Developing metaphors for a selection task using the 3x3 method.

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Application: a kiosk at a car tuning shop that allows customers to select the performance and visual upgrades that fit their vehicle to then be ordered and installed.

Metaphors considered and selected for the 3x3:

1. **Searchable catalog.** Customer searches for or navigates through levels of upgrade categories toward the chosen upgrade.

    a. Advantages:
        i. Familiar model for browsing: categories, subcategories; broad to concrete.
        ii. Relatively cheap and quick to implement (and prototype). Many off-the-shelf packages can be customized to fit the task.

    b. Disadvantage(s):
        i. Not everyone organizes things in the same way; people's schema differ.

2. **Car model.** Customer uses a 3-D model of his/her car to zoom in on the areas where an upgrade is desired, selects the upgrades, "installs" them onto the model, and previews the results.

    a. Advantages:
        i. Related to human factors:
            1. using images in addition to words takes advantage of the rapid parallel processing power of the human visual system.
            2. taps into visual memory, not just verbal. A customer may remember visually where the part is located, but forget the name of the location.
            3. emphasizes recognition rather than recall. Good for customers not familiar with all the lingo. For example, even those users who don't know the correct name for "one of those wingy thingies that go on back" can just click on the part of the trunk where spoilers go to indicate they want to add one.
        ii. Just as fast as hypertext. The user can "home in" on the correct part just as quickly as with hypertext—provided the 3-D model is responsive enough.
        iii. The fun factor: the tool allows customers to be active participants in tuning their vehicle and preview the finished result. By seeing their car in that much detail, the customers also learn more about it—more fun for a true car fan.
        iv. Strong business case: seeing their new and improved car may get customers excited enough to buy more than they originally intended.

    b. Disadvantages:
        i. A customer may not know where exactly to click on the car for upgrades that fulfill specific performance goals. For example, the customer may now know that tightening suspension (adjusting spring rates, etc.) helps with handling.

        ii. Customers who are looking for a particular upgrade and want to locate and order it quickly will find themselves stuck with navigating a 3-D model when what they really want to do is a simple text search.

3. **Body of a human athlete.** Customer is presented with a graphical representation of a human body, where different parts of the car are mapped—using text labels—to body parts. For example, the heart might be labeled "engine." Customer selects the body part and selects from a list of upgrades available in that area of performance/appearance.

    a. Advantages:
        i. Familiar for non-technical customers: most people know approximately how the human body works.
        ii. Many of the body parts can map conceptually onto how cars work:
            1. The heart (with it's valves) is the engine;
            2. The lungs is the air intake;
            3. The brain is the electronics, including the engine control unit;
            4. The four extremities can be mapped to the four wheels;
            5. Sneakers on the feet are tires;
            6. Exhaust, well… take a guess here.
        iii. Marketing may argue that this approach will resonate on a less conscious level: you're whipping your athlete into shape, so that s/he will perform better.

    b. Disadvantages:
        i. *Incomplete mappings.* Not all car parts (or groups of parts) map to body parts, and vice versa. Battery, transmission, brakes are just a few that don't map.
        ii. *Ambiguous mappings.* Should liver map to the fuel filter or catalytic converter?
        iii. *Imprecise function.* For example, there is no direct mechanical link between the heart (the engine) and the extremities (wheels).
        iv. *Imprecise form.* Arms and legs don't look (or act for that matter) like wheels.
        v. *Cognitive stretch.* Car-to-body part mapping may simply be too confusing.

Additional metaphors considered.

4. A town with different parts stores (performance store, wheels and tires, body shop, paint and graphics, etc.), where a customer would drive his/her car from store to store.

5. Physical store, where a customer would get a bird's eye view of the store and zoom in on the aisles of interest until individual parts appeared.

Reason for rejecting both: too inefficient for browsing collections of items; need 3 for this exercise.

Catalog

Suspension
  Shocks
  Springs
  Control Arms
Wheels
  Rims
  Tires

User clicks on categories and subcategories to drill down the product hierarchy.

Tires
  Yokohama
  Bridgestone
  GoodYear
  Pirelli
  Dunlop

Rims
  By Brand
    BBS
    Enkei
    Racing Hart
    O.Z.
  By size
    15"
    16"
    17"

Brand is only one way to organize products. Faceted organization can be used to let the user narrow down the list of available products.

| Bridgestone 17 inch | Search |

Results   See all Bridgestone
           See all 17"
           See all High Performance

Bridgestone Potenza 050 Ultimate performance 17" -- $120/ea
Bridgestone Potenza 092 High performance 17" -- $100/ea

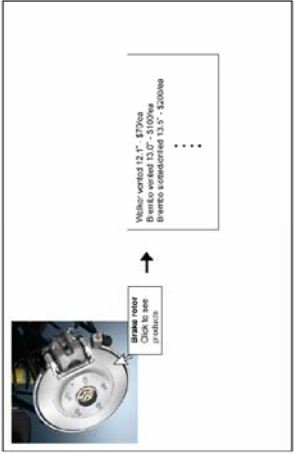Integrating searching and browsing: "smart" search maps search terms onto categories (i.e. "See all Bridgestone").

3-D Car model

Muffler

User can spin/turn the model to get a better view. Hovering the mouse over items highlights them and displays a hoverpopup.
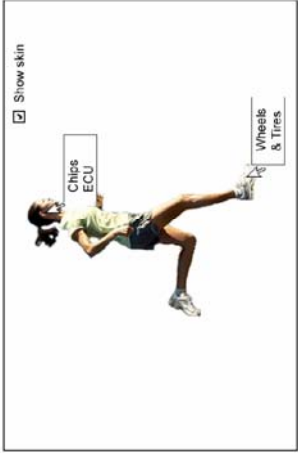

Body panels can be turned off to get a better view of the parts hiding underneath.

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brake rotor
Click to see products

Walker vortex3 12.1" - $70/ea
Brembo vented 13.0" - $100/ea
Brembo xdrainforted 13.5 - $200/ea
. . . .

Once the user is pointing to a single part, a product list becomes available.

Human body

☑ Show skin
Chips
ECU
Wheels & Tires

User clicks a body part to select a top-level category.

☐ Show skin
Engine
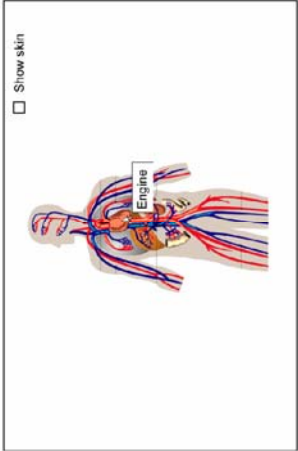
Can also remove the athlete's skin to view/select internal part categories.

Tires

Rims
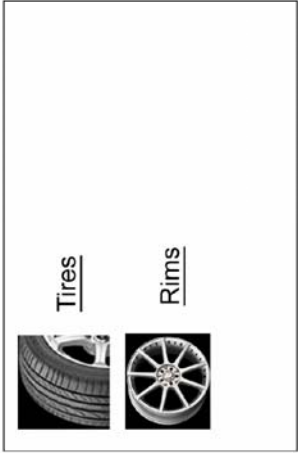
The body metaphor only works at the high level. The primary method of interaction at the lower levels is category browsing / searching.

Discussion.

The challenge.

The biggest challenge was which three views to include. Which three views would be most relevant? Should they be used to represent the flow of the user through the part selection task or several different representative views as a way to validate the metaphor in several different situations. I picked both the latter—by using the three screens to illustrate the most important user interactions for each model—and the former—by ordering the screens according to the order in which the interactions would occur in the task flow.

The chosen metaphor.

The human body is clearly inferior to the other two. The reason for including it was to try something that was somewhat "out there" and see whether any part of it can be used to make the task easier. And while it works at the most basic level of what a metaphor does—mapping the familiar onto unfamiliar to allow users to get started by letting them take advantage of what they already know— there are just too many problems here as I outlined on page 2 above.

So which one? But why one? Could we combine the product catalog with the 3-D car model? Since the metaphors serve to facilitate the same task—product selection—it is not as easy to combine them as the product catalog and the shopping cart metaphors (where they are used for different tasks). However, the requirements of an application to support different types of browsing preferences may require those two metaphors to "live" together side by side. In this case, the product catalog and the 3-D model could literally be placed side by side. The user could start by making a selection using either one and the other side would update so that the two are in sync. There are at least two advantages to the combined approach: (a) The user if free to start using the one s/he feels the most comfortable with; (b) If the user has difficulty making progress, s/he can switch to the other one to get him/her going again without having to start over, because the progress made using one is reflected in the other's state.