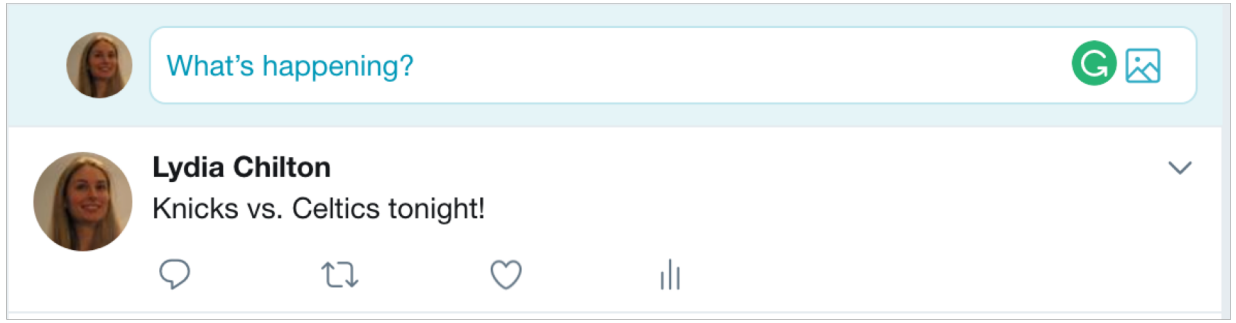
Know the users' goals and design interactions as: **execution** and **evaluation**





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