Understand the Principles of Good Interface and Screen Design

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Outline

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  - What Users Do
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Antarmuka yang baik

- Mencerminkan kemampuan, kebutuhan, dan tugas penggunanya. Dikembangkan dalam batasan fisik yang dipaksakan ditampilkan oleh perangkat keras.

- Memanfaatkan kemampuan perangkat lunak pengendalian secara efektif.

- Mencapai tujuan bisnis dari sistem yang dirancang.

Pertimbangan Manusia dalam Design Interface dan Layar

- **Cara Mencegah Timbul Masalah dari Pengguna**
  Semua gangguan dan putus asa harus dihilangkan dalam desain.

- **Apa yang Pengguna Inginkan**
  Arah yang diinginkan adalah menuju kesederhanaan, kejelasan, dan dimengerti

- **Apa yang Pengguna Lakukan**
  Ketika berinteraksi dengan komputer, pengguna:
  - Mengidentifikasi tugas yang harus dilakukan atau kebutuhan untuk dipenuhi
  - Memutuskan bagaimana tugas akan diselesaikan atau kebutuhan terpenuhi.
  - Komputer Memanipulasi kontrol.
  - Mengumpulkan data yang diperlukan atau konten sementara menyaring data yang bermakna atau konten.
  - Bentuk penilaian menghasilkan keputusan yang relevan dengan tugas atau kebutuhan.

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Interface Design Goals

- Mengurangi pekerjaan visual.
- Mengurangi pekerjaan intelektual.
- Mengurangi kerja memori.
- Mengurangi kerja motor.
- Mengurangi atau menghilangkan beban atau instruksi dikenakan oleh teknologi

The Test for a Good Design

Sebuah tes sederhana untuk desain yang baik

- Apakah semua elemen layar atau halaman web diidentifikasi oleh isyarat lain selain dengan membaca kata-kata yang membuat mereka dapat didefinisikan?

- Interface terbaik membuat semuanya jelas pada layar.

Screen and Web Page Meaning and Purpose

- Semua elemen antarmuka harus memiliki makna untuk pengguna dan melayani tujuan dalam melaksanakan tugas atau memenuhi kebutuhan.

- Jika elemen tidak memiliki arti bagi pengguna, maka disebut kebisingan dalam antarmuka.
  - Kebisingan adalah informasi tidak berguna. Sinyal merupakan informasi yang berguna
  - Kebisingan mengurangi kejelasan layar atau halaman Web
  - Tujuan dalam desain adalah untuk meminimalkan kebisingan dan memaksimalkan sinyal

Starting Point

- Menyediakan titik awal yang jelas di sudut layar yang kiri atas.

- Fokus perhatian pengguna pada bagian yang paling penting dari sebuah layar atau halaman.

  - Menampilkan Tekstual
    Melihat dan menampilkan informasi tekstual, biasanya mata satu langkah pertama ke tengah kiri atas layar, dan kemudian dengan cepat bergerak melalui layar searah jarum jam

  - Menampilkan grafis dan Web
    orang mengambil keuntungan dari detail visual seperti ruang putih atau komponen yang menonjol mencolok dari komponen lainnya.

  - Orang cenderung melihat teks pertama, bukan gambar.
    Jenis lebih besar mendominasi tipe yang lebih kecil.
    Mengubah informasi ditinjau sebelum informasi non-berubah.

Ordering of Data and Content

- Bagilah informasi ke unit yang logis, bermakna, dan masuk akal.

- Diatur oleh derajat keterkaitan antara data atau informasi.

- Memberikan pemesanan unit layar informasi dan unsur-unsur yang diprioritaskan sesuai dengan harapan dan kebutuhan pengguna.

- Beberapa kemungkinan yang termasuk skema pemesanan
  - Konvensional.
  - Urutan digunakan.
  - Frekuensi digunakan.
  - Fungsi.
  - Pentingnya.
  - Umum ke spesifik.

- Bentuk kelompok-kelompok yang mencakup semua kemungkinan.

- Pastikan bahwa informasi yang harus dibandingkan adalah terlihat pada saat yang sama.

- Pastikan bahwa informasi hanya relatif terhadap tugas-tugas pengguna atau kebutuhan disajikan pada layar.

Ordering Web Pages

- Menetapkan tingkatan fungsi sangat penting.
- Tempatkan informasi penting di dekat bagian atas situs Web.
- Tempatkan item penting di bagian atas halaman.
- Mengatur informasi secara jelas.
- Menempatkan item penting secara konsisten.
- Memfasilitasi pemindaian.
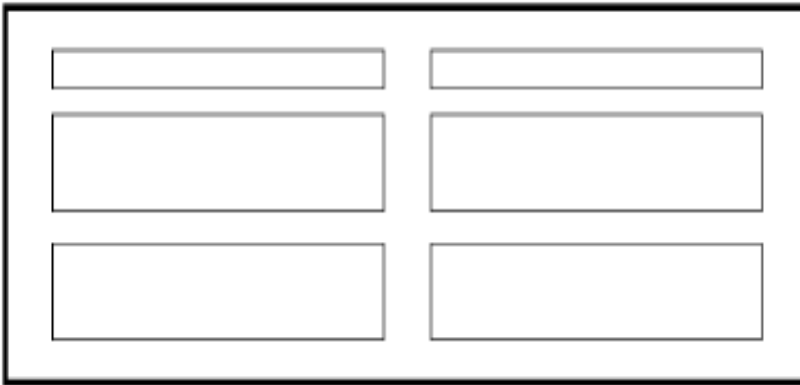- Buat Struktur untuk memudahkan dalam membandingkan.

Navigation and Flow

- Memberikan informasi pemesanan layar dan elemen-elemen yang memiliki irama, mata membimbing seseorang dalam layar. Mendorong urutan gerakan alami. Meminimalkan pointer dan jarak gerakan mata.

- Pencarian, elemen atau kontrol yang paling penting dan paling sering digunakan simpan di bagian kiri atas.

- Mempertahankan aliran, atas-ke-bawah kiri-ke-kanan.

- Membantu dalam navigasi melalui layar oleh Pengelompokan unsur-unsur, atau Menggunakan batasan.

- Melalui fokus dan penekanan, berurutan, perhatian langsung ke item yang
  1. Kritis.
  2. Penting.
  3. Sekunder.
  4. Peripheral.

- Tab melalui jendela di urutan logis dari informasi yang ditampilkan. Perintah locate tombol di akhir urutan pesanan tabbing.

- Ketika kelompok informasi yang terkait harus patah dan ditampilkan pada layar terpisah, memberikan istirahat di titik logis atau daerah di arus informasi.

Visually Pleasing Composition

- Memberikan komposisi visual atau estetika yang memiliki kualitas berikut :
  - Balance
  - Symmetry
  - Regularity
  - Predictability
  - Sequentiality
  - Economy
  - Unity (Kesatuan)
  - Proportion
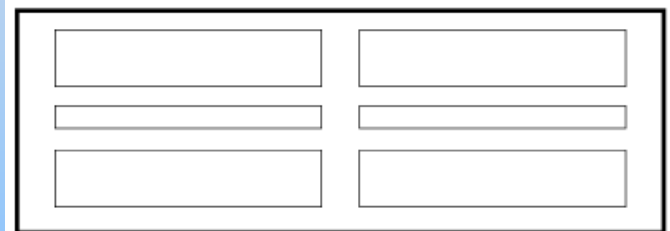 - Simplicity
  - Groupings
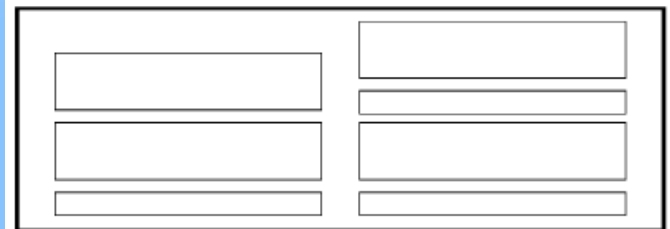
Visually Pleasing Composition (example)
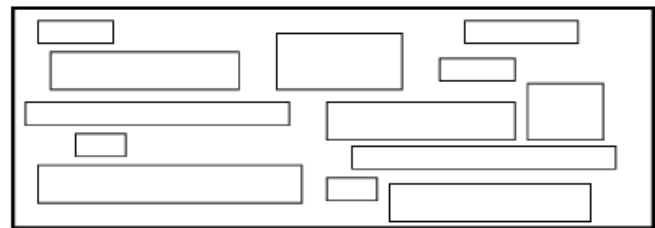
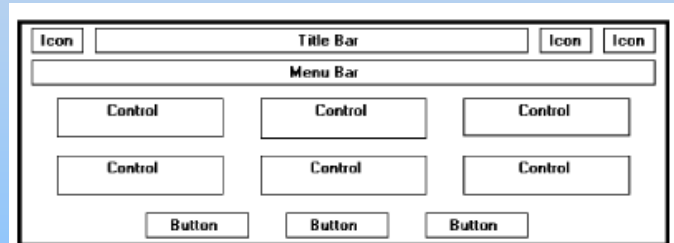

Balance

Instability

Symmetry

Asymmetry
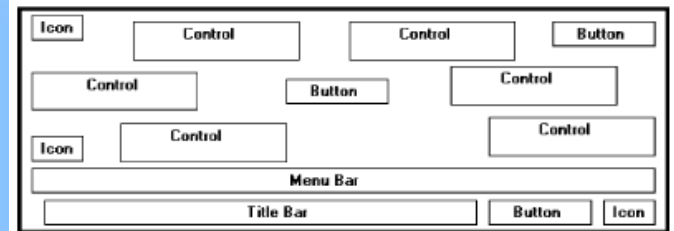
Visually Pleasing Composition (example)

Regularity
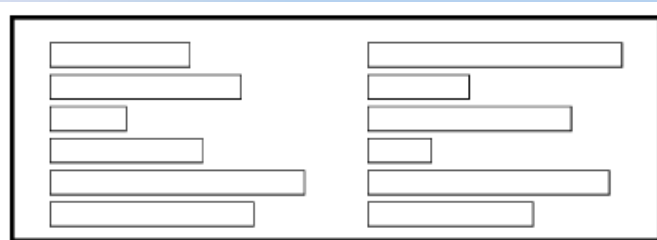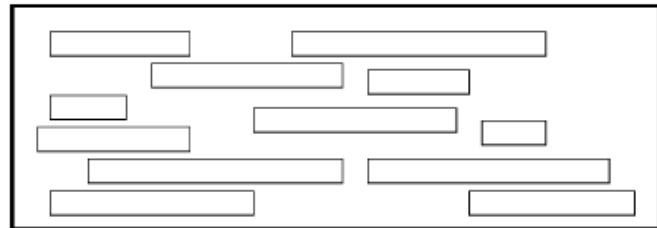

Irregularity
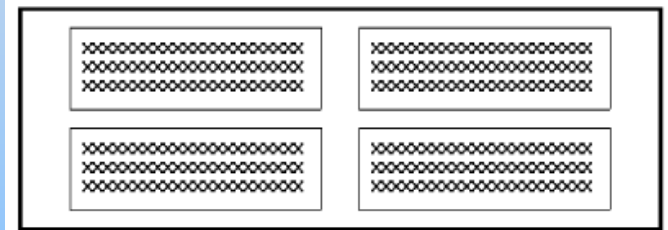

Predictability

Spontaneity

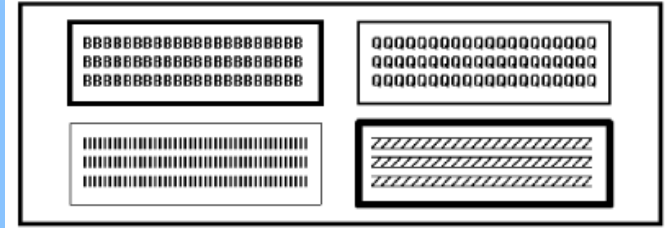# Visually Pleasing Composition (example)
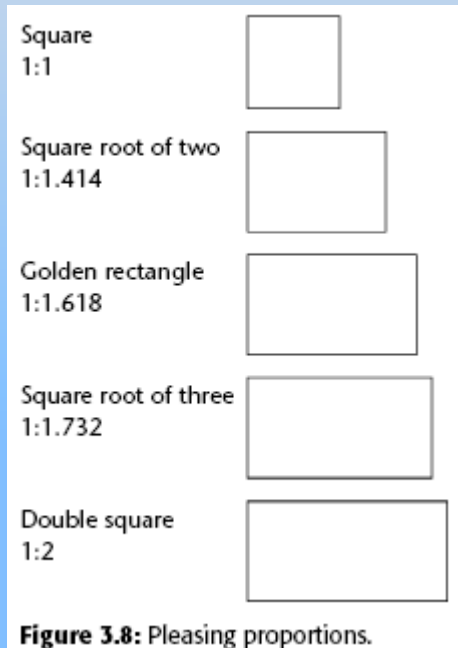

Sequentiality

Randomness

Economy

Intricacy

Visually Pleasing Composition (example)

Unity

Fragmentation

Square
1:1

Square root of two
1:1.414

Golden rectangle
1:1.618

Square root of three
1:1.732

Double square
1:2

Figure 3.8: Pleasing proportions.

Visually Pleasing Composition (example)

Simplicity

Complexity

Figure 3.12: Original screen, from Tullis (1981), with grouping indicated by bold boxes.

Figure 3.13: Redesigned screen, from Tullis (1981), with grouping indicated by bold boxes.

Distinctiveness (Kekhususan)

- Kontrol layar individu, dan kelompok kontrol, harus memiliki perseptual yang berbeda.
- Layar kontrol
  - Sebaiknya tidak menyentuh perbatasan jendela.
  - Sebaiknya tidak saling menyentuh
- Field and group borders
  - Sebaiknya tidak menyentuh perbatasan jendela.
  - Sebaiknya tidak saling menyentuh.
- Buttons
  - Sebaiknya tidak menyentuh perbatasan jendela.
  - Sebaiknya tidak saling menyentuh
- Label Tombol tidak harus menyentuh tombol perbatasan.
- layar elemen berdekatan harus ditampilkan dalam warna atau nuansa kontras yang cukup satu sama lain

Focus and Emphasis (tekanan)

- Visually emphasize components
- To provide emphasis use techniques such as
  - Higher brightness.
  - Reverse polarity or inverse video.
  - Distinctive Typeface.
  - Blinking.
  - Line rulings and surrounding boxes or frames.
  - Color.
  - Larger size.
  - Animation.
  - Positioning.
  - Distinctive or unusual shape.
  - Isolation.
- De-emphasize less important elements.
- To ensure that emphasized screen elements stand out, avoid
- Minimize screen clutter.
- In Web page design
  - Call attention to new or changed content.
  - Ensure that page text is not overwhelmed by page background.

Menyampaikan Tingkat Kedalaman atau Tampilan Tiga-Dimensi

- Gunakan highlighting, shading, dan teknik lain untuk mencapai penampilan tiga-dimensi.
- Selalu berasumsi bahwa sumber cahaya berada di sudut kiri atas layar.
- Tampilan command button di atas bidang layar
- Display screen-based controls on, atau terukir atau diturunkan di bawah, the screen plane.
- Perspektif jangan berlebihan dan hindari
  - Menggunakan perspektif untuk elemen noniteraktif.
  - Memberikan detail terlalu banyak.

Presenting Information Simply and Meaningfully

- Provide legibility.
    - Information is noticeable and distinguishable.
- Provide readability.
    - Information is identifiable, interpretable, and attractive.
- Present information in usable form.
    - Translations, transpositions, and references to documentation should not be required to interpret and understand information.
- Utilize contrasting display features.
    - To attract and call attention to different screen elements.
- Create visual lines.
    - Implicit and explicit, to guide the eye.
- Be consistent.
    - In appearance and procedural usage.

Typography
    - Font Types and Families, Font Size, Font Styles and Weight, Font Case, Defaults, Consistency, Text Backgrounds

Application and Page Size

- ***Scrolling and Paging***
- ***Amount of Information to Present***
  - Present the proper amount of information for the task.
    - Too little is inefficient.
    - Too much is confusing.
  - Present all information necessary for performing an action or making a decision on one screen, whenever possible.
  - People should not have to remember things from one screen to the next.
  - Restrict screen or window density levels to no more than about 30 percent.
- ***Paper versus Screen Reading***
  - Provide a simple facility for printing out a hard copy of documents

Application Screen Elements

- ***Title***
  - **Windows**
    - All windows must have a title located at the top
  - **Web Pages**
    - All Web pages must have titles located in the browser title bar and on the content pages themselves.
    - Browser bar title and page title should be consistent.
    - Titles must be : Descriptive Unique , meaningfully different from other Web pages and Concise.
- ***Captions/Labels***
  - Data Fields
  - Control Caption — Data Field Differentiation
  - Control Caption — Data Field Justification

- ***Headings***
  - Section Headings
  - Subsection or Row Headings
  - Field Group Headings
- ***Special Symbols***
- ***Instructions***
- ***Completion Aids***
  - Required and Optional Data
- ***Lists***
- ***Keying Procedures***
  - Keystrokes
  - Tabbing
  - Manual Tab versus Auto Skip
  - Keying Rules
- ***Data Output***
  - Reports
  - Tables

Application Screen Elements example (1)

First Amount:
Last Amount:
This Amount:
That Amount:
Who Cares Amount:

AMOUNT >>   First:
            Last:
            This:
            That:
        Who Cares:

Figure 3.21: Providing better control caption discrimination. (The redundant word "amount" is incorporated into a heading.)

Division:
Department:
Title:

Figure 3.26

Division:
Department:
Title:

Figure 3.27

Application Screen Elements example (1)

Figure 3.28: Entry screen with captions above single data fields. Captions distinct from data but with poor alignment and organization of fields. Left-to-right orientation and no groupings. Fair readability.

Figure 3.29: Display/read-only inquiry screen maintaining same structure as 3.22. Extremely poor differentiation of captions and data. Crowded look and extremely poor readability.

Figure 3.36: Entry/modification screen with much better alignment and readability than previous screens. Captions crowd data fields, however. Also, has no groupings and does not maintain post office suggested format for City, State, and Zip.

Figure 3.37: Display/read-only screen maintaining same aligned structure as 3.36. Captions not very distinctive and poor readability. Again, it looks very dense and crowded.

Application Screen Elements example (1)

Figure 3.38: Entry/modification screen with the better alignment and readability of 3.36. Caption positioned to left, however, resulting in more distinctive data fields. Still no groupings, though, and does not maintain post office suggested format for City, State, and Zip.

Figure 3.39: Display/read-only screen maintaining same alignment and positioning of captions of 3.38. Captions and data much more distinctive. Still no groupings though, and does not maintain post office suggested format for City, State, and Zip.

Figure 3.42: Entry/modification screen identical to 3.40 except that captions for State and Zip are stacked with City, enhancing distinctiveness and readability of the data fields. The screen also achieves a more compact and balanced look. The recommended style for this kind of entry screen.

Figure 3.43: Display/read-only screen maintaining same alignment, item positioning, and data segmentation as 3.42. Good readability but the lengthy caption City/State/Zip does impinge upon the distinctiveness for the data.

Application Screen Elements example (1)

PERSONNEL

Manager:

Employees:

Payroll:

Figure 3.49

— Alternately, headings may be located within a border surrounding a grouping, justified to the upper-left corner.

┌─ PERSONNEL ─────────────

Manager:

Employees:

Payroll:

Figure 3.50

AUTOMOBILE

Driver   License Number

Figure 3.54

Type for changes only.

Kind:

Model:

Number:

Figure 3.56

— Using a mixed-case font.

Application Screen Elements example (1)

Completion Date: ☐ / ☐ / ☐ (MM/DD/YY)

Frequency: ☐ (D, W, M, Y)

Figure 3.57

Europe's Capital Cities

Amsterdam

Berlin

Brussels

Lisbon

Figure 3.59: A List Heading.

ARRAY LIKE THIS:	NOT LIKE THIS:			
Amsterdam	Amsterdam	Berlin	Brussels	Lisbon
Berlin	London	Madrid	Paris	Vienna
Brussels				
Lisbon				
London				
Madrid				
Paris				
Vienna				

Figure 3.58: List Formats.

Application Screen Elements example (1)

- Report Body
  - Provide clear column headings.
  - Show units of measurement.
  - Use the right fonts.
  - Clearly identify rows.
  - For a body that is too wide:
    - Let users move or resize the columns.
    - Wrap information in a column of cells.
  - Break up pages logically.
- For headers:
  - Minimally include:
    - Print date.
    - What or whom the report is for.
    - Title.
  - Consider including:
    - Report or file parameters.
    - Print or retrieval time.
    - Logo and other organization identity items.
- For footers:
  - Minimally include:
    - Current Page Number.
  - Consider including:
    - Number of pages in report.
    - Print date (if not in the header).
    - Data source (file, database or table name).
    - Report format name.
    - URL or other location information.
    - Legal information.
  - Repeat at the bottom of every page.

Table 3.1: A Table
EUROPEAN UNION NEW MEMBER STATES IN 2004

COUNTRY	CAPITAL	GOVERNMENT	POPULATION	AREA (SQ.MI.)
Czech Republic	Prague	Republic	10,320,000	30,450
Estonia	Tallinn	Republic	1,450,000	17,413
Hungary	Budapest	Republic	9,963,000	35,920
Latvia	Riga	Republic	2,452,000	24,595

Table 3.2: A Table with Wrapped Cells
EUROPEAN UNION NEW MEMBER STATES IN 2004

COUNTRY	CAPITAL	GOVERNMENT	POPULATION	LANGUAGES
Czech Republic	Prague	Republic	10,320,000	Czech, Slovak
Estonia	Tallinn	Republic	1,450,000	Estonian, Russian
Hungary	Budapest	Republic	9,963,000	Hungarian
Latvia	Riga	Republic	2,452,000	Latvian, Russian
Lithuania	Vilnius	Republic	3,639,000	Lithuanian, Russian, Polish

Organization and Structure Guidelines

- *Information Entry and Modification (Conversational) Screens*
  - Grids
- *Text Entry from a Source Document*
  - Dedicated Source Document Screens
- *Display/Read-Only Screens*
  - Organization
  - Data Presentation
  - Data Arrangement
  - Data Justification
  - Data Display

Organization and Structure Guidelines example

~~330302345~~   ~~072179~~   ~~162152~~

338-30-2245   07/21/79   16:21:52

Figure 3.64

- Format common items consistently.
- For data strings of five or more numbers or alphanumeric characters with no natural breaks, display in groups of three or four characters with a blank between each group.

~~K349612094~~   K349 612 094

Figure 3.65

- Right-justify lists of numeric data.

Charge:	~~645,194.00~~		Charge:	645,194.88
Federal Tax:	~~19,235.16~~		Federal Tax:	19,235.16
State Tax:	~~5,204.03~~		State Tax:	5,204.03
Local Tax:	~~1.24~~		Local Tax:	1.24
Total Cost:	~~669,635.31~~		Total Cost:	669,635.31

Figure 3.67

- Left-justify text and alphanumeric formats.

Name:	~~Bill Watters~~	Name:	Bill Watters
Street:	~~612 Hidden Valley~~	Street:	612 Hidden Valley

Figure 3.66

- Create a data "ladder."

Tree:	~~Pine~~	Tree:	Pine
Age:	~~14~~	Age:	14
Number:	~~422,590~~	Number:	422,598
Class:	~~C~~	Class:	C
Location:	~~NW~~	Location:	NW

Figure 3.68

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Statistical Graphics

- Grafik statistik adalah data yang disajikan dalam format grafis.
- Grafik statistik harus memiliki kualitas sebagai berikut:

  Tujuan dan penggunaan grafik harus jelas.
  Jenis grafik harus dikenali.
  Jenis grafik harus membantu pengguna memahami data yang lebih mudah.
  Data harus diformat dan disajikan dengan benar.
  Data harus diformat dan disajikan untuk audiens yang menggunakan.
  Grafik harus menghindari distorsi dengan menceritakan kebenaran tentang data.

- ***Components of a Statistical Graphic :*** axes, scales, an area, a title and a legend or key,
- ***Data Presentation***
- ***Axes***
- ***Scales and Scaling***
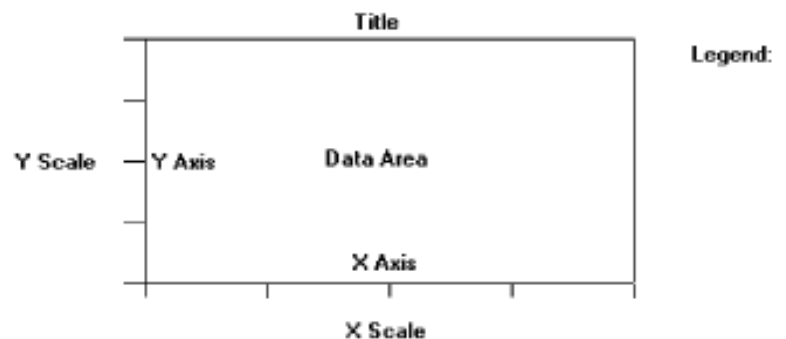- ***Proportion***
- ***Lines***
- ***Labeling***

Figure 3.71: Components of a statistical graphic.

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Types of Statistical Graphics

- **Curve and Line Graphs :** can be used to show relationships between sets of data defined by two continuous variables.
- **Surface Charts :** If the data being depicted by a curve or line represents all the parts of a whole, consider developing a *surface* or *area chart*,
- **Scatterplots :** can be used to show relationships among individual data points in a two-dimensional array.
- **Bar Charts :** can be used to show a few differences between separate entities or to show differences in a variable at a few discrete intervals.
- **Segmented or Stacked Bars :** If both the total measure of a value and its component portions are of interest, consider using *segmented* or *stacked bars*.
- **Pie Charts :** can be used to show an apportionment of a total into its component parts

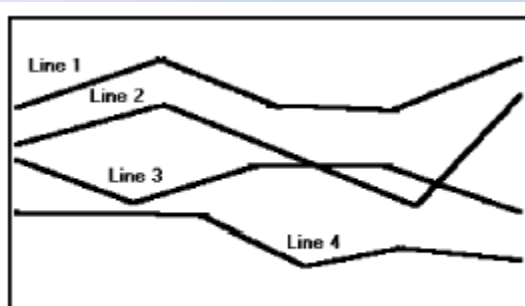# Types of Statistical Graphics example (1)
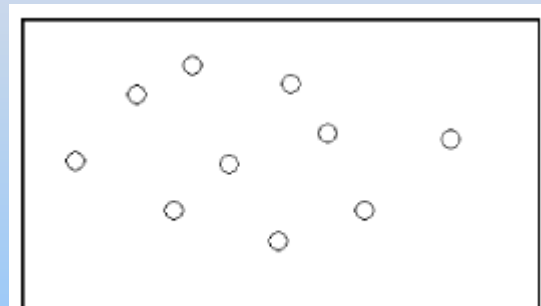

Figure 3.76: A line graph.
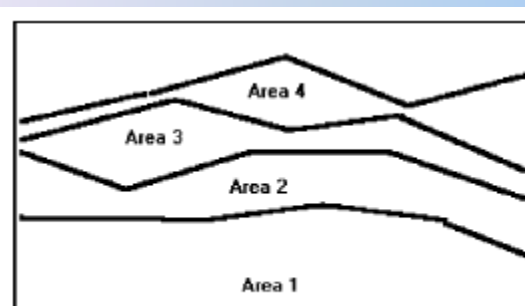

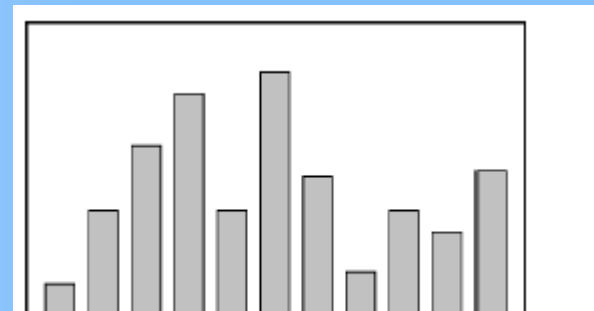Figure 3.78: A scatterplot.

Figure 3.77: A surface chart.

Figure 3.79: A bar chart with a common origin point.
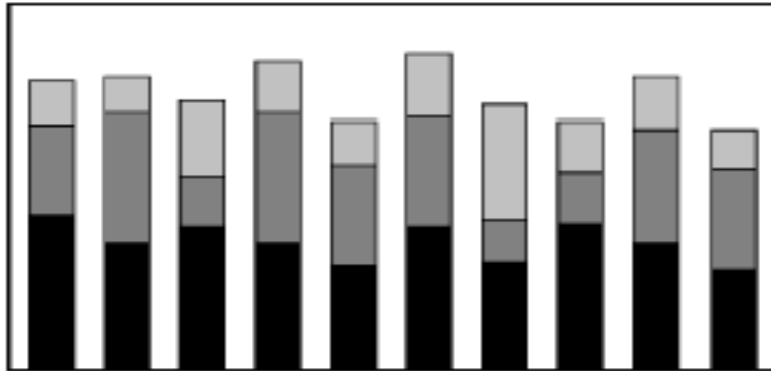
Types of Statistical Graphics example (1)

Figure 3.82: A segmented, or stacked, bar graph.

Figure 3.83: A pie chart.

Table 3.4: Tasks and Best Types of Graphs

	PROPORTION			
	WITH SCALE	WITHOUT SCALE	COMPARISON	CHANGE
Best	Line Graphs	Segmented Bars	Bar Graphs	Line Graphs
	Bar Graphs	Pie Charts	Segmented Bars	Bar Graphs
	Segmented Bars			
	Pie Charts			
Poorest	–	Bar Graphs	Pie Charts	Segmented Bars
	Line Graphs	Pie Charts		

Source: Hollands and Spence (1992) and Simkin and Hastie (1987).

Technological Considerations in Interface Design

- **Graphical Systems**
  - Screen design must be compatible with the capabilities of the system, including
    - System power.
    - Screen size.
    - Screen resolution.
    - Display colors.
    - Other display features.
  - Screen design must be compatible with the capabilities of the
    - System platform being used.
    - Development and implementation tools being used.
    - Platform style guide being used.
- *System Power*
- *Screen Size*
- *Screen Resolution*
- *Colors*
- *Other Display Features*
- *Platform Compatibility*
- *Development and Implementation Tool Compatibility*
- *Style Guide Compatibility*