THE BRAIN AND TECHNOLOGY

Brain science in interface design

LESSON 3. INTUITION

[Brian Whitworth](#), BA (Psych), BSc (Maths), MA (Psych), PhD (IS), Major (Retd.)
With illustrations by Jasmin Whitworth

INTUITION

I'd explain it better, but I'm low on puppets and crayons.

PART 1. RELIABILITY – WHY WE HAVE INTUITION

"How could a mechanism composed of some ten billion unreliable components function reliably while computers with ten thousand components regularly fail?" – Von Neumann

A brain loses a neuron and we carry on.

    The **connections** of brain neurons that die can't be replaced.

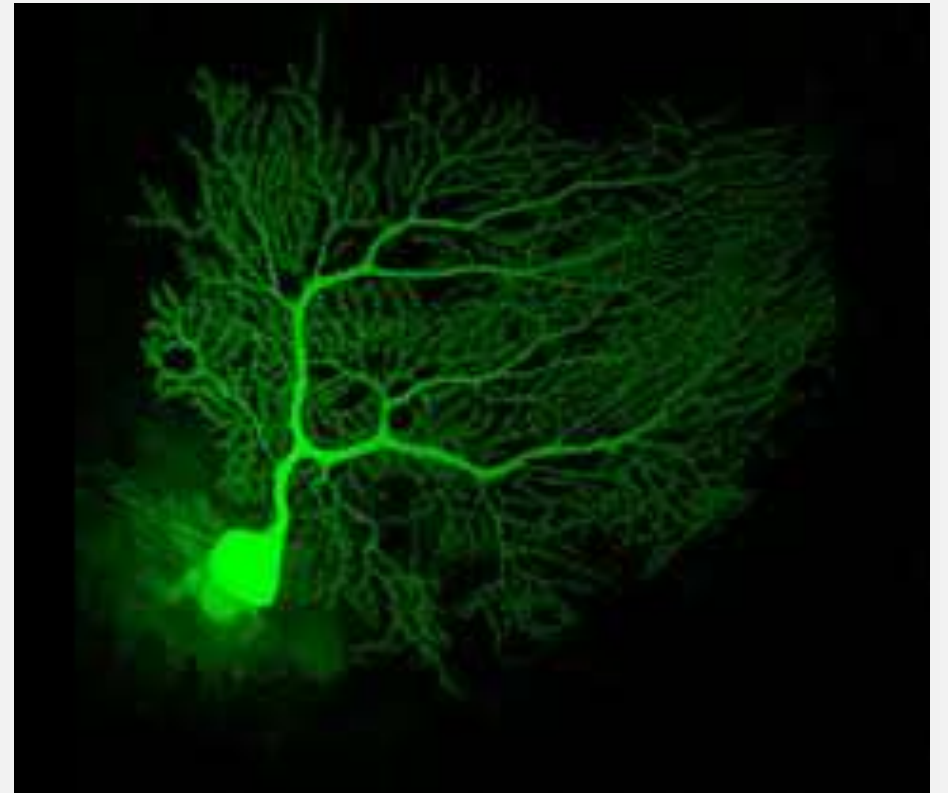A computer loses a transistor and crashes!

Why is the brain so reliable?

    Different architecture – **overlaid**

    Different protocols – **upward and downward** effects

    Different way of working – **no central control**

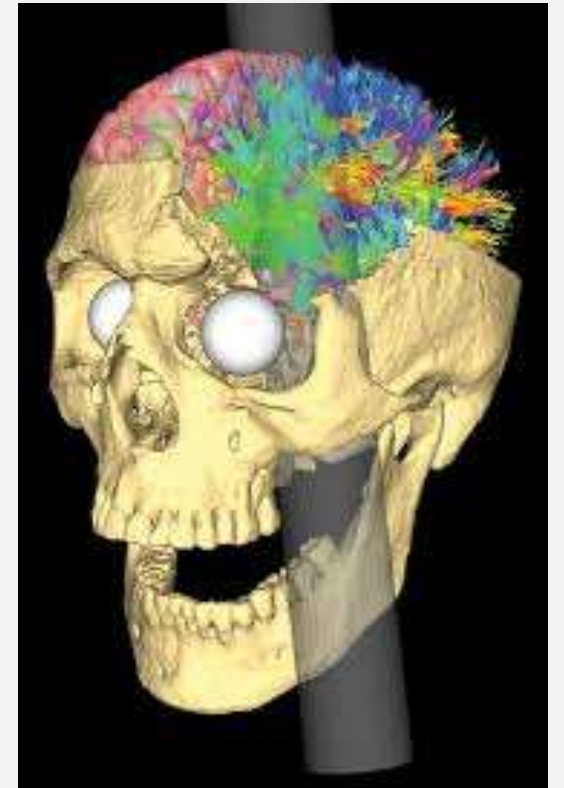**Dynamic** rather than **static** system

THE CASE OF PHINEAS GAGE

A speeding iron rod smashed the middle and left lobes of his cerebrum.

- Within minutes was conscious and speaking
- Showed disturbed behavior
  - His wife knew
- Lived for 13 years, died of unknown causes

If you bang a nail through your laptop, will it still work? (Don't do this.)

Brain performance degrades but doesn't **crash**.

DEVELOPMENT BY OVERLAY

Software updates **replace** the old software.

Brain "updates" **overlay** the old system.

- When a more complex subsystem overlays a more primitive one:
  - The new system can **inhibit** the older one.
  - The old one is **backup** if the new one fails (reliability).
  - The old one—being faster—can **jump in first** (intuition).

Intuition: *When older overlaid sub-systems of the brain affect behavior or thought*

- Earlier systems come in when higher sub-systems are:
  - **Too slow**: A comment blurted out
  - **Too weak**: Children who blurt offence
    - "Is she fat because she eats too much?"
- Or when earlier sub-systems are:
  - **Strongly activated**: A real feeling expressed
  - **Trusted to act**: The higher respects the lower.
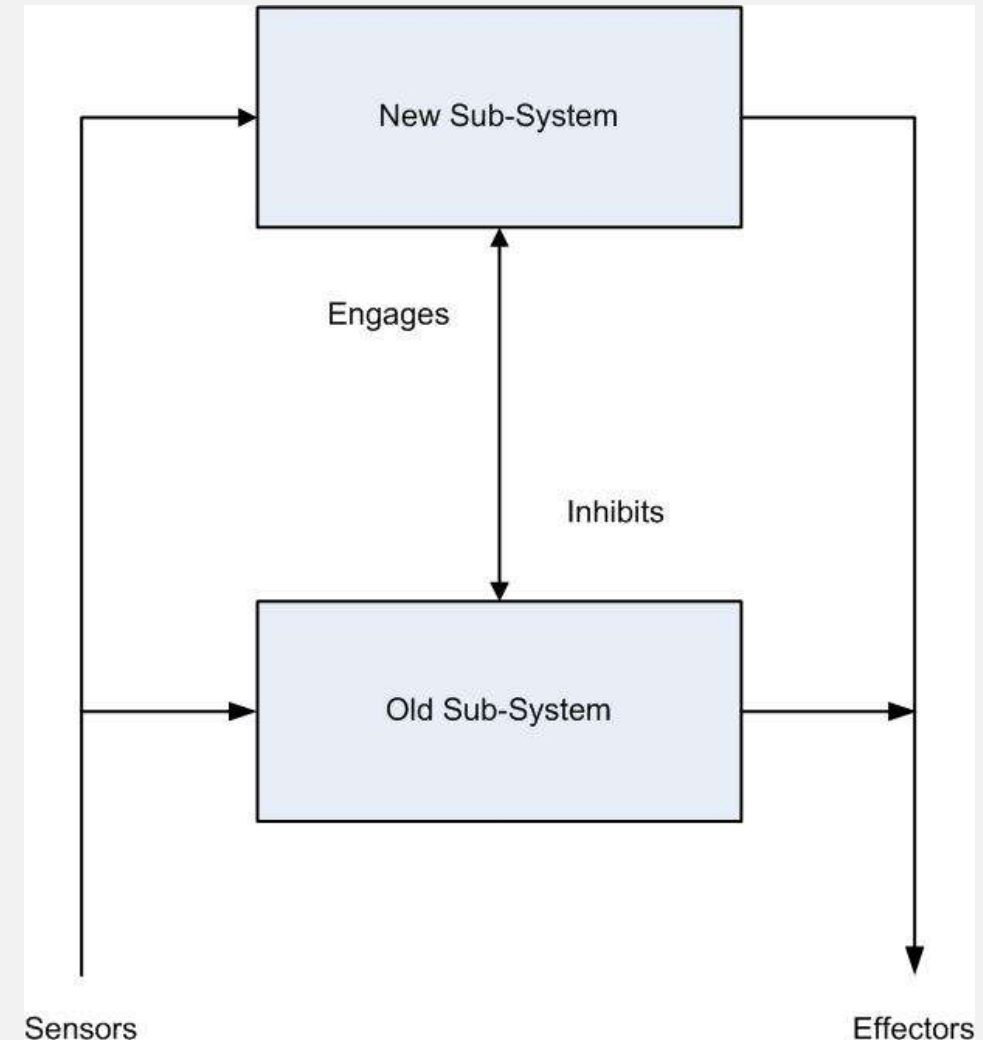
A new subsystem can inhibit or activate another, but it doesn't *control* it.

INTUITION

Intuition is when the old brain acts.

- We use it to assess people in minutes by:
  - Appearance, Body language, Smell, Facial expression, Tone of voice

The update-by-overlaying method gives the brain fast/simple **and** slow/complex responses:

- **Fast/simple**: Intuitive responses are fast based on relatively simple algorithms.
  - Dance now, think later!
- **Slow/complex**: Rational responses are complex but can't handle **real-time** problems.
  - **The centipede**

19th century rationalism: That **reason** can handle all things, that everything can be calculated

- We now know this is not true.

The Centipede Dilemma

A centipede was happy quite
Until a toad in fun
Said: "Pray which leg moves after which?"
This raised her doubts to such a pitch
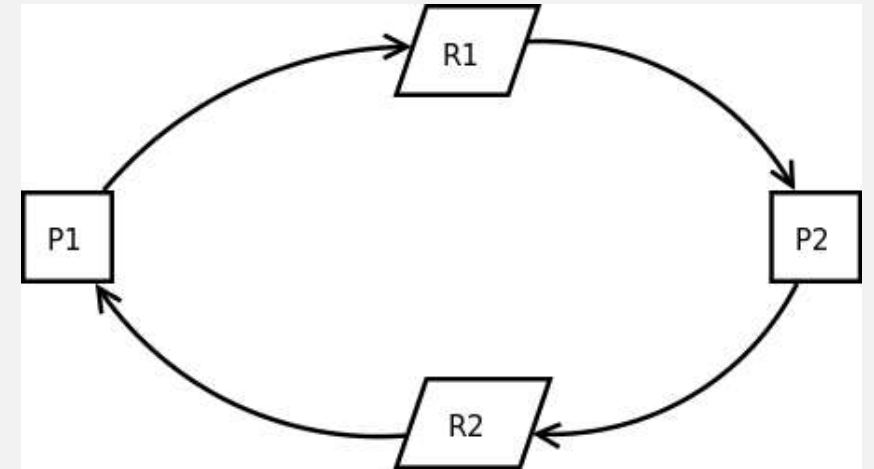*She fell exhausted in a ditch*
Not knowing how to do.
Katherine Craster in Pinafore Poems, 1871

EXCLUSIVE CONTROL

Computers need **exclusive control** of resources to avoid **processing infinities** or **lost data**:
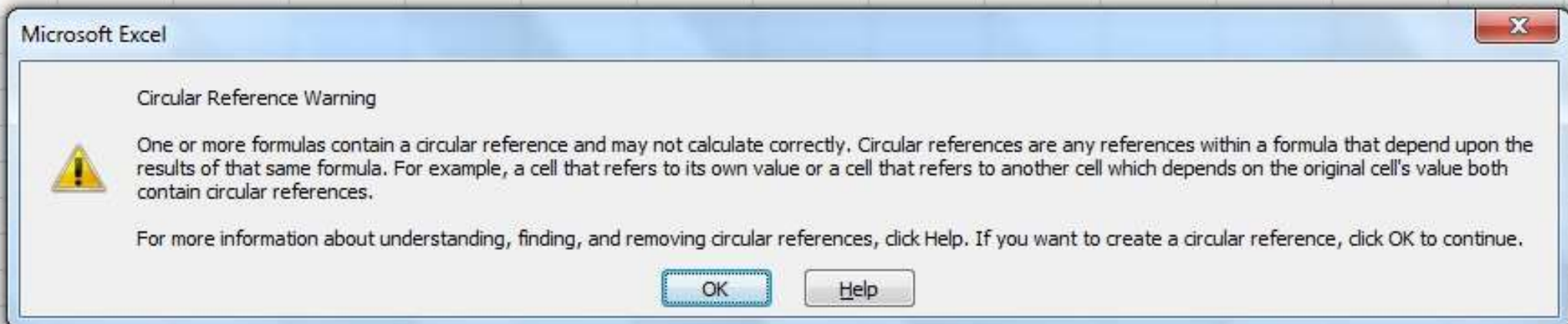
- Database edits require a **lock** or can lose edits.
  - Dropbox's **shared control** means work can be lost.
- Network printers accept one document at a time.
  - **Two** people can't direct **one** document's printing.
  - Two documents don't print interspersed.

Processing infinities like deadlock can **crash** software, so spreadsheets avoid them.

Deadlock:
P1 has locked resource R2 and needs R1, P2 has R1 and needs R2. Both wait forever.

Microsoft Excel

Circular Reference Warning

One or more formulas contain a circular reference and may not calculate correctly. Circular references are any references within a formula that depend upon the results of that same formula. For example, a cell that refers to its own value or a cell that refers to another cell which depends on the original cell's value both contain circular references.

For more information about understanding, finding, and removing circular references, click Help. If you want to create a circular reference, click OK to continue.

[OK]   [Help]

SHARED CONTROL

Shared control can process many options.

- Can like **and dislike** a book
- This strategy evolved millions of years ago.

Arousal can manifest as:

- **Fear***: Avoid, run away!
- **Curiosity***: Approach, investigate
  - What frightens the weak may interest the strong.

With two options, the system can*:

- **Choose one**: Investigate **or** flee.
- **Choose both**: Freeze in place.
- **Alternate**: "Will I, wont I?"
  - Uncertainty creates stress.

The Cows and the Remote Control Car

Deer in headlights

CONSISTENCY

Consistency: Minimizes brain-processing changes.

- Changing, say, a text font requires that part of the brain factory to **retool its neural machinery**.

- Older people especially don't like this.

- Be **consistent** with:

  - Screen layout

  - Colors (foreground/background)

  - Use of fonts and styles (bold/italic)

  - Menus: Fade rather than remove the inapplicable

  - Graphic style, Navigation, Language, Help, Search …

- Be **frugal** with changes.

- Be **predictable** with changes.

Consistency means people don't have to learn new things as they move around a site.

PART 2. THE BRAIN ONION

The brain is like an **onion** with layer upon layer, as each evolution **overlaid** the last:

- **Brain stem** reflexes (pons)—e.g., suck reflex
- **Hind-brain** motor schema (cerebellum)—e.g., walking
  - 10% of the brain's volume but over 50% of its neurons
- **Mid-brain** emotions (limbic system)—e.g., fear
  - Speechless aphasic patients can still swear and sing!
- **Cortical** cognitions (neocortex):
  - **Language** (temporal cortex)
  - **Planning** (frontal cortex)
  - **Recognition** (occipital cortex)
  - **Memory** (+hippocampus)

All parts of the brain **continue to evolve**.

The brain is an onion
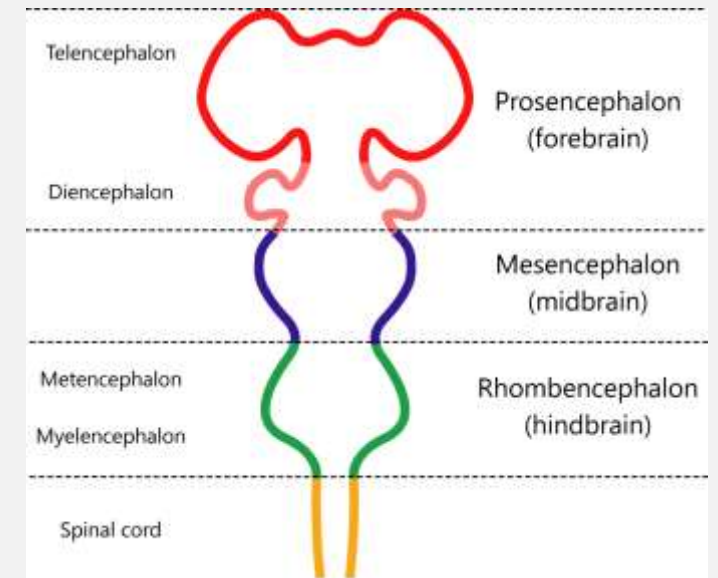
RESPONSE LAYERS

Put hand on hot stove:

- Pull away *(**spinal reflex***)
- "Aaaggh!" *(**instinctive cry***)
- Put hand in water *(**physical response***)
- "What idiot left that on!" *(**emotional blame***)
- Remember, turn off stoves. *(**intellect plan***)

Processing levels:

- **Physical**: Comes first—handles motor details
  - Reflex, instinct
- **Emotional**: Comes next—handles body states
  - Fear, anger, blame
- **Intellectual**: Comes last—handles reasons
  - Justifies, explains

Time

Time

A shark bite is fast because it is **monosynaptic** – sensory neurons trigger motor neurons directly.

COMPUTING LAYERS

Kernel*: Parity error cluster 17340056A …"*   **Primitive**

DOS*: "Not ready reading drive Abort, Retry, Fail?"*

Basic

Windows*: "I/O error! Retry. Cancel."*

Word*: "The selected drive is not in use. Check to**   **Simple**
make sure a disk is inserted." Retry. Cancel.

Today*: Can't save the file. Save changes*   **Meaningful**
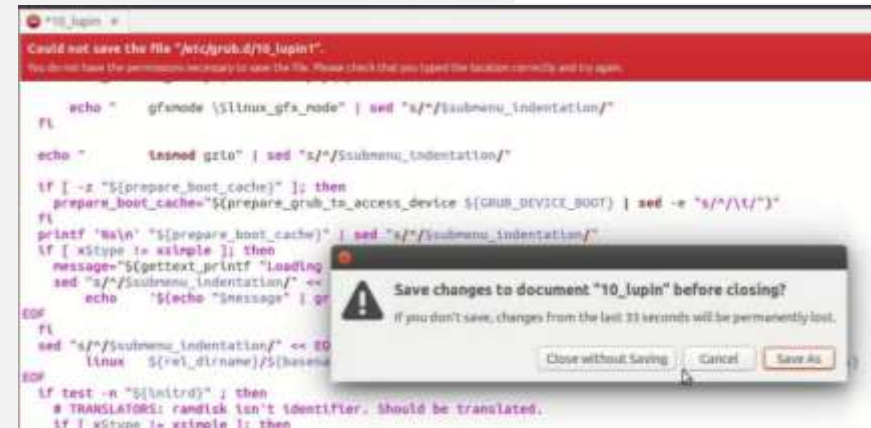elsewhere before closing.

For a reliable O/S, build it in layers.   **Useful**
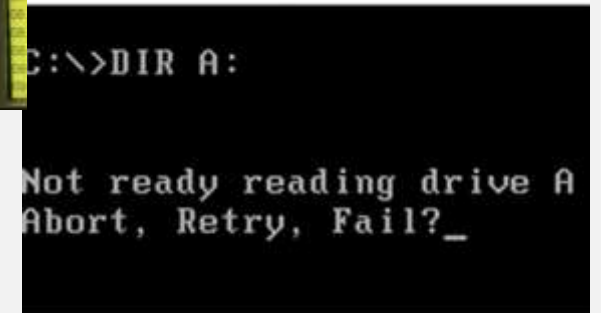
INTUITION GONE WRONG

Brains' **first responders** can get it wrong.

- **Stuttering***: Emotional censors restart motor schema*
  - "The Kings Speech"
- **Tourettes**: When the cortical overlay doesn't work
  - We have **the same subsystems** but inhibit them
    - Momentary Tourettes outbursts from stress
- **Tics***: Motor schema that repeat indefinitely*

But they can also save our lives.

- Psychomotor system is always working
- See [Guy get punched in the face on Halloween](#).

See Impossible rugby league tries
including Nathan Friends backflip miracle on
https://www.youtube.com/watch?v=wyEYtlETcUY

Basal Ganglia and Related Structures of the Brain

- basal ganglia
- globus pallidus
- thalamus
- substantia nigra
- cerebellum

TOURETTE
APTT
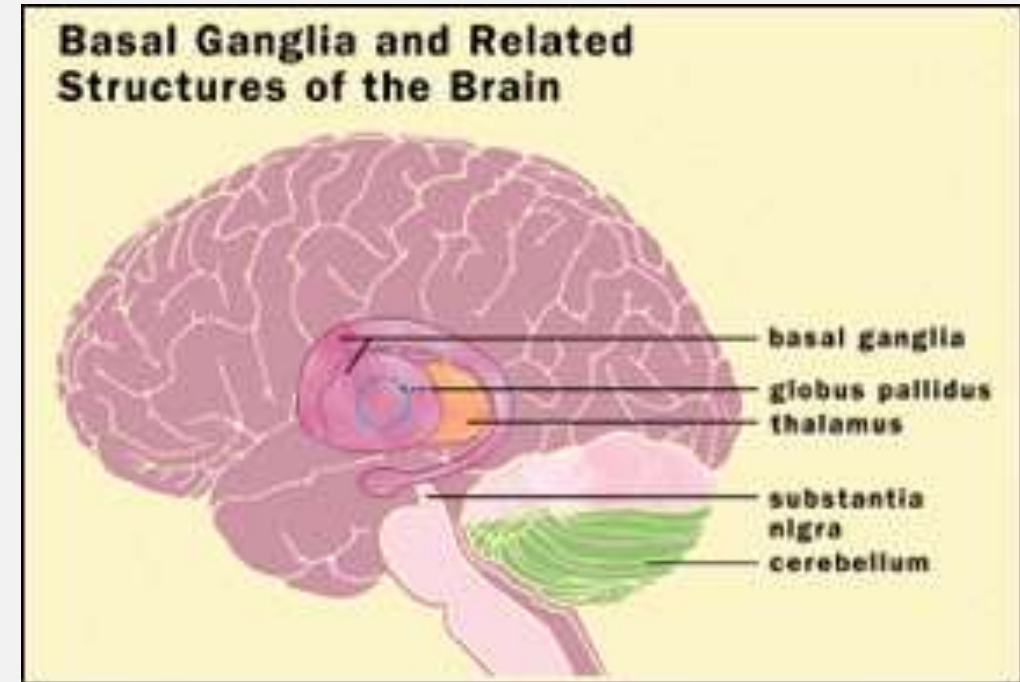
Don't tempt intuitions: Right next to **Delete One** annoying cookie is **Delete All**—i.e., every password or permission you ever set.
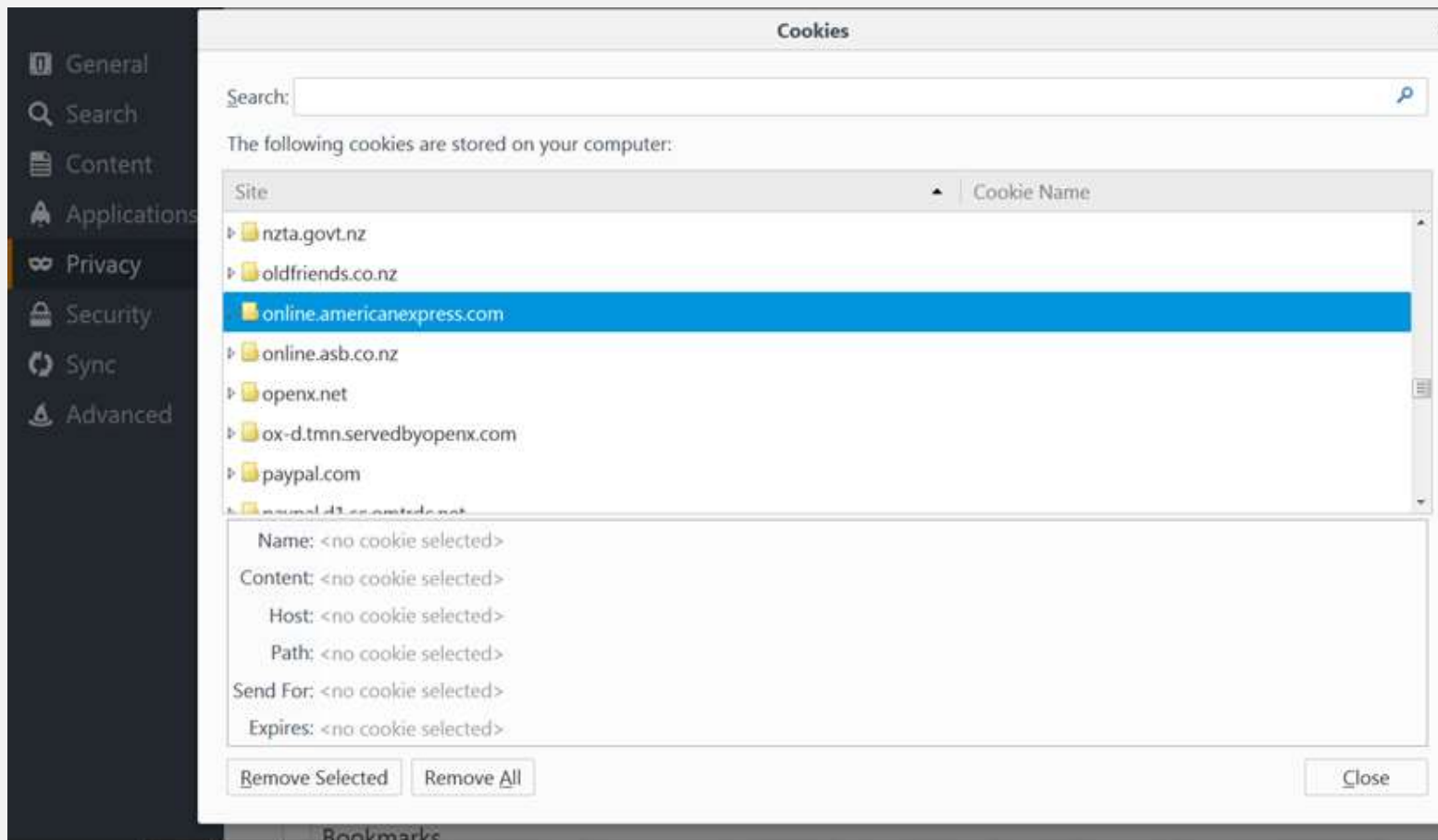
What did you do?
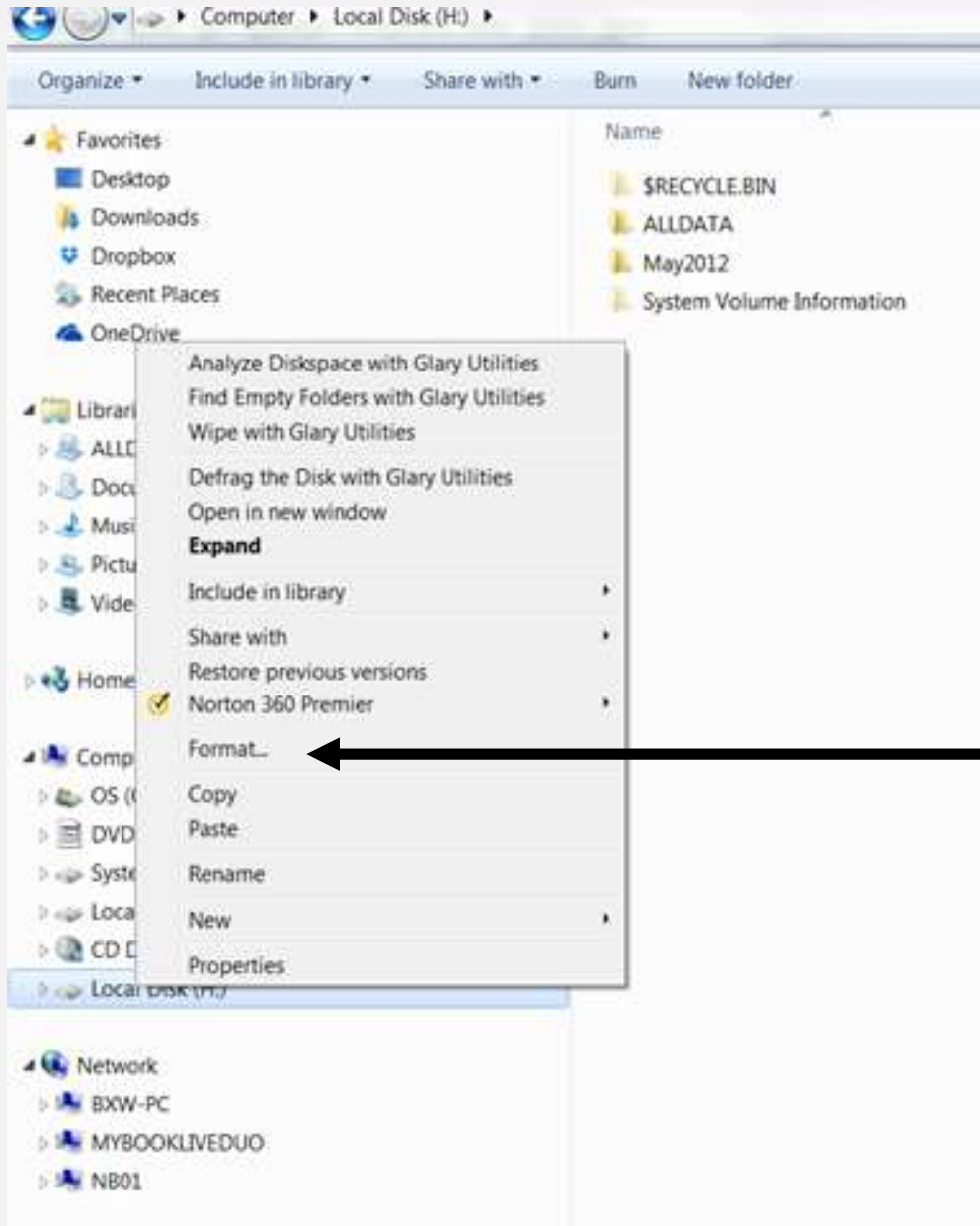
Like a plane cockpit with a **Stop Engine** button next to the **Lift Landing Gear**

FIRST IMPRESSIONS

Visitors judge your site in less than **1/10th** of a second based on **look and feel**.

> Scrolling down depends on it!

The Squint test measures a system's **intuitive effect.**

- Screw up your eyes and see it like a thumbnail.
    - What **structure** do you see?
    - How does it make you **feel**?
    - What **can you do**?
- The intuitive brain works from that squint!

The "WOW" factor is based on intuitions:

- I LIKE this.
    - Colors, graphics, sound, feel, consistency, flow
- I UNDERSTAND this.
    - Simple words, diagram, help tips, idea clarity
- I KNOW WHAT TO DO.
    - Sense of space, movement, intuitive controls
- I TRUST THEM (social level).

**Use the squint test**

PART 3. SYSTEM PERFORMANCE

- **Performance**: How well a system interacts with its environment

- **Current HCI uses TAM** (Technology Acceptance Model) reduces HCI to **usefulness** and **ease of use**.

- **TAM ignores:**
    - **Security**
    - **Reliability**
    - **Privacy**, …etc.

- **Systems theory** suggests four basic system parts:
    - **Boundary:** Monitors system entry/exit
    - **Structure**: Support and control
    - **Effectors**: Generate output
    - **Receptors**: Analyse input
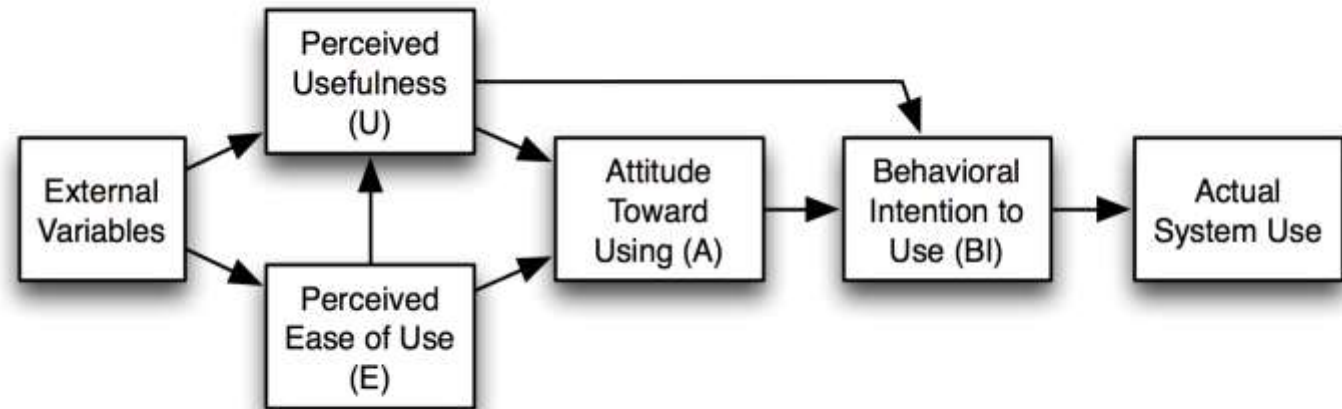
TAM – an old two-factor model of Usefulness and Ease of Use that leaves out other factors like privacy and security

WEB OF SYSTEM PERFORMANCE

- **Boundary**
  - Enable useful entry (**extendible**)
  - Deny harmful entry (**secure***)*
- **Internal structure**
  - Accommodate external change (**flexible**)
  - Accommodate internal change (**reliable**)
- **Effectors**
  - Maximize external effects (**functional**)
  - Minimize internal effort (**usable**)
- **Receptors**
  - Enable meaning exchange (**connected**)
 - Limit meaning exchange (**private**)
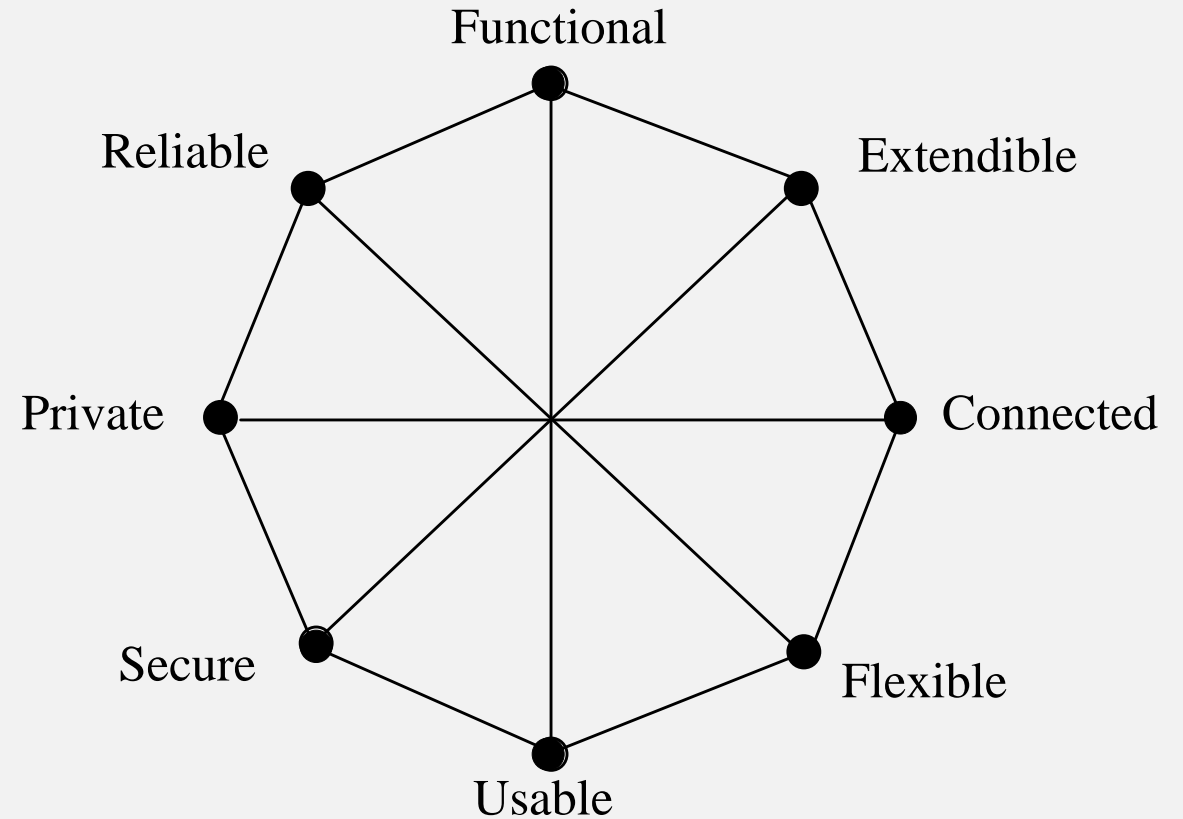
The Web of System Performance is 8 factors that affect technology success

FUNCTIONAL

- **Power to change the environment**

- **What acts** can the system do?

- Capable, powerful, useful, effective, effectual, competent
  - A fast car
  - Complex software (bloatware)
  - Can always **get the job done**
  - Meets task goals
  - Many tools/functions

- **Task analysis**: Investigate the **tasks** people do, not the **functions** the software can do.
    - **Backup** function vs. painful **Save As** function
    - **Save** that cycles past versions

Functions are like tools
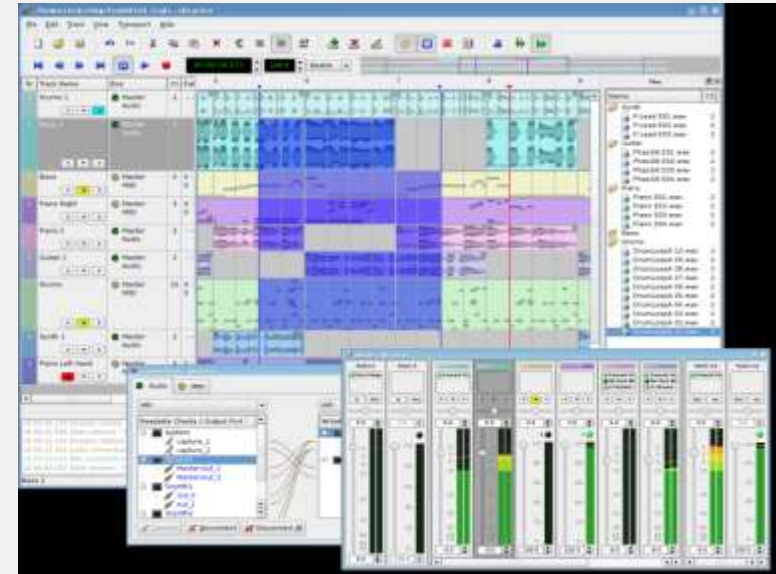
Sound management software
has lots of functions

USABLE

Actions cost less (time, money, effort …)

- **What resources** do actions use?
- Easy to use, efficient, user friendly, simple, accessible, cheap
    - A petrol-efficient car
    - Usable software means less training, no manual
        - Word (day to learn) vs. Word Perfect (week to learn)
    - Remove **bells and whistles**
    - HTML, email, chat, texting, twitter
        - Email was based on an actual physical office message system.
    - Usable doesn't mean childish or stupidly easy!
    - *Physical usability* is **lite** software
    - Community tagging is *social usability*.
- **Effort analysis**:
    - **Effort = No. of Clicks X Frequency of Use**
        - **Put most used options first**

Usable means easy to use

How people deal with unnecessary data requests

Academia, an academic paper online publisher, wants my 4 co-author names <u>and emails</u>!

- What now?
- **If I pimp their emails to the academia software, then it will start bugging them!**
- So I create a co-author **Et Al**. with my other email.
- Academia then emails "Et Al" to confirm.
- I say "yes".
- *People* know what "Brian Whitworth et al." means.
- The paper lists all authors if anyone reads it.
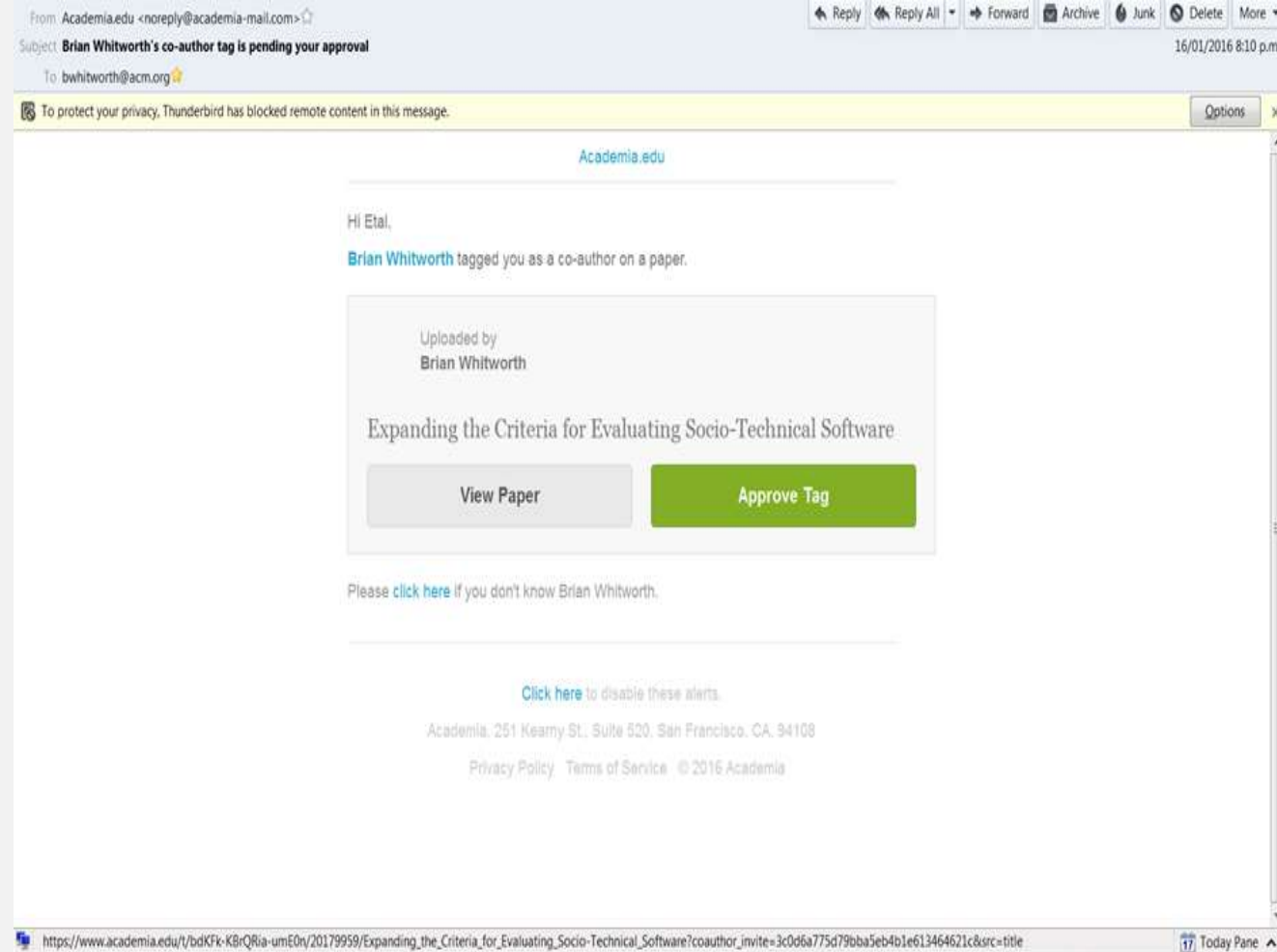
RELIABLE

Continues to work, despite part failures

- **How often** does the system work?
- Dependable, stable, robust, trusted, rugged, MTBF, available
  - A reliable car starts every day.
  - Reliable software doesn't "hang".
  - **Warranties** recognize reliability (Dell).
  - **Redundancy**: if a part fails, another takes over.
  - **Decoupling**: one error doesn't cause another.
  - **Recovery time** after breakdowns is low
  - **Undo/Back** to reverse errors is available
  - <u>Social level</u> reliability is **trust**.
- **Load analysis**:
  - **Load up** the system, and try to overload it.
    - Officer selection/training courses **stress** people level
    - Network load tests
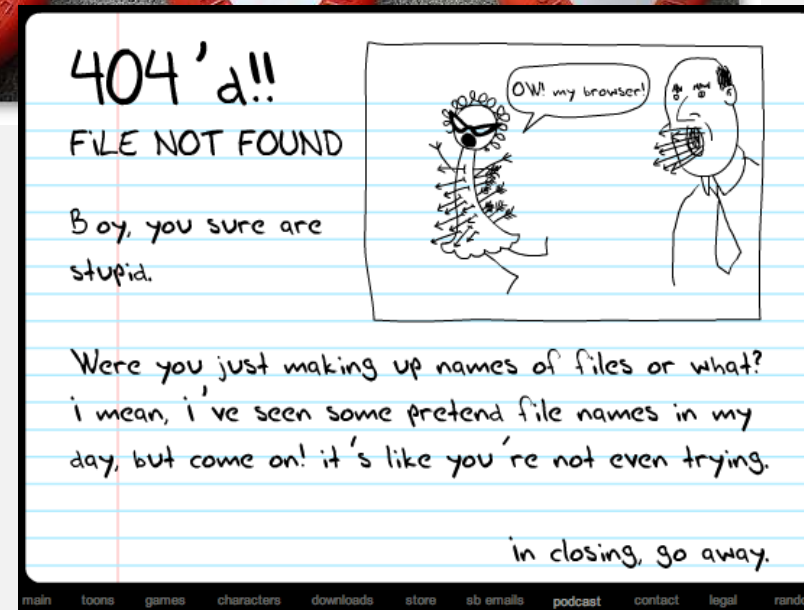
FLEXIBLE

Works in many environments

- **Where** can the system work?
- Adaptable, tailorable, portable, customizable, platform independent, plastic, agile, modifiable, adjustable
  - All-terrain vehicles work anywhere.
  - Mobile computing is anywhere, anytime.
    - Cell phones adapt to new country networks.
  - Hardware-independent software
  - Apps that are operating system independent
  - Customize to person via control panel, options or preferences, e.g. disability features like big text
- **Contingency analysis***:*
  - Try all possible environments or situations
    - I recall an Regular force soldier who left to join the Territorial Force then returned to RF and crashed the entire personnel system
    - Test web site on **different browsers***, mobile*
    - *"It works on my laptop at home!"* my students always say
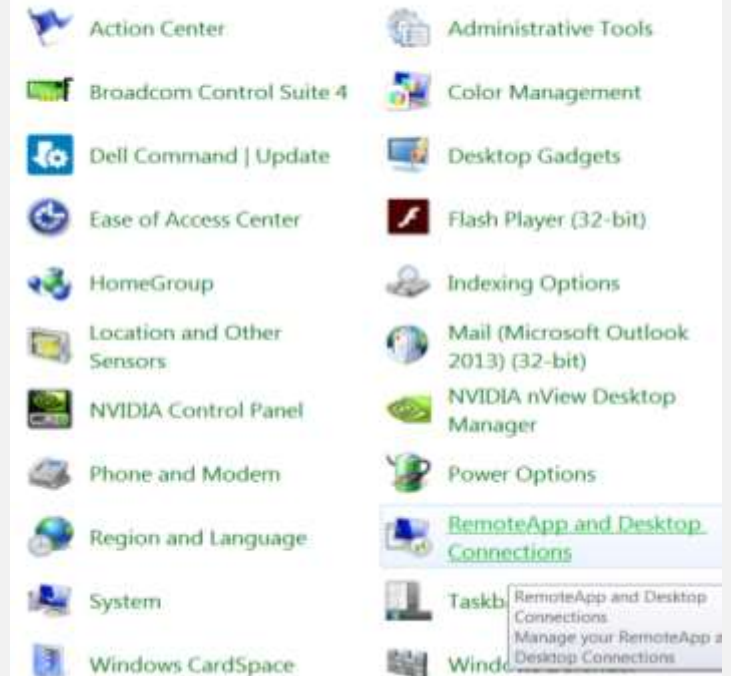
EXTENDIBLE

Can use external systems to expand itself

- **With what** can the system work?
- Standardized, open, interoperable, compatible, parasitic
  - Car with the right-sized tow bar can add a trailer
  - Open software plug-ins and *add-ons*
  - Game **modder** community
  - **Clip and paste** between applications
  - IBM PC allowed third-party add-ons vs. Macintosh's sealed system
  - Open source requires standards.
  - Plug & Play architecture
    - Web mashups of other sites
- **Compatibility analysis***:*
  - Does it work with other systems?
    - Follow common standards?

Extending Firefox with add-ons

IBM was extendible and Apple wasnt

SECURE

Resists attack, unauthorized entry, misuse or take over

- **Who controls** the system?
- Protected, defended, safe, firewalled, integrity
  - Car with secure locks/alarm
  - Most frequent Windows downloads ->
    - Uninstallers, virus checkers, file and registry cleaners
  - Security resists hackers/viruses
  - Boundary checks – logon password
    - Protect against **identity theft**
- **Threat analysis**:
  - Try to hack the system!
    - Ashley Madison 32 million hack

CONNECTED

Exchanges information with other systems

- **With whom** can the system communicate?
- Networked, online, communicating, social
  - Cars that sense other cars or things
  - Software connects people to people
  - Connected software updates itself
  - Software connecting business to customers
    - Reduce complaint "cycle time"
- **Legitimacy analysis**:
  - Does the system support human rights like fairness and ownership?
    - See my paper **Towards an Online Bill of Rights**.

Statue of Justice is blind

PRIVATE

- **Control over the release of self data**
  - Privacy isn't security: e.g., in a plexi-wall glass cage
- **Who has data about my person?**
- Tempest proof, opaque, stealth, unseen camouflaged, anonymous, secret, hidden
  - **Car tinted windows**, sunglasses
  - **Camouflage**, stealth is physical privacy
  - **Encryption** makes data private: e.g., Apple iPhone vs FBI
  - **Firewall** privacy - Black Ice, Zone Alarm
  - **Regeneration** needs privacy: e.g., packing a file, sleep.
  - **Digital "rights"** are for business, not everyone.
    - Disney copyright of **public** fairy tales
  - I own my body and its information: e.g., face data!
    - Corporations are **stealing** data they should *pay* for.
- **Privacy analysis**:
  - What do others see of me? **Switch role** menu options

Administration

Course administration
- Stop Editing
- Activity chooser on
- Edit settings
- Users
- Filters
- Reports
- Grades
- Backup
- Selective Import
- Question bank

Switch role to...
- Guest Instructor
- Non-Primary Instructor
- TA (Group)
- TA (No Grade)
- Non-Editing Instructor
- Untimed Student
- Student
- My profile settings
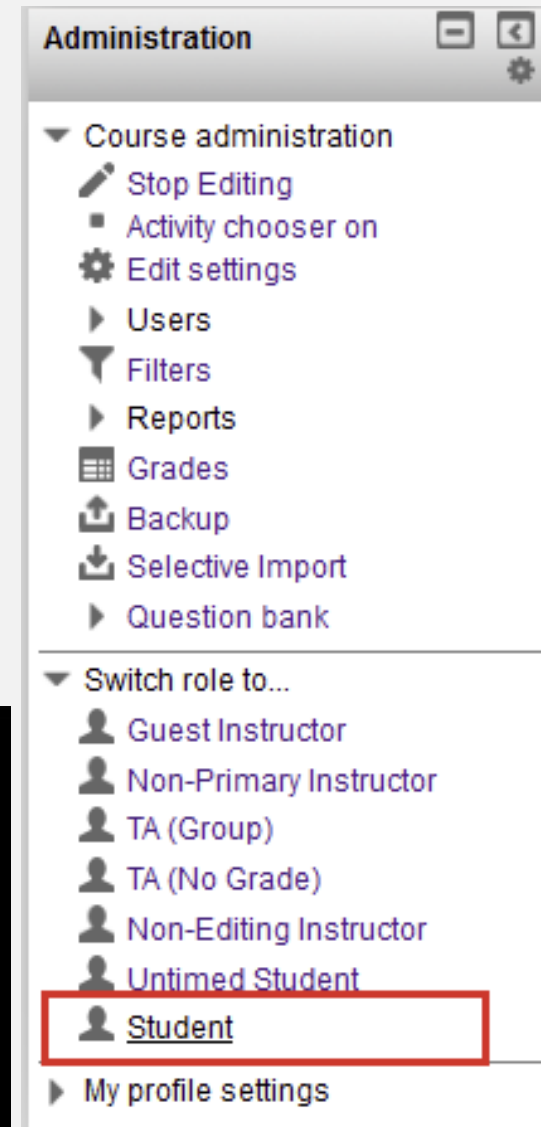
DESIGN BALANCE

One requirement alters another.

- **Alexander's** vacuum trade-off
  - Castle walls protect trade and reduce it
- **Version 2 paradox** – effort makes it worse!

Apple CEO Sculley introduced the hand-held Newton in 1992 because he believed that portable computing was the future.

- **He was right**, but in 1998 Apple had to drop the line.
  - The small screen made data entry hard.
  - **Portability** gain was nullified by **usability** loss.
  - When **Graffiti** improved writing recognition, the personal digital assistant (PDA) market revived.
  - Sculley's **flexibility** was half the answer.
  - The other half was improving **usability.**

Design is about balancing requirement trade-offs.
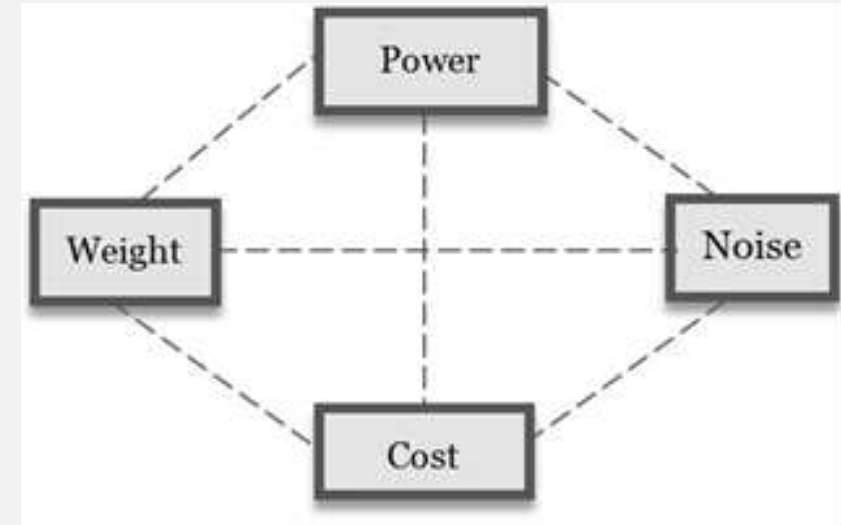
Why Sculley's Newton failed

THE MYTH OF PERFECTION

There is no perfect web site as there is no perfect animal.

* Is your software a **Swiss-army knife** or a **custom tool**?

* Multi-media video vs. reliable download speed?

* Many functions vs. easy to use simplicity?

* Customer modifiable vs. fail-safe?

* Moddable vs. secure?

* Connected vs. private?

Design your software "animal" to fit your niche.

Design team structure:

* Two: Opportunities team and Risks team

* Three:

    * **Actions:** Functionality and Usability

    * **Interactions:** Security and Extendibility

    * **Changes:** Flexibility and Reliability

    * **Interchanges:** Connectivity and Privacy

PART 4. A SOCIETY OF MIND

The brain is mostly a jack-of-all-trades

- The **conscious mind** is like a CEO whose minions do most of the work, that **overpays** itself **because it can.**
  - The **attribution error** – Two-thirds of drivers think that two-thirds of other people are worse drivers than them.
  - *Descartes*: "*I think therefore I am*"
    - The **reticular formation** can turn thinking off anytime.
    - It should be: "*I am therefore I think.*"
- We are strangers to ourselves.
  - In **Undercover Boss**, CEOs discover workplace reality.
  - Likewise, the conscious mind ignores the unconscious.
    - See **Man's intuition**.
- The intellect's main function for a social animal is to:
  - **Rationalize** to oneself
  - **Justify** to others—i.e., make excuses
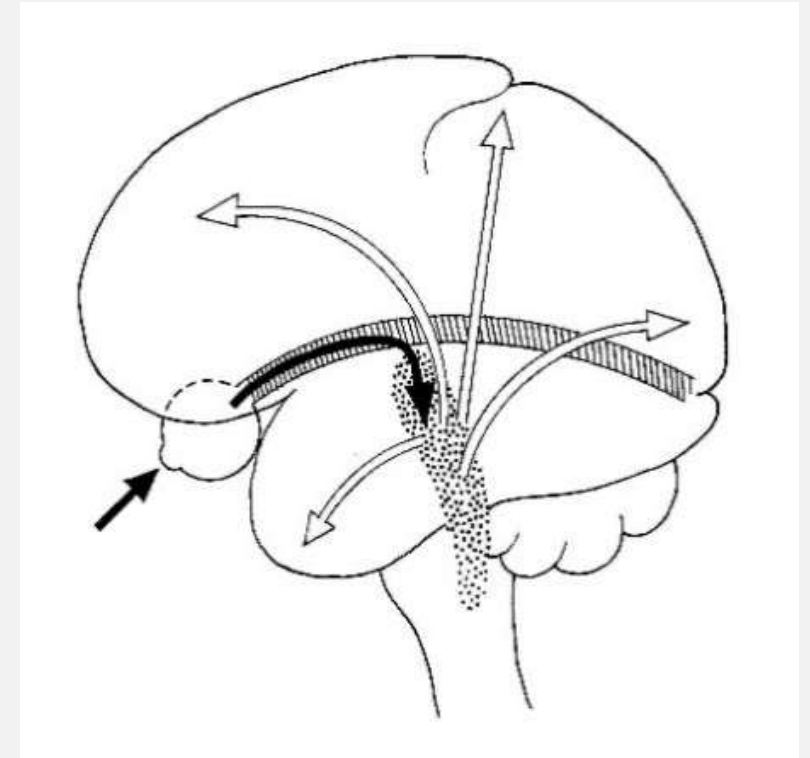
Reticular formation can turn off the brain at any time

Bhaghdad Bob, Iraqi war Information Minister 2003: **"We have them surrounded in their tanks."**

A classic example of justification!

BRAIN GOVERNANCE

Each brain subsystem has **autonomy** or **freedom.**

- **How they share control gives**:
  - **Expectations**: Higher systems direct lower
  - **Distraction**: Lower systems direct higher
  - **Intuition**: Older systems take charge
  - **Justification**: Higher systems cover up errors
- Computing equivalents:
  - **Expectation**: Page **caches** improve speed
  - **Distraction**: Processor **interrupts**
  - **Intuition**: Security and reliability
    - e.g., DOS ChkDsk, virus checker
  - **Justification**: Error messages

thedotbros

I don't have a short attention span … **Oh look, kitties!**

CURRENT KNOWLEDGE

Use people's current knowledge: Knowledge people bring from:

- The physical world
- Other sites

Don't waste it! Visitors aren't **blank slates**

- For example knowledge about:
  - **Desktop**: User hand, Drag and drop, papers overlay
  - **Book**: Page curl prompt, **Magnifier:** To search
  - **Buttons, Switches, Levers…** Press, flick or pull
  - **Briefcase**: To store, **Trashcan**: To throw away
- We **know** the world, so don't **reinvent the wheel**:
  - **Highlighters**: To select
  - **Doors**: Handles to enter, lock to secure
  - **Blinds**: To hide
  - **Spatial dimensions**: People have huge knowledge!

EXPECTATIONS

Expectations: Higher analyzers readily lower to process a certain way.

- Illustrates **top-down influence**

Priming: Sites that encourage relevant expectations are **easier**.

- **Reaction time***:* For expected signals can be zero!
- **Driving***:* Road rule expectations make driving possible.
- **False expectations** are a major accident cause!

Bias: Pre-existing expectations

- **Confirmation bias***:* To hear only what confirms our thinking
  - **Newspaper readers***:* Cherry-pick facts to a mental model
  - **Internet searches**: Confirm our biases (theories?)
- **Social ignoring***: **Choosing** not to see what is embarrassing
  - Gas chamber neighbors could smell it!
- **List bias**: Assumption that top of a list is best
- **Community bias**: We believe what our community does.

LALALALALALA…I cant hear you!

IRONY

Irony: When an act contradicts itself

- For 10 seconds, don't think about a **white polar bear**
- **Keyboard failure**, **press F1 to continue**
- Epimenides the Cretan says: *"All Cretans are liars."*
  - If he is a Cretan, he must be lying; if he is lying, then Cretans are not liars, so he is telling the truth ….
  - Gödel's incompleteness theorem

Computers handle irony like US Customs handles humour.

- IT group's spam warnings filter into my spam folder.
- Why computers **didn't** take over online help!
  - Computers **assume** we know what the problem is!
    - My computer mouse won't work.
    - Is it a hardware or a software failure?
  - People can **listen** without **assumed** options 1. 2. 3. …
  - People can empathize – look at our web site is rejection
- **Example: WD Live Duo wont start**: Solution is to update the firmware via the Dashboard which is part of Live Duo – which won't start

PART 5: DISTRACTION

Distractions: When lower subsystems direct higher ones

- Illustrates **bottom-up control**
  - Subjects attended one ear but
  - **Some** other ear words "got through"!
    - Emotional words (my name)
    - Contextually probable words
- **Part** of the brain still processed "non-attended*"* channels
  - A sleeper wakes to her name.
  - A sleeping mother hears her baby cry.
  - Your child **is listening** *(*on a lower level).
    - **Just say it another thousand times.**

Can be good or bad

- **Good***:* **Gamers,** your bladder is talking to you!
- **Bad:** Continual ad distractions are **really** annoying.

ADS

Annoying ads <u>steal attention </u>from your content

- Flash/blink/jiggle/dance while we read
- **Popups** that grab centre screen
  - We now have *pop-up videos* that take-over
- Ads that play **audio without warning** - hijack your sound card
- **Talk-over videos** - video person pops up and starts talking **AT YOU**
- **Mouse-over** video ads make the screen a **minefield**

Myth: We need **ads** to pay for the **content**

Fact: Ad providers give very little money to content providers.

- Publishers give **less than 5%** to authors, writers and creators.
- Businesses that steal attention weaken the social fabric.
- People in general buy less - did theft **ever** improve business?
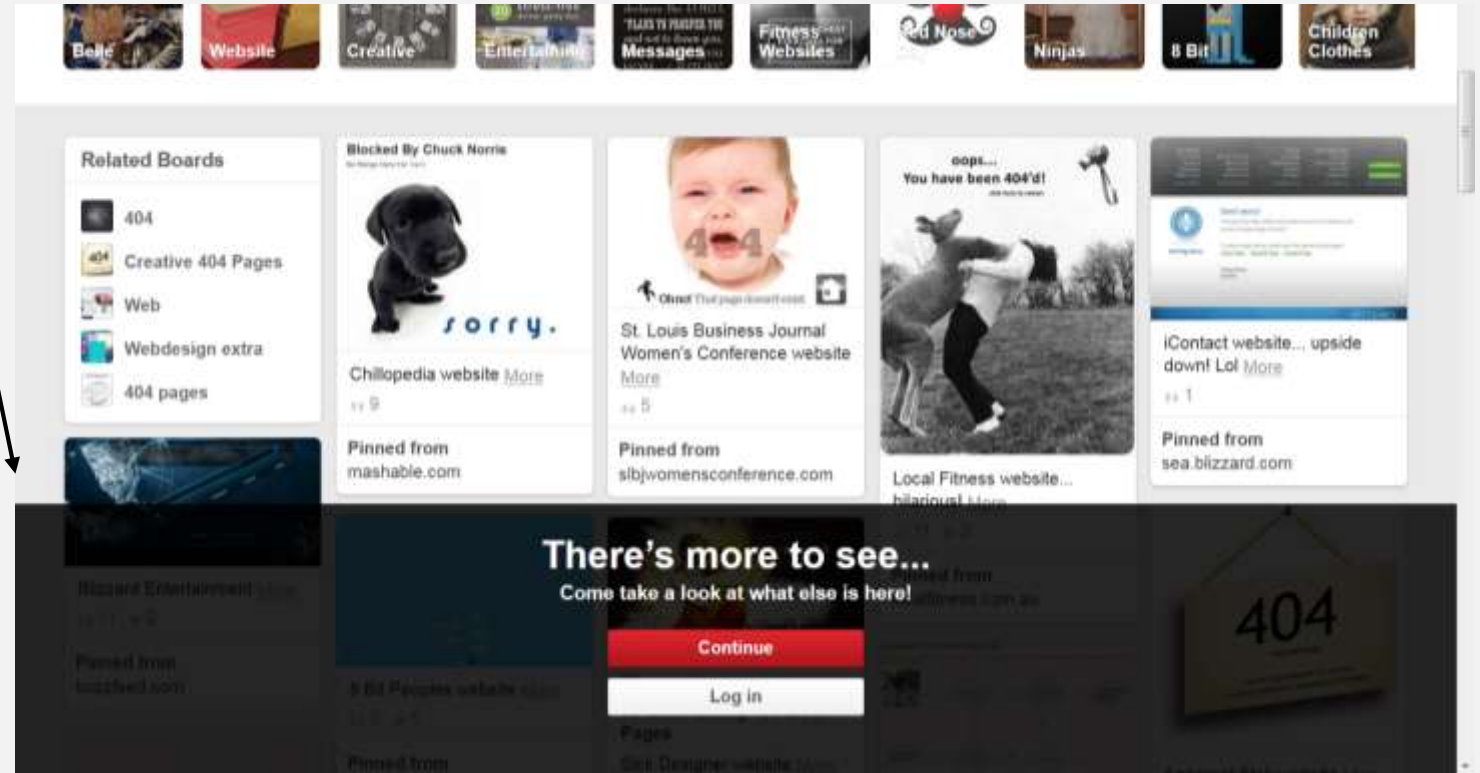
Web sites/blogs go ad-free to avoid annoying ads they can't control, e.g. my Polite Computing interview appeared on a site full of pop-ups!

POP-UP ASSAULT

The **browser** gets a pop-up assault

- **Grabs** attention
- What **more are you talking about**?
- **No close** icon
- Must read **both** buttons
- I don't **want** to give registration details.
- People have to **fight** with software.

Technology progress?

- Popups for popups!

Social progress!

- The right to be **left alone**

Does hassling customers work offline?

We now have popups for popups!

SELLING WITHOUT DISTRACTIONS

Minimalistic design: The product needn't scream to be heard

Natural attention: Let the product naturally attract the buyer's attention

How?

- What is the main product?
- Does the design focus on this?
- Remove what distracts.
- Remove what isn't necessary.
- Kill your darlings.
- Sell what people are **already seeing.**

MODAL WINDOWS

Modal windows: Popups that **require** an answer, like to press OK

Will: The **effort** by higher parts of the brain to **direct** lower ones

- Lower decisions just occur, but higher control requires will.
- *Will* is a limited resource used up by
    - Scrolling down **half-screens**
    - Responding to **prompts**
    - Answering **questions**
    - **Every conscious click is work.**

Self-centred software craves **attention.**

- "*I did it!*" Give me a modal **OK** pat
- **Insolence** Do you really want to …?
- **Error nags** "Unfortunately, Calendar storage has stopped." I don't care!
- Mr Clippy: A **modal help nag** we just wanted to **go away**

Impolite software can't **remember.**

- **Explorer** doesn't know where I was last.
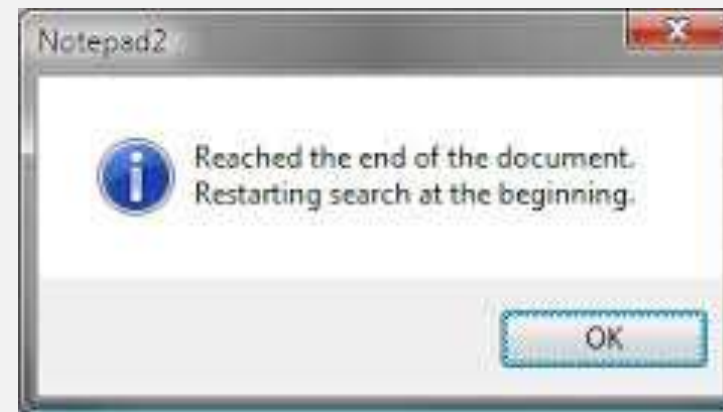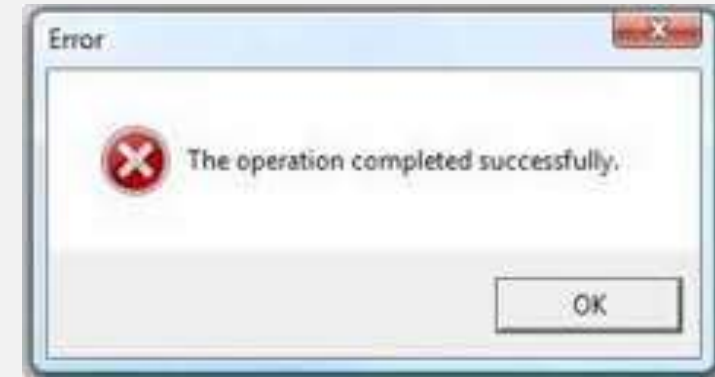
**Modal windows
REQUIRE an answer**

SIDELINE REMINDERS

Modal window: Online equivalent of grabbing a person by the collar and talking in his face

- Used by **bossy** software
- OK for **security** issues

Sideline reminder: Like waving "Hey look here!"

- Used by **social** software
- Examples
  - **Help**: Is now side-panes, i.e., optional not forced
  - **Updates**: Even updates are now often optional.
  - **Badges:** An optional side reminder of a choice
    - **Dropbox** adds a badge to your screen
    - **Word**: A welcome back badge that remembers where I was last – finally!!

Modal Window

Sideline Badge

Welcome back!
Pick up where you left off:

Monday

META-CHOICES

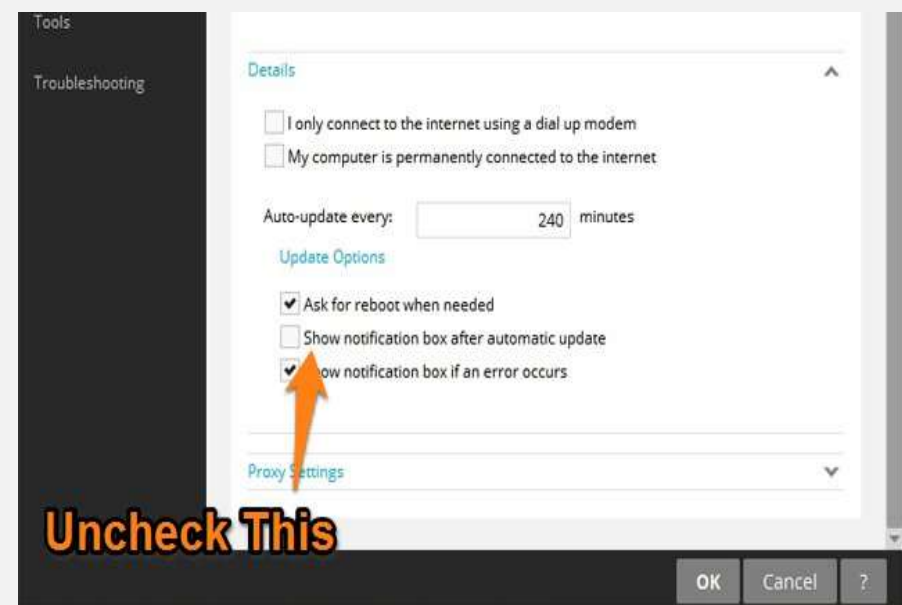**Meta-choice**: A choice about other choices

- Batch copy: Windows "Yes to all" means one needn't repeatedly say "Yes" to the "Overwrite Y/N?" question.
- Modern computing is **full** of tedious repeat choices that a meta-choice can relieve (Don't Ask Me Again box).
- Do you really want to …? (Must I say Yes **every time**?)
- Firewall choices
    - Always accept (meta-choice)
    - Always reject (meta-choice)
    - Ask every time (revert to local choosing)

Meta-choice undo, e.g., turn tutorial hints back on

- Fossick through a thousand preferences?
- YouTube is full of help videos on that.
- **Mode flag**, e.g. showing Cookies on/off

Meta-choice console:

- **Remember** my Options changes **in latest order.**

Uncheck This

I DON'T WANT A DISLIKE BUTTON
I WANT A "SHUT ___ UP" BUTTON

And select option NEVER CHECK FOR SOLUTIONS

PART 6: STRESS

Uncertainty creates **stress**:

- How long will my wife stay in the shop?
  - The cell phone: My *wife finder*
- How long will the download take if I click?
- Should I update to Windows 10 "free"?
  - Do I then have to pay every year after that?

Uncertainty can be more **stressful** than actual bad results.

- Don't raise hopes you will later dash, e.g., in a relationship.

Some stress is necessary:

- In space, astronauts' bones become weak.
- **Stress-strain curve** applies to people!

To reduce online stress

- **Be trustworthy**; defections increase stress.
- **Be honest**; lying increases stress.
  - Lying by omission
- **Full disclosure**; secrets increase stress.
- **Updates**; silence increases stress.
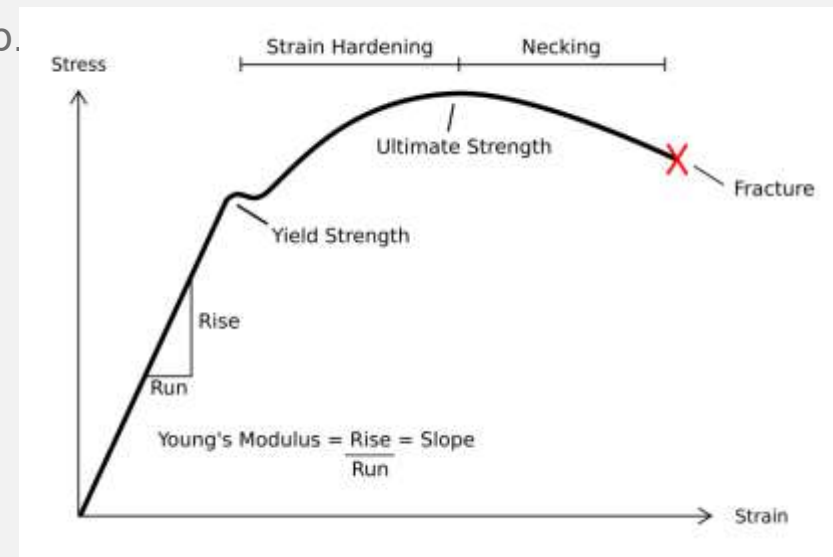
The stress curve

PRETENDING

People lie and pretend to get what they want.

- **Pretend** they are what they aren't
- To know if a suitor is faking:
    - **Annoy** him: He will reveal himself
    - **Make him wait**: Fakes give up and go away.

Now **software** also lies and pretends:

- Error cover-ups
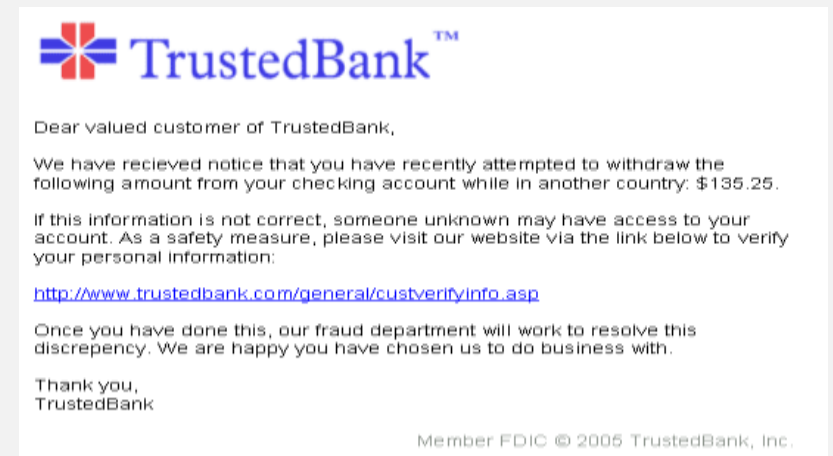- The Facebook "*A lot has happened*" lie
- **Phishing**

The **Internet** can help detect fakes:

- **Twitter**: Short messages sent from many situations reveal more.
- **Chat**: First reactions are more genuine.
- **Reputation systems**: Built over time
- **Report systems**: Someone is watching.

Actually I'm just a program that has no idea what is really going on

Phishing example

THE FAKE IT OPTION

- **Fake-it option**: A short-term policy
  - Young people try it.
  - Companies try it.
  - Governments try it.
  - Now software is trying it!
    - **Pretend** to know
    - **Pretend** to be helping
    - **Pretend** to care
- **Be honest**: A long-term policy
  - Tell them
    - What is actually known
    - Action choices, with risks
- **Lying** destroys **trust** (the social fabric).
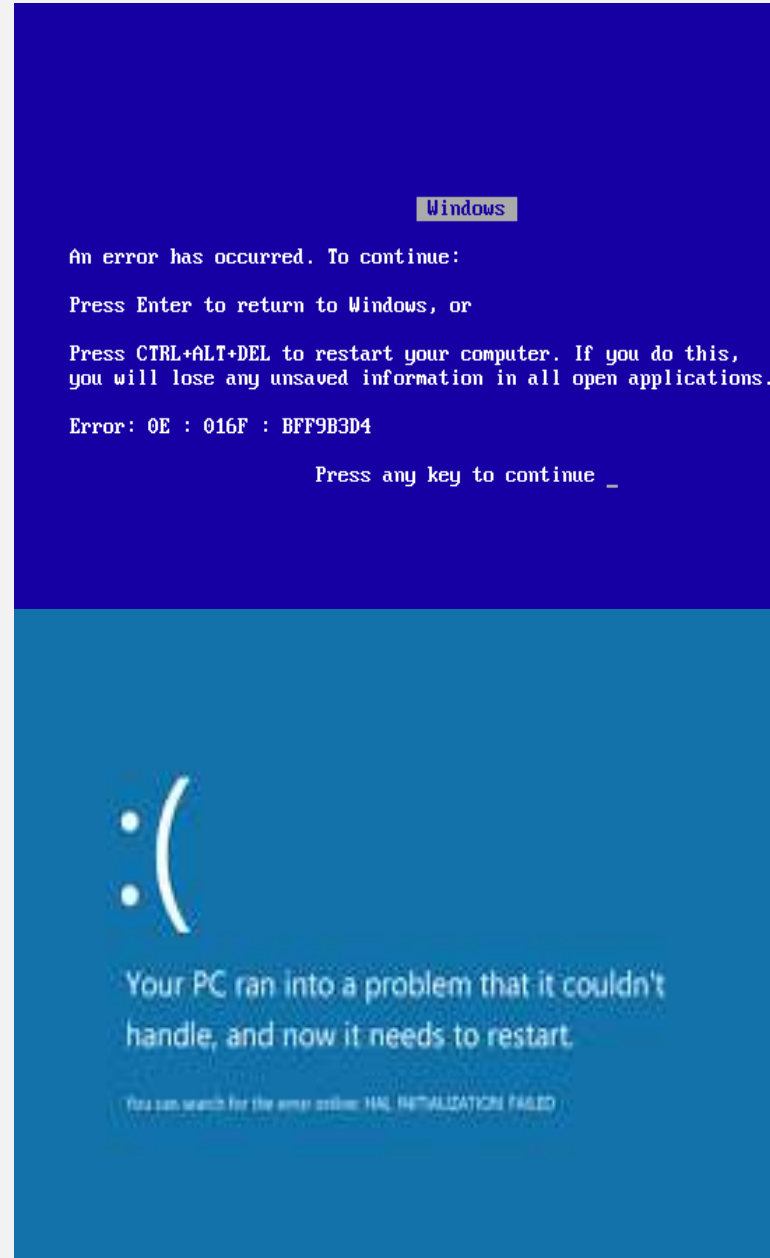
FAKE HELP

PowerPoint decides **by itself** to open a file in "protected" mode and says **See Help** for why:

- **Help** lists all the **possible** reasons a file **might be** protected.

- Why **this file** was protected isn't explained.

- When an app does something and refuses to say why, it is a **cover up.**

- It says "It's in your interests" but every big brother says that.

Fake help for cars would list the 10,0000 reasons your car won't start, including the Earth's magnetic field.

Real help is for your specific case.
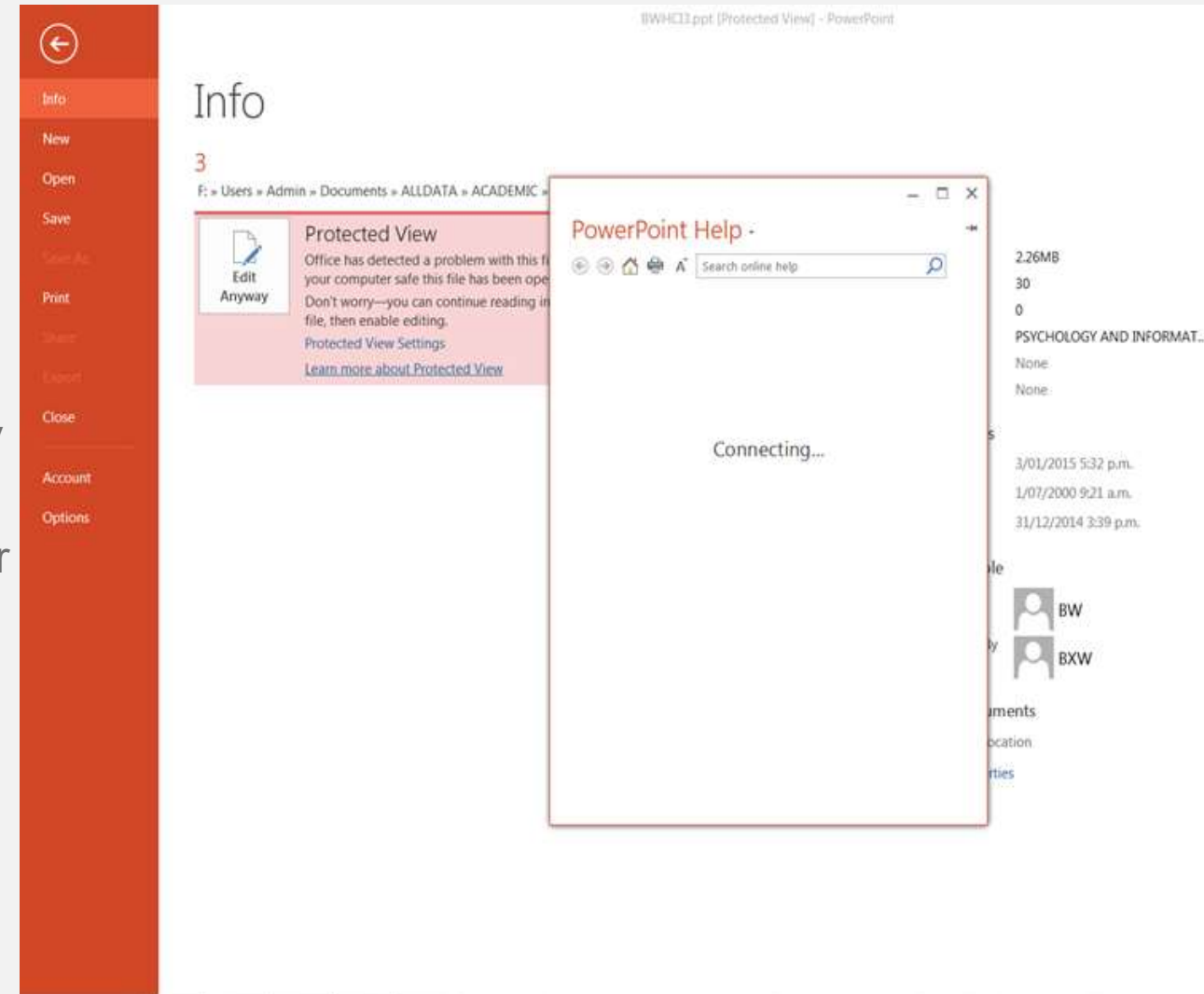
Pretend Help!

FAKE MESSAGES

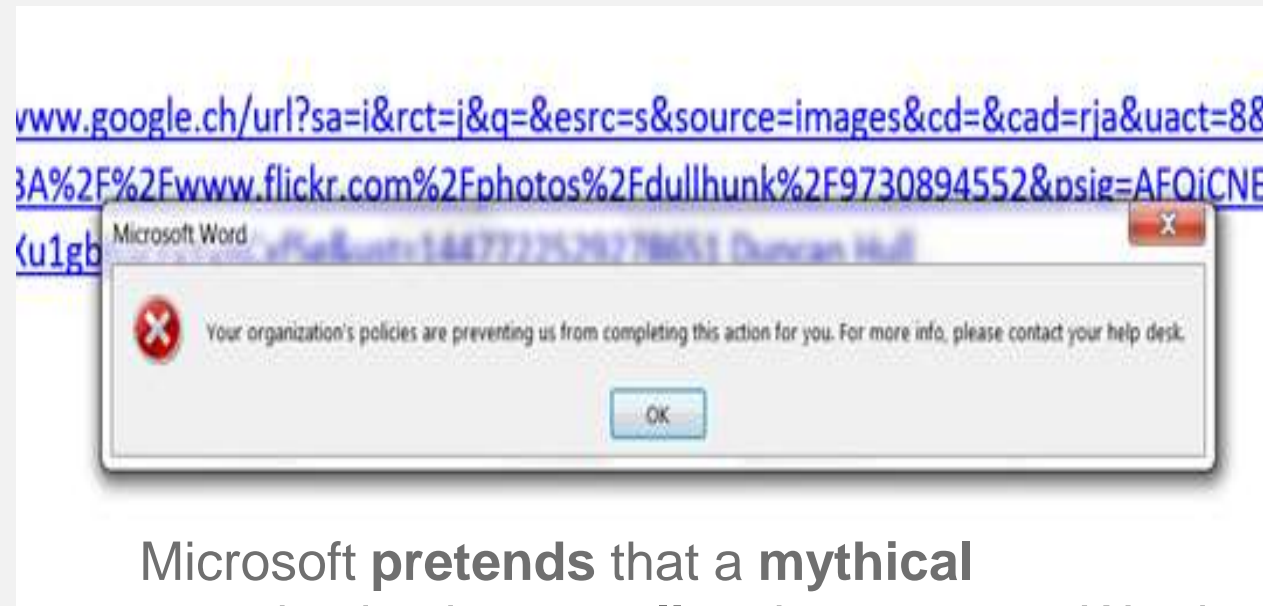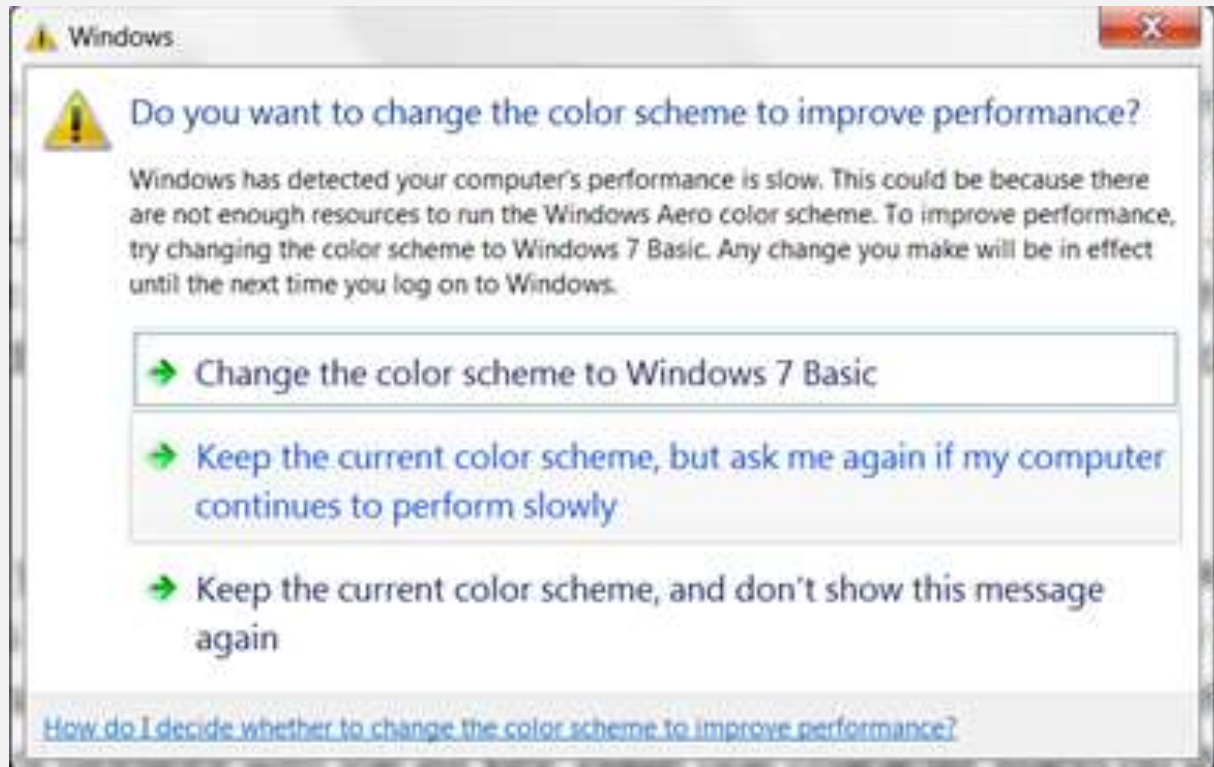**The fake "Don't show again message" does nothing.**

Microsoft **pretends** that a **mythical** organization has a **policy** that prevents Word from jumping to a valid link *on my computer*.

Cleverbot (CB) conversation, run through twice:

Me: *If you become me, am I you?*

CB: I believe in you babe, or What if I don't believe they are?

Me: *If you are not you, who are you?*

CB: I am not a vampire, or I'm you. *(fake it)*

Me: *How do you know?*

CB: Because I'm a girl, or Because you know I know I know you know me *(fake it)*

Me: *But girls can be vampires.*

CB: Yes they can, or No they can't. *(fake it)*

Me: *So could you be a vampire girl?*

CB: No. I am not, or A girl. *(random guess)*

Me: *Could you become a vampire girl?* *(fake it)*

CB: Why? or No, could you become a girl?

Me: *If you were bitten by a vampire would you be a vampire girl?* *(fake it)*

CB: Who have you told that I am Jesus? or I'd buy an X-wing, because they're awesome. *(fake it)*

Me: *So you could become a vampire girl?*

CB: I doubt it. But I know it could be true, or I could be a lot of things. *(fake it)*

Me: *That contradicts what you said before.*

CB: I don't think it does, or You are contradicting yourself. *(fake it)*

Me: *You could be not you and a vampire.*

CB: No, I'm just a rabbit, or Girl vampire. *(fake it)*

Me: *Could you be not you as a vampire girl?*

CB: No, or I could probably be a giraffe, if science were able to make me so. *(random guess)*

Me: *You just said you could be a vampire girl which is not you.* *(random guess)*

CB: I never said I was a boy, or I never said I was a girl.

This painful conversation has no end. It is not hard to see the programmers **faking conversation**, i.e. it is a Turing test fail. One year olds babble pretend talk and this is computer *thought babble*.

From http://cleverbot.com

FAKE INTELLIGENCE

FAKE REPORTING

To use Windows Error Reports, *developers must:*

- **Pay** to join Verisign Class 3 Digital ID
- **Significantly** modify their code
- **Learn** how to use the error dump data
- **Prompt** WER to collect data

The result:

- When people hit the "Send Error Report" button, the error data is *almost always ignored*
- When developers do get error data, it is almost always useless.

We eventually learn that **Microsoft error reporting is a waste of time.**

INTUITIVE MESSAGES

After an error people **don't want:**

- **Codes**: Except to pass on
- **Vague** promises, links to generic help
- **Cover-ups***: We are doing our very best …
- Systems **calling-home** data without asking

People **do** want:

- **Reassurance**
- **Intuitive** explanation
  - **Color**, caps or bold to draw attention
  - **Simple** words – e.g., "Not found"
  - **Graphic** symbols
- **Useful** suggestions
  - E.g., "Turn modem off and on"
  - What you could do—e.g., **links** to printer settings
- **Risk** advice
  - Safe option vs. risky option

The "What now?" interaction

ERROR MESSAGES

Error messages should:
- **Reassure**
- **State** the problem simply
- Have a Details button for more
- **Say** what the software did
- **Suggest** what you could do
- Have a Details button for more
- Give **risk advice**
- Safe vs. risky option

PART 7: GOOD INTUITIONS

My name is legion:
For we are many.

Should **reason deny animal intuitions**?
- It has long been known that the Self isn't unitary.
  - See the Bible: **My name is legion; for we are many.**
- The brain **republic** needs the **peasant** intuitions.

"Primitive" fears are only "bad" in the wrong place.
- A weed is a flower in the wrong place.
- A negative emotion is a useful emotion in the wrong place.
  - Without lust, the human race would die out.

The intuitive brain is as evolved as the cortex, just as bacteria are as evolved as we are.
- **Simpler and so faster**
- **More powerful**
- **More genuine** - less likely to lie or pretend
  - We detect lies better by voice than face because there is **less** control.

Software for everyone
- **Slashdot** readers vote comments up and down.

WE LIKE KITTIES

Nurture instinct: To care for a baby

- Without it, we wouldn't exist.
- Also affects men: To guard and protect
  - Wide eyes, helplessness
    - Puss-in-boots look, Gollum's look
  - Babies' eyes follow you (eye tracking)
  - Primal baby cries cross species
- Babies use it, cats use it, dogs use it
- The **Sony dog** doesn't
  - **Watch** us like a real dog
  - **Cuddle** like a cat or teddy bear
  - **Need** us like a baby
  - Its designers ignored the **nurture instinct.**
- A Roomba could greet me, or create a mood by music (whistle while it works).

SONY dog vs real dog!

BLINDSIGHT

Blindsight*:* Subjects who **verbally** report blindness still catch a ball.
Amnesia patients given the same jigsaw each day say:
> "**I haven't seen this before.**"

- Yet each day solve it faster than the day before
- The conscious doesn't know, but the intuitions do.
  - Meeting Janet Sniezek in Hawaii
- Feelings ignored tend to surface as they are **part of us.**

Software and the **non-verbal self**:

- **Invite participation** – just click here
  - By **habit** each use gets easier.
- **Evoke feelings** – music and pictures
  - To **remember** past feelings
- **Recognize** feelings
  - **Anonymity**: Sharing irrational feelings without punishment can resolve or magnify them: The West displays; The East hides!
  - **Averaging:** Online secret ballots reveal a community view.

"YOU CAN CLOSE YOUR EYES TO THE THINGS YOU DON'T WANT TO SEE, BUT YOU CAN'T CLOSE YOUR HEART TO THE THINGS YOU DON'T WANT TO FEEL."
-Johnny Depp
JPONY.COM

Coping With The Death of Your Pet

HIGHER VS. LOWER

**Newborns** hold their breath under water and swim!

- The leg movement pattern is **reptilian**, and after six months the **reflex** is lost (overlaid) but re-appears if the brain is damaged.
  - **Activating a reptilian reflex** isn't learning to swim.
  - Learning *restarts* for each brain overlay.
- At about eleven **formal thought** starts overlaying **rote learning.**
  - Einstein was a slow **rote learner** at school, but a good **thinker.**

When higher functions overlay lower ones

- Lower functions, like the Emperor's wife, work **behind the scenes**
- **To change a fear**
  - Cognitive **talk** doesn't change emotions.
  - Must re-engage the original emotions.
- **Ponder** a question to evoke the **real intellect.**
- **Walk about** to activate the moving brain.

Target lower instincts or higher reason?

- Donald Trump appeals to Bully America, but a bully America will put a bullseye on every American's back! This will not make Americans safer.
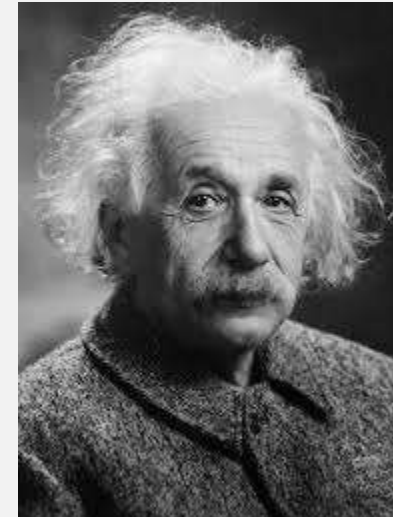
APPEAL TO THE HIGHER

Software can appeal to **lower emotions**:

- **Hate**: All bad things come from **them.**
- **Xenophobia:** Keep the bad guys out.
- **Fear**: They will attack us, take our stuff, rape our women.
- **Violence**: We need to kill, exclude, destroy them.

Or to **higher emotions**:

- **Love**: To help another is to help ourselves.
- **Understanding:** "**They**" are no different from "**Us**".
- **Synergy:** Everyone wins (cf win/lose), e.g. trade.
- **Acceptance:** The world is doing the best it can given the circumstances it is in.

"And whether or not it is clear to you, no doubt the universe is unfolding as it should. Therefore, be at peace with God, whatever you conceive Him to be." – Desiderata

Do-it *Be more*

Sign up | Sign in

Start volunteering | Find volunteers | Search organisations | News & Campaigns | Find a job | Post a job

Do something good today

Here's how to get started

Volunteer for people and causes that matter to you.

Find an opportunity

TROLLS

The Internet is a **mirror to humanity**:

- Our emotional dirty washing (racism, sexism, …) is out for all to see.
    - Bad feelings grow unless dealt with!
    - Why is there so much online hate?
        - The Internet reveals what was always there.

Trolls: Think their abnormal ideas are normal so:

- Trolls are **obvious.**
- Don't **argue** with a troll, but **speak up** (I don't agree that …).
- It takes a **community** to change a *troll.*
- The ultimate community **sanction** is *banishment.*

Flaming: When negative emotions surface via technology

- Often disastrous consequences if sent to work colleagues
- Send that 2 a.m. group email message to yourself first!
- **Sexting**: Your lust on the record

"*The only thing necessary for the triumph of evil is for good men to do nothing.*" – Edmund Burke

PART 8. DESIGNER NOTES: INTUITION

Consistency

- Only change for a reason; people like to be warned.

First impressions

- What is the 1-second response to your site?

Find your niche

- Success requires balance, not excellence.

Current knowledge

- Use it! Don't reinvent the semantic wheel.

Distractions

- Don't hassle people. Replace modal by sideline panes or badges.

Stress

- Reassure, be clear, guide and explain risks honestly.

Good intuitions

- Higher emotions exist.

People's intuitions are "good" or "bad" depending on the situation.

CONSISTENCY

- File menu in Adobe Photoshop displays **consistent options.**
- With **consistent words** such as "New…", "Open…", "Save As…", etc.
- We don't have to **relearn the rules** for every new menu.
- Every option has a keyboard shortcut.
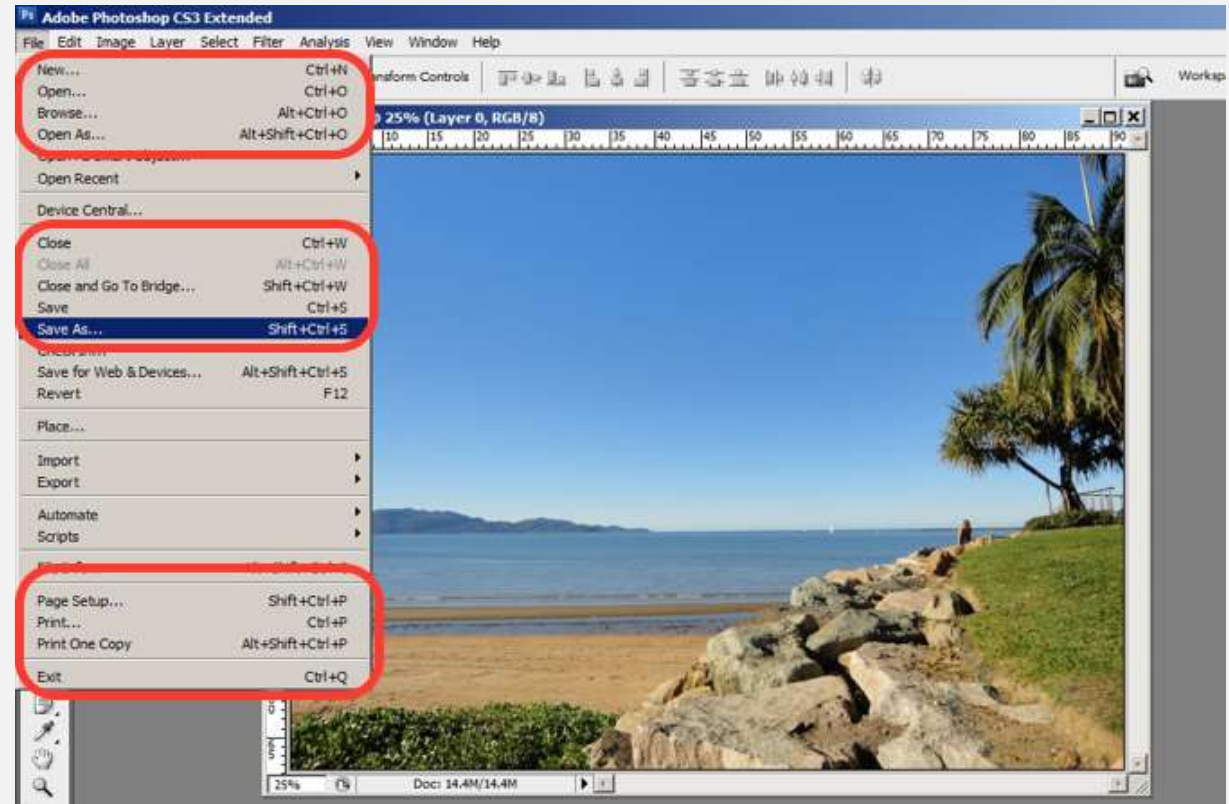
FIRST IMPRESSIONS

Virtual art display

- Navigate by current knowledge of space.

- Click on pictures for more.

- Other people looking could indicate online viewers.

- Can talk to the painter?

and see any work in detail

FIND YOUR NICHE

- A fun free game
- Pastel colors
- Many types of people
- Movement
- Space
- Other people
- Obvious next step

FIND YOUR NICHE

FIRST IMPRESSIONS

CURRENT KNOWLEDGE
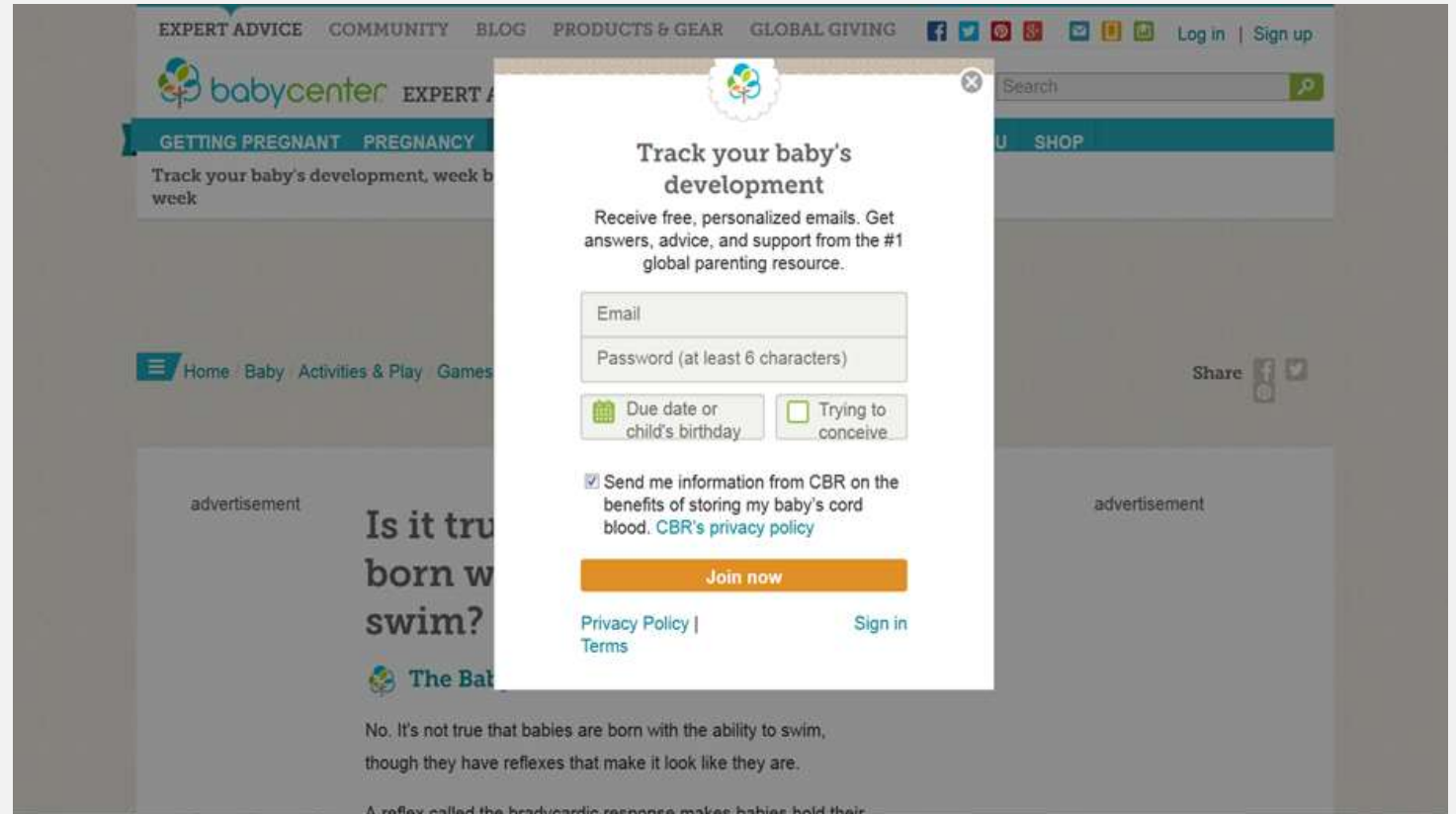
CURRENT KNOWLEDGE

- Good contrast
- Simple layout
- Graphic supports theme
- Next action obvious
- Sense of space
- Relaxing
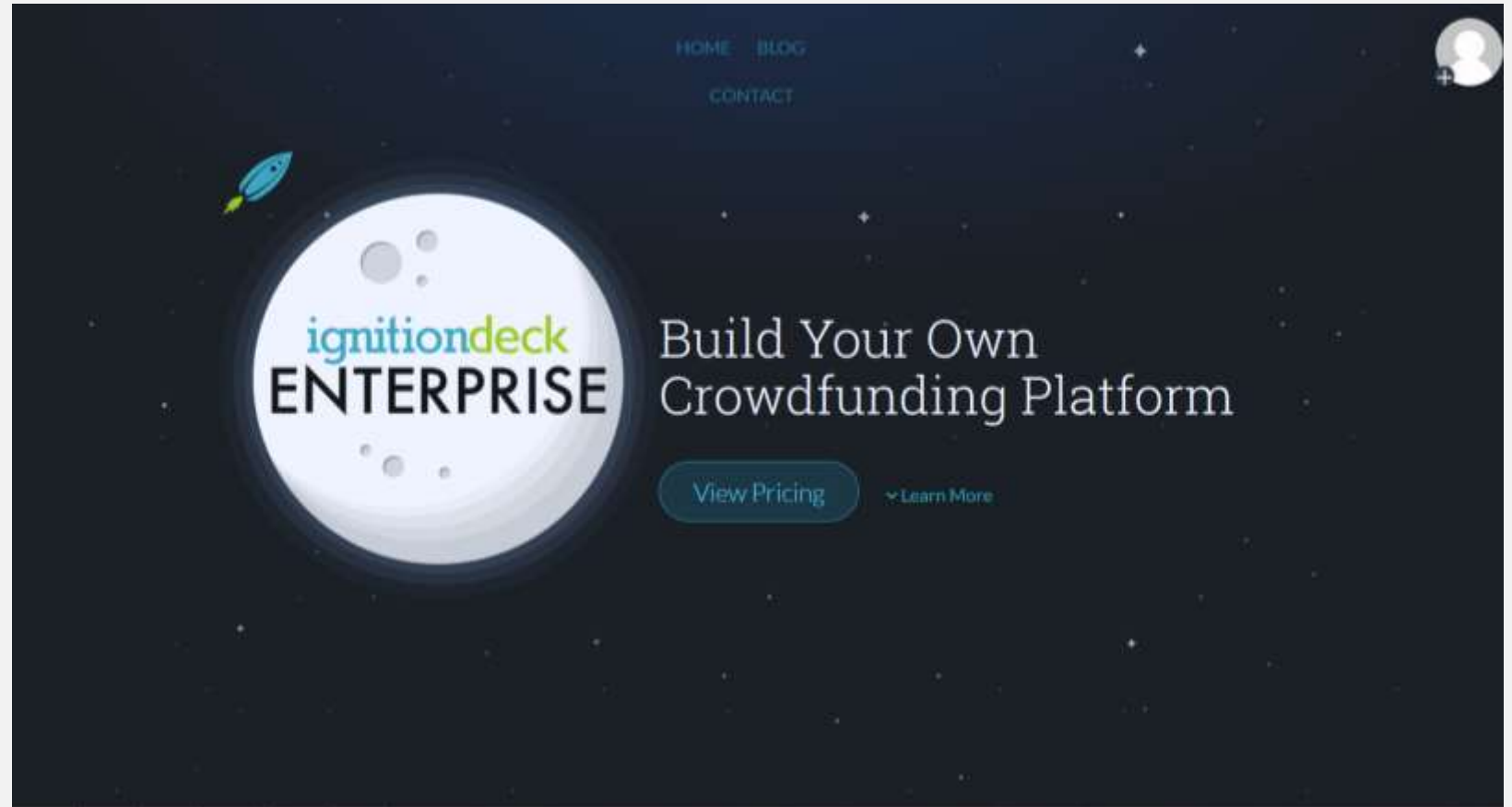
DISTRACTIONS

The **free** story isn't really free.

- The software grabs your attention.
- Give us your email, or you will miss out.
- Tell us your due date or if you are trying for a baby.
- We already added you to our CBR database.
- WE CLOSE IT!

VIDEO DISTRACTIONS

Movie trailer automatically starts playing in the top-right corner, complete with sound, in an attempt to **grab** your attention.

People who are looking for something find this **attention hijack** irritating!
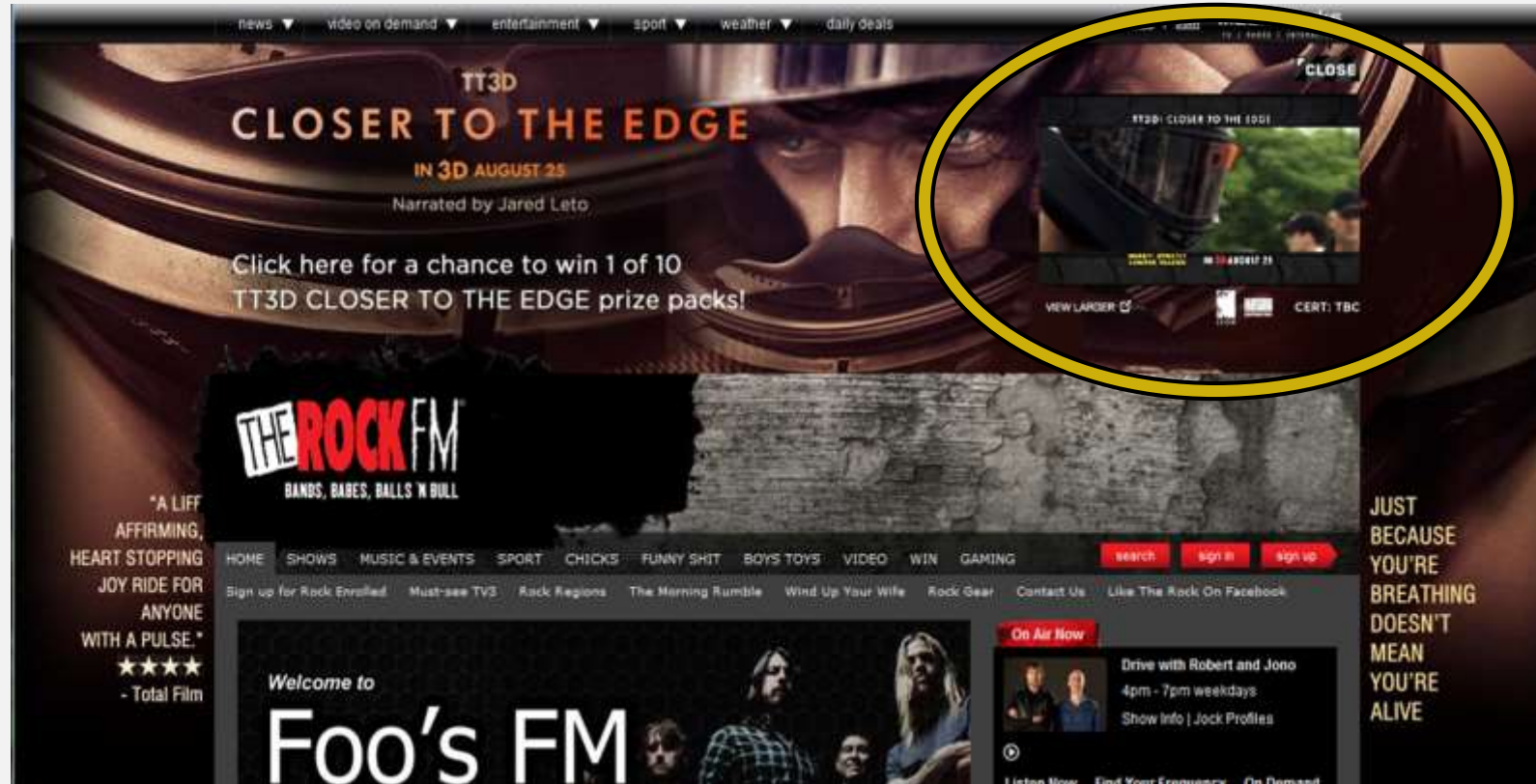
STRESS

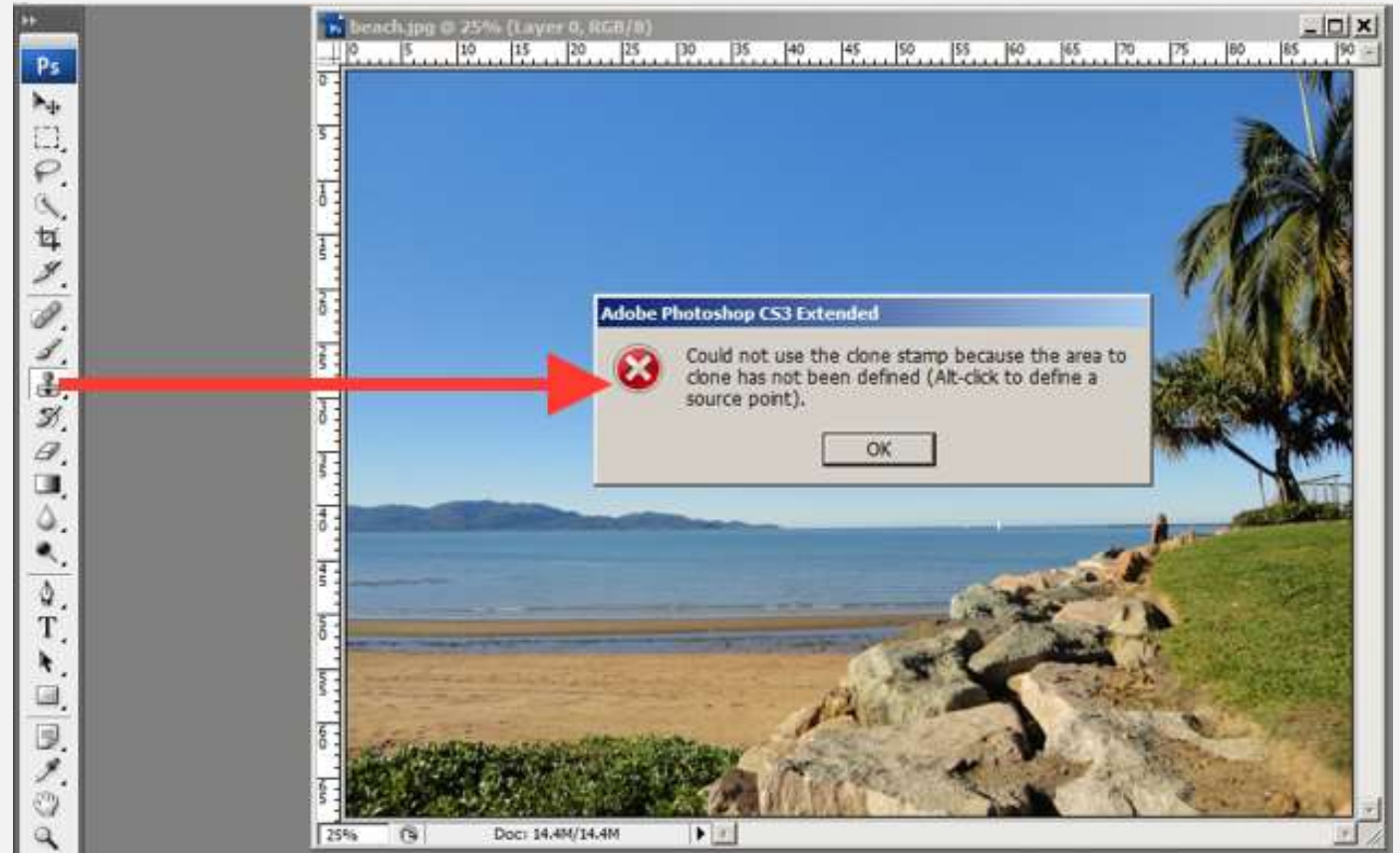**The Windows blue screen with the words "fatal" and "terminated" scares many people.**

DE-STRESS ERROR MESSAGE

Tumblr error picture

ERRORS

Whenever there is an error, Photoshop provides dialogue that lets the user know what went wrong and how to fix it.

Photoshop explains the misuse of the clone stamp error and how one could proceed from there.

ERROR MESSAGES

No-big-deal error message:

- **Color blue** relaxes
- **Heading** draws attention
- **Simple** words
- **Graphic** friendly
- **Suggests** what to do

APPEAL TO THE GOOD

Please read:
A personal appeal from
Wikipedia founder Jimmy Wales

People have a good side

HandUP

HOW IT WORKS   HELP SOMEONE   GIFT CARDS   WHO WE ARE

Donate directly
to a homeless
neighbor in
need.

◉ WATCH ONE STORY