MONASH University

MONASH
INFORMATION
TECHNOLOGY

Lecture 11

FIT5152 - User Interface Design and Usability

Reports

Error Messages

GROUP OF EIGHT AUSTRALIA

Learning objectives

In this lecture you will learn about:

- What are reports?
- Why reports are useful.
- Types of Reports
- Guidelines to designing reports
- Type of visuals used in reports
- User Errors
- Error Messages
- Guidelines to writing good error messages

Reports

- A report is a business document that contains data used for reading and viewing purposes only and is generally used to make decisions.
- Examples of reports include invoices, sales summary reports and progress reports.
- Data in the reports can be presented in charts and graphs to make it easier for the user to understand the content of the report.
- Reports can be printed on paper or can be viewed electronically.

Report Types

The four types of reports that are provided by an information system are:

- Detailed reports
- Summary reports
- Exception reports
- Executive reports

(Satzinger et al. 2012)

Report Types

- Detailed reports
  - reports that contain specific information on business transactions
  - for example, a list of books sold in a bookshop on a given day, with each line of the report having basic information about the sale such as book code, book title, selling price, etc. If there are 500 books sold in a day then there would have 500 detail lines in the report.

Report Date: 30/Sep/2019

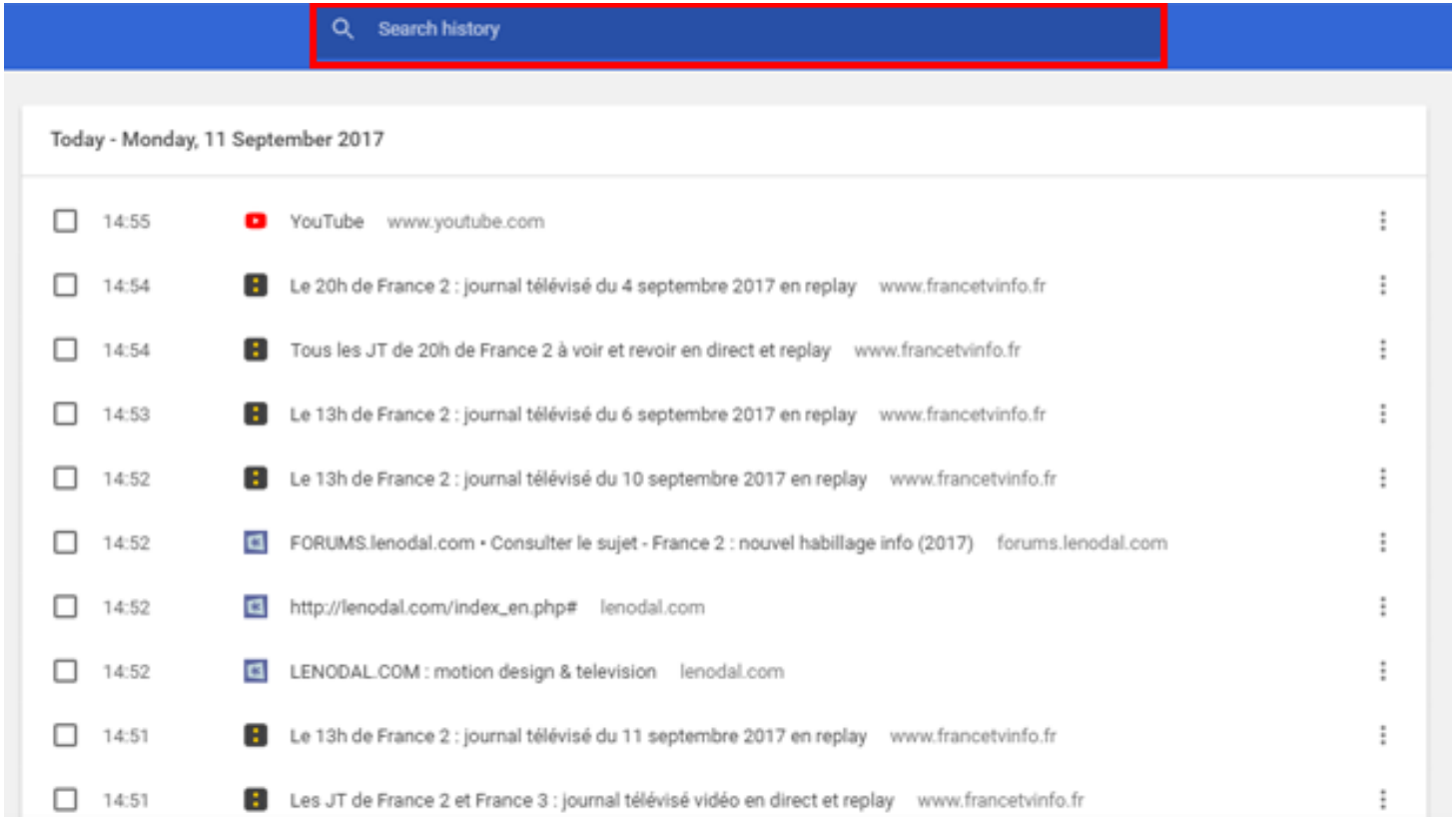
MONSU Caufield Bookshop
Sales Report for 30/Sep/2019

Book Code	Title	Selling Price
1	Back To Eden	$40.45
2	The Alchemist	$30.15
3	The Conference of the Birds	$42.25
4	The Four Agreements	$40.00
4	The Four Agreements	$40.00
6	The Masnavi	$23.05
1	Back To Eden	$40.45
6	The Masnavi	$23.05
9	The Seven Spiritual Laws of Success	$30.85
2	The Alchemist	$30.15

(Satzinger et al. 2012)

Report Types

- Detailed reports



Source: https://home.bt.com/tech-gadgets/internet/browsers/how-to-view-delete-web-history-11363940473012

Report Types

- Summary reports
  - reports that summarise detail or recap periodic activity
  - for example, a periodic (daily or weekly or monthly) summary of all sales in the bookshop, with total number of books sold and total dollar value of sales.
  - Managers use this type of reports to track performance.

Report Date: 30/Sep/2019

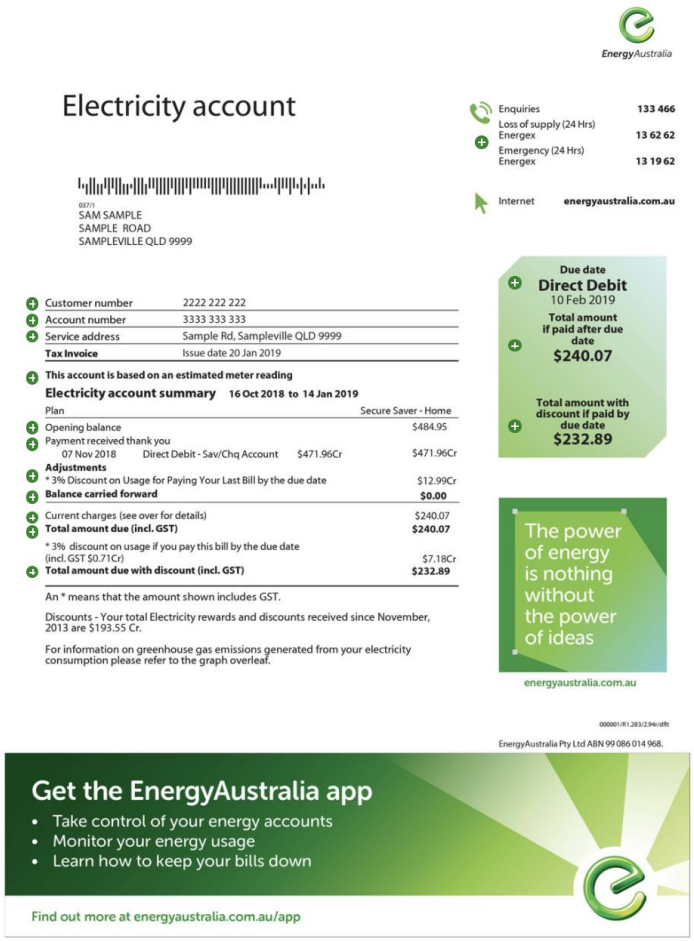
MONSU Caufield Bookshop
Weekly Sales Report (2019 Q3)

Week No	Title	Total Books Sold	Total Sales
1	01-Jul-2019 to 7-Jul-2019	765	**$6,987.45**
2	08-Jul-2019 to 14-Jul-2020	905	**$8,930.25**
3	15-Jul-2019 to 21-Jul-2021	10000	**$49,892.15**

(Satzinger et al. 2012)

Report Types

- Summary reports



EnergyAustralia

Electricity account

Enquiries 133 466
Loss of supply (24 Hrs) Energex 13 62 62
Emergency (24 Hrs) Energex 13 19 62
Internet energyaustralia.com.au

037/1
SAM SAMPLE
SAMPLE ROAD
SAMPLEVILLE QLD 9999

Customer number	2222 222 222
Account number	3333 333 333
Service address	Sample Rd, Sampleville QLD 9999
Tax Invoice	Issue date 20 Jan 2019

This account is based on an estimated meter reading

Electricity account summary 16 Oct 2018 to 14 Jan 2019

Plan			Secure Saver - Home
Opening balance			$484.95
Payment received thank you			
07 Nov 2018	Direct Debit - Sav/Chq Account	$471.96Cr	$471.96Cr
Adjustments			
* 3% Discount on Usage for Paying Your Last Bill by the due date			$12.99Cr
Balance carried forward			$0.00
Current charges (see over for details)			$240.07
Total amount due (incl. GST)			$240.07
* 3% discount on usage if you pay this bill by the due date (incl. GST $0.71Cr)			$7.18Cr
Total amount due with discount (incl. GST)			$232.89

An * means that the amount shown includes GST.

Discounts - Your total Electricity rewards and discounts received since November, 2013 are $193.55 Cr.

For information on greenhouse gas emissions generated from your electricity consumption please refer to the graph overleaf.

Due date
Direct Debit
10 Feb 2019
Total amount if paid after due date
$240.07
Total amount with discount if paid by due date
$232.89

The power of energy is nothing without the power of ideas

energyaustralia.com.au

000001/R1283/2.94e/dfk

EnergyAustralia Pty Ltd ABN 99 086 014 968.

Get the EnergyAustralia app
- Take control of your energy accounts
- Monitor your energy usage
- Learn how to keep your bills down

Find out more at energyaustralia.com.au/app

Source: https://www.energyaustralia.com.au/home/bills-and-accounts/understand-your-bill/bill-guides

(Satzinger et al. 2012)

Report Types

- Exception reports
  - reports that contain detail or summary information about transactions or summary results that fall outside of a predefined normal range of values.
  - no such reports are needed when business is progressing normally.
  - for example, the bookshop might produce a report that lists books that are to be returned to the supplier if even a single copy of a book is not sold in the last 18 months.

Report Date: 30/Sep/2019

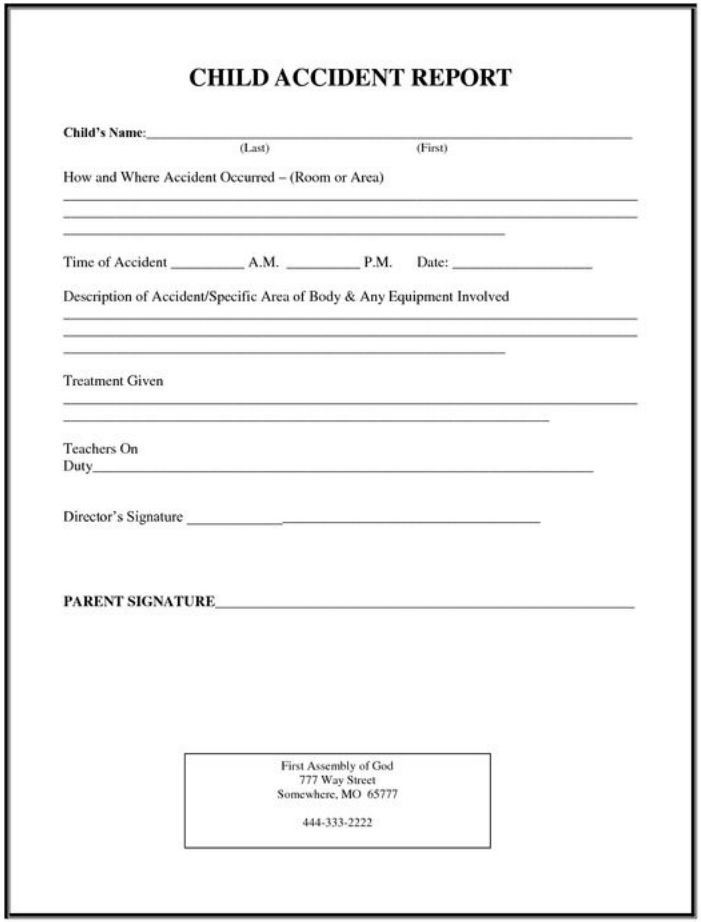
MONSU Caufield Bookshop
Return To Supplier Report for September 2019

Book Code	Book Title	Quantity On Hand	Last Copy Sold in
7	The Road Less Traveled	6	March-2018
8	The Secret	4	March-2018

(Satzinger et al. 2012)

Report Types

- Exception reports



CHILD ACCIDENT REPORT

Child's Name:_____
(Last) (First)

How and Where Accident Occurred – (Room or Area)

Time of Accident _____ A.M. _____ P.M. Date: _____

Description of Accident/Specific Area of Body & Any Equipment Involved

Treatment Given

Teachers On Duty_____

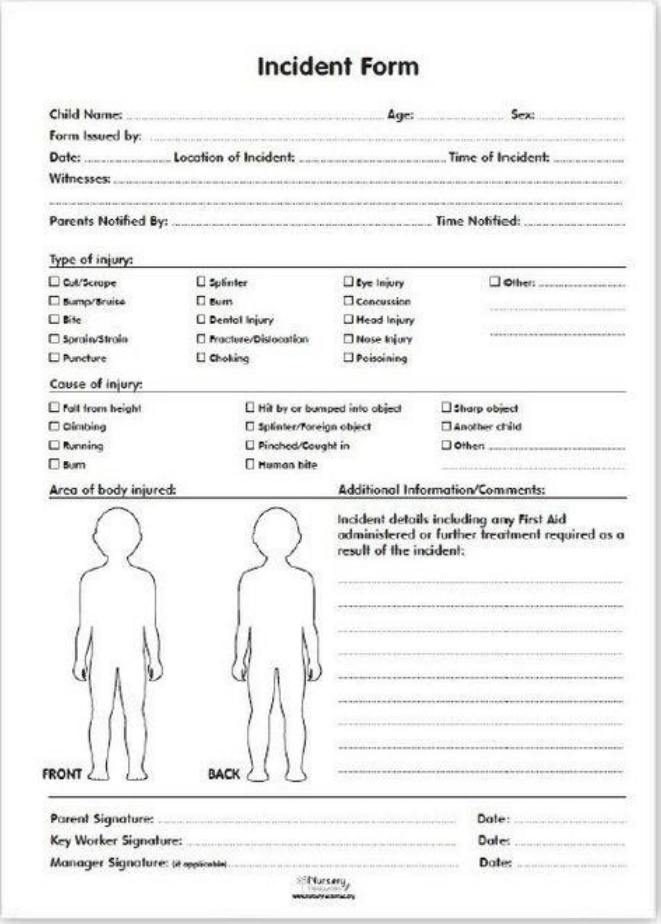
Director's Signature _____

PARENT SIGNATURE_____

First Assembly of God
777 Way Street
Somewhere, MO 65777

444-333-2222

Source:
https://www.pinterest.com.au/pin/739505201291275130/



Incident Form

Child Name: ..... Age: ..... Sex: .....
Form Issued by: .....
Date: ..... Location of Incident: ..... Time of Incident: .....
Witnesses: .....
Parents Notified By: ..... Time Notified: .....

Type of injury:

- ☐ Cut/Scrape
- ☐ Bump/Bruise
- ☐ Bite
- ☐ Sprain/Strain
- ☐ Puncture
- ☐ Splinter
- ☐ Burn
- ☐ Dental Injury
- ☐ Fracture/Dislocation
- ☐ Choking
- ☐ Eye Injury
- ☐ Concussion
- ☐ Head Injury
- ☐ Nose Injury
- ☐ Poisoining
- ☐ Other: .....

Cause of injury:

- ☐ Fall from height
- ☐ Climbing
- ☐ Running
- ☐ Burn
- ☐ Hit by or bumped into object
- ☐ Splinter/Foreign object
- ☐ Pinched/Caught in
- ☐ Human bite
- ☐ Sharp object
- ☐ Another child
- ☐ Other: .....

Area of body injured:

FRONT BACK

Additional Information/Comments:

Incident details including any First Aid administered or further treatment required as a result of the incident:

Parent Signature: ..... Date: .....
Key Worker Signature: ..... Date: .....
Manager Signature: (if applicable) ..... Date: .....

Source:
https://www.pinterest.com.au/pin/386042999310646801/

Report Types

- Executive reports
  - reports that contain summary information from different operations/sources within or outside an organisation.
  - used by top-level managers to assess overall health and performance of the organisation.
  - can show comparative performance with industry-wide averages

Report Date: 30/Sep/2019

MONSU Caufield Bookshop Nationwide 2019 Market Share Report			
Year	Quarter	Total Sales Amount	% Market Share
2019	1	**$506,776**	**0.0213**
2019	2	**$836,766**	**0.0225**
2019	3	**$976,766**	**0.0227**

(Satzinger et al. 2012)

Report Types

- Executive reports

This report was commissioned to examine why the sales volume of Choice Chocolate has dropped over the past two years since its peak in 1998 and to recommend ways of increasing the volume.	Terms of reference Statement of problem/ topic
The research draws attention to the fact that in 1998, the market share of Choice Chocolate was 37%. The shares of their key competitors such as Venus and Bradbury were 22% and 18% respectively. The size of the chocolate market then was $36 million. Over the next two years, although Choice Chocolate retained its market share the volume of sales in the whole market decreased to $29 million. Further investigations reveal that this market shrinkage coincided with an increase in health awareness amongst consumers who regard the milk and sugar ingredients in chocolate as negative; moreover, since the second half of 1999, an increasing number of rival 'health candies' had appeared on the market. These claimed to offer the consumers a healthy alternative. These factors appear to be the major causes of the decreased sales volume of Choice	Formal language appropriate to report writing Key findings summarised

factors appear to be the major causes of the decreased sales volume of Choice Chocolate.	Problem solution summarised
Slim Choice is the latest chocolate range put forward by the R & D Department of Choice Chocolate. The report evaluates this range and concludes that it would be an ideal candidate to meet the challenge presented by the market and could satisfy the new consumer demand since it uses significantly reduced milk and sugar ingredients and is endorsed by renowned health experts. According to 97% of the 2000 subjects tested recently, it also retains the same flavour as the original range.	
It is recommended: • that Choice Chocolate take immediate measures to launch and promote Slim Choice alongside its existing product range; • that Slim Choice adopt a fresh and healthy image; • that part of the launch campaign contains product endorsement statements by renowned health experts; • that Slim Choice be available in health food shops as well as in traditional chocolate retail outlets	Recommendations summarised

Source Image: https://unilearning.uow.edu.au/report/4bi1.html

Report Design

Questions to consider when Designing Reports

- Who will use the report?
- What is the purpose of the report?
- When is the report needed and used?
- Where is the report needed and used?
- How many users will be using or viewing the report?
- Which data should the report have?

(Valacich et al. 2015)

Report Guidelines

- Use meaningful titles of the report.
- Include meaningful information.
- Balance the layout.
- Design an easy navigation system for a multi-page report.
- All important information should be highlighted.
- For displaying text in a report,
  - use mixed uppercase and lowercase.
  - avoid using overly fancy fonts
  - use enough spacing between paragraphs.
  - left-justify text and leave a ragged right margin.
  - use abbreviations and acronyms only when they are widely understood and are significantly shorter than full-text.

(Valacich et al. 2015)

Report Guidelines (cont'd)

- For displaying content in tables and lists in a report
  - all columns and/or rows should have meaningful labels
  - labels should be separated from other content by using highlighting
  - redisplay labels when the data extend beyond a single screen or page.
  - sort in a meaningful order
  - avoid using overly fancy fonts
  - right-justify numeric data
  - left-justify textual data.
  - break long sequence of alphanumeric data into small groups of 3 to 4 characters each.

(Valacich et al. 2015)

Report - Good or Bad?

- Let's check if report guidelines have been followed or not in the following report

1 2 3 4

Pine Valley Furniture
Salesperson Annual Summary Report, 2016

January 10, 2017 Page 1 of 2

Region	Salesperson	SSN	Quarterly Actual Sales First	Second	Third	Fourth
Northwest & Mountain						
	Baker	999-99-9999	195,000	146,000	133,000	120,000
	Hawthorne	999-99-9999	220,000	175,000	213,000	198,000
	Hodges	999-99-9999	110,000	95,000	170,000	120,000
Midwest & Mid-Atlantic						
	Franklin	999-99-9999	110,000	120,000	170,000	90,000
	Stephenson[1]	999-99-9999	75,000	66,000	80,000	80,000
	Swenson	999-99-9999	110,000	98,000	100,000	90,000
New England						
	Brightman	999-99-9999	250,000	280,000	260,000	330,000
	Kennedy	999-99-9999	310,000	190,000	270,000	280,000

[1]Sales reflect July 1, 2016 – December 31, 2016.

5 6 7 8 9

(Valacich et al. 2017, pg 370)

Report - Good or Bad?

- Let's check if report guidelines have been followed or not in the following report

Place meaningful labels on all columns and rows

Alphabetic text is left justified

Use a meaningful title

Box the table data to improve the appearance of the table

Pine Valley Furniture
Salesperson Annual Summary Report, 2016

January 10, 2017 Page 1 of 2

Region	Salesperson	SSN	*Quarterly Actual Sales* First	Second	Third	Fourth
Northwest & Mountain						
	Baker	999-99-9999	195,000	146,000	133,000	120,000
	Hawthorne	999-99-9999	220,000	175,000	213,000	198,000
	Hodges	999-99-9999	110,000	95,000	170,000	120,000
Midwest & Mid-Atlantic						
	Franklin	999-99-9999	110,000	120,000	170,000	90,000
	Stephenson[1]	999-99-9999	75,000	66,000	80,000	80,000
	Swenson	999-99-9999	110,000	98,000	100,000	90,000
New England						
	Brightman	999-99-9999	250,000	280,000	260,000	330,000
	Kennedy	999-99-9999	310,000	190,000	270,000	280,000

[1]Sales reflect July 1, 2016 – December 31, 2016.

Superscript characters can be used to alert reader of more detailed information

Sort columns in some meaningful order (names are sorted alphabetically within region)

Long sequence of alphanumeric data is grouped into smaller segments

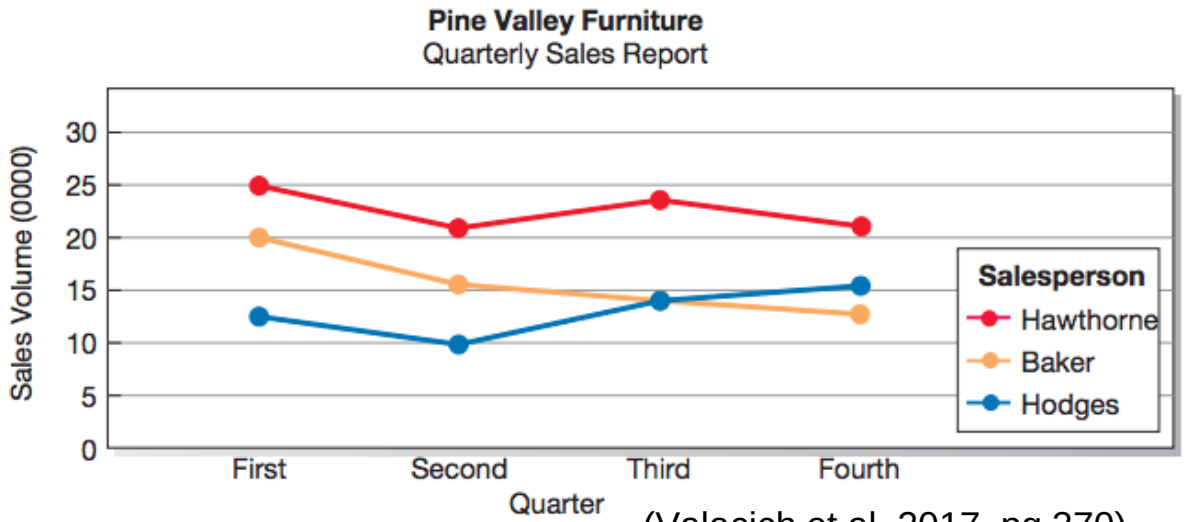
Right justify all numeric data

Try to fit table onto a single page to help in making comparisons

(Valacich et al. 2017, pg 370)

Report Guidelines (cont'd)

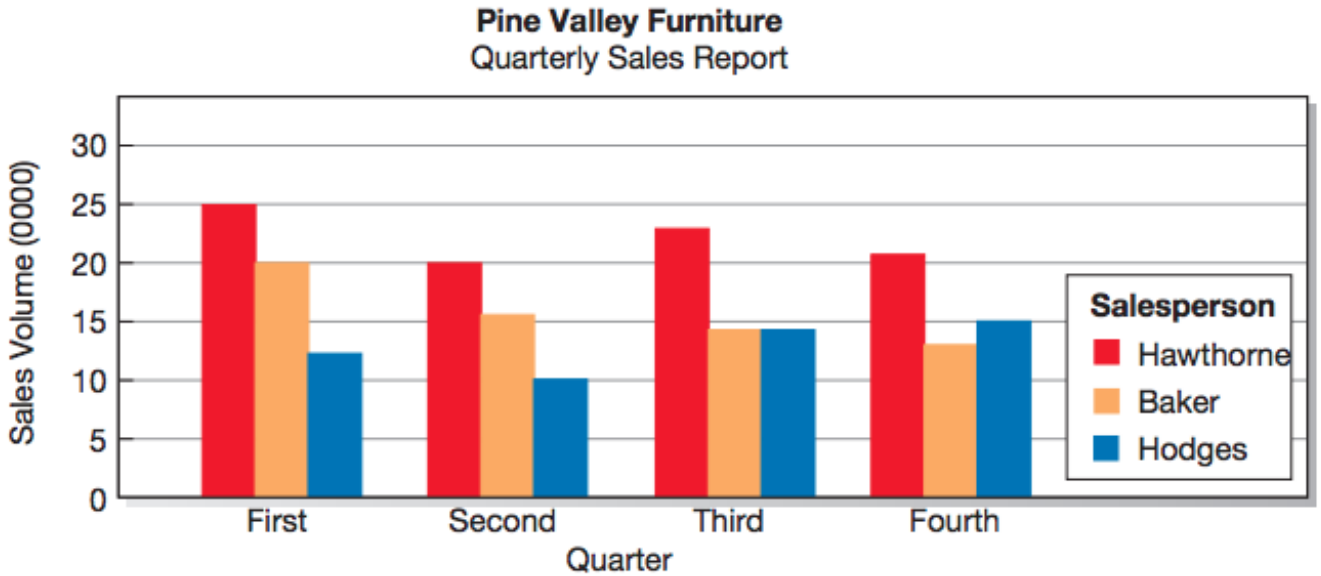
- For displaying data with visuals, use the right type of visual with the data in the report to turn report data into knowledge.
  - Use line graph to track changes over a period of time. Line graph is preferred over bar graph when changes are smaller. Line graph is also useful to compare changes over the same time period for multiple groups.



(Valacich et al. 2017, pg 370)

Report Guidelines (cont'd)

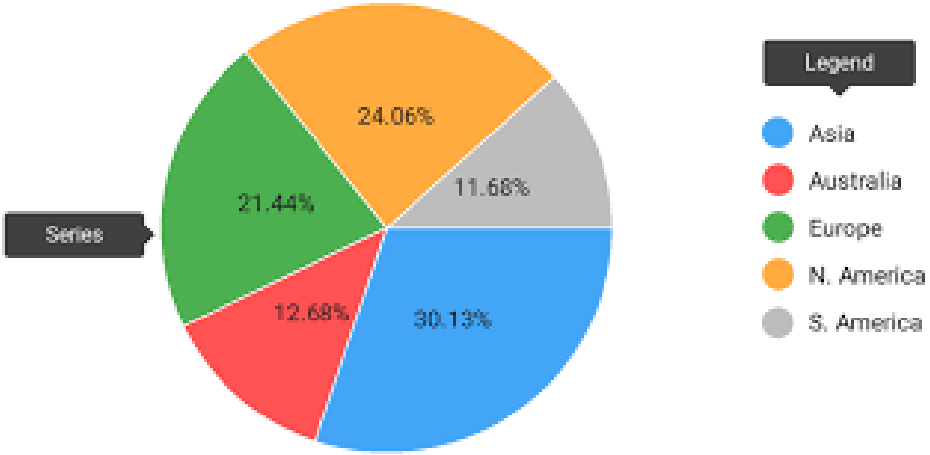
– Use bar graph when comparing things between different groups or when tracking changes over a period of time. When tracking changes over a period of time, bar graph is preferred over line graph when changes are larger.



(Valacich et al. 2017, pg 370)

Report Guidelines (cont'd)

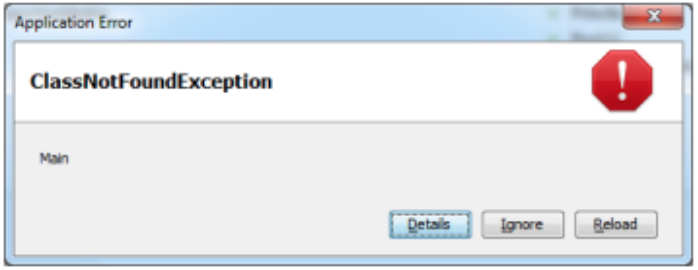
– Use pie chart when comparing different parts of a whole. Pie chart should not be used to show changes over a period of time.



docs.devexpress.com

- If there is a lot of data to display in a report that requires scrolling, apply filters and make use of hierarchies/drill-downs.

Errors - Oops!



https://en.wikipedia.org/wiki/Abort,_Retry,_Fail%3F

Errors - “To err is human”

- Error is a situation when a user working with an interface unexpectedly gets stuck somewhere in response to his or her actions **or *because the application fails***.
- Errors cause frustration to users of an interface.
- Designers generally employ a number of strategies to prevent user errors.
- Users of an interface will run into errors no matter how much effort has been put in by the designers to prevent errors. **But this should not stop designers to try and prevent as many user errors as possible.**

pinterest.com

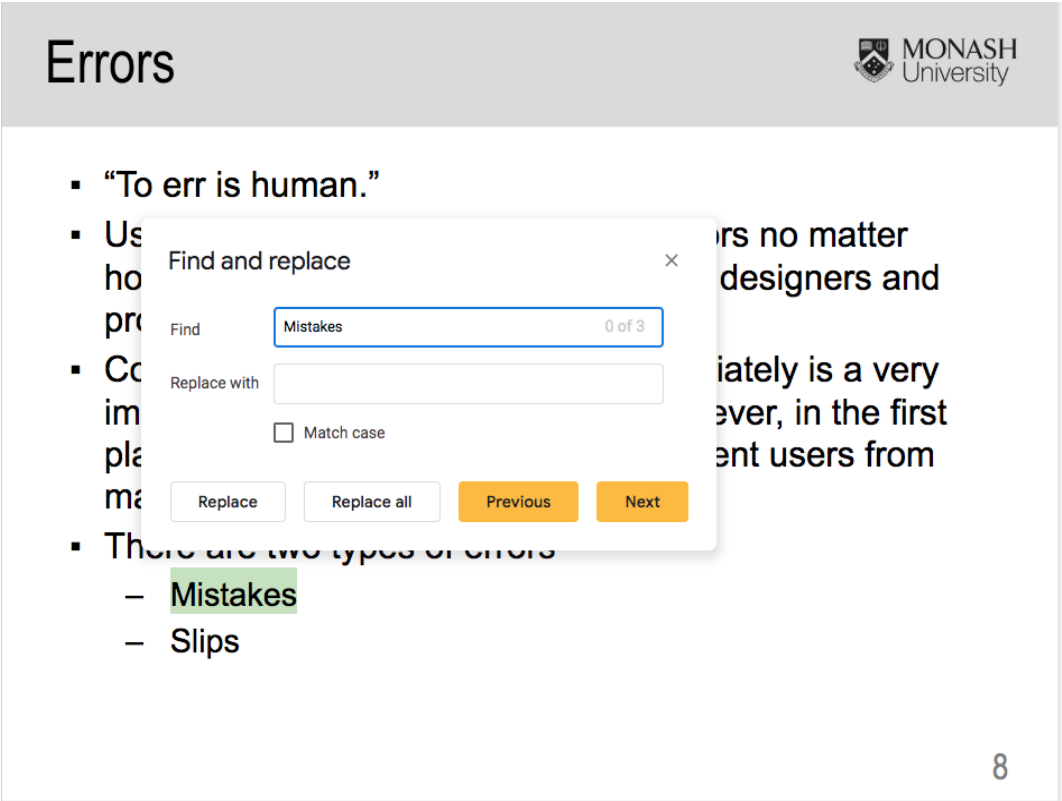
User Errors

- Mistakes:
  - “Errors in choosing an objective or specifying a method of achieving it (Sternberg, 1996).”
  - "A Person establishes an intention to act. If the intention is not appropriate, this is a mistake (Norman, 1986).”

- Slips:
  - “Errors in carrying out an intended method for reaching an objective (Sternberg, 1996).”
  - "If the action is not what was intended, this is a slip (Norman, 1986).”

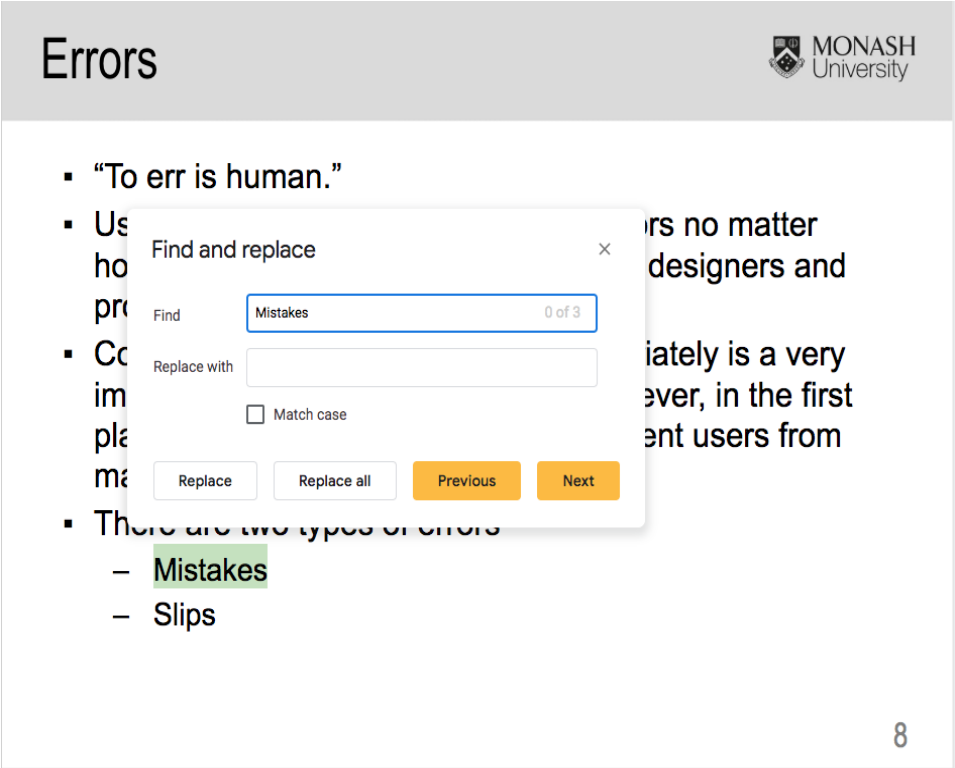
User Errors: Mistakes

For example, for finding the word “Mistake” in a document, the user chooses the wrong option “Find and Replace” when only “Find” option was to be used.



User Errors: Slips

For example, for finding and replacing all the occurrencesof the word “Slips” with a blank in a document, the user chooses the right option “Find and Replace” but types in the wrong word “Mistakes” in the textfield.



Mistake or Slip?

A driver wants to get to a destination safely; however a warning light starts to blink. The driver tries to deal with the warning light and in doing so crashes with a car in front of him.

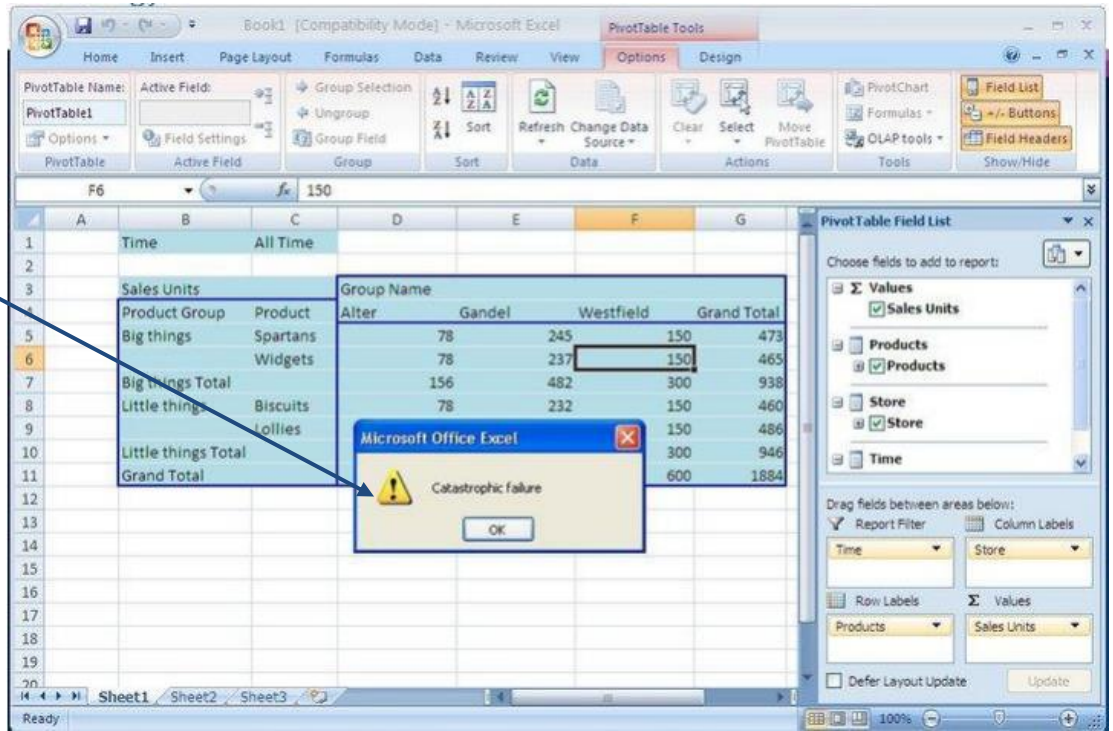
Mistake or Slip?

A driver wants to get to work as as soon as possible but find a traffic jam in the way. The driver decides to go through another route that he/she doesn’t know and gets lost for a while. Ultimately the driver has to go back to the known route and gets to work very late.

Error Messages

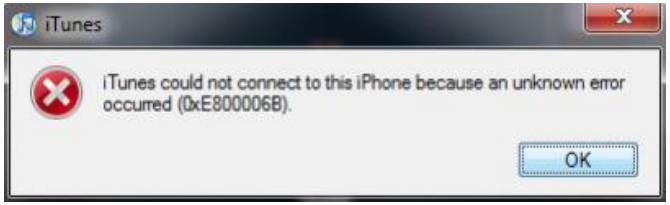
- Error messages occur unexpectedly and can relate to technically complex situations that users may not understand.
- Error messages are an **important part** of interface design but often are the **most neglected part** of the design.

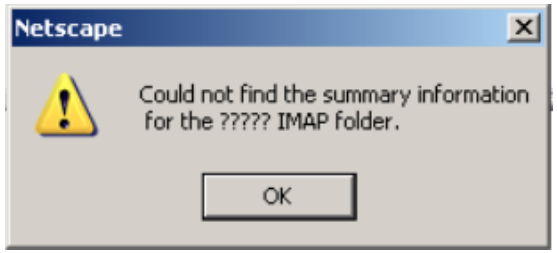
i2picture.com



Error Messages

- Every error message, irrespective of the cause, when encountered frustrates the users and can block them from moving forward in their experience.
- Error messages provided by an interface that are not helpful not only affect user experience and but also reduce productivity.



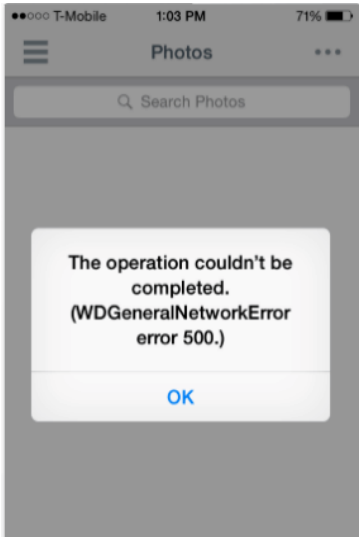


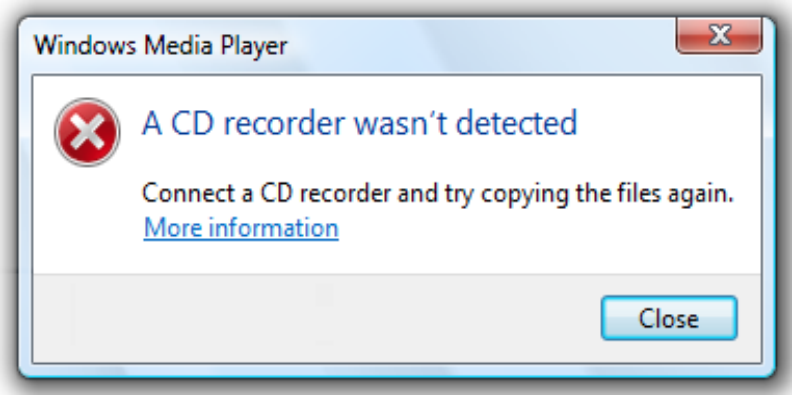
- On the contrary well-designed error messages that provide enough guidance and support to the user (so that they can easily rectify the error) reduce the frustration, thereby, improving the user experience.

Error Messages - Guidelines

- Be as specific and precise as possible.
- Choose user-centred phrasing. State problem, cause, and solution.
- Consider multiple levels of messages.
- Use a positive tone. Be courteous. Avoid condemnation.

X

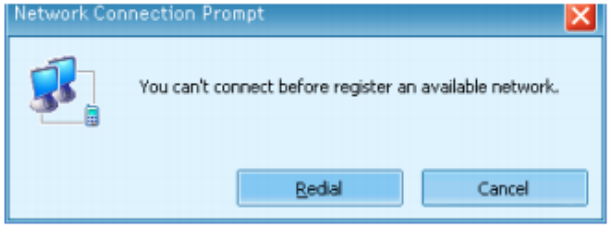




https://usabilla.com/blog/error-messages/

Error Messages - Guidelines

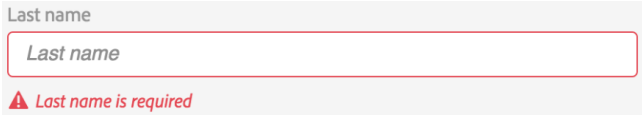
- Maintain consistent grammatical forms, terminology, and abbreviations.



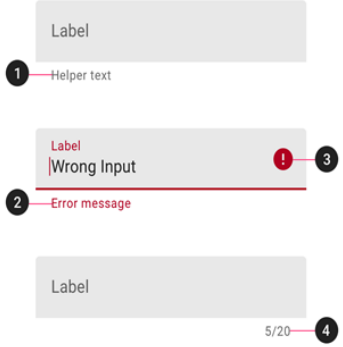
X

- Keep error messages next to fields in forms.

- Use color to differentiate errors from normal field states



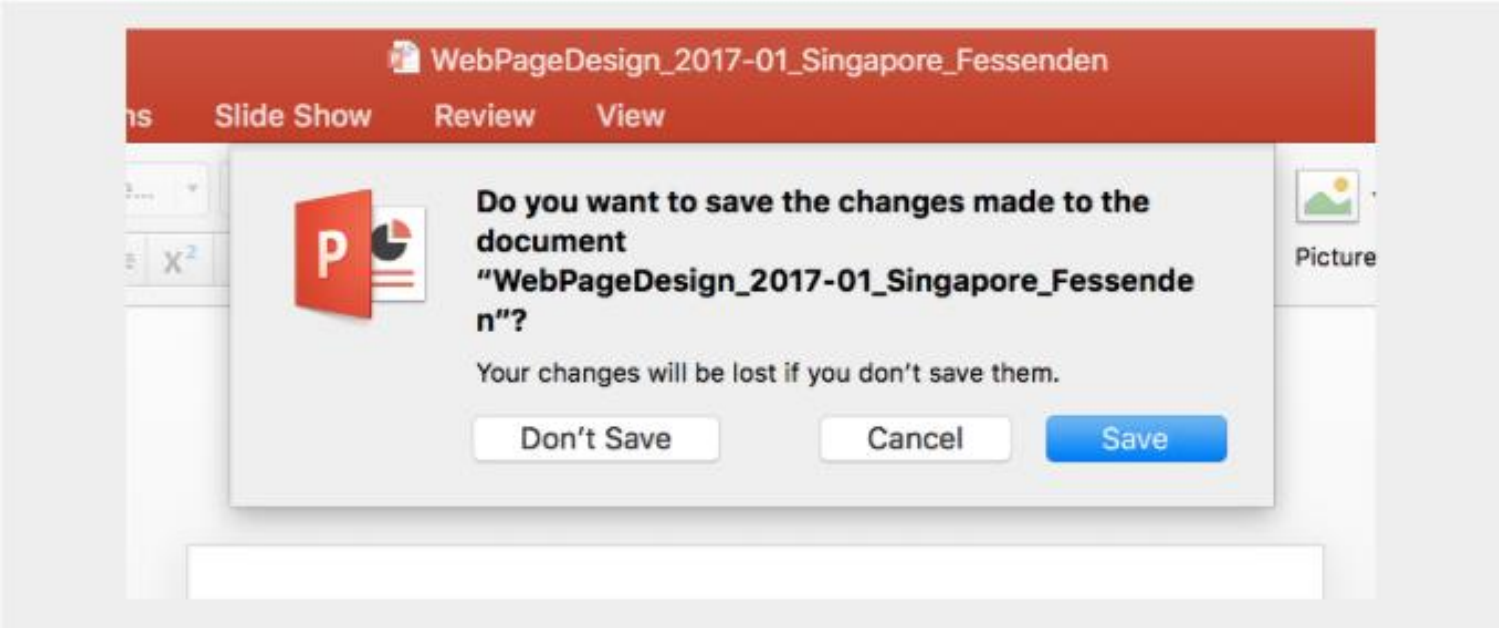
- Add iconography or subtle animation for easy scanning
- Maintain consistent visual format and placement.



Example from Form Design lecture

Error Messages - Guidelines

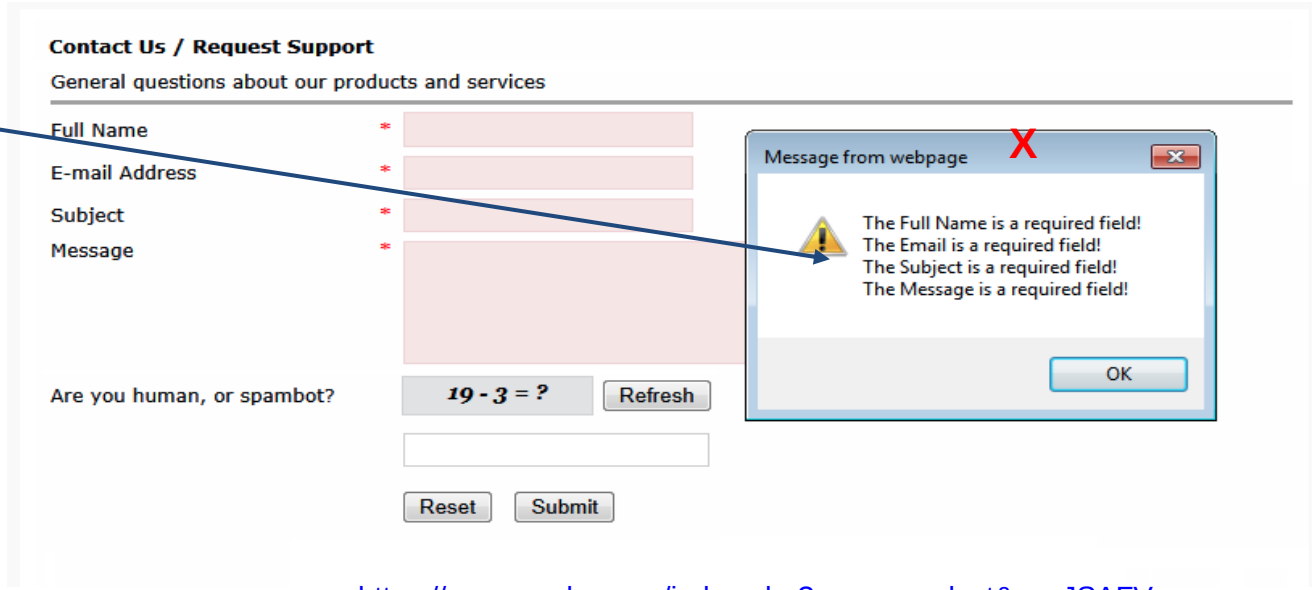
- Use modal dialogs for important warnings to **prevent or correct critical errors**
  - Use modal dialogs **only** when there is a need to draw extra attention to an error that can lead to some irreparable consequences.



Error Messages - Guidelines

– Modal dialog boxes are disruptive as they disable the main content and do not allow the user to continue interacting with the interface until the dialog box is open, thereby, interrupting the user from completing their task.

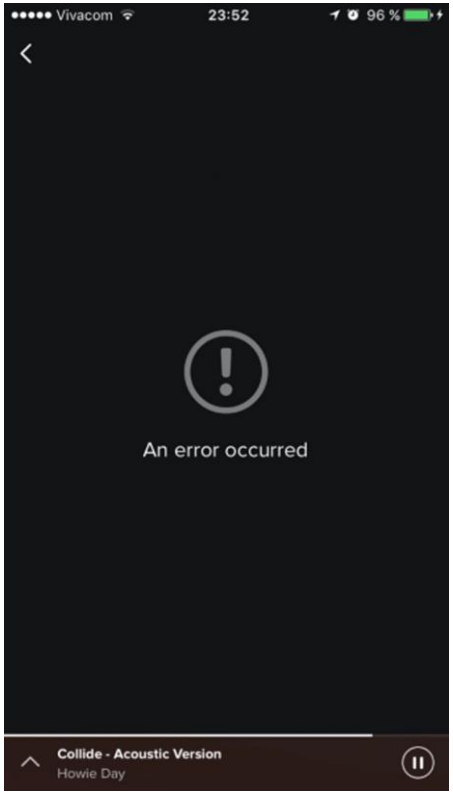
Modal box not very useful here

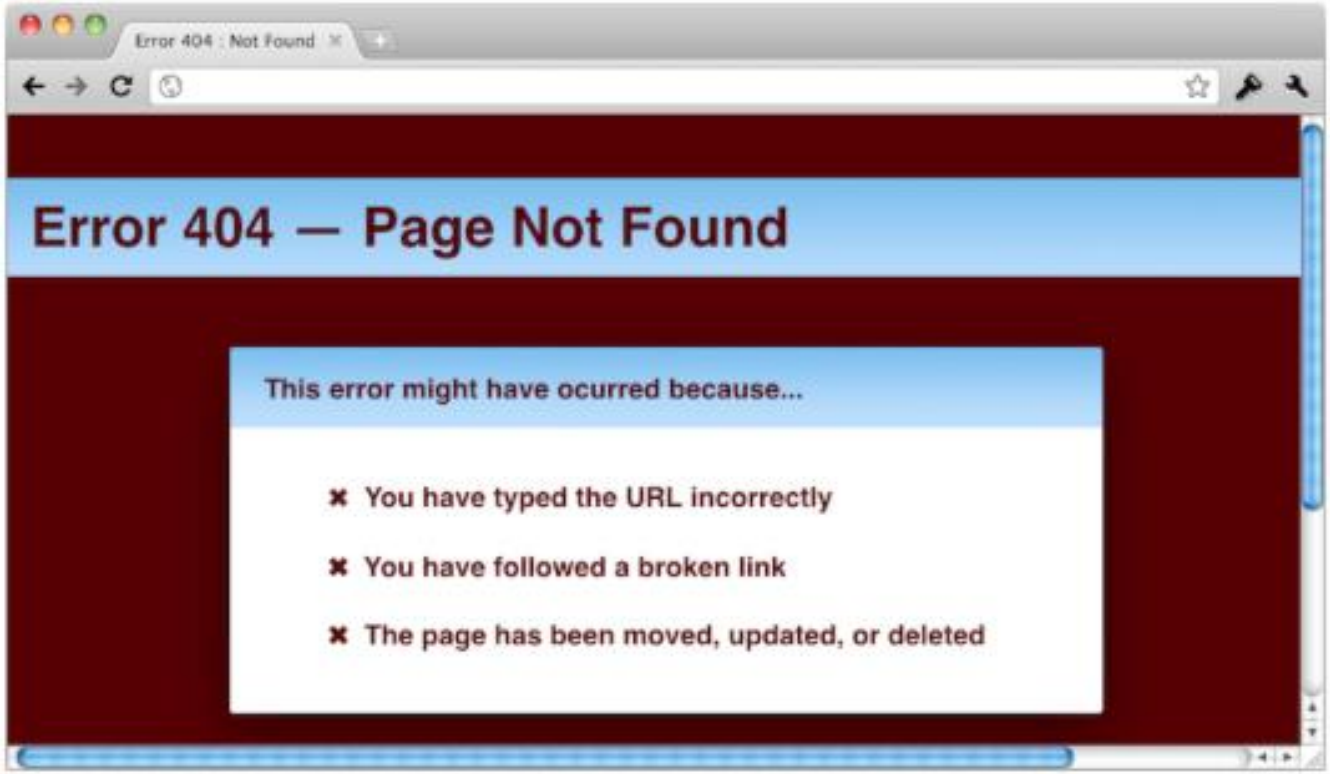


https://www.apphp.com/index.php?page=product&pc=JSAFV

Error Messages - Good or Bad?

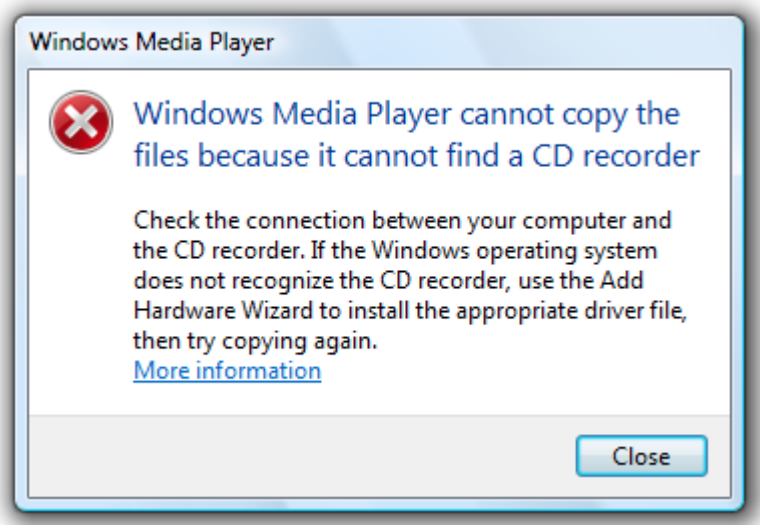
- Let’s check if guidelines have been followed or not in the following error messages

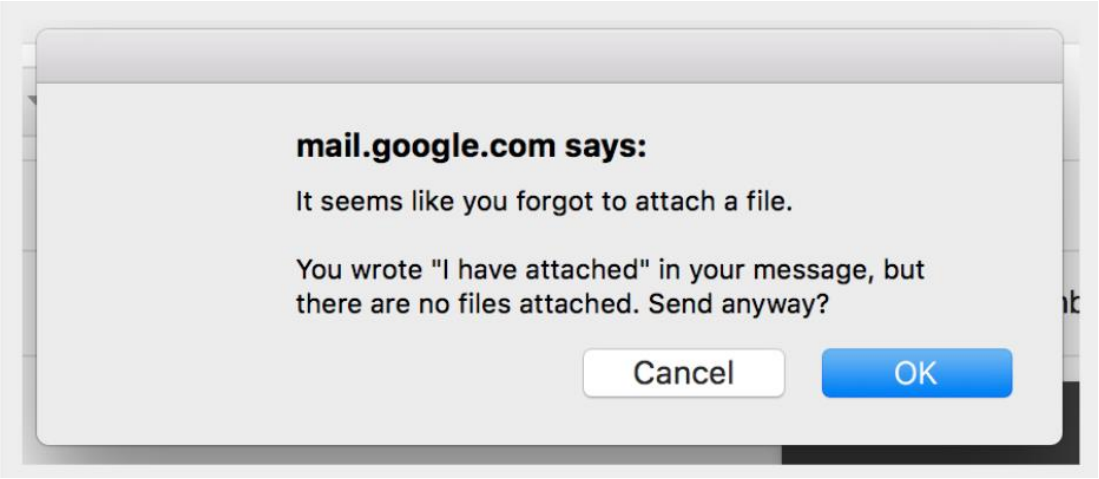


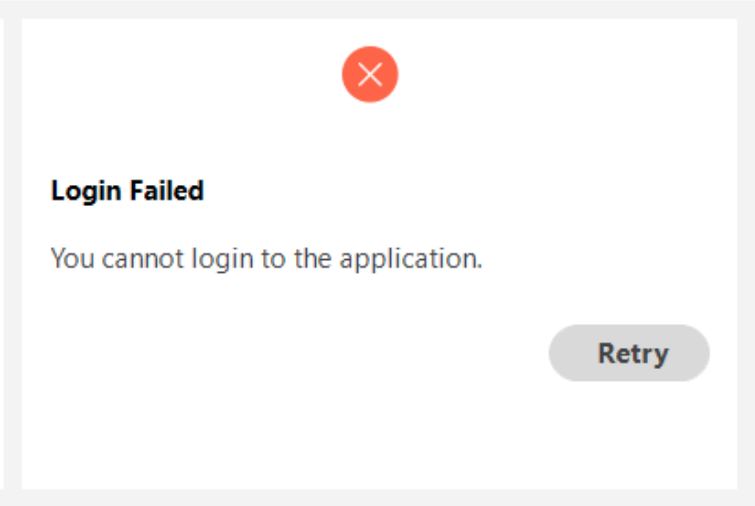


https://www.oreilly.com/library/view/designed-for-use/9781680501902/f_0298.xhtml

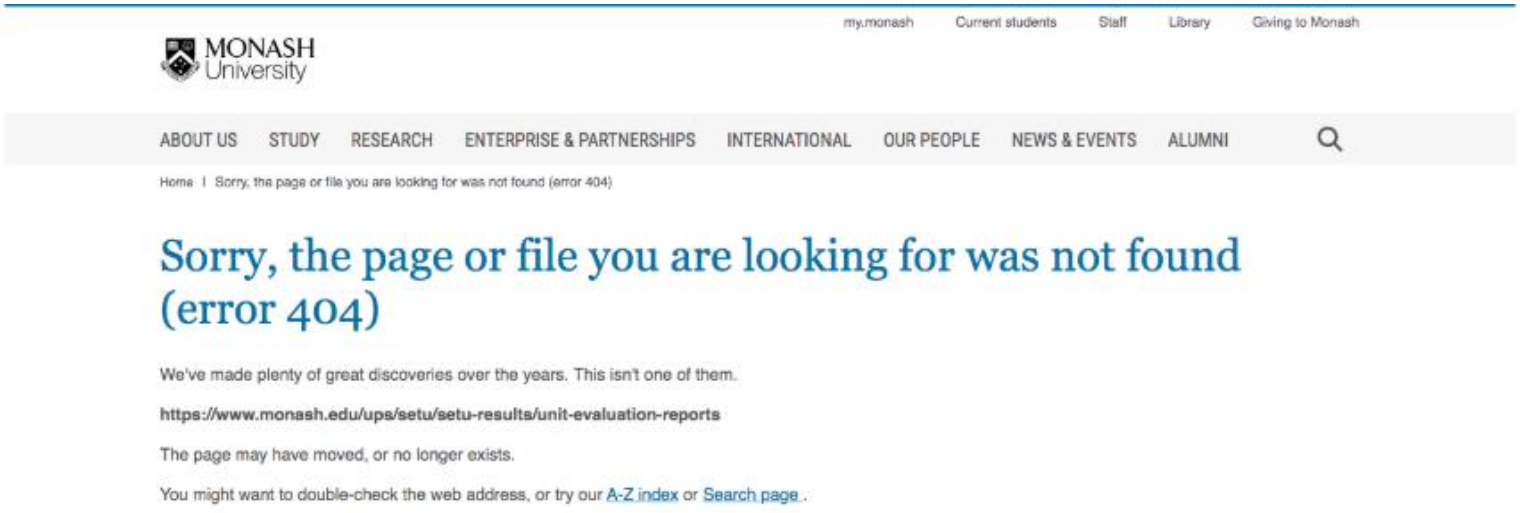
Error Messages - Good or Bad? (Cont'd)

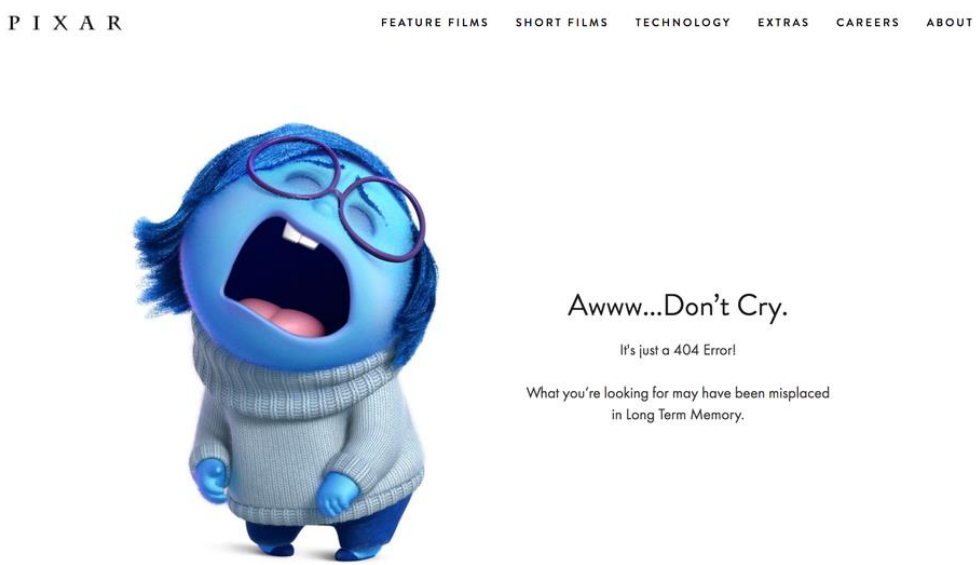


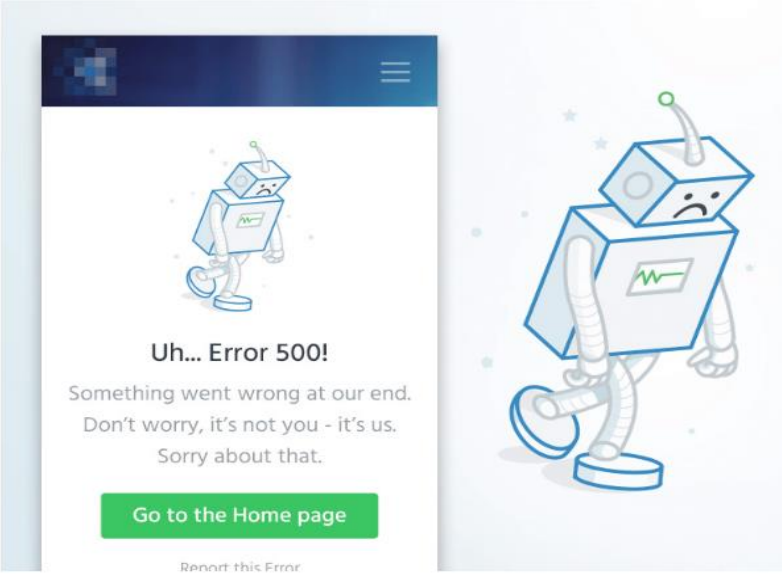




Dealing with 404 Error Message



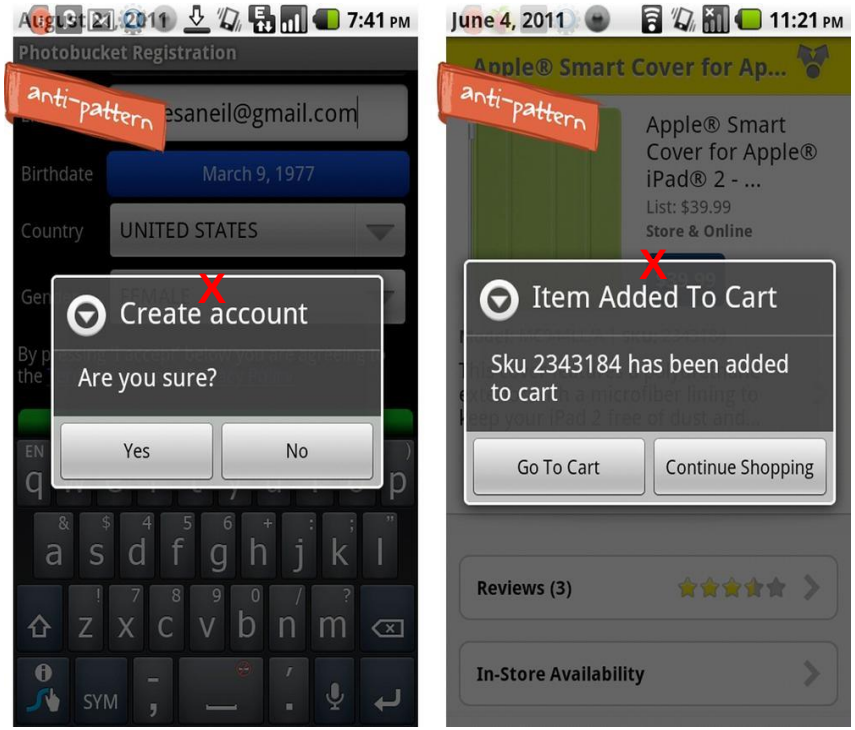




https://www.pagecloud.com/blog/best-404-pages

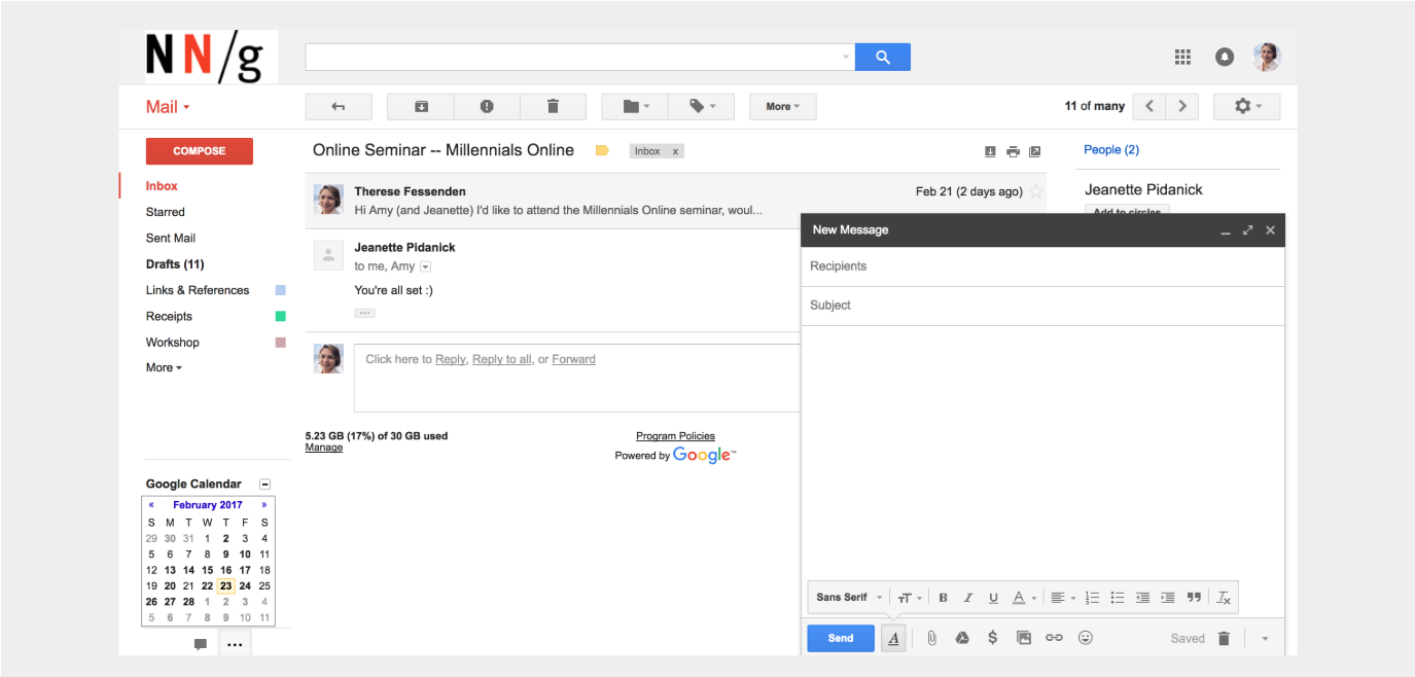
Antipattern - Modal Dialog Box Misused for Messages

Idiot Box: “A person enters a highly productive mental state by working in harmony with her tools....Interrupting a user’s flow for no good reason is stopping the proceedings with idiocy and is one of the most disruptive forms of excise.” (Alan Cooper)



Non-modal Dialog Box

Non-modal dialog boxes, on the contrary, are *less disruptive* than modal dialog boxes as they let users continue interacting with the interface even if the dialog box is open and can be ignored by the user, if they want.



Summary

- There are four types of reports that are provided by an information system.
- Reports should be designed taking into consideration a number of guidelines to make them user-friendly.
- It is important to understand what needs to be conveyed to the user in deciding the visuals
- Effective error messages for users critical for users to be able to complete tasks.
- There are significant costs to an organisation when user information is not effective - poorly designed and written.
- Modal dialog boxes should be avoided *as much as possible* for error messages and user feedback.

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