



Non-Functional Requirements

Chapter 8 of the text

Lecture Objectives:

- 1) Define non-functional requirements ✓
- 2) Explain how non-functional requirements may cause additional functional requirements to be assigned. ✓
- 3) Explain the relationship between non-functional requirements and use cases ✓
- 4) List the types of non-functional requirements ✓

Quote of the day...

- “Non-functional properties may be the difference between an accepted, well liked product and an unused one.”
– Robertson

Non Functional Requirements

- Non-functional requirements do not alter the products essential functionality
 - Functional requirements remain the same.

But,

Non-functional reqs may add new FR's to the product.

Of Rabbits, Horses, and Elephants



Use NFR's template as a checklist w/ the client.



Horse: Ensure we properly capture every NFR's for the product.



Elephant: Document in writing all of the NFR's.

Critique : What's wrong

with this designj?

Loan Calculator

The screenshot shows an "EMI Calculator" window with the following fields and controls:

- Loan Amount:** A text input field containing the value "1".
- Buttons:** "Calculate" and "Reset" buttons.
- Interest Rate:** A slider control with a value of "7.30000000000000". The slider has tick marks at 5 and 30.
- Tenure:** A slider control with a value of "10 Years". The slider has tick marks at 1 and 30.
- EMI:** A text input field containing the value "Rs. 0.01".

Handwritten annotations in red and blue ink are present:

- A red arrow points to the "Loan Calculator" title.
- A red arrow points to the "Interest Rate" value, with the note "Too many decimal points".
- A blue circle highlights the "Interest Rate" slider.
- A green arrow points to the "Tenure" slider, with the note "Lengthy + Slider bar?".

Lengthy +

Too many decimal points

< 5 or Higher than 30?

Slider bar?

EMI Calculator | X | 24

Loan Amount

10000

Interest Rate

2.75%

Length

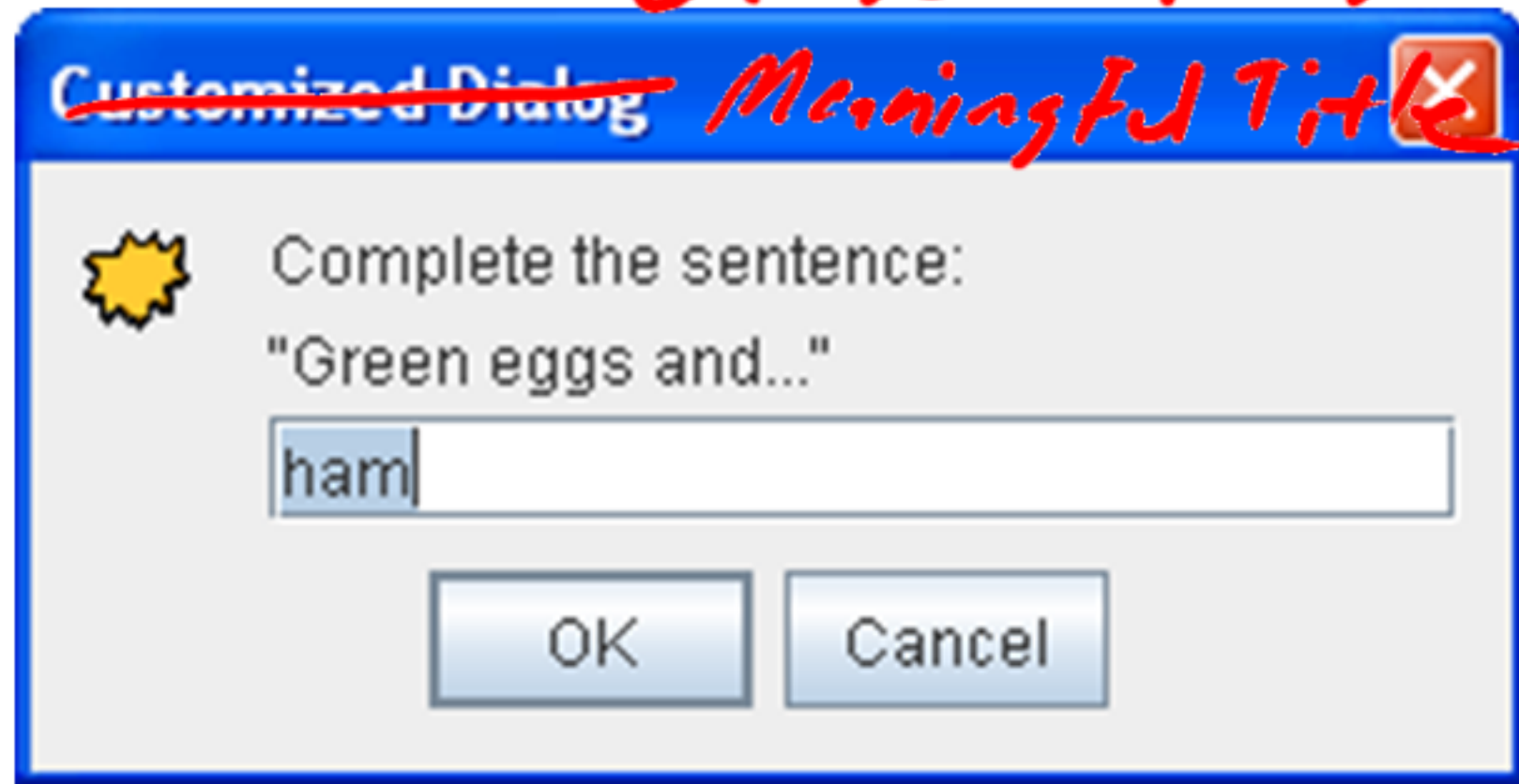
36 months

Calc

Reset

- Lets assume you are building a GUI application

Close Dialog

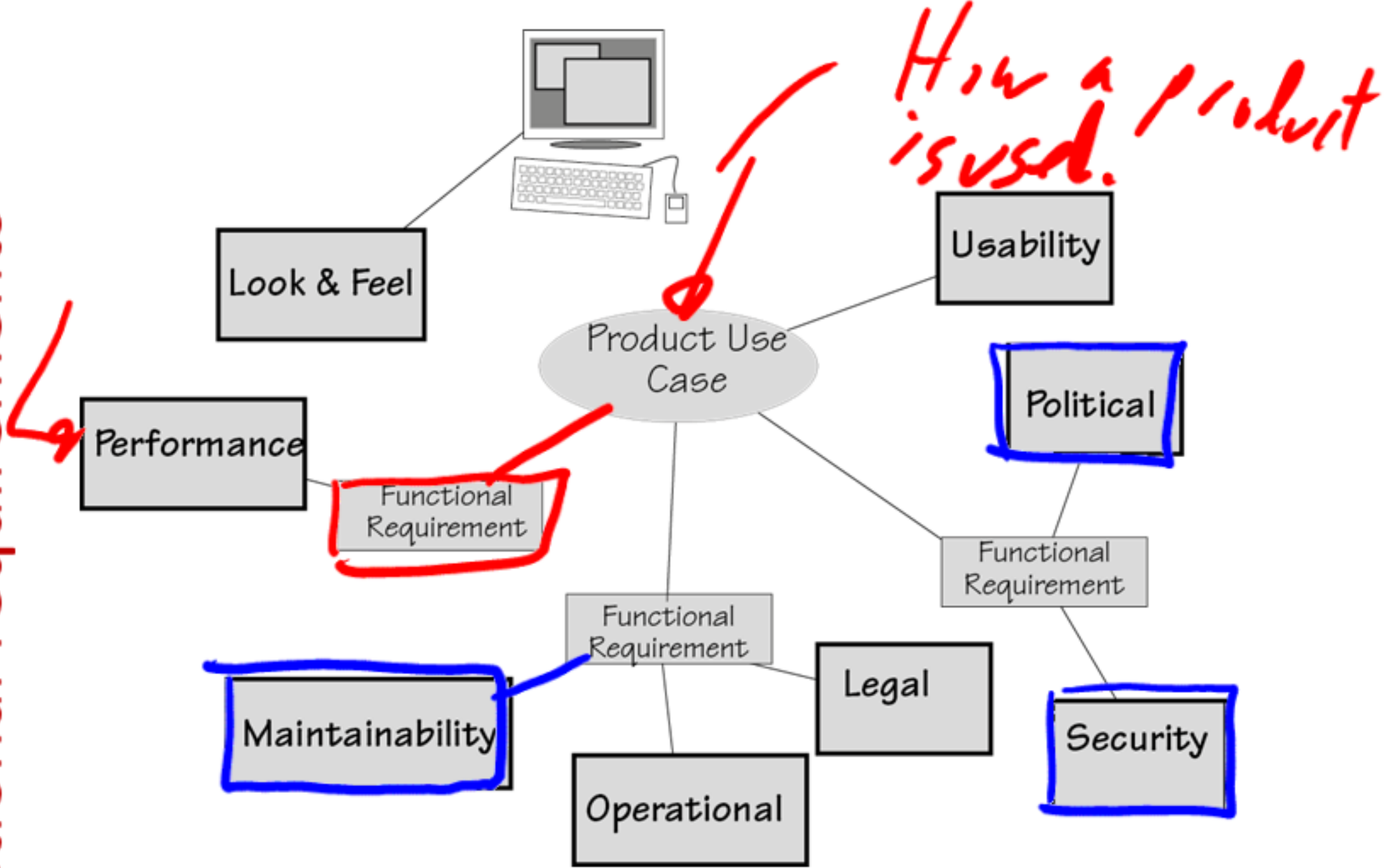


*-X and
Cancel
do
same
thing.*

Example

*Intrinsic requirement: Ability to
paste the text into the
box.*

Relationship with use cases and functional requirements



Types of non-functional requirements

- Look and feel
 - The spirit of the products appearance
- Usability and humanity
 - The products ease of use and any special user characterizations
- Performance
 - How fast, how safe, how many, how available, etc.
- Operational;
 - The operating environment of the product
- Maintainability and support
 - Expected changes and the times necessary to make them
- Security
 - Security, confidentiality, recoverability of the product
- Cultural and political
 - Culture and customs of the user
- Legal
 - The laws and standards that apply to the product

Example Requirement

- Requirements
 - The product shall comply with Microsoft corporate branding statements.

- Rationale

Look and feel of the product must represent corporate standards.

- Fit Criteria

- Logo shall be no smaller than 50x50.
- Microsoft Logo shall appear in color.



Usability and humanity

Requirements



www.pennyjuice.com/htmlversion/whoisjp.htm

Who is Penny Juice?

People have alot to say about Penny Juice!

THE CHILDREN AT KID KOLLEGE LOVE THE TASTE OF PENNY JUICE AND DRINK IT WITHOUT ENCOURAGEMENT FROM OUR TEACHEPS. I LIKE PENNY JUICE FOR THAT REASON AND BECAUSE IT IS 100% JUICE FROM CONCENTRATE REQUIRING NO REFFROGERATION PRIOR TO MIXING. THE HANDY MIX PITCHER TAKE THE GUESS WORK OUT OF PREPARATION.

CASSIE PENCE - KID KOLLEGE,BILLINGS, MT

"THANK YOU FOR THE OPPORTUNITY TO LET EVERYONE KNOW ABOUT YOUR TERRIFIC COMPANY! IT'S EASY TO STORE AND MIX AND WE RECEIVE GREAT SERVICE!"

MARY CELLA - BLISS ACADEMY EARLY LEARNING CENTER, GREENWOOD VILLAGE, CO

I LOVE THE PROMPTNESS OF SERVICE "EASY MIXING BOT"

KID'S WORLD LEARNING CENTER, BROOKINGS, SD

I HAVE BEEN USING PENNY JUICE AT MY CHILDCARE CENTER FOR 2 YEARS. THE CHILDREN LOVE ALL THE FUN COLORS. I HAVE RECOMMENDED PENNY JUICE TO OTHER CHILDCARE DIRECTORS IN THE AREA.

DANA HOENIGSCHMIDT - KIDS COUNTRY CHILDCARE ST. FRANCIS, MN

THEY OFFER A GREAT PRODUCT AT A REASONABLE PRICE. THEIR CUSTOMER SERVICE IS EXCEPTIONAL. WE HAVE ENJOYED OUR EXPERIENCE WITH PENNYJUICE AND LOOK FORWARD TO MANY MORE YEARS OF DOING BUSINESS TOGETHER.

LISA E. INGRAM - ANGELS' NEST, INC., COLORADO SPRINGS, CO

THANK YOU! WE ARE SO GRATEFUL TO HAVE FOUND PENNYJUICE. I AM 100% PLEASED WITH PENNY JUICE. KEEP UP THE GOOD WORK.

ROSEMARY - LARAMIE COUNTY HEAD START,CHEYENNE, WY

I LOVE THE VARIETY OF THE FLAVORS AND THE FACT THAT OUR AUTOMATIC SHIPMENTS ARRIVE IN A TIMELY MANNER. THANKS SO MUCH! GOD BLESS!

DEBBIE MOORE, DIRECTOR - CHILDREN'S LEARNING CENTER,BOSSIER CITY, LA

AS TH DIFECTOR OF A UNIVERSITY AFFILIATED, BUT PRIVATELY OWNED CHILD CARE FACILITY TOP QUALITY PRODUCTS THAT ARE ALSO BUDGET-FRIENDY ARE ESSENTIAL. I ESPECIALLY LIKE THE EASE OF ORDERING ON-LINE OR BY PHONE, KNOWING THAT THE JUICE WILL BY PROMPTLY DELIVERED DIRECTLY TO THE CENTER. NO MORE HAULING SHOPPING CARTS FULL OF FROZEN JUICE CONCENTRATE FORM THE GROCERY STORE!

THANKS, PENNYJUICE FOR SAVING ME TIME AND MONEY!

KATIE DAVIS, DIRECTOR,OWNER - UNIVERSITY CHILDREN'S CENTER,SUPERIOR, WI

"PENNY JUICE HAS CERTAINLY BEEN AN ASSET TO OUR FOOD PROGRAM. I AM VERY HAPPY WITH SWITHING TO PENNY JUICE AND WOULD RECOMMEND YOU IN A HEATBEAT YOU PROVIDE AN EXCELLENT PRODUCT, HASSLE FREE. IT DOESN'T GET ANY BETTER THAN THAT. "

BABE WALTON - CHILDREN'S ENRICHMENT CENTER,N. LITTLE ROCK, AR

AS GENERAL BUSINESS MANAGER OF ABC CHILD DEVELOPMENT CENTER AND PURCHASING MANAGER OF ABC PRE-SCHOOL AND DAYCARE, I AM RESPONSIBLE FOR 3 MEALS AND 2 SNACKS DAILY FOR 200-250 CHILDREN. ONE OF THE BUSINESS DECISIONS I HAVE MADE WAS TO INSTITUTE A JUICE PROGRAM FOR OUR MID-AFTERNOON SNACK. THE PRODUCT COST, LABOR COST, AND EASE OF STORAGE AND INVENTORY MANAGEMENT MAKE THIS PRODUCT EVEN MORE ECONOMICAL THAN MILK. "

GALEN SIMPSON - ABC CHILD DEVELOPMENT CENTER,CLEARFIELD, UT

EASY, CONVENIENT, ECONOMICAL AND THE CHILDREN LOVE IT!! WHAT ELSE IS THERE TO SAY? WE LOVE IT.

SUSAN DOSHER - TWIN OAKS CHILD DEVELOPMENT CENTER,GULF PORT, MS

"The children, teachers, and parents all love PENNY JUICE. There is no more lugging fifty bottles of juice around the grocery store, to the car, and back to the preschool. We have also found it to be less expensive than even sale prices at the grocery store."

All - Valley Cathedral Parish Early Education Center/ St. Augustine, FL

"We absolutely love the prompt service, personal touch, and genuine quality of this juice. We will use PENNY JUICE as long as we are a provider."

Dani - We Love Kids/ Minneapolis, MN

"It's an excellent product! The best part of it is with all the flavors the kids never get bored."

Dee - TWICA Child Care/ Minneapolis, MN "Midtown"

"We've come to our senses. See, smell, taste, we use Penny Juice."

Joe Watts - Creative Center for Young Children/ Des Moines, IA

"All of the flavors are wonderful. There's a huge variety over what the food wholesalers offer. The service provided is excellent and meets all needs."

Jana - Kopy's Learning Place on Cantonment/ Peoria, IL

"The Price is good, the delivery person is nice and helpful and works with us. But most of all the kids love it."

Cheryl Dee - Midtown/ Minneapolis, WI

"We will continue to order and endorse PENNY JUICE for it's quality, flavor and convenience. Thank you for introducing this product to us. We love it!!"

Nancy L. Maier - First Baptist Wesley Ministry/ Jacksonville Beach, FL

"The kids really love all the bright colors, and I really love it when the kids are happy."

Shery - Booksie Books Books/ St. Louis, MO

"Finally a 100% juice all the kids will drink, and a yummy variety of flavors. Not to mention great delivery guys."

Call, James, and Georgia - Christenbrook Academy and Nohel Learning Center/ Little, IL

"There's more variety than J&J Juice. The staff says it's easier to handle."

JO Kids - Business/ Des Moines, IA

© Penny Juice, 2010. All rights reserved. Penny Juice is a registered trademark of Penny Juice, Inc. All other trademarks are the property of their respective owners.

Usability and Requirements

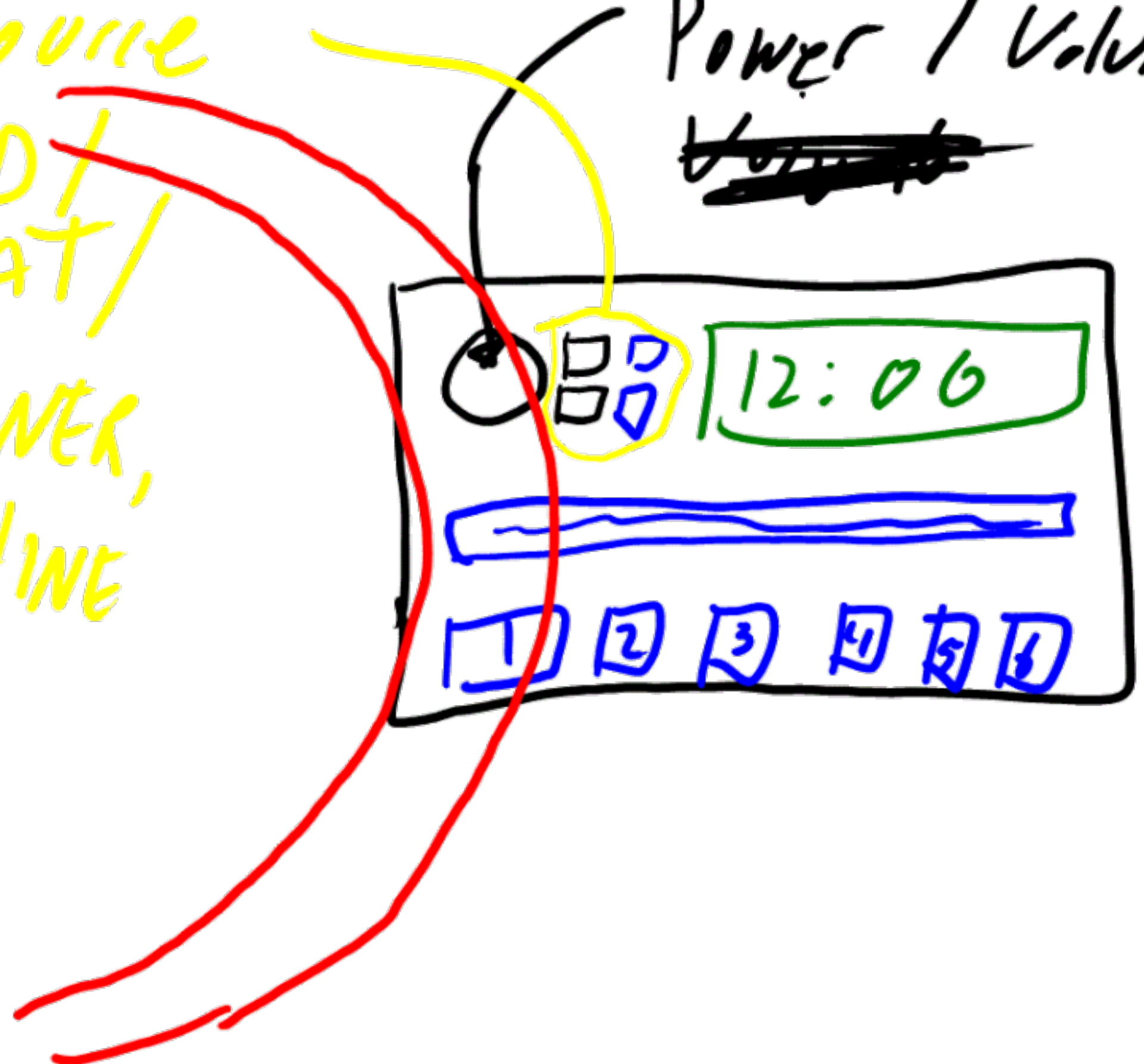
- Often ignored

"No one would ever do something that dumb."

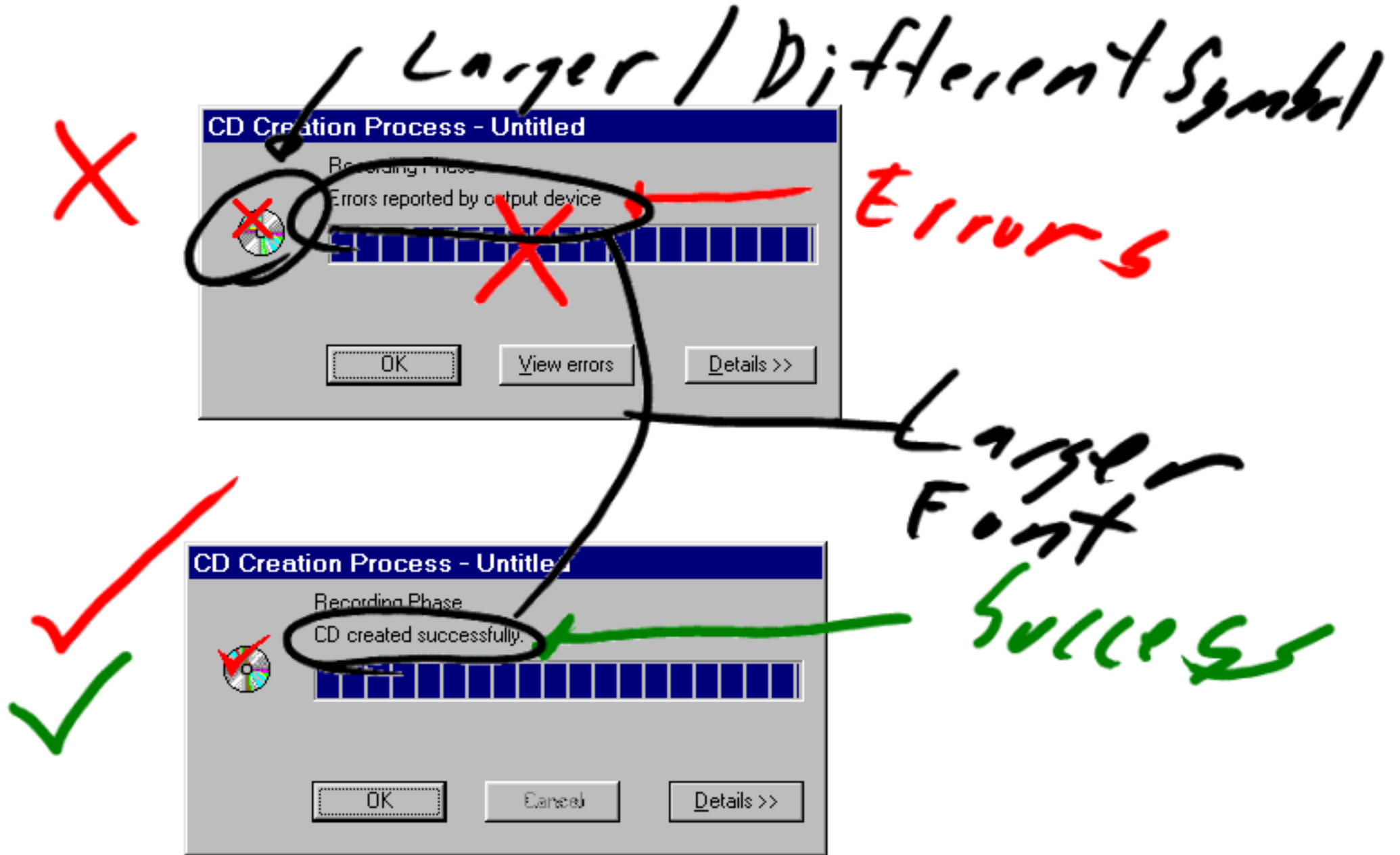
- Do not make the assumption that someone would not do something bad in the design

Source
CD/
SAT/
TUNER,
PHONE

Power / Volume
~~Volume~~



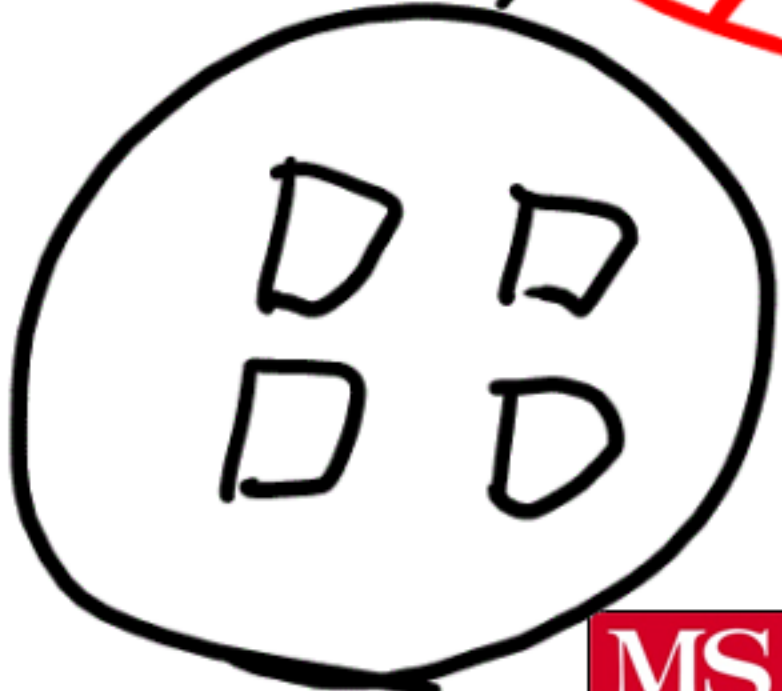
A Bad usability design



Poor contrast and usability

What are these buttons?



MP3 player on a PC.
Directory Look up →  Help

Performance Requirements

- Written when there is a need to do something within a certain amount of time
 - Examples:


A robot shall stop w/in .25s of detecting a safety violation.

The dictionary shall be capable of storing words up to 32 characters in length.

Security

- Probably the most difficult portion of the project to get right
 - Most significant area of risk

Aspects of security

- Access
 - The products data and functionality are accessible to the authorized users and can be produced in a timely manner
- Privacy 
 - Data stored by the system is protected from unauthorized or accidental disclosure
- Integrity
 - The products data is the same as the source of the data, or authority, and is protected from corruption

No changes in data.

- Example statement
 - The product shall ensure that only authorized users have access to the phone numbers for faculty members on the hub

Rational:

We want to avoid SPAM phone calls.

Privacy

- Example
 - The product shall prevent all personal and confidential data from being printed

Cultural Requirements

- Coffee

- What is a regular coffee?

Depends

Boston

or any where else?

