

Techniques for visual UI-design

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Based on *Designing Visual Interfaces: Communication Oriented Techniques*, by Kevin Mullet and Darrell Sano (Sun Microsystems, 1995)

Software is released with lousy visual design

Professional graphical designers cannot work on every little dialogue in a system

Solution: Some simple techniques everybody can learn to avoid the worst mistakes

A visual language refers to visual properties (form, size, position, orientation, colour, texture...)

of a composition of design elements (point, line, plan, body...)

and of their relations (balance, rhythm, structure, proportion...)

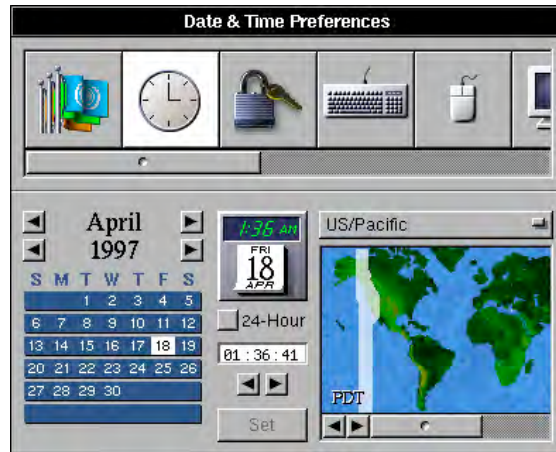
Elegance and simplicity

Eligere: to carefully select

A design is elegant when it displays an immediately obvious success of a novel approach that solves a problem completely yet in a highly economical way.

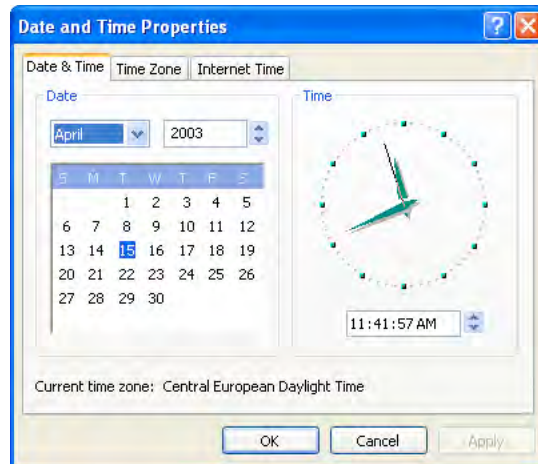
Understand of core of the problem and express it

A cluttered display



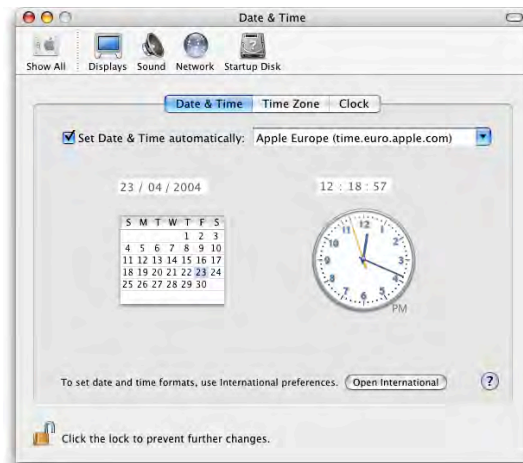
Setting the time in Openstep.

Less cluttered display



Setting the time in Windows XP Pro

Reduced display



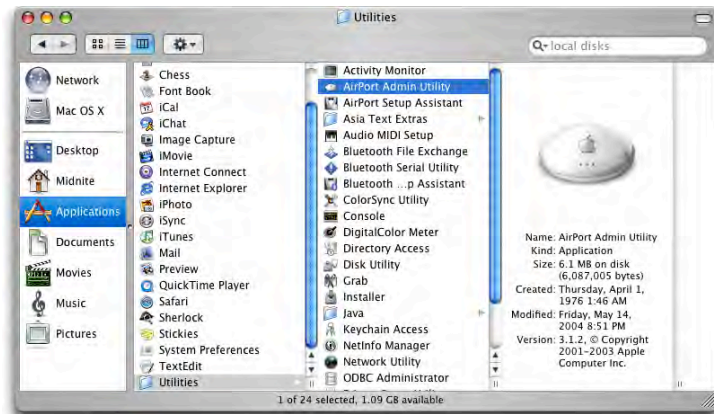
Setting the time in Mac OS 10.3

Reduction

You can amplify the message by removing things that are not necessary.

1. Decide what the essential qualities that the design should convey (typically a short list of adjectives) along with fixed formal elements such as names/labels, an essential control, or a colour, texture, pattern or image.
2. Critically examine every element and ask yourself why it is necessary, and how it contributes to the essential qualities, and how the design would suffer if you removed it. Remove it if you cannot answer one of these questions.
3. Experiment by removing an element anyway. What happens? If the design fails instrumentally, aesthetically, or communicatively you should put it back. Otherwise, consider removing it from the final solution.

Regularized display



The Finder in Mac OS 10.3

Regularization

Patterns simplify a design. The eye is drawn to irregularities. Use that to mark things out.

1. Use regular geometric forms, simplified contours, and calm colours wherever possible.
2. If several similar forms are needed, make them identical, if possible, in size, shape, colour, texture, line weight, orientation, alignment, or spacing.
3. Limit variation in typography to a few sizes from one or two families.
4. Make sure critical elements intended to stand out are not regularized.

Display with redundant element



Media Player 9 i Longhorn 4015

Leveraged display



The ELIN system on a smartphone

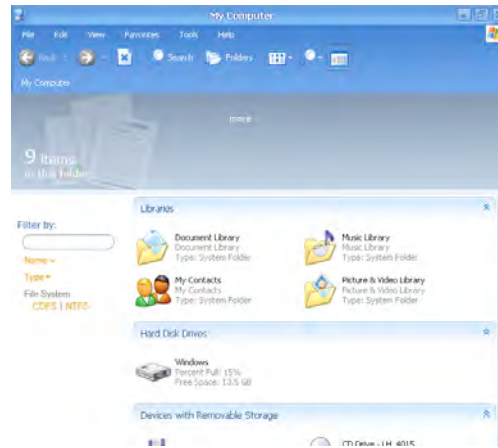
Leverage

Remove all redundancy that is not necessary.

1. Analyze the functional role of every elements (comes naturally if you have done a reduction).
2. Look for situations where several elements play (or partly play) the same role.
3. Question if the role of the element also can be filled by an adjacent component, possibly after minor modifications.
4. Combine redundant elements to a single simpler unit or replace them with a common higher-level idiom from the user's task-domain.

Be careful not to introduce a solution that demands "knowledge in the head." An example of that are the multiple functions and modes of operation controlled by pushing a tiny button on a digital watch.

Imbalance and many contrasts



File manager in Longhorn 4015

Scale, contrast and proportion

A clear, harmonic, active and balanced composition is equally dependent on the relations between design elements as on the elements in themselves.

The Squint Test

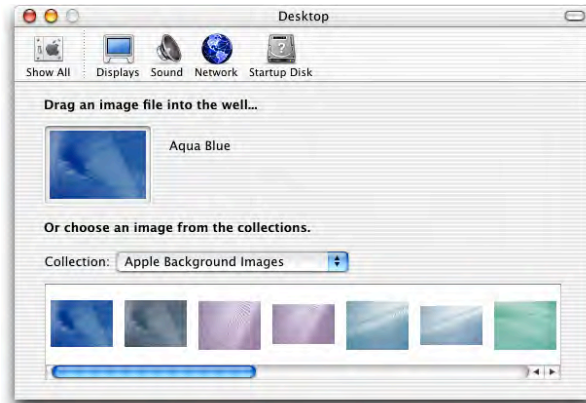
Is used to identify perceptual organisation and coding effects.

Close one eye and squint with the other eye to reduce focus and light

Look at the screen as a whole and identify features of interest

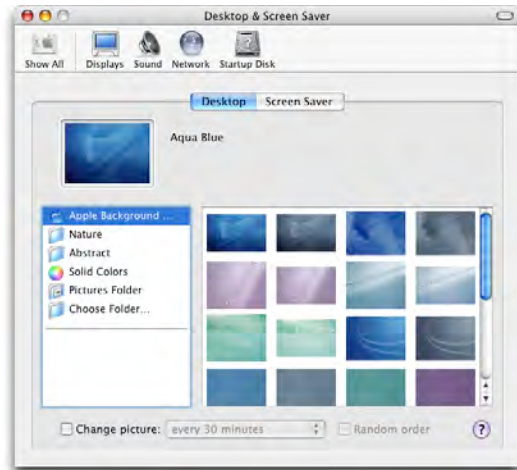
What you now see is what will be seen at a glance in the finished display

Imbalanced display



Changing background in Mac OS 10.1

Balanced display



Changing background in Mac OS 10.3

Display with clear layers/groups



Choosing fonts on Mac OS 10.3

Layering

Scale and contrast can partition a display in regions or layers that can be processed selectively or in sequence

1. Group every item of information in 5 – 10 categories. A category must be established for any group of items that need to be processed independently. Each item must be assigned to at least one group.
2. Determine the rank or importance of the categories and organize the to an even smaller number of categories (3 – 5) based on this ranking
3. Use appropriate perceptual variables (size, value, hue, orientation, texture, form, position) to create layers. Size and value can establish clear hierarchies, while hue is most effective for creating non-hierarchical grouping.
4. Maximize the perceptual difference between groups and minimize the difference within groups.
5. Use the squint test to ensure that elements within a layer group works as a unit while the group is visually separable from the rest of the display.

Sharpened



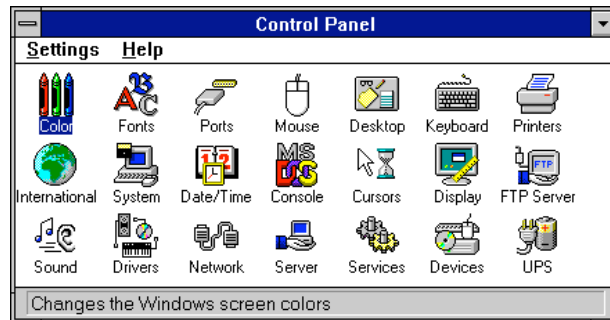
Instructions for troubleshooting a Xerox machine.

Sharpening

Sharpening ensures that there is enough contrast to communicate or achieve an aesthetical effect

1. Identify the rankings across information groups (see Layering)
2. Determine the maximum range of variations (e.g., maximum and minimum for values or size, number of colours, etc.) and use as much as possible of that.
3. Use logarithmic rather than linear scaling across the visible range to ensure discriminability of contrasts at large absolute magnitudes. Doubling each successive level is usually sufficient.
4. Use the squint test to ensure that at least the two or three most important groupings are easily recognized at a glance. The most important information should draw the eye.

Poor integration of figure/ground



The Control panel in Windows NT 3.51

Integration

A primary form element (the figure) must be fitted to its surroundings (the ground). The figure and the ground should be approximately equal in visual weight. This is one of the most difficult tasks in visual UI-design.

Better integration of figure/ground

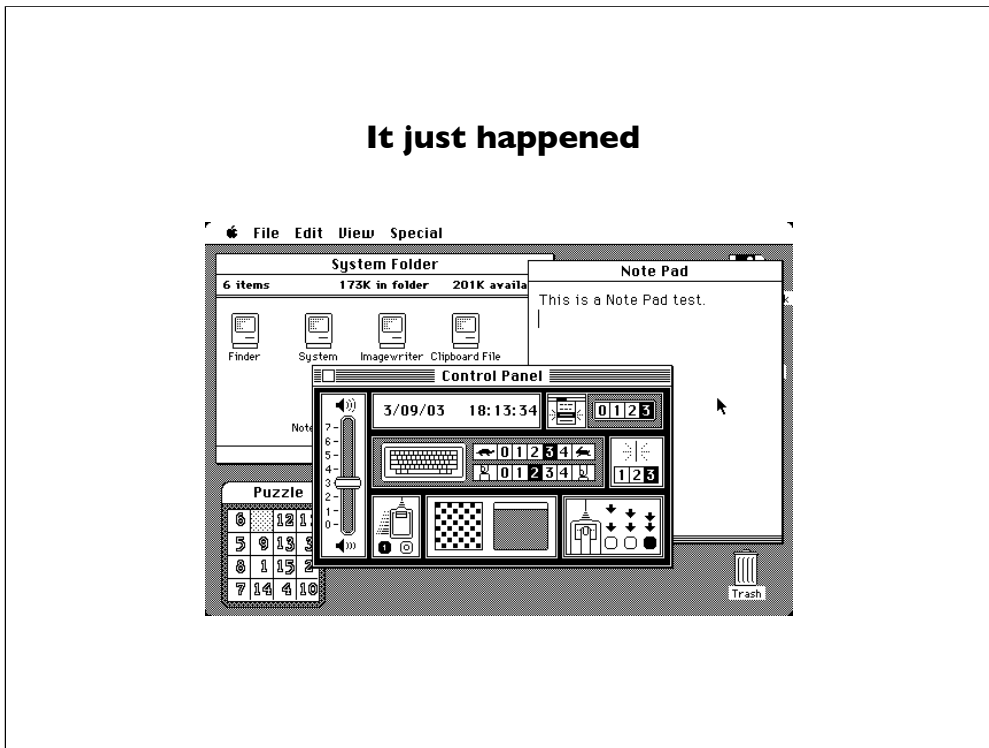


The Control Panel in Windows 95

Integration

1. Determine the overall size of the figure/ground combination. A design usually require readjustment internally if the overall size is changed since critical internal relationships are disrupted.
2. Equalize the visual weight of figure and ground. Use the squint test to ensure that neither the positive nor the negative space dominate
3. Provide enough space around the margins of the figure to eliminate unwarranted visual tension. This is difficult in GUI-design since the screen real estate is a precious resource.
4. Position the figure correctly within the ground. Usually centred if you do not want to communicate something particular. Use the squint test to ensure that the figure still appears to be centred.

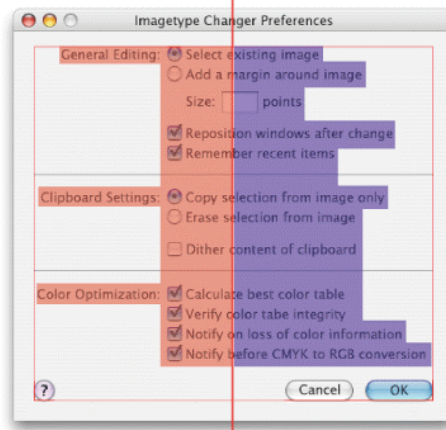
It just happened



The Control Panel in System 1.1

Organisation and visual structure provides the user with visual pathways to experience the product in a systematic way. It guides the interaction. To get it right you need sound interaction analysis, task analysis and information architecture.

Symmetrical display

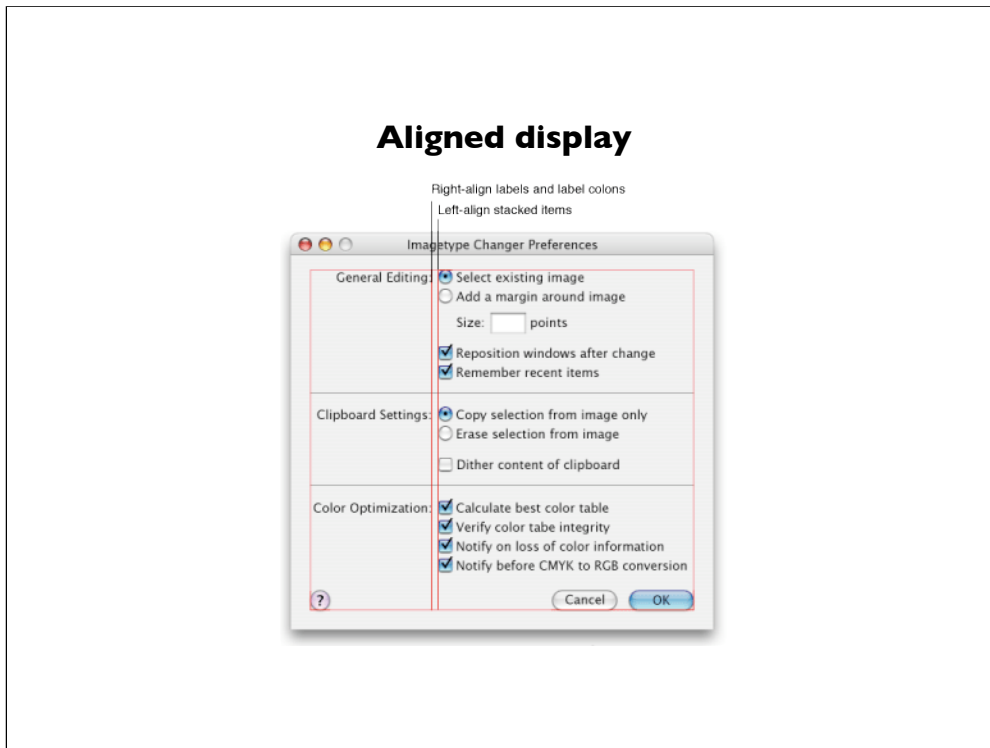


Example from Apple Human Interface Guidelines

Symmetry is used to achieve balance.

1. Identify the axis around which the symmetry will be built. In GUI-design, this tends to be either a horizontal or vertical symmetry.
2. Symmetry around the vertical axis is more prominent in human perception and usually more usable in visual displays.
3. Centre the information on the axis by carefully balancing the amount of information on either side. The sides do not need to be mirrored, but the mass and extent should be equalized.
4. Make sure the axis of symmetry is centred in the overarching context. Use the squint test to verify the result.

Aligned display



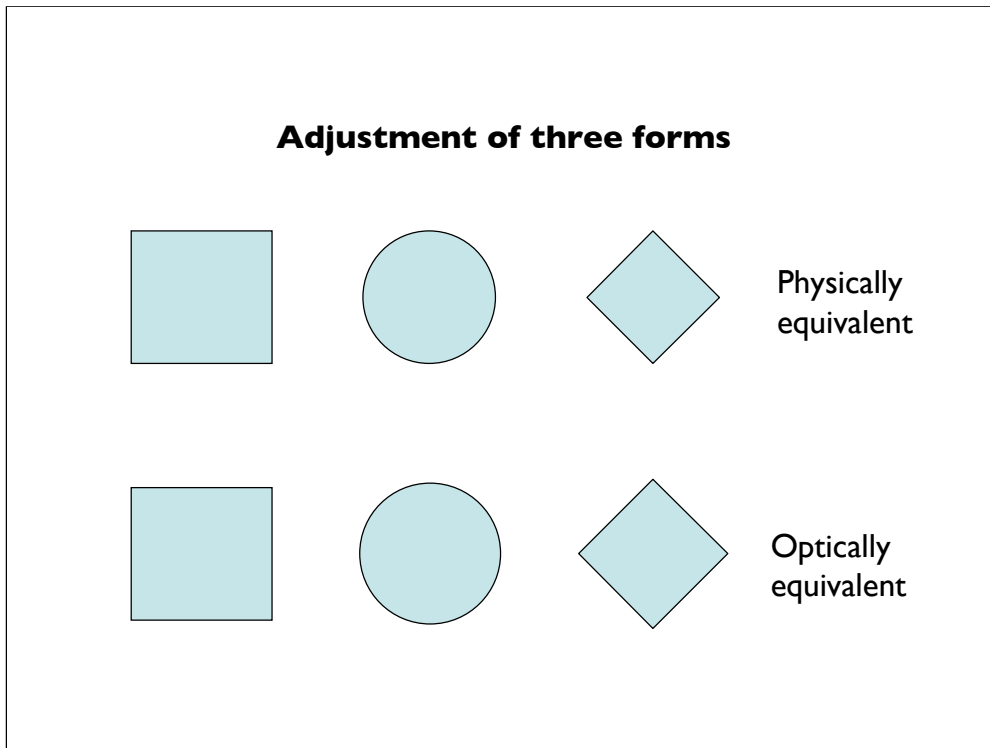
Example from Apple Human Interface Guidelines

Alignment

Effective design builds on a meaningful overarching structure.

Alignment of elements makes conscious deviations more salient.

1. Identify boundaries in the existing layout and enhance them by moving additional elements into alignment with them.
2. Identify element and margins, both internally and externally, that almost, but not quite, are aligned to one another and bring them into alignment by altering their size or position.
3. Identify free-standing elements and make sure they are aligned with something else in the display: either a major margin or some other element to which they are related.
4. If an element cannot be related to any other element on in the display, try to relate it to the proportions of the display itself by positioning the element to correspond to a regular division of the space.

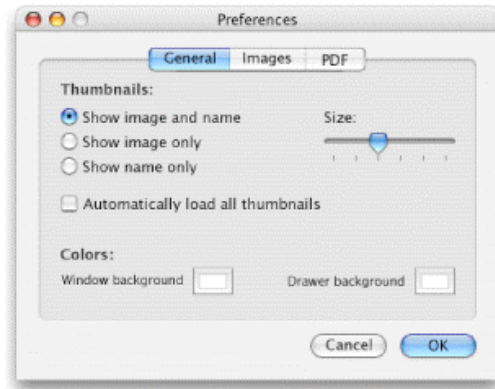


Optical adjustment

Optical effects often makes automatic alignment, spacing and scaling very difficult. Therefore ocular examination is necessary.

1. Determine the true point of alignment, dimension of extent, or unit of spacing required. Translate this into the what it would look like if a rectangular element occupied the same space.
2. Extend elements beyond the margins. The greater the acuteness of angle, the farther it will need to extend beyond the "normal " margin.
3. Use a close-up version of the squint test encompassing only the elements in question to verify alignment with the intended margin.

Good use of negative space

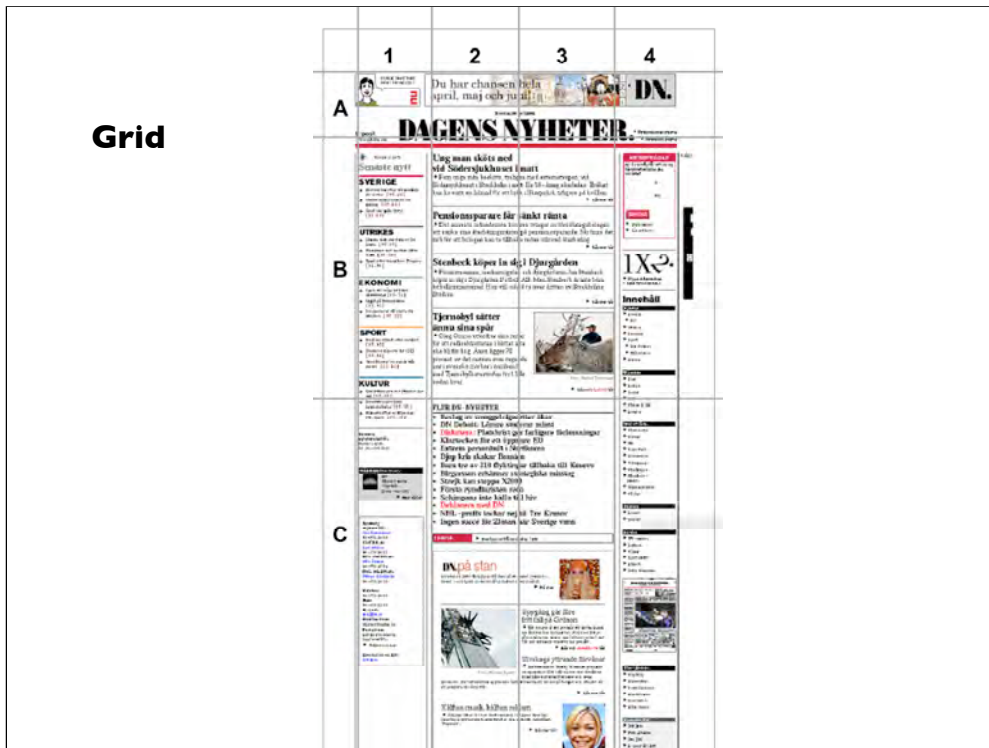


Example from Apple Human Interface Guidelines

Negative space

White space is needed for integration of figure and ground, but also for composing how the eye should be drawn to the clues needed to find interesting information.

1. Review the organization of the information into a prioritized set of chunks of manageable size, re-use the work made in Layering.
2. Ensure spatial separation of independent units of information by adding extra white space between chunks. Extra space is needed even if explicit boundary delimiters are used.
3. Determine which elements that require additional visual emphasis. (These often include individual elements that work as labels for larger, less important chunks)
4. Increase the white space surrounding critical elements by moving them into the margins, by moving other elements away from them.
5. Remember that white space is not wasted space! Its function is to direct the viewer's attention to adjacent regions containing critical information.



Grid

The grid of www.dn.se

Grids are invaluable for creating large-scale information systems that encompass multiple products. They help regularizing the design and making the product range consistent and readable with better aesthetics as a side-effect.

1. Determine any size restrictions on the area to be laid out.
2. Determine the basic vertical and horizontal modules. The vertical module is determined by the widget set, while the horizontal is determined by the number of controls (and the length of labels). These parameters (row height, column width, and number of columns) define the canonical grid.
3. Develop a rough layout sketch that approximates the sizes, positions and orientations of the relevant control elements.
4. Use the canonical grid to adjust the sizes and positions of elements. Short elements are extended to fit and long elements are allowed to span multiple columns or are shortened to fit.
5. For dynamic layouts, identifying the minimum size that can be accommodated by the layout is usually a better solution than trying to re-compute the layout for arbitrarily small display sizes.

Final words

- Everybody can re-consider their design and apply a few simple tools for thought that make the visual communication work better.