THE IMPORTANCE OF ERROR MESSAGES

(and other feedback messages)

IN THE USER INTERFACE

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SWE 432

Design and Implementation of Software for the Web

"The needs of both people and machines can be reconciled; users will respond more efficiently and intelligently if they receive meaningful feedback."
                    – B. Dwyer, CACM, Sept. 1981

Principles

- People remember more about when bad things happen than when good things happen

- Error messages should not be (just) pointers to manuals

Four General Ideas

1. Be specific

2. Give constructive guidance in a positive tone

3. Use a user-centered style

4. Use an appropriate physical format

Be Specific

A message that has to be explained has failed.

- Users should not have to read a message twice
- Messages should be concise
- Messages should be brief, informative, and in the <u>users'</u> vocabulary

Be Specific (2)

A useful message should state:

1. What error has been detected
2. Which input field contains the error

   OR

3. What corrective action to take

Be Specific (3)

Examples

Non-specific | Specific

Invalid input

Invalid date

SYNTAX ERROR

Illegal entry

Error accessing
http://www.cs.gmu.edu:
SOCKET: Connection
refused

The id number must be a 5-digit number

Format: MM/DD/YY

Unmatched left parenthesis

Type first letter: Send, Read, or Drop

www.cs.gmu.edu is busy, try again later

Be Specific (4)

A note on beeping ...

Beeps are non-specific, and can be embarrassing and annoying.

Give Constructive Guidance in a Positive Tone

- Meaningful messages

- Positive tone

- Not incriminating

- Blame system, not users

- State what <u>should</u> be there,

  not what should <u>not</u>

Give Constructive Guidance in a Positive Tone (2)

Examples

Non-constructive	Constructive
Illegal year!	The year must be between 1975 and 1995.
Your id # has characters!	The id # must be numeric. Please re-enter.
Part Code not numeric.	Part Code must be 3 numeric digits.

Give Constructive Guidance in a Positive Tone (3)

Do not use hostile terminology:

- Fatal error
- Run aborted
- Catastrophic error
- Illegal error
- Invalid
- Bad

Use a User-centered Style

Users should feel that they are in control.

Messages should be:

- Courteous
- Not Imperative

Use a User-centered Style (2)

Examples

Non-user-centered	User-centered
ENTER DATA.	Ready for command:
Ready!	Your turn:

Use an Appropriate Physical Format

Messages should be neat, consistent, and readable.

- Mostly mixed upper and lower-case
- All upper-case only for brief, serious warnings
- Message placement should not interfere
- Include white space around messages
- Input and message on same screen
- Highlight erroneous data fields

Examples

- ! HT ACCESS: Error accessing "http://www.isse.gmu.edu/ofut.html": "HTTP: File/directory does not exist"
- The requested URL /ofut.html was not found on http:// ...

- !PrintMonitor is currently printing "Doc 1: Bad Examples" from "WordPerfect 2.1". If PrintMonitor quits now, "Doc 1: Bad Examples" will be printed when the system is restarted with MultiFinder. Do you want to finish printing before PrintMonitor quits? (*Windows 95*)
- Currently printing. If shutdown occurs now, the document will not be printed until WordPerfect restarts. You can still delay shutdown until the document finishes printing.

Another Example

✖ **http://www.inwarehouse.se/ : Microsoft OLE DB Provider for ODBC Drivers error '80004005'**

[Microsoft][ODBC SQL Server Driver][SQL Server]Your transaction (process ID #85) was deadlocked with another process and has been chosen as the deadlock victim. Rerun your transaction.

/script/webkatalogen/pb.asp, line 221

✱ **Internal failure, please try again.**

More Examples

✖ Bus error, core dumped (*Unix*)

✳ Access through a nil pointer in function GetNext()

✖ Terminating thread, due to a stack overflow problem. A VxD, possibly recently installed, has consumed too muhc stack space. Increase the setting of MinSPs in SYSTEM.INI or remove recently installed VxDs. There are currently 5 SPs allocated. (*Windows 2000*)

✳ ???

An Outstanding Example

ERROR 403 - Forbidden

The server understood the request, but is refusing to fulfill it. Authorization will not help and the request SHOULD NOT be repeated. This status code is commonly used when the server does not wish to reveal exactly why the request has been refused, or when no other response is applicable.

Having trouble? Maybe one of these links will help you find what you are looking for: Hardware, Software, Solutions, Storage Systems Products.

Search:

Another Outstanding Example

From a spreadsheet, if you try to delete too many columns:

Can't delete 5 columns, 2 columns left

An Interesting Example

Command: Mail   To: fred
Subject:
No subject – Continue with message? (y/n) n ___

Interesting escape, and a reminder that we
should use subjects.

Intrusive or protection?

If Error Messages Were Haikus

Yesterday it worked Today it is not working Windows is like that	A file that big? It might be very useful. But now it is gone.
wind catches lily scatt'ring petals to the wind: segmentation fault	Windows NT crashed. I am the Blue Screen of Death. No one hears your screams.
Three things are certain: Death, taxes, and lost data. Guess which has occurred.	Errors have occurred. We won't tell you where or why. Lazy programmers.

Client-side Checking or Server-side?

- Typically uses javascript
- Does not require "round-trip" to server
  - Can check immediately
- JS is interpreted (slow!)
- JS has limited abilities to:
  - Format error message
  - Redraw screen
  - Diagnose problem
  - Access back-end data
- JS is quite error-prone

- Typically uses Java (or CGI)
- Requires "round-trip" to server
  - Check is after "go" button
- Java is very fast
- Java is very powerful:
  - Arbitrary message formatting
  - Can create a new screen
  - Exception-handling mechanism
  - Can access database!
- Java programs are much more reliable
- Client side can be "bypassed"

Client-side Checking or Server-side (2)

- Server-side checking with Java has many advantages

- Only client-side advantage is speed:
  - Advantage disappears when JS gets complicated (interpreted!)
  - Other advantages of server-side outweighs speed of client-side by a lot

- Up-to-date programmers and most modern web sites are moving to doing all of their checking on the server side

Summary

Good Error Messages:

- Decrease time of use
- Increase subjective satisfaction
- Reduce repeat errors