Dashboards, v. 1.2

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Overview

Fortune 1000 and other large companies will use Planet Metrics' SaaS to monitor their carbon footprint. The product will organize massive amounts of client's data so executives can track their emissions in terms of the whole enterprise, various divisions, brands, products, suppliers, raw materials, geographic territories, etc.

Clients will range from auto manufacturers to airlines to cosmetics retailers

Those executives will need to digest large amounts of high-level data at a glance and be able to drill down to get as much detail as they might want. While there will be default settings for everything, users must be able to customize the presentation to suit their own particular needs and interests.

Scope

This design addresses only the dashboards that client executives will use for their high-level analysis. The design for the rest of the product is described elsewhere.

Treemaps & sparklines

The two key elements of this design are treemaps and sparklines, both of which are highly-efficient means of summarizing lots of data visually.

Various software products on the market are available to convert data into these forms. Planet Metrics is currently reviewing those products to pick the most suitable choices.

Intro to treemaps

A treemap is a powerful tool for helping executives make informed decisions in the face of complexity. It is an information-rich, highly visual way of summarizing massive amounts of data at a glance and enabling you to drill down as far as you want to go into the details.

Decision tool for professionals
At first, a treemap looks like a meaningless abstract painting, just a bunch of colored rectangles. But it is not meant for one-time casual visitors; it is designed for professionals who will come back to it frequently. The few seconds it takes them to learn the meanings of those colored rectangles pay off handsomely in their long-term ability to get a quick overview of mountains of data and instantly spot patterns, problems, and opportunities.

How they work
We'll use Smart Money's Map of the Market (www.smartmoney.com/map-of-the-market/) as an example, at right.

Background
Treemaps, also called heatmaps, are the brainchild of Ben Schneiderman of the University of Maryland. There is a wide assortment of applications of the basic idea. See http://www.b-eye-network.com/view/2673

One of the best is Smart Money's Map of the Market.

Smart Money's Map of the Market shows today's performance of hundreds of stocks. It divides the stock market up into several big sectors: Health Care, Financial, Technology, etc. Each segment is represented as a large rectangle bordered by a thick gray line. The size of the rectangle represents that sector's size in the stock market as a whole.

Color key. The brighter the green, the better the stock price's performance today. The brighter the red, the worse the performance. The predominance of blacks (0% change) and dark reds on today's treemap indicate a lackluster day for the market as a whole. But it was a bad day for the Energy sector and a good day for the Transport sector.
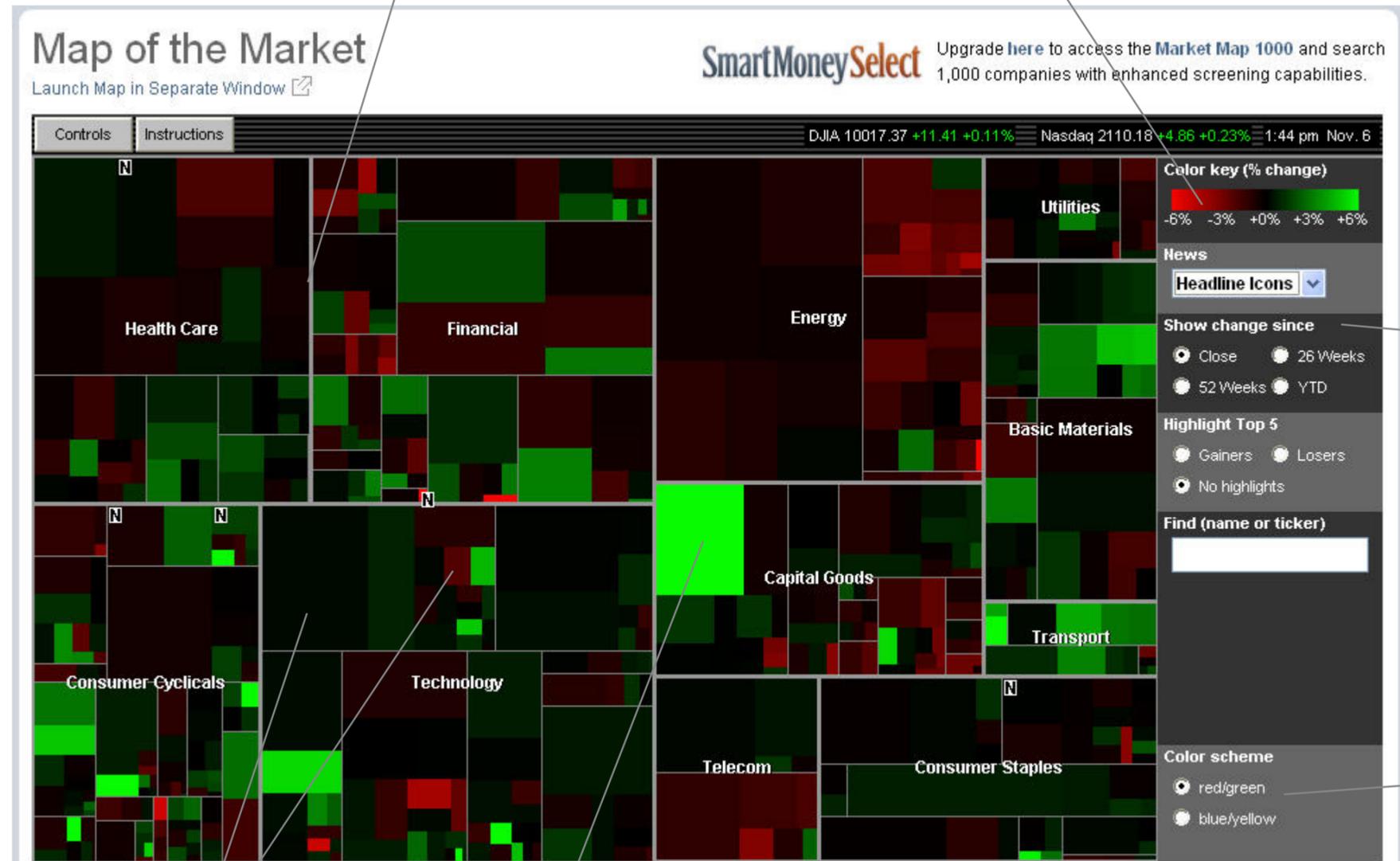
Various controls let you change the timeframe and certain other display parameters.

You can change the color scheme to accommodate colorblindness.

Within each sector, rectangles represent individual companies. The larger the company rectangle, the larger that company is within its sector. So the rectangle representing Microsoft, for example, is larger than the rectangle representing Adobe. Since those company rectangles are always in the same place, users with a particular interest in Microsoft or Adobe quickly learn exactly where to look for them.

The biggest company having the best day today. Want to know more? Mouse over any rectangle (i.e., company) for a rollover identifying the company and giving some particulars about it. Click the rectangle for options for drilling down for as much detail as you want (e.g., financials, ratings, news, etc.).

Intro to sparklines

Suppose you had a typical graph showing, say, revenue fluctuations over time. The focus of attention would be the squiggly line on the X-Y axes.
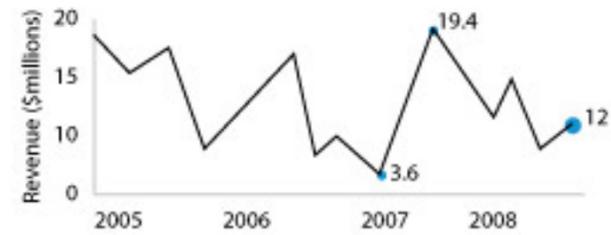
Now suppose you took away from that graph everything except the squiggly line itself.

You wouldn't have the whole story, but you would still have the general idea -- certainly enough to know whether things were trending up or down. For the purposes of a high-level overview, that may be all you need to decide whether to explore further.

Now suppose you shrunk that squiggly line down to tiny size:

That's a sparkline: a data-rich graphic about the size of a word in a sentence. When an executive just needs a 50,000-foot summary in a dashboard amid lots of other data, a sparkline is perfect. If the contour of the line looks notable, the executive clicks it or mouses over it to see the complete full-size graph.
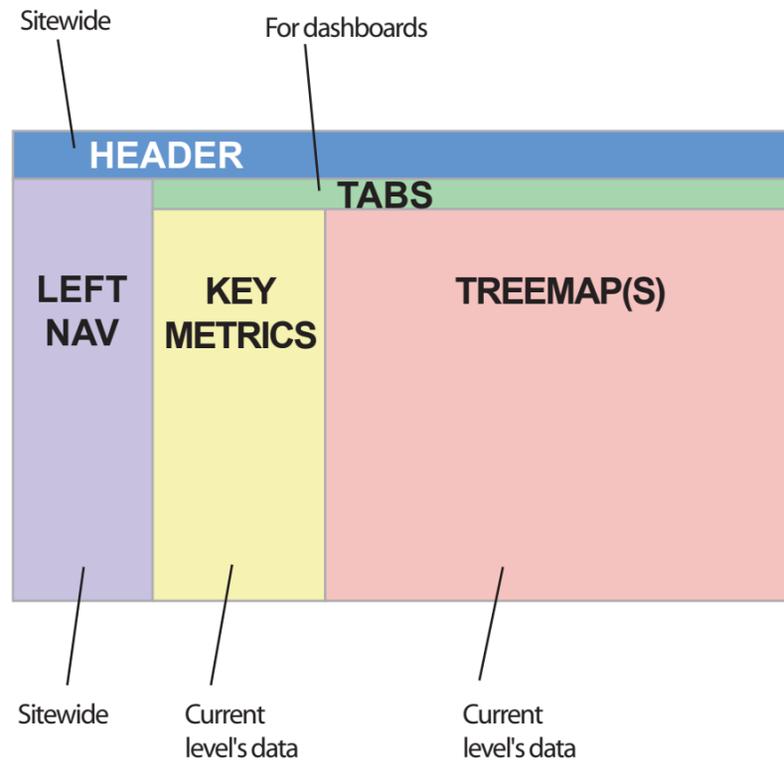
Background
Sparklines are the brainchild of Edward Tufte, who devotes a chapter to them in his book "Beautiful Evidence."
See http://sparkline.org/
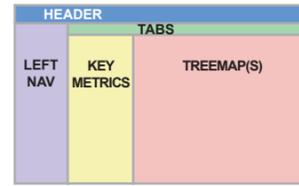
Dashboard template

The deeper the user drills down, the more detailed and granular the information is. But the template into which the data is poured remains the same, regardless of the level of detail.

Different customers will have more or fewer levels than others. And even within a given customer's data, some categories will yield more levels of detail than others. But regardless of whether there are 3 levels of data or 10, the template in which the data appears remains the same.
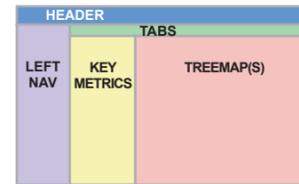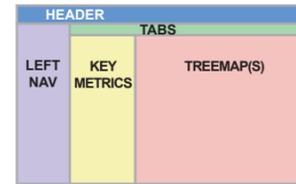
Sitewide   For dashboards

HEADER		
	TABS	
LEFT NAV	KEY METRICS	TREEMAP(S)

Sitewide   Current level's data   Current level's data

Levels of dashboards

Level 1 (enterprise)

HEADER		
	TABS	
LEFT NAV	KEY METRICS	TREEMAP(S)

Level 2 (e.g., transportation)

HEADER		
	TABS	
LEFT NAV	KEY METRICS	TREEMAP(S)

Level 3 (e.g., trucking)

HEADER		
	TABS	
LEFT NAV	KEY METRICS	TREEMAP(S)

Level 4 (e.g., Northeast region trucking)

HEADER		
	TABS	
LEFT NAV	KEY METRICS	TREEMAP(S)
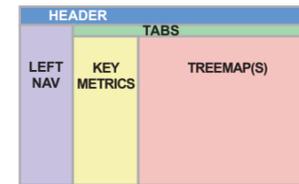
Level 5 (e.g., Peterbilt fleet in Northeast)
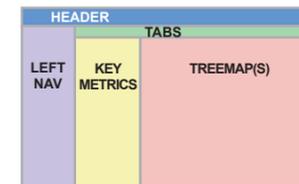
HEADER		
	TABS	
LEFT NAV	KEY METRICS	TREEMAP(S)

[etc.]

planetmetrics™

(A) **Welcome, Nate**

(B) You last logged on July 17, 2008, at 10:41 a.m.

(C) $6 Cap & trade, *Chicago, July 25*

Search: (D) SEARCH
○ All ○ Facilities ○ Products
My last 10 searches ▼ (E) SEARCH

LoremIpsum, Inc. (F)

(H) | Overview | By Transport | By Fuel | By Raw Materials | By Product | By Facility | By Groupings | Waste | Lorem Ipsum | Set up |
(I) (J)

(K) **LoremIpsum, Inc.'s CO2 Emissions**

Company > (G)
Reference >
Transport >
Usage type >
Left nav etc. >
Left nav more >
Additional left nav >
Even more left nav >

1,119 tons overall for corporation (N)

(L) 13 kg per $ of sales
25 kg per employee
4 kg per sq. foot factory
451 kg per key metric 1
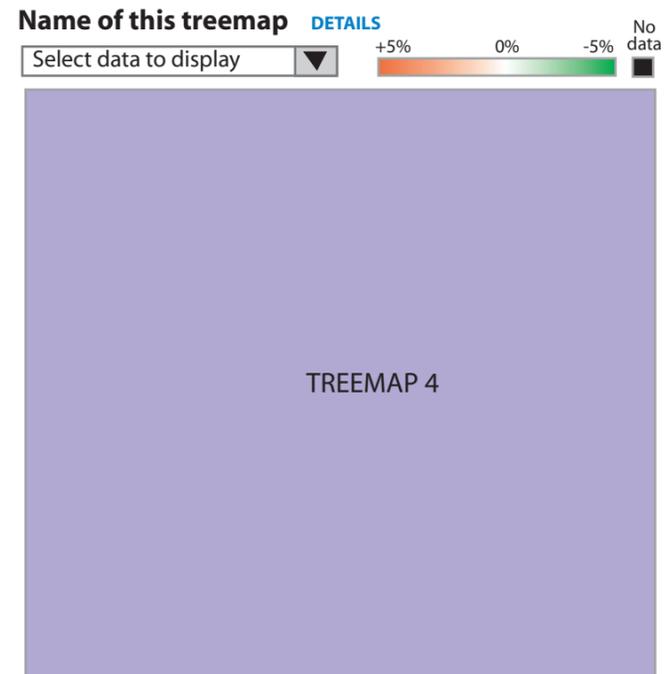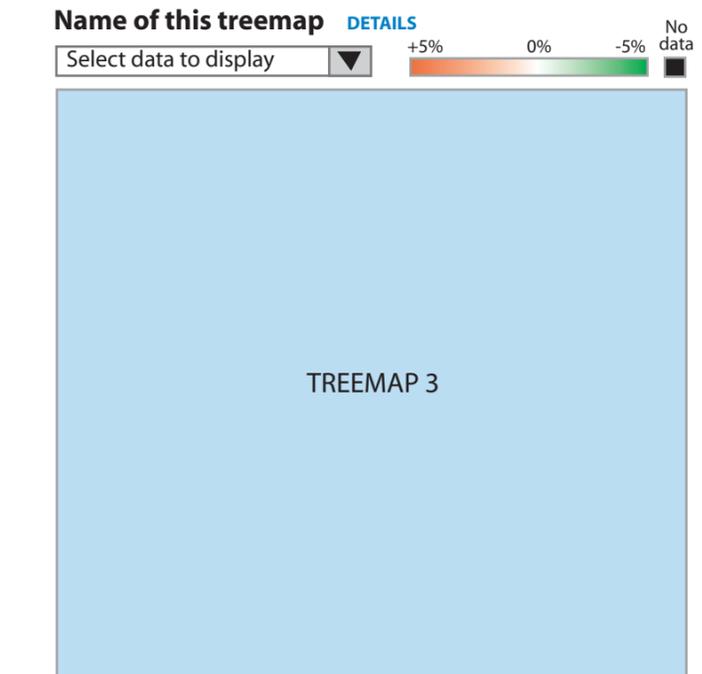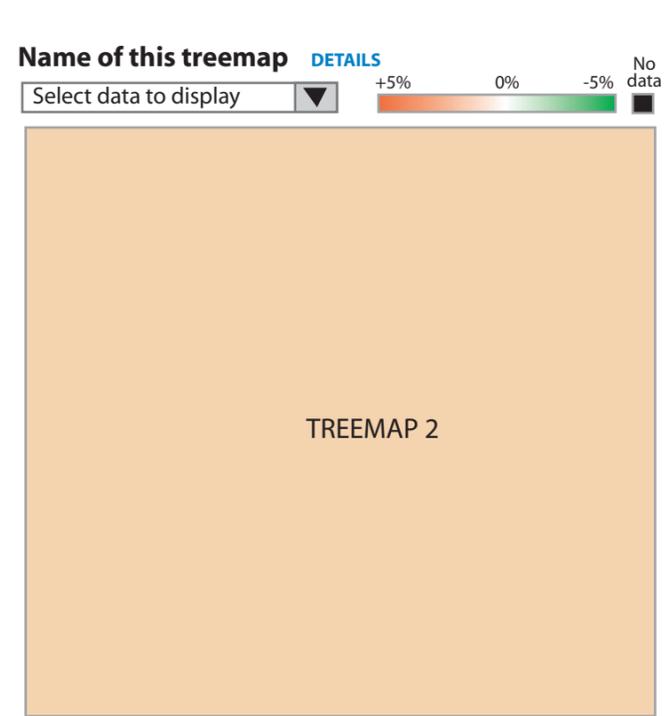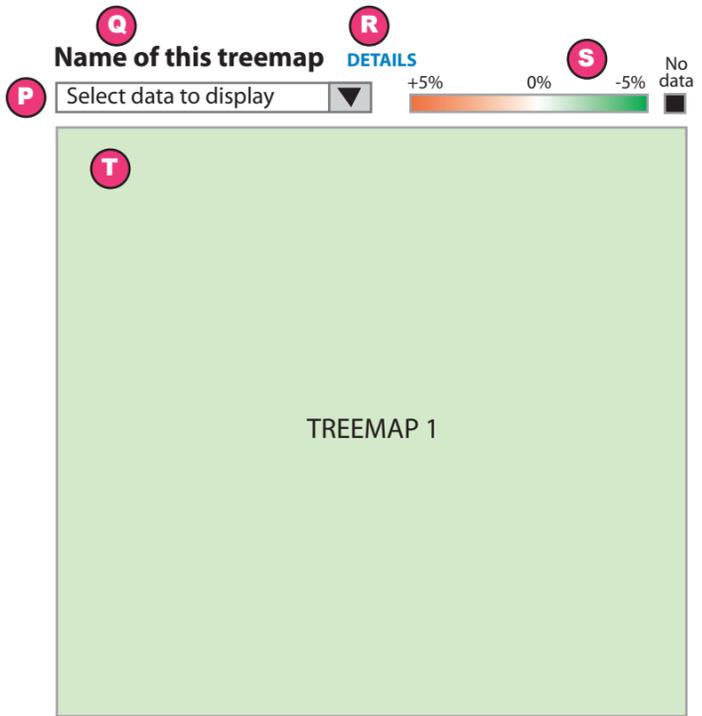7 kg per key metric 2

(M) **Facilities**

629 tons all facilities combined
221 tons Omaha
194 tons Lexington (O)
83 tons Searcy
52 tons Albuquerque
79 tons all other facilities combined

Products

287 tons all products combined (U)
52 tons Product Wonderful
41 tons Product Excellent
23 tons Favorite Product
12 tons BestSelling Product
159 tons all other products combined

Transportation

148 tons all transport combined
71 tons trucking within US
32 tons Shanghai-Long Beach
16 tons Puerto Rico - Miami
5 tons trucking within Canada
24 tons all other transport combined

Name of this treemap (Q) DETAILS (R) +5% 0% -5% No data (S)
Select data to display ▼ (P)

(T) TREEMAP 1

Name of this treemap DETAILS +5% 0% -5% No data
Select data to display ▼

TREEMAP 2

Name of this treemap DETAILS +5% 0% -5% No data
Select data to display ▼

TREEMAP 3

Name of this treemap DETAILS +5% 0% -5% No data
Select data to display ▼

TREEMAP 4

This mockup is the template for a Overview Dashboard, which should be each user's homepage. This page conveys the highest level summary information for the entire enterprise. This template is very similar to the template for lower-level dashboards.

Specifications

A   The user's first name appears after the word "Welcome,"

B   The date and time of this user's latest login is shown in the header, in the simple form shown rather than as all digits.

C   The latest Cap & trade price is shown. The line begins with a sparkline showing the ups and downs of the price over time on this exchange. The words "[price] Cap & trade" are a link that leads to a page that gives more details about the cap & trade price, such as the page within the site of the carbon exchange that shows pricing information. The city of the exchange is shown, along with the date of the latest price. (Time of day is not needed for these prices.)

D   The site's search functionality is described in Marc Miyashiro's wireframes.

E   This user's last 10 searches are listed in this listbox. Selecting any of those listings and then clicking the Search button next to the listbox launches the same search and yields the results that are currently available.

F   The user's company name (or, if possible, their logo) is shown.

G   The left column is for sitewide navigation. Placeholder navigation is shown here for illustration purposes only.

H   The top row of tabs applies to the dashboards, so it appears only on dashboard pages. They are shortcuts to jump directly to a particular high-priority dashboard. The specific tabs shown here are place holders to indicate the idea. The currently active tab is highlighted.

I   The "By Groupings" tab would include whatever groupings are meaningful to this particular user, such as brands, subsidiaries, business units, product lines, suppliers, etc.

J   The "Set up" tab is where the user specifies their preferences for such matters as which treemaps to include on the Overview Dashboard, which key metrics to include in the Overview Dashboard, how those metrics are grouped, units in which data appears, what data is included, what

goes into which hierarchies, what various metrics are called, etc.

One important setting to include on the Setup tab is to control the color scheme of treemaps. While there will be a default color scheme (such as red to green), keep in mind that one in 10 males is colorblind. There are many different flavors of color blindness, but red-green is the most common (both look like identical shades of gray). So we need to offer one or two alternate color schemes. For an example of this, see the legend for Smart Money's Map of the Market (http://www.smartmoney.com/map-of-the-market/).

Settings specified on the Setup tab apply to all treemaps for this particular user, which are overridden locally by settings the user specifies page by page for individual treemaps. If this user has locally overridden any given setting three times, the system presents a small dialog box pointing out that settings specified in the Setup tab apply to all treemaps (in case the user didn't realize that).

K   The title of this page (such as "[company name]'s CO2 Emissions") appears at the top of the second column, which is devoted to key metrics.

L   Each item in the key metrics column begins with a sparkline showing the ups and downs of that metric over time. The rightmost endpoint of each sparkline is a dot.

If the user mouses over a sparkline or its label for 0.5 seconds, a flyout window (identical to the one spawned by mousing over a cell within a treemap) appears immediately adjacent to that sparkline, giving the full-size graph that the sparkline represents, including the labels and the values of its X and Y axes, and any additional details that are pertinent to that data.
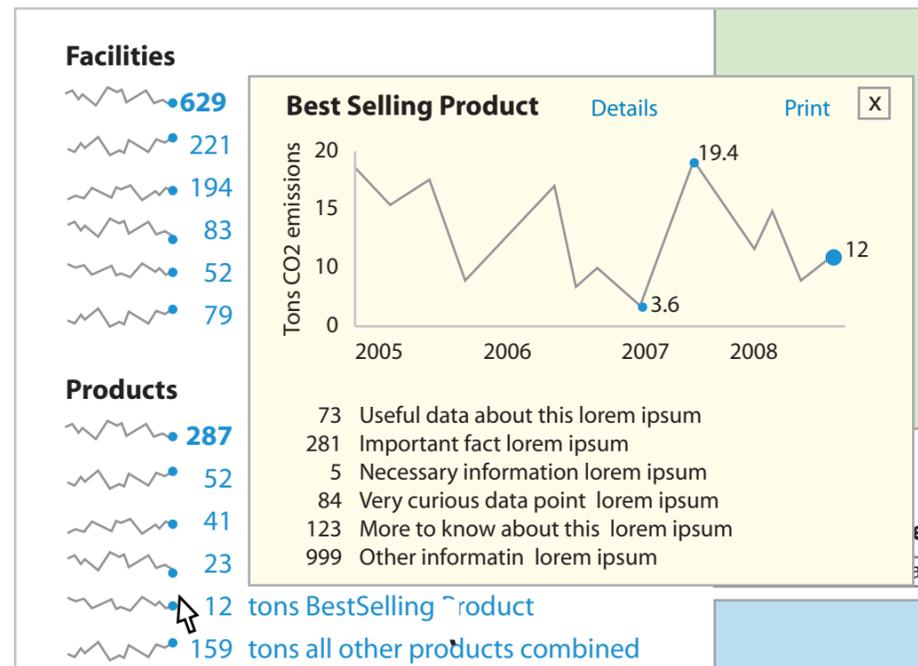
Clicking a sparkline is the same as clicking the link beside it.

M   Metrics in the key metrics column are grouped under appropriate subheads.

N   The first item listed in the key metrics column is the overall carbon footprint for the corporation. Because of its importance, it is highlighted.

O   Each item in the key metrics column is a link that takes the user to the dashboard for that topic.

P   We offer a default set of treemaps for the Overview Dashboard. The user may override that default set by specifying in the Setup tab which treemaps they want to see on their Overview Dashboard. As a convenience, a listbox accompanies each treemap, offering multiple options of data to display there. The system remembers any selection that the user makes in any listbox here, so that same dataset is represented by that treemap next time they come to this page.

Q   Each treemap has a name, preferably assigned to it by the user. Existing names can be changed in the Setup tab.

R   The Details link that accompanies each treemap takes the user to the highest-level dashboard that is devoted to the subject of that treemap. (Note that this link does not appear on lower-level pages.)

S   A color key goes at the top of each treemap. Each treemap may have its own color key, different from other treemaps on this dashboard as appropriate to the data being presented. The color scheme and meaning of the colors may be changed in the Setup tab. Double-clicking the color key opens the Setup tab. (If the part of the Setup tab where this work is done might fall below the fold, then treat the color key as an anchor link so the user easily sees treemap setup widgets.)

T   Mousing over in a cell in any treemap brings up a flyout window of details (see example in Dashboard Level 2 wireframe). Clicking or double-clicking any cell takes the user to the highest-level dashboard that deals with the subject of that cell. The user may also navigate from links within the details flyout.

U   If the metrics in any grouping in the key metrics column are parts of a single total (for example, products that are included in the total for all products, or specific facilities that are included in the total for all facilities), then the first item in the grouping shows that total and is bold. This should typically be the case, but there may be exceptions, in which case that item would be treated the same as the others.

Specific (lower-level) dashboard (example)

planetmetrics™

Welcome, Nate You last logged on July 17, 2008, at 10:41 a.m.

$6 Cap & trade, *Chicago, July 25*

SEARCH

● All ○ Facilities ○ Products

My last 10 searches ▼

LoremIpsum, Inc.

| Overview | By Transport | By Fuel | By Raw Materials | By Product | **By Facility** | By Groupings | Waste | Lorem Ipsum | Set up |

(A) Company >

Reference >

Transport >

Usage type >

Left nav etc. >

Left nav more >

Additional left nav >

Even more left nav >

Facilities Emissions

(E) 10   5   0   No data

Name of this treemap

(B) **629 tons all facilities combined**

221 tons Omaha

194 tons Lexington

83 tons Searcy **(C)**

52 tons Albuquerque

79 tons all other facilities combined

Key averages

229 tons total lorem ipsum

6 kg per $ of sales

15 kg per facility employee

4 kg per sq. foot factory

Fuels used

287 tons all fuels combined

52 tons coal

41 tons natural gas

23 tons diesel
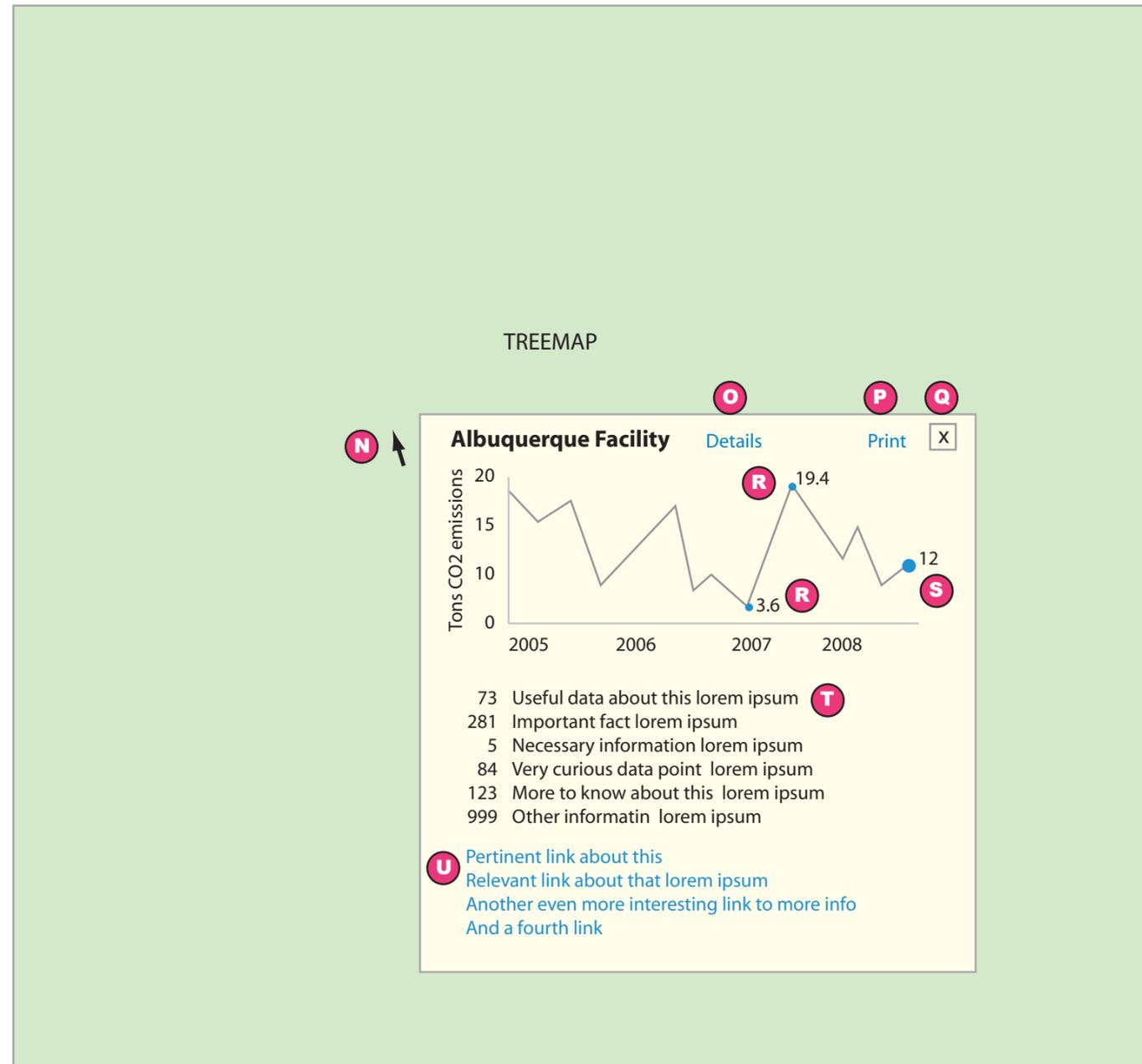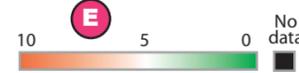
17 tons electricity

154 tons all other fuels combined

Lorem ipsum category

148 tons all loremipsum combined

71 tons rapsidus sic

32 tons olobundicus et dolor

16 tons lorem ipsum

Additional category lorem ipsum

148 tons all loremipsum combined

71 tons rapsidus sic

32 tons olobundicus et dolor

16 tons lorem ipsum

TREEMAP

(N) **(O)** Details **(P)** Print **(Q)** X

Albuquerque Facility

Tons CO_2 emissions

20

15

10

5

0

(R) 19.4

3.6 **(R)**

12 **(S)**

2005   2006   2007   2008

73 Useful data about this lorem ipsum

281 Important fact lorem ipsum

5 Necessary information lorem ipsum

84 Very curious data point lorem ipsum

123 More to know about this lorem ipsum

999 Other informatin lorem ipsum   **(T)**

(U) Pertinent link about this

Relevant link about that lorem ipsum

Another even more interesting link to more info

And a fourth link

Data display controls **(F)**

Data to display:

Carbon all US facilities ▼ **(G)**

Time period:

Past 12 months ▼ **(H)**

Cell size means:

Quantity for facility ▼ **(I)**

Cell fill color means:

Quantity per employee ▼ **(J)**

10   5   0   No data

Cell border thickness means:

Special interest ▼ **(K)**

——— Normal

━━━ Special interest **(L)**

Cell border color means:

Region ▼ **(K)**

——— Northeast

——— Southeast

——— Nothwest **(L)**

——— Southwest

Lorem ipsum control:

Robiscus dominus ▼ **(M)**

Lorem ipsum rapsidus control:

Semper pestulum et ▼

Description

This mockup is the template for dashboards below the Overview level. It differs from the Overview dashboard in the following ways:
• Whereas the Overview dashboard has multiple treemaps, lower-level dashboards have only one treemap.
• Lower-level pages have a full set of data display controls.
• Lower-level pages omit the Details link that accompanies each treemap on the Overview Dashboard.

All specific information shown on this mockup is for illustration purposes only.

Specifications

A   The left column is for sitewide navigation. Placeholder navigation is shown here.

B   Since no number is meaningful except in relation to some other number(s), each number in the key metrics column is preceded by a sparkline. The rightmost endpoint of each sparkline is a dot.

If the user mouses over a sparkline for 0.5 seconds, a flyout window (identical to the one spawned by mousing over a cell within a treemap) appears immediately adjacent to that sparkline, giving the full-size graph that the sparkline represents, including the labels and the values of its X and Y axes, and any additional details that are pertinent to that data.

Clicking a sparkline is the same as clicking the link beside it.

C   Each item in the key metrics column is a link that leads to a lower-level dashboard that gives details about that particular metric. Clicking the sparkline that precedes each item has the same effect.

D   The tab for the current dashboard (or its parent, as the case may be) is highlighted as the active tab.

E   The color key for the current treemap appears immediately above the treemap. Note that the data represented by the various colors differs according to the data being shown, so the numbers above the key may vary from treemap to treemap.

F   The data display controls can apply to only one treemap at a time, which is why the full set of controls appears only on pages that have a single treemap.

Note that there are no action buttons accompanying any of these listboxes. Making a selection in each listbox effects the change immediately.

G   Each dashboard at each level will have some default set of data to display and some number of alternate data sets. So the options listed in the "Data to display" listbox will vary from dashboard to dashboard.

H   The time period options to be offered are TBD, but would presumably be along the lines of:
Past 3 months
Past 6 months
Past 9 months
Past 12 months
Past 2 years
Past 5 years

I   The user is able to control the meaning of the treemap display by using the listboxes shown here. Cell size refers to how big each unit within the treemap is. Each treemap will have some default meaning for cell size, along with some number of alternate meanings to offer.

J   Each treemap will have some default meaning for the color treatment of cells, along with some number of alternate meanings to offer.

Note that the color key appears immediately below the Cell fill color listbox, with the numbers appropriate for that meaning (e.g., percentages, absolute numbers ranging from X to Y, dollar amounts, etc.)

K   At this point, it is not known whether any treemap software will enable us to control the borders around cells (in addition to the standard dimensions of cell size and fill color). But if we can, border thickness and color can convey two additional dimensions of meaning with each cell.

For example, a user might be able to identify certain idiosyncratically chosen units of information (such as a particular factory, a particular supplier, a particular ingredient, etc.) as being of special interest to himself; borders of the cells representing those units might then appear thicker than normal cell borders to call a little more attention to themselves. Other possible meanings that could be conveyed via border characteristics include which ones are:
• in/out of compliance
• over/on/under budget
• the purview of this or that executive
• associated with this or that region, brand, or subsidiary
• acquisitions subsequent to some important event
• powered by this fuel or that fuel

L   If we can control border characteristics, the border characteristics listboxes would be immediately followed by a key explaining what each variation of that characteristic means. It would be desirable to repeat these keys above the treemap, alongside the color key.

M   There may or may not be some number of additional data display controls, as needed and appropriate to the data at hand.

N   If the user mouses over any cell in the treemap for least 0.5 seconds, a flyout window appears immediately adjacent to that cell, containing whatever details we have to offer about the thing represented by that cell. This mockup shows one kind of chart that might be offered, but the visual representation of data may come in any form appropriate to the data.

O   Clicking the Details link loads the dashboard specific to the unit represented by the selected treemap cell, in this case the Albuquerque Facility.

Once the user drills down far enough, eventually there will be no deeper level of detail to go to. At that point, the Details link is omitted.

P   Clicking the Print link launches a standard procedure to print this details popup.

Q   The details flyout can be closed by either mousing away from the cell for at least 0.5 seconds or by clicking the close box.

R   The highest and lowest points on the graph are each marked with a dot, and the value represented is shown immediately adjacent to the dot.

S   The current (or most recent) value is marked with a larger dot, and its value is shown immediately adjacent to the dot.

T   The 5-10 most important pieces of data we have about this particular unit is presented below whenever graph we have.

U   There may be any number of links, each leading to some page/dashboard pertinent to this data.