Our Attention is Limited, Our Memory is Imperfect

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- Yet again everything here is based on the book Designing with the Mind in Mind

- By Jeff Johnson

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- Long term memory differs from short term memory in that it is actually a memory store

- as stated before there is no one specific neuron or group of neurons that store all memories

- because memories like perceptions involve a large group of neurons that fire in a given pattern

  - a pattern that is specific to the perception or memory

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- Related memories are those that have overlapping neurons that fire on multiple memories

- thus every memory that is stored in the brain is stored in a distributed manner

- However long term memory has its weaknesses particularly in that it is easily biased or alterable

- we will examine some of these weaknesses here

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- Error prone
  - everything in long term memory is not an accurate HD recording of our experiences
  - you could thing of a long term memory having lossy compression applied
    - thus there is information lost
  - some memories will have lots of detail others will have very little

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- it is highly dependent on how frequently that memory is accessed

  - for example you will remember lots more details about your best friend/significant other that you would an acquaintance

  - but again it is a set of features that are stored and not an exact bitmap

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- In human computer interaction people may remember that there is a function for doing a specific task

  - but may not remember where that task was exactly located

  - tasks that they commonly perform will be located with ease

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- Long term memories are also weighted by emotions

  - humans are emotional creatures (yes including the men)

  - memories that carry strong emotions (positive or negative) will be stored more vividly in the human mind

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- retroactively alterable

  - it is possible for the mind to adapt features of a memory so that they fit a common profile

  - for example if two people see a whale shark one might remember it as a whale and the other a shark

  - to fit the details to the profile

  - for example when words are memorised the concept is memorised not the word

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- Implications of long term memory characteristics for UI design

    - The main thing you need to know is that people need tools to augment their long term memory

    - books, lists, stories, notches, computers etc etc

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- Thus your applications and UIs should try and fulfill the need to augment user's long term memory

- instead of burdening it

- A prime example of this is authentication systems

  - many people have many different accounts with their own passwords

  - gets particularly troublesome when password restrictions are enforced (random characters, numbers symbols etc)

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Instruction:

Change your PIN to a number that is easy for you to remember. A PIN can be 6-10 digits and cannot start with 0.
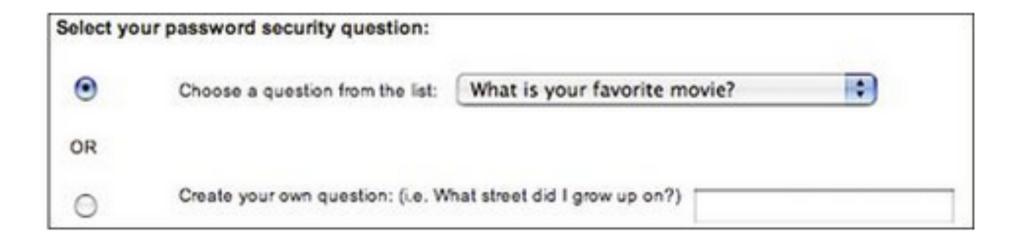Your PIN must be numeric.

New PIN:

Confirm New PIN:

Remember: Please write down your PIN.

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- Security questions are another example
    - what if you can't answer any of the questions?
    - what if their are multiple answers to the questions?
    - again places a burden on long term memory

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- thus if there are multiple answers they may write them down

- so people may end up also having to remember where they placed them

- a better option would be to give a user a choice or make a question of their own

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Select your password security question:

○ Choose a question from the list: [What is your favorite movie? ▲▼]

OR

○ Create your own question: (i.e. What street did I grow up on?) [   ]

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- another aspect is that UI design and long term memory is enhanced by interface consistency

- the more consistent the actions and UI interactions the less a user has to learn

- the increase in different actions and functions to learn will increase the burden on long term memory

- for example take a look at the following designs and see which is easiest

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Object	Document Editor Keyboard Shortcuts: Alternative Designs					
	Design A		Design B		Design C	
	Cut	Paste	Cut	Paste	Cut	Paste
Text	CNTRL-X	CNTRL-V	CNTRL-X	CNTRL-V	CNTRL-X	CNTRL-V
Sketch	CNTRL-X	CNTRL-V	CNTRL-C	CNTRL-P	CNTRL-X	CNTRL-V
Table	CNTRL-X	CNTRL-V	CNTRL-Z	CNTRL-Y	CNTRL-X	CNTRL-V
Image	CNTRL-X	CNTRL-V	CNTRL-M	CNTRL-N	CNTRL-X	CNTRL-V
Video	CNTRL-X	CNTRL-V	CNTRL-Q	CNTRL-R	CNTRL-E	CNTRL-R

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- Even though the concept of consistency has been critisised as ill-defined and easy to get wrong

- the fact remains that a user interface that is consistent will reduce the long term memory burden on a user

- also makes applications more intuitive to begin with.