Consistency Heuristics for Usability Testing

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Usability for testers

- Not to be confused with usability testing…

- Usability for testers, is the low level tests that actually speak to the details the users will deal with on a day to day basis.

- These heuristics give testers a vocabulary to create compelling bugs.

Heuristic Test Oracles

- **Heuristic**
  - A solution to a problem that works most of the time.

- **Test Oracle**
  - A mechanism for determining whether the program has passed or failed a test.

Consistency Heuristics

- History
- Image
- Comparable Product
- Claims
- User Expectations
- Product
- Purpose

Consistency Heuristics

For our purposes in this talk, the more consistent an application is, the easier it is to use.

Google Earth
(Beta version 3.0.0762)

An example

I found this bug in just a couple of minutes. It seems that if you search with large strings, Google Earth thinks it has a network error.

What's even more interesting is that it actually changes your search criteria. I found that if I searched with a 5,000-character string followed by a 1,000-character string, Google Earth changed my search criteria back to the 5,000-character string. It continued to do this for several different values.

An example (continued)

"How do you know the behavior you found above is a bug? You don't have any requirements telling you what the software should do."

"Uh, well…it just didn't seem right to me."

But that response wouldn't win many supporters, would it?

Inconsistent with History

A product should be consistent with past versions (or history).

History can include previous versions, patches, claims, etc.

If something has changed, and no one told you it was supposed to change, then you might have found a problem.

Inconsistent with Image

Most companies want to have a good image in the marketplace. Therefore, their software needs to look professional and be consistent with accepted standards.

If a product is inconsistent with the desired image, what you're saying is this: "We'll look silly (or unprofessional) if we release this software to market."

Inconsistent with Comparable Product

You're letting another product serve as your oracle for this test.

As long as the comparable product really *is* comparable, and you want your product to be an alternative to that product, or you want to get the users that that product has, then this oracle can be very compelling.

Inconsistent with Claims

A "claim" can be anything that someone in your company says about the product.

If something is inconsistent with claims, it's inconsistent with the product's stated requirements, help, marketing material, or just something that a project stakeholder said in the hallway.

Inconsistent with User Expectations

This product doesn't do something that a reasonable user of this product would expect it to do, or doesn't perform a task in a way that the user would expect.

Using this oracle means that you have some idea of who the user is and some indication of what he or she expects.

Inconsistent Within the Product

Something behaves in one way in one part of the product, but in a different way in another part of the product. The change could be related to terminology, look and feel, functionality, or feature set.

All you're doing is pointing out where the product is inconsistent with itself.

These are often compelling bugs.

Inconsistent with Purpose

This oracle states that the behavior you found is contradictory to what a user would want to do with this software.

This oracle is often used in conjunction with *Inconsistent with Claims* or *Inconsistent with User Expectations* because those oracles also tend to address the purpose of the software.

Inconsistent with History

A product should be consistent with past versions (or history).

History can include
- Previous versions
- Patches
- Marketing material (or other claims)
- etc.

If something has changed, and no one told you it was supposed to change, then you might have found a problem.

Crossover among oracles

- I've found the oracles *Inconsistent with Claims*, *Inconsistent with Comparable Product*, and *Inconsistent with History* to be the most effective in getting bugs fixed.

- After those, *Inconsistent Within Product* and *Inconsistent with Purpose* tend to influence developers, but rarely managers.

- Finally, *Inconsistent with Image* and *Inconsistent with User Expectations* tend not to get much notice in the defect-resolution world.

Back to Google Earth Examples

Negative Values for Altitude

History

Image

Comparable Product

Claims

User Expectations

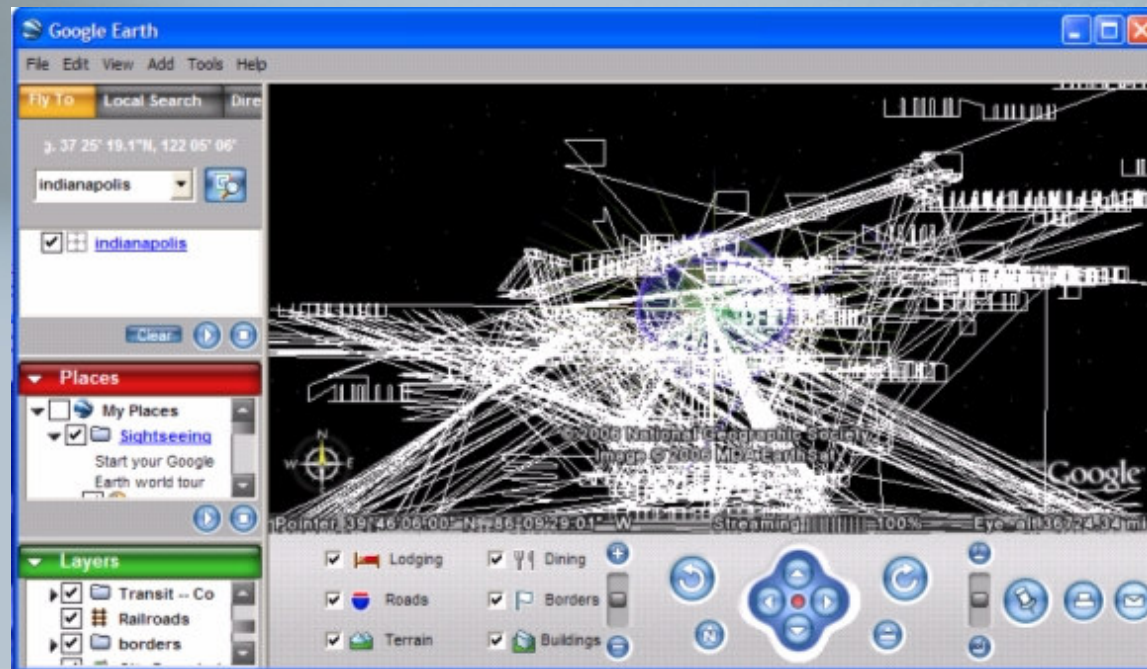**Within the Product**

Purpose

Negative Values for Altitude

- *Inconsistent Within the Product.* I can't zoom to a negative altitude if I don't apply a tilt.

- *Inconsistent with Purpose.* The purpose of zooming and tilting isn't to get negative altitudes—it's to get a better view of the landscape.

- *Inconsistent with User Expectations.* I certainly didn't expect to see a negative value.
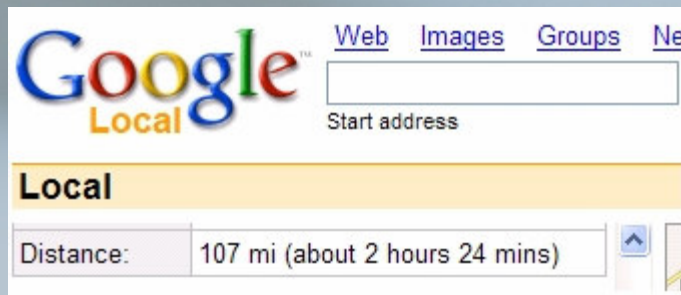
Rendering Lines When Selecting Layers

Rendering Lines When Selecting Layers

- *Inconsistent with Purpose.* The lines obscure my ability to see the actual map.

- *Inconsistent with Image.* This is a fairly basic problem that I discovered the first time I ever used Google Earth (months ago). It looks bad, and since I like Google's software so much, I expect more from Google.

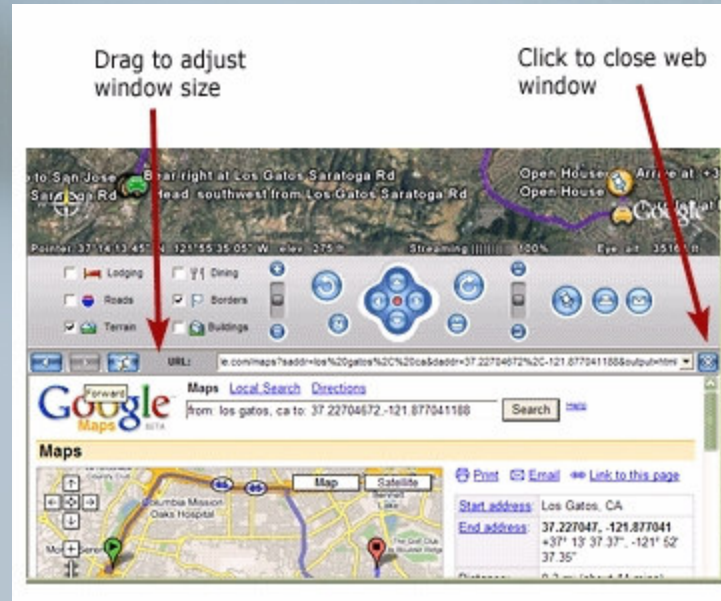# Different Travel Times for Directions

Different Travel Times for Directions

- *Inconsistent with Product.* Both Google products should get the same result.

- *Inconsistent with Image.* Google makes both products; their inconsistent behaviors aren't good for Google's image.

Inaccurate Documentation

History
Image
Comparable
Product
Claims
User
Expectations
Within the
Product
Purpose

Inaccurate Documentation

- Rather than appearing at the bottom of the page, when I click the link the web page opens in my Firefox web browser.

- This is *Inconsistent with Claims*.

- On the other hand, I don't feel that it's *Inconsistent with User Expectations* or *Inconsistent with Image* because the functionality as it worked met my expectations as a user, and I think it's good for Google's image to show that their application works with other products such as Firefox.

Remember our example?

Unable to perform search

Google Earth detected a network error.
Please check your network connection and try again.

[OK]

Remember our example?

"I believe it's a bug because **the message states** that there's a network problem, and yet searches with smaller values still work. The search feature **behaves inconsistently** given the same network conditions. In addition, the search field changes my search text after I get the error message, but it **doesn't do that *before*** I get the error message. That's also **inconsistent behavior**. Finally, I don't have evidence to support that there's a network error, which means that Google Earth is possibly reporting **an inaccurate error message**. I don't believe Google really wants to report inaccurate error messages. That makes them look bad. That's not good for their **company image**."

Thank you

Feedback and Questions?

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