

Evaluation of error-messages in commercial applications and operating systems

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Original presentation in ODP format is available [here](#)

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What is an error-message?

- Wikipedia: An **error message** is a message displayed when an unexpected condition occurs

Causes of unexpected conditions

- **User**
 - Users performs some invalid operation
- **System / program / ... / anything user does not have direct control of**
 - Bug in program
 - Server malfunction
 - Device not ready
 - ...

Expected user interaction

- **User can not fix the problem**
 - i.e.: HTTP 500 – Internal Server Error
 - the only thing one can do is explain user there is a problem and ask user to try later
- **User can fix the problem**
 - mostly (but not only!) unexpected conditions caused by user himself
 - important thing is to tell user where the problem is, what the problem is and how the problem can be fixed
 - error message must speak the same language as user (!)

Error message usability

“Good” error message should usually consist of:
(not everything is always applicable)

1. Unique identifier (Message ID)

HTTP 503: Service unavailable

ORA-01007: variable not in select list

2. Any relevant information for help-desk

Timestamp, User name, Memory dump...

3. Message type and severity

Warning, Error, Hint, ...

4. Short message for user

File not found; Disk is full

Error message usability

5. Longer description and tips how to fix the problem

What consequences does this error have for user and his work?

How to fix the problem?

How to avoid having this problem in future?

Does not have to be directly in error message itself – i.e. it can be a link to documentation

Why are error-messages so bad?

There are few reasons why overall quality of error messages is quite bad:

- 1. error messages are never tested for usability**
- 2. error messages for “normal” people are written by programmers, error messages for programmers are written by marketing departments**
- 3. belief that error messages are not important**
 - “my program would work without errors”
 - “if user does everything according to manual no error can occur”

Evaluation criteria

- For each application / operating system we will try to answer following questions:
- **Are given error-messages user-friendly?**
- **Are they useful for typical user?**
- **Do they provide enough error-recovery features?**
- **Do they give enough useful hints?**

Applications we will look at

- According to type of application demands on error messages differ
- We take a look at:
 - **web applications**
 - **desktop applications** (office tools)
 - **operating systems**

Web applications

- While using a web application user may encounter two types of error message
 - **those given by server** (mostly technical problems)
 - **those given by application** (mostly problem with user input)
- Sometimes it is hard to tell whether it is a server or application error message

“Good” web app. error message

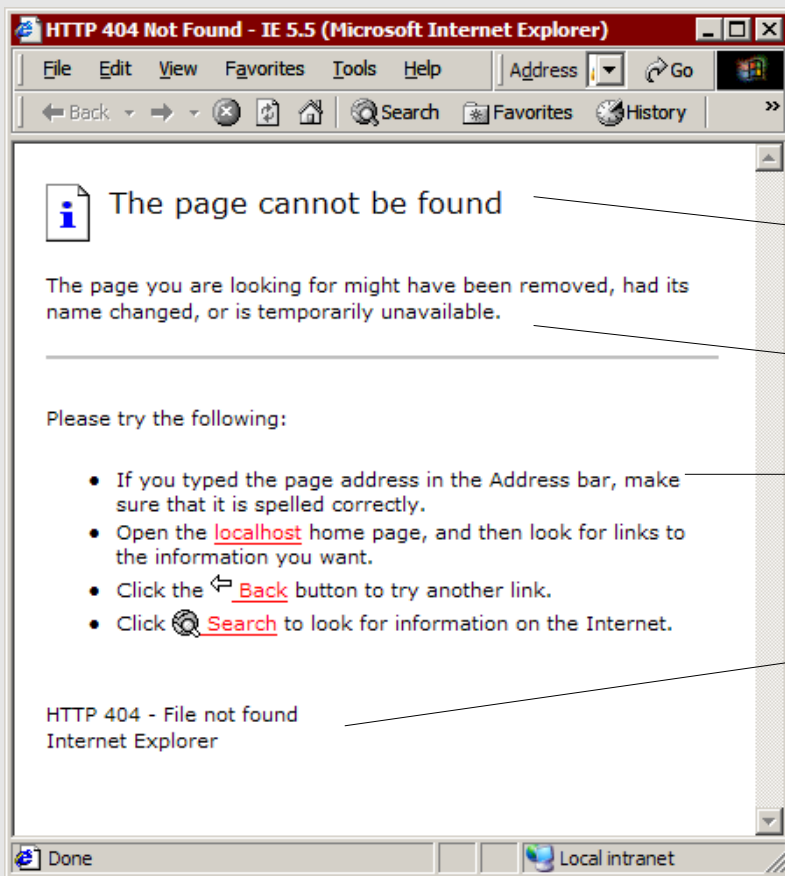
- “Good” error message should consist of:
 - Unique identifier
 - Timestamp, user, user agent
 - Message severity (error / warning)
 - Short message for user
 - Longer descriptions + recovery features
- All of those could be included on one page

Overriding ugly server messages

Not Found

The requested URL /notexits.html was not found on this server.

Default HTTP 404 error message of Apache server



“User friendly” error message given by Internet Explorer (default behavior)

+ Short and clear

+ Longer description of problem

+ Recovery features that actually make sense!

+ Error code

- No useful information for support (time stamp, URL, ...)

Overriding ugly server messages

- Better way than relying on client is to make error messages “nice” on server side
- **.htaccess** (on Apache)

sme.sk: Something bad happened...



This is a server error and user can not do anything about it

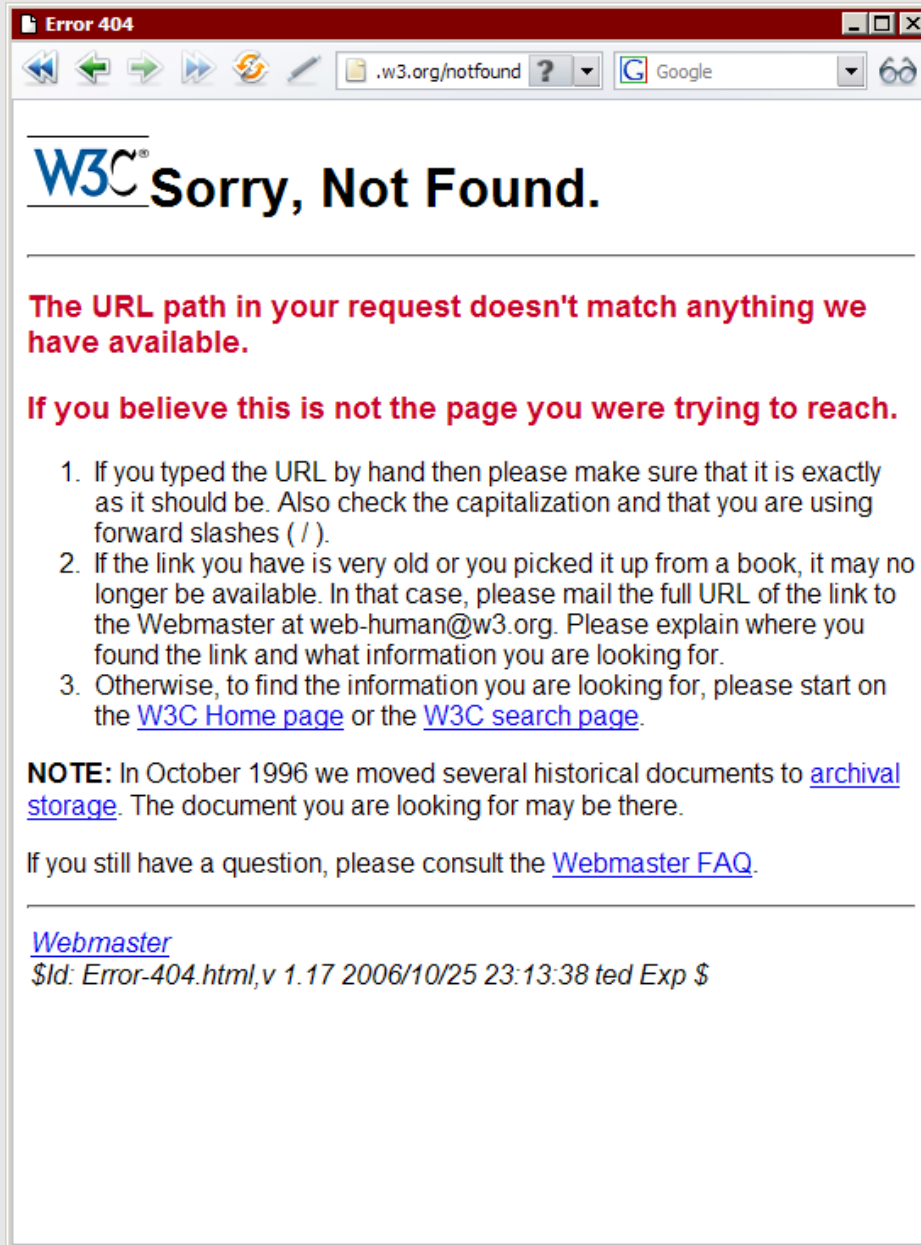
BAD: Does not contain:

- unique identifier
(original HTTP response code)

GOOD:

- + it's funny – does not piss the user off
- + does give recovery feature

w3.org: Sorry, Not Found



The screenshot shows a web browser window with a red title bar that says "Error 404". The address bar contains ".w3.org/notfound" and the search engine is set to "Google". The main content of the page is as follows:

W3C[®] Sorry, Not Found.

The URL path in your request doesn't match anything we have available.

If you believe this is not the page you were trying to reach.

1. If you typed the URL by hand then please make sure that it is exactly as it should be. Also check the capitalization and that you are using forward slashes (/).
2. If the link you have is very old or you picked it up from a book, it may no longer be available. In that case, please mail the full URL of the link to the Webmaster at web-human@w3.org. Please explain where you found the link and what information you are looking for.
3. Otherwise, to find the information you are looking for, please start on the [W3C Home page](#) or the [W3C search page](#).

NOTE: In October 1996 we moved several historical documents to [archival storage](#). The document you are looking for may be there.

If you still have a question, please consult the [Webmaster FAQ](#).

[Webmaster](#)
\$Id: Error-404.html,v 1.17 2006/10/25 23:13:38 ted Exp \$

This can be considered to be a “good” server error message

Web applications errors

- are produced by application itself
- mostly reactions to user input (form validations, etc.)
- should always contain a recovery feature
- should always show where and how problem occurred
- should never blame user
 - Instead of “You entered wrong postcode”, it is better to use “Given postcode is invalid – can only contain numbers”

Web application: Validating a form

registration form:

Page 1

New User

Create

* Name

* Password

* Re-enter password

Address

* Postcode

Page 1


2 errors have occurred

- Password can not be left blank! Please enter a new password!
- Postcode is invalid - must consist of 5 numbers.

New User

Create


* Name

 * Password

Password can not be left blank! Please enter a new password!

* Re-enter password

Address

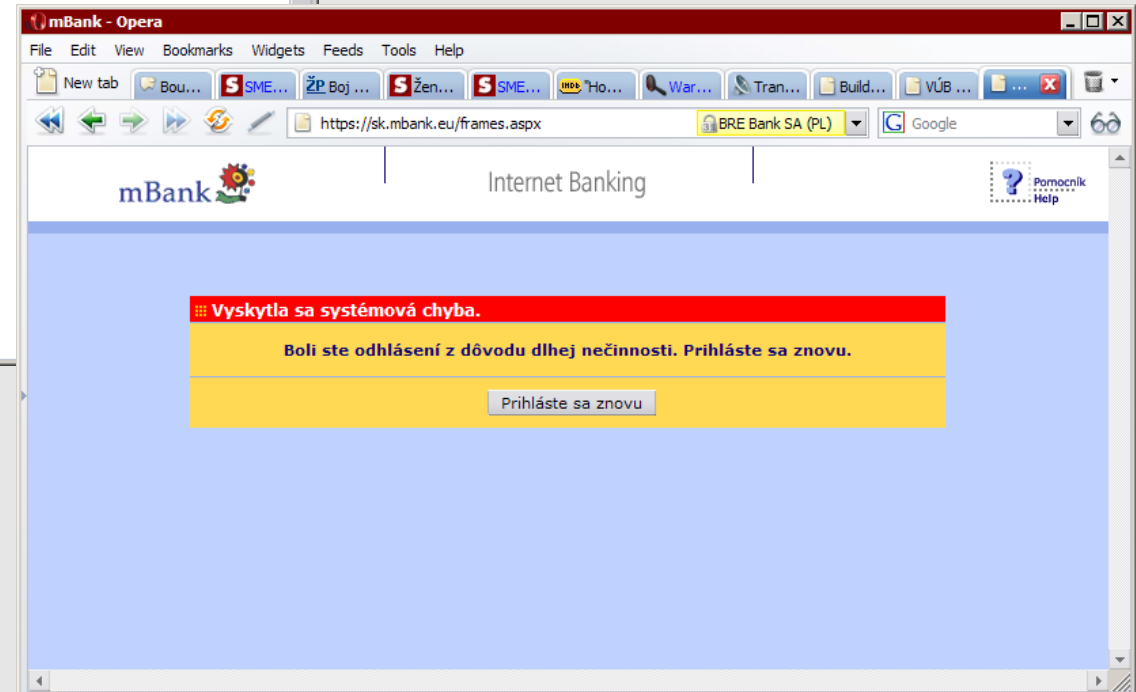
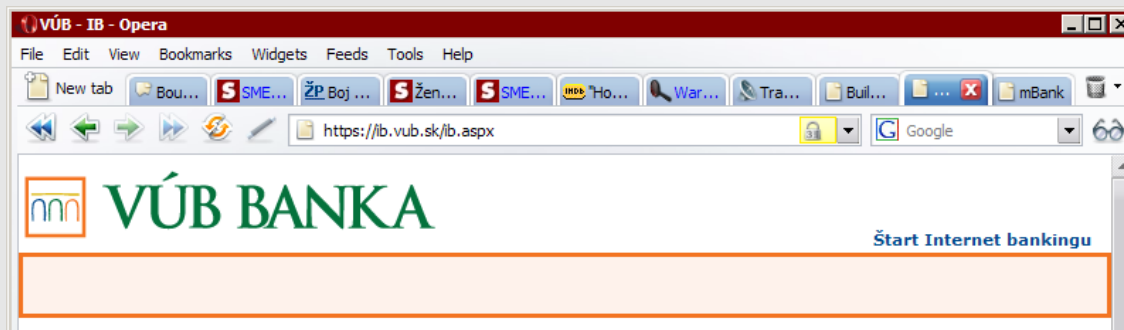
 * Postcode

Postcode is invalid - must consist of 5 numbers.

validation errors
example:

Web application: Global errors

example how two internet banking applications handle situation of long user inactivity (session expire)



E-Mail error messages

- Few examples of error messages returned by **MAILER DEAMON** in case mail could not be delivered

E-Mail error messages (qmail-send)

```
Hi. This is the qmail-send program at mxavas6.forpsi.com.  
I'm afraid I wasn't able to deliver your message to the following addresses.  
This is a permanent error; I've given up. Sorry it didn't work out.  
<uzivatel@domena.tld>:  
user is over quota
```

```
Hi. This is the qmail-send program at mxavas6.forpsi.com.  
I'm afraid I wasn't able to deliver your message to the following addresses.  
This is a permanent error; I've given up. Sorry it didn't work out.  
<uzivatel@domena.tld>:  
user does not exist, but will deliver to  
/home/vpopmail/domains/2/b/serbus.org/nobody/  
can not open new email file errno=2  
file=/home/vpopmail/domains/2/b/serbus.org/nobody/Maildir/tmp/1182584444.17359.m  
xavas6.forpsi.com,S=3463  
system error
```

BAD:

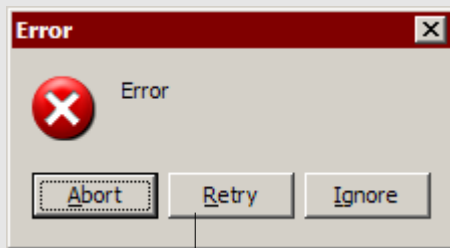
- no unique identifier
- no timestamp, user name etc. that may help helpdesk when reporting error
- it is not clear it is an error message

GOOD:

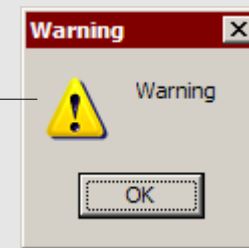
- first part understandable for novice users too
- contains severity and consequences for user

Error messages in OS

- must attract user's attention – or even make him stop his work and concentrate on error message
- => **modal windows** – shown above all others, without confirming error message it is not possible to continue in work



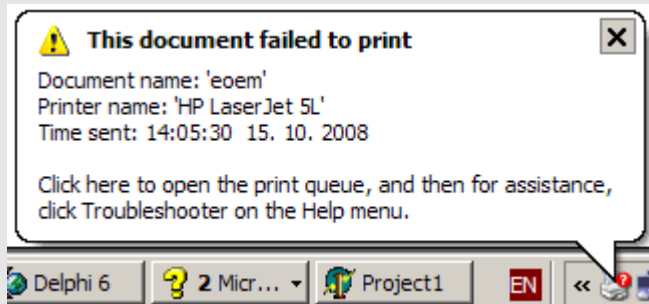
Buttons – user interaction



Icons indicate severity of error

Error messages in OS

- sometimes error message does not require immediate attention from user



operating system should than inform us about the error and let us decide when and how we will handle it

OS: Program crashes

How does it look when some program crashes?

a.) program simply disappears, no error message given

“The worst error message is that isn't”

b.) some error message is displayed

Q: How many detailed information should we provide to user?

crash reporter program:

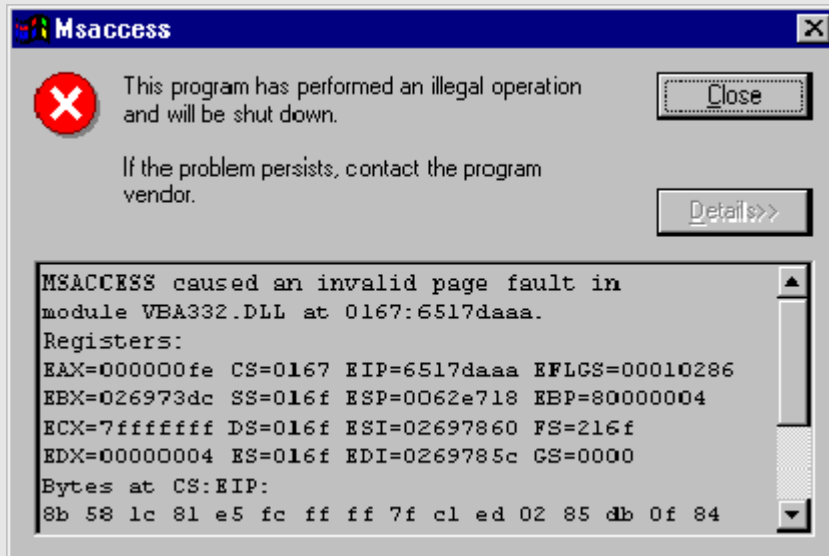
Win: Windows Error Reporting

Mac: Crash Reporter

Gnome: Bug Buddy

KDE: Dr. Konqi

OS: Program crashes



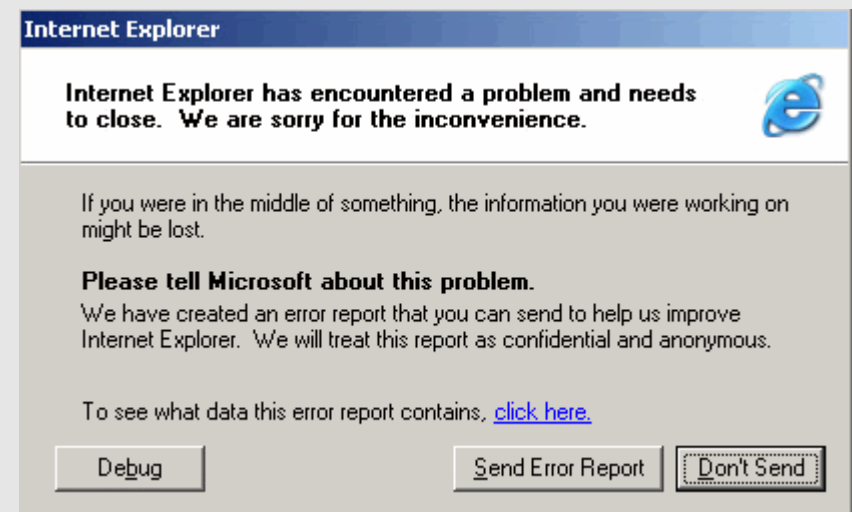
Well known message from Win95 era

Its newer version from XP

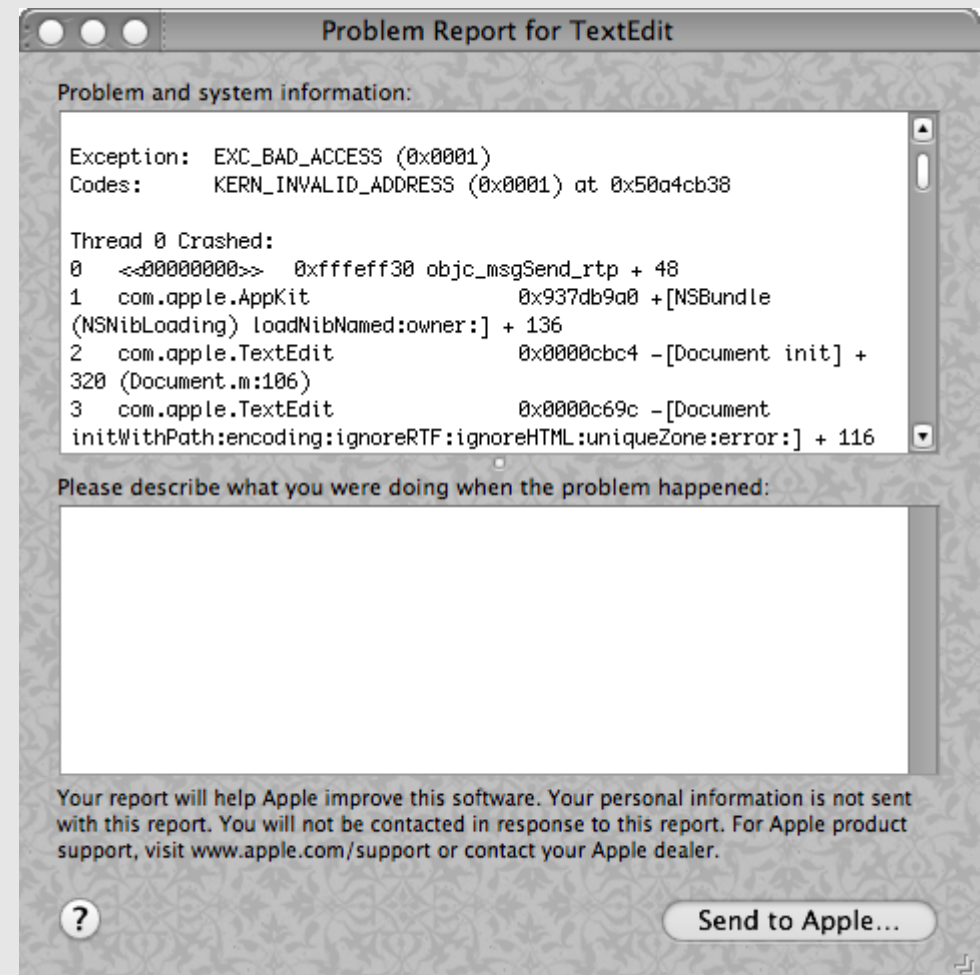
What's better:

- more polite
- contains consequences

But from programmer's view it is completely useless.



OS: Program crashes



Desktop Application

- Demands on error messages mostly depend of purpose of application
- In general, we would like to have error message linked with help

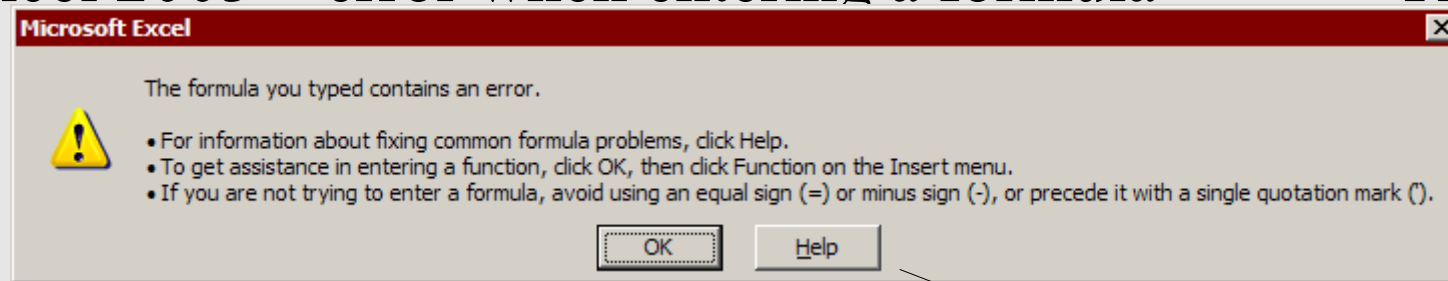
“Good” desktop app. error message

- “Good” error message should consist of:
 - Unique identifier
 - Message severity (error / warning)
 - Short message for user
 - Longer descriptions + recovery features, ideally in a form of link or button that will open a corresponding help page
- If there is a possibility to fix error by choosing from some options, application should provide this option using i.e. buttons

Example of very bad error message

MS Excel 2003 – error when entering a formula

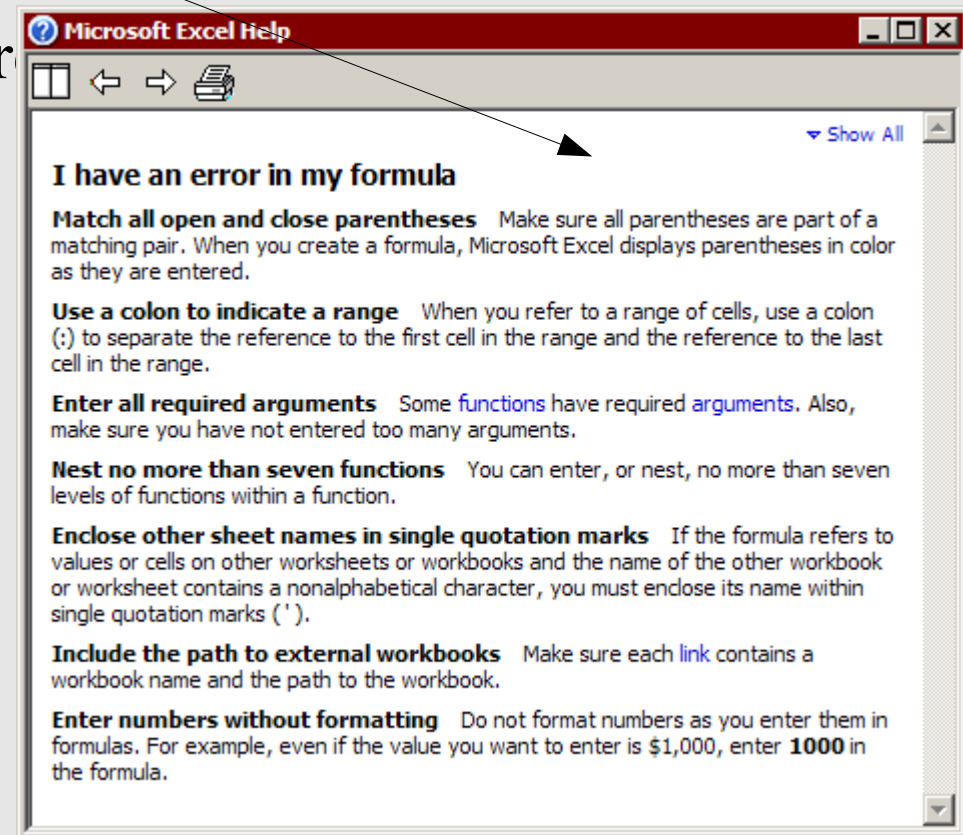
=ROUND()



- no information which error occurs

- help button leads to a vague text which contains a lot that has nothing to do with user's actual problem

BETTER: Instead of general help open description of problematic function in formula



It can still be worse...

Open Office 2.4 Calc

User enters formula **=ROUND()**

No error message is displayed

The cell turns into **Err:511**

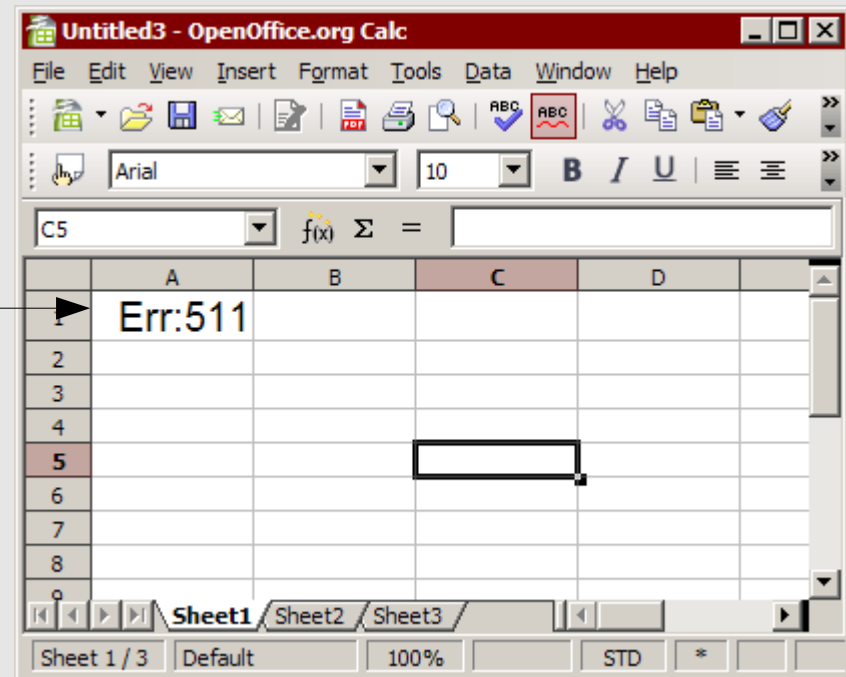
User: What does that mean???

- there is no help button

- if user presses **F1** on that cell only generic help opens

- 'Err:511' is not even an index term

- searching for 'Err:511' in help finally brings user to Error codes page, where he can find that Err:511 means: “Function requires more variables than are provided, for example, **AND()** and **OR()**.”



Welcome to the OpenOffice.org Calc Help

How to Work With OpenOffice.org Calc

[Instructions for Using OpenOffice.org Calc](#)

[OpenOffice.org Calc Features](#)

[List of Functions by Category](#)

[New Changes in OpenOffice.org](#)

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[Getting Support](#)

Conclusion

- We shown an overview of different type of error messages in different situations mostly with stress **how not to make them.**
- Unfortunately, error messages are still (and probably forever) on the edge of interest
- More on this topic will be then published on Martin's blog