

The Importance of Error Messages

(and other feedback messages)

In the User Interface

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<http://www.cs.gmu.edu/~offutt/>

SWE 632

User Interface Design and Development

Thanks to Sabrina Parker

**“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**

Philosophies

- 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. Must be specific
2. Must use constructive guidance and positive tone
3. Must be in a user-centered style
4. Must use appropriate physical format

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(1) 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 users' vocabulary

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(1) Be Specific

A useful message should state:

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

and most importantly ...

3. What corrective action to take

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(1) Be Specific

Examples

Non-specific

Invalid input
Invalid date
SYNTAX ERROR
Illegal entry
Error accessing
<http://www.cs.gmu.edu>:
SOCKET: Connection
refused

Specific

The id number must be 5 numeric digits
Format: MM/DD/YY
Unmatched left parenthesis
Type first letter: Send, Read, or Drop
www.cs.gmu.edu is busy, try again later

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(1) Be Specific

A note on beeping ...

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

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(2) Give Constructive Guidance in a Positive Tone

- Meaningful messages
- Positive tone
- Not incriminating
- Blame system, not users
- State what should be there,
not what should not

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(2) Give Constructive Guidance in a Positive Tone

Examples

Non-constructive

Illegal year!
Your id # has characters!
Part Code not numeric.

Constructive

The year must be between 1975 and 1995.
The id # must be numeric. Please re-enter.
Part Code must be 3 numeric digits.

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(2) Give Constructive Guidance in a Positive Tone

Do not use **hostile** terminology:

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

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(3) Use a User-Centered Style

Users should feel that they are in control

Messages should be :

- In the user's vocabulary
- Courteous
- Not Imperative

(3) Use a User-centered Style

Examples

Non-user-centered

ENTER DATA.
Ready!

User-centered

Ready for command:
Your turn :

(4) Use an Appropriate Physical Format

Messages should be neat, consistent, and readable

- Mostly mixed case (upper and lower)
- 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

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Example

Blackboard Commerce Suite - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://masonline.gmu.edu/webapps/portal/frameset.jsp

Blackboard Commerce Suite

Do you want Firefox to remember the password for "offutt" on gmu.edu? Remember Never for This Site Not Now

GEORGE MASON UNIVERSITY
Mascon Money
Online Card Office

Welcome All University Card Office

Card Verification (CVV2) 444

Billing Address 1 4400 university drive

Billing Address 2

City Fairfax

State Virginia

Zip Postal Code 22032

Country United States

Email offutt@gmu.edu

3 Specify Amount

Specify the amount to be added to the designated account.

Deposit Amount \$ 200 .

4 Submit

Click Submit to finish. Click Cancel to quit.

* Required Field

Cancel Submit

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Example

The screenshot shows a web browser window titled "Blackboard Commerce Suite - Mozilla Firefox" with the URL "https://masonmoneyonline.gmu.edu/webapps/portal/frameset.jsp". The page displays a form for "Mason Money Online Card Office" with several sections: "Card Verification (CV)", "Billing Address 1", "Billing Address 2", "City", "State", "Zip Postal Code" (22032), "Country" (United States), and "Email" (otum@gmu.edu). A "Specify Amount" section is highlighted, showing a "Deposit Amount" of \$200.00. A callout box points to the "50" in the amount field, stating "I did! Maybe I need 50 cents ...". Another callout box points to the error message "A value must be provided: Deposit Amount." with the text "The page at https://masonmoneyonline.gmu...".

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Example

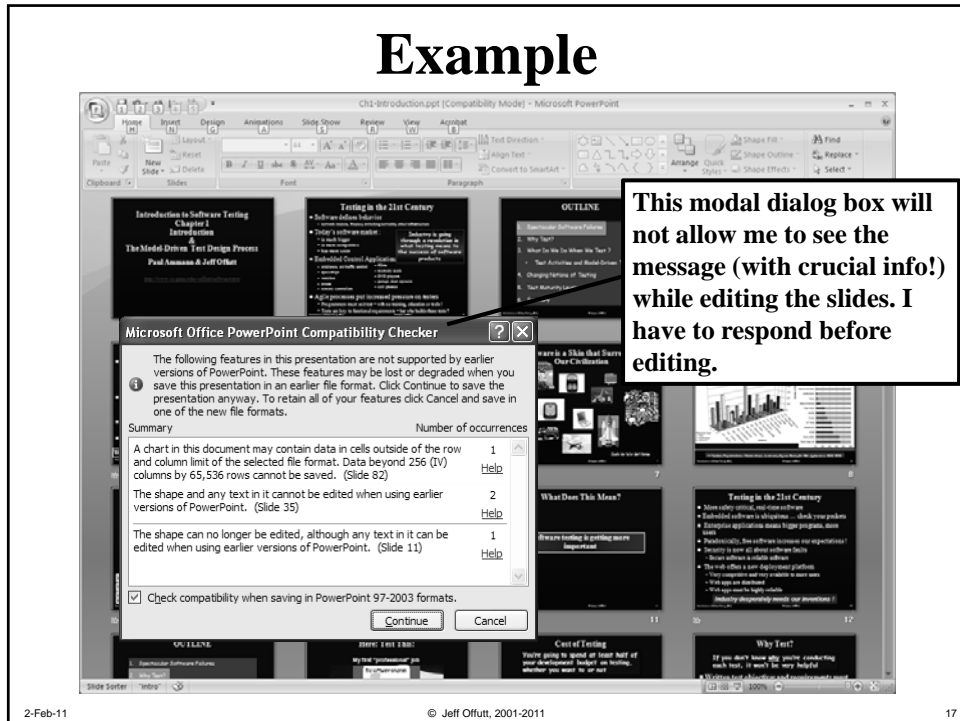
The screenshot shows the same web browser window as the first example. The "Specify Amount" section now shows a "Deposit Amount" of \$200.00. A callout box points to the "00" in the amount field, stating "Must enter 2 zeros (other values not allowed)". Another callout box points to the error message "A value must be provided: Deposit Amount." with the text "The page at https://masonmoneyonline.gmu...".

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Example



Examples

- ⊗ ! HT ACCESS: Error accessing “http://www.cs.gmu.edu/offutt.html”:
“HTTP: File/directory does not exist”
 - ☺ The requested web page /offutt.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 MS Word restarts. You can still delay shutdown until the
document finishes printing.
- Wait and shutdown after printing:
- Shutdown now and cancel 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.**

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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 much stack space. Increase the setting of MinSPs in SYSTEM.INI or remove recently installed VxDs. There are currently 5 SPs allocated. (*Windows 2000*)
- ☺ ???

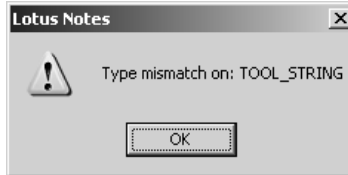
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Yet Another Example

- From Lotus notes



- What does that mean ???

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A Confusing Example

This webpage has a redirect loop.

The webpage at

<https://property.onesite.realpage.com/system/onlinepayments/default.asp>

has resulted in too many redirects. Clearing your cookies for this site may fix the problem. If not, it is possibly a server configuration issue and not a problem with your computer.

Here are some suggestions:

Reload this web page later.

Learn more about this problem.

More information on this error

Below is the original error message

Error 310 (net::ERR_TOO_MANY_REDIRECTS): There were too many redirects.

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Yeta Yet Another Example

- From an online bill payment system



- Is it legal to “abort” in this state?

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A Commonly Occurring Example

- Most browsers give a warning before submitting POST data for the second time
 - Avoid duplicate submissions and updates
 - Avoid duplicate purchases
- Users should be very careful before overriding this hesitation
- However ... how many users understand “POSTDATA”?



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Last (Negative) Example

- ☹ Program Error: WINWORD.exe has generated errors and will be closed by Windows. You will need to restart this program. An error log is being created. (*Word 2000*)
 - ☹ I got this message, intermittently, for several months before diagnosing the problem
 - ☹ It occurred when I started MS Word (and PowerPoint) ... *sometimes* ... and they immediately exited
 - ☹ Restarting the computer did not work
 - ☹ I took my computer to the support center, but they couldn't get the problem to repeat
 - ☹ The actual problem ???
- ☹ The default printer is a network printer and is currently unavailable. Word is continuing, but you will not be able to print.

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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:

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An Interesting Example

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

Interesting escape
A reminder that we should use subject lines

Intrusive or protection?

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A Stupid Example

Where is the 'any' key
on my computer keyboard?



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Another Stupid Example



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If Error Messages Were Haikus

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

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Client- or Server-side Checking?

- 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 C#)
- 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
- Users can “bypass” client-side checking

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Client- or Server-side Checking?

- 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 outweigh speed of client-side by a lot
- Modern web sites are moving to doing all of their checking on the server side
- A compromise uses Ajax
 - Checking can be done on the server
 - But without the user explicitly sending a request

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Philosophy of Designing for Errors

- Think of the user's point of view
- Assume every mistake will occur
- Make every action reversible
- Use syntactic constraints as much as possible
 - Selection vs. typing
- Make the results of actions obvious
 - If possible, make them obvious before actions are committed

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Summary

Good Error Messages:

- Increase speed of use
- Increase subjective satisfaction
- Reduce repeat errors

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