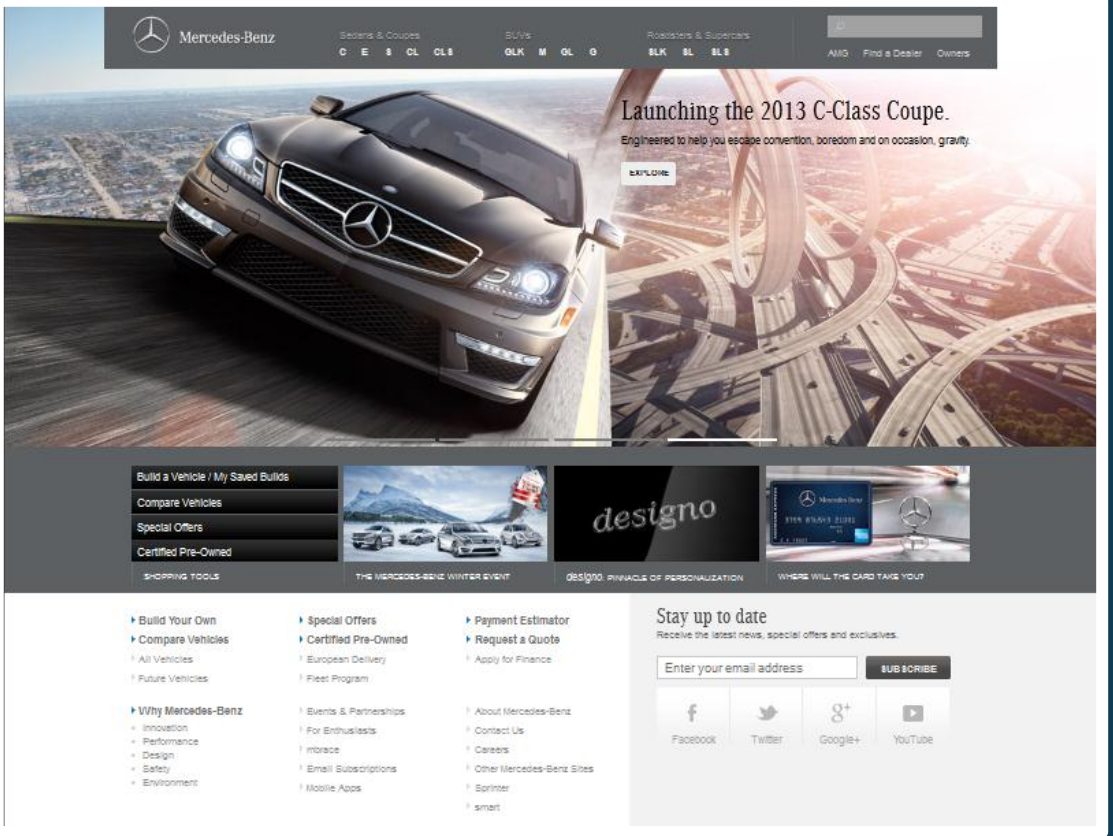
Fall 2012

Mercedes-Benz Website Heuristic Evaluation

www.mbusa.com



Sin Lee Loh

PSYC 273 – Engineering Psychology

Contents

Introduction 3

Executive Summary 5

Project Overview 7

Methods 8

Project Goals 11

Website Goals 12

User Goals 13

Business Goals 14

Users & Personas 15

Contextual Inquiry 18

Semi-structured Interviews 19

Informal Usability Tests 24

Summary of Contextual Inquiry Findings 30

Global Usability Issues 32

Goal-Based Design 33

Attention 35

Progressive disclosure 37

Affordances 39

Salience Coding 43

Visual Accessibility 45

Navigation 47

Visibility 51

Visual Sampling 52

Spatial Usage 54

Feedback 60
Visual Metaphors 61
Visual Momentum 63
Consistency 65
Cross-pollination 68
Feed Forward 71
Forcing Functions 73
Efficient/Effective Use of Screen Real Estate 74
Readability 75
Summary of Global Usability Issues 77
Local Usability Issues 80
Home Page 81
Site Map 82
Dealer Map 83
Request a Quote 84
Search Results 85
Warranty Information 86
Owners Support 87
Overview and Feature Detail Page 88
S-Class Build Page (Technical Errors) 89
Summary of Local Usability Issues 90
Visual Summary of Usability Issues 91
Glossary of Terms 92
Resources 94
Contact Information 94

Introduction

The Mercedez-Benz brand has been a statement of luxury around the world since the mid 1920's and is one of the most well-known luxury sedan brands known for quality, performance and sleek aesthetics. In addition to their sedans, the brand is also known for coupés, sports utility vehicles, cabriolets, roadsters and multi-purpose vehicles. As such, the website needs to support not just brand messaging, but also provide an accessible way to browse the wide selection of vehicles – each with unique features.

The Mercedez-Benz flagship website for their cars (www.mbusa.com) needs to convey a cohesive user experience with an emphasis on quality, consistency and effectiveness. Potential and current owners of Mercedes-Benz would expect the kind of website experience that would mirror the experience of driving a luxury car – pleasant, reliable and engaging.

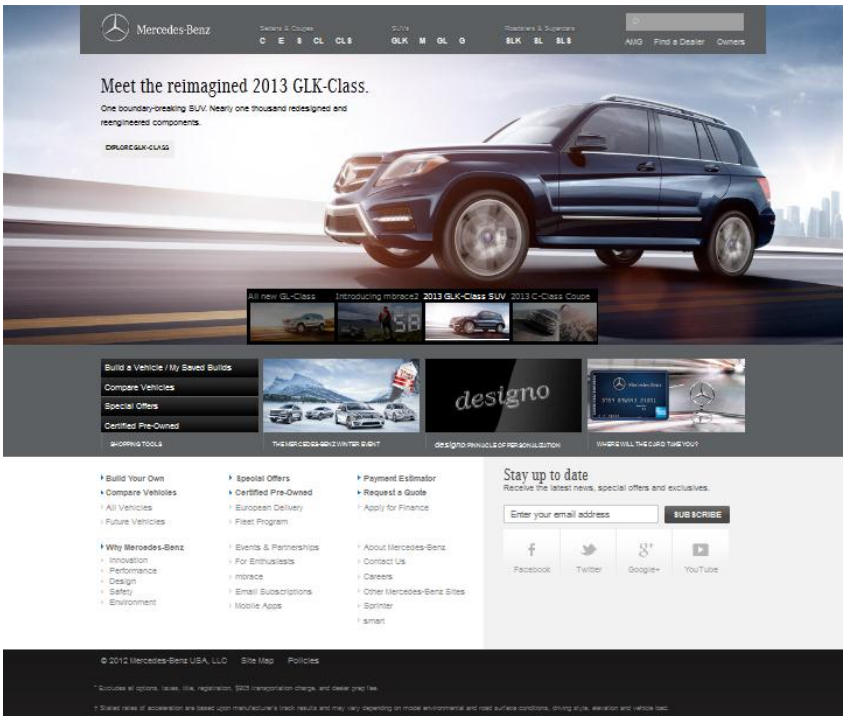


Figure 1: Main page (http://www.mbusa.com/mercedes/index)

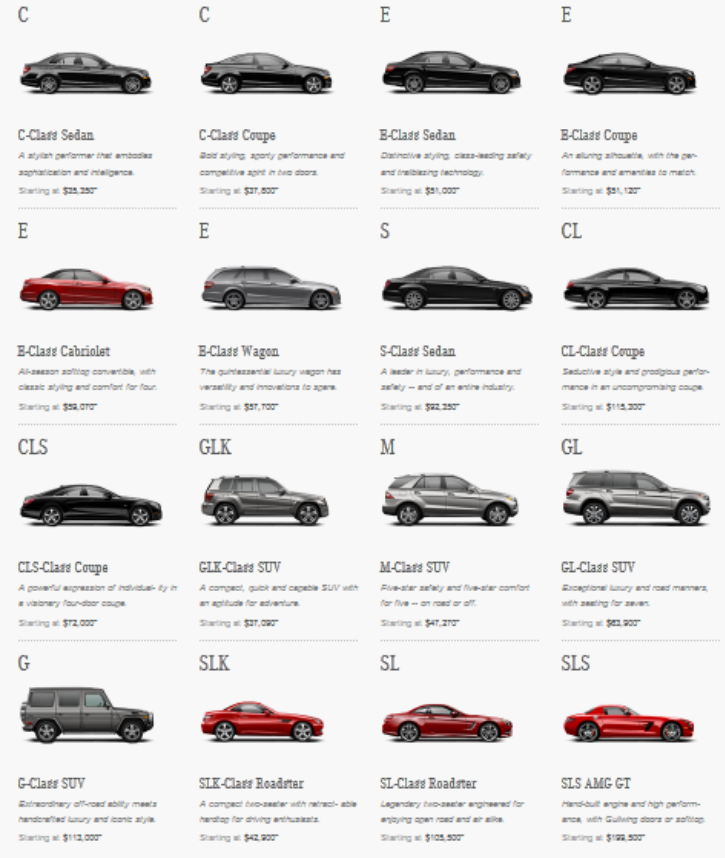


Figure 2: List of all models

Since the website is a likely first-contact of the purchasing process, the interactions within the website are paramount to a smooth user-experience. The focus of this project is to identify global and local issues in the website and areas for improvement through a rigorous heuristic evaluation by experts in website usability. Using an established methodology (including contextual inquiry methods and task analysis) the project examines the website with an eye on known principles of good user-interface design.

Overall, the project has led to insights of poor application of design principles and violations of standard interface rules for usability. Global issues persistent throughout the website lead to poor user experience and failure to accomplish key user goals and tasks vital to a positive experience. Local issues on specific pages were also identified, with recommendations towards improving an experience consistent with the expectations of a product from Mercedes-Benz

Executive Summary

A detailed analysis of the Mercedes-Benz website (www.mbusa.com) was conducted in the Fall of 2012. The project endeavored to uncover usability issues in the interface which impose obstacles to a positive user experience. Ultimately, the project endeavored to find issues on the website that could be improved so that a great user experience can be delivered and brand loyalty can be preserved or enhanced. A good website should be effective in three critical areas – it should be useful, usable, and desireable.

Project planning involved determining project goals, identifying target users and creating personas. The website goals for users and Mercedes-Benz were then defined to focus the project further. Two contextual inquiry methods were used to generate data relevant to the project goals to uncover common patterns in user needs, goals and patterns of behavior relevant to the car-purchase experience. Additionally, the contextual inquiry methods provided a secondary method of discovery of usability issues.

Usability is the ease of which a user can interact and manage a product to achieve pre-defined goals and the evaluation of the website is grounded on this definition. The website underwent an expert heuristic evaluation based on known usability principles. Usability issues uncovered are documented and organized as “Global” or “Local”.

Global usability issues refer to issues that persist throughout the website that obstruct successful, efficient and enjoyable use of the website. Many of the issues stem

from a site architecture that is not goal-based. Poor visual detailing led to a lack of visual perceptibility and poor use of affordances, among many other issues.

Local usability issues were uncovered where issues were presented on individual areas of the website. These issues are undesirable to user experience, because they cause unnecessary frustration disrupt or hinder users from efficient task completion. Local issues uncovered were mostly design-related issues, though some technical issues on parts of the interface contribute to a negative experience.

Critically, the website has been found to be lacking in every area which would provide a great user experience. The website **does not present itself as particularly useful** due to poor value proposition and hidden content (i.e; what you cannot find, you cannot use). **Usability issues throughout the website** prevent users from navigating and using the functions on the website effectively. Lastly, the inconsistent, imperceptible and frustrating experience of using the website makes it **undesirable** to the user.

All issues should be corrected, and greater attention to detail should be enforced during design to focus on a better balance of user-goals and business goals. It is recommended that the architecture be modified to aid navigation, and that greater progressive disclosure be used to prevent overwhelming those new to the Mercedes-Benz brand, while still allowing enthusiasts to delve deep into the details.

Thorough consideration of the issues and recommendations in this document will provide a guide and framework for future redesigns to deliver a user experience consistent with the quality expected from the Mercedes-Benz brand.

Project Planning

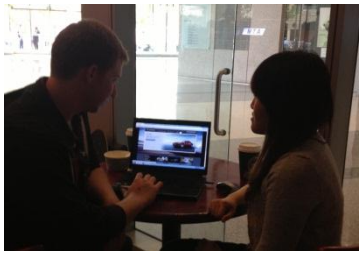
Identify Project Goals	Identify Target Users • Car Novices • Car Experts	Create Personas

Website Goals

User Goals • Use cases	Business Goals

Contextual Inquiry

Interviews • Novices & Experts	Informal Usability Testing • Novices & Experts



Heuristic Evaluation

Global Issues • Recommendations	Local Issues • Recommendations

Methods

Several methods were used in the undertaking of this project to identify usability issues for two key user groups – car novices and experts. Each method was selected to give impactful information and perspectives throughout the heuristic evaluation process

1. **Goal identification** was conducted to identify the main user goals and main business goals of the website before the heuristic evaluation. This allows the project to focus on the effectiveness of task-based and goal-based interactions during the evaluation.

2. **Personas** were created based on the identification of the two key user groups. Subsequently, navigation patterns of the interface the two personas the interface from two perspectives – David, The Car Expert, and Melanie, The Car Novice.

3. **Contextual inquiry methods** were used to explore user needs, goals, preferences and behaviors relevant to the project. Web usage characteristics to the car-purchasing process were also obtained. The project focused on two target user groups - users familiar with cars in general (Car Experts) and those who are not as familiar with cars (Car Novices).

    a. **Interviews** were conducted in-person. Common user goals and expectations were extracted from the semi-structured interviews.

Information from the interviews were also analyzed to break down the tasks they go through in the car-purchasing process.

b. **Informal usability tests** were conducted with users asked to perform certain key tasks. Common patterns of behavior were recorded, along with quantitative information on time-on-task, errors and success rates. Users also commented on the interface post-task.

4. **Heuristic evaluation** techniques were applied in the thorough examination of the interface, by evaluating against scientific and design principles known to be true as well as expert experience.

   a. **Global usability issues** present usability issues that persist throughout the website that prevent efficient and effective use of the website. Typically, global issues stem from inefficient architecture of the entire site resulting in navigational errors.

   b. **Local usability issues** occur on individual areas (or pages) that are stumbling blocks to usability. These are usually design-related issues.

5. **Severity index** icons are used throughout indicating the severity of the identified issues. Yellow indicates a mild issue presenting a minor obstacle to effective use of the interface. Orange indicates a moderate issue, followed by red indicating a severe issue preventing task effectiveness while using the website and should be fixed immediately.

Mild

Moderate

Severe

6. **Recommendations** are provided in several areas as suggestions for improvement. These may be found in the relevant sections as global and local issues are discussed.

7. **Glossary of terms** may be found for quick reference for definitions of terms used in the usability domain.

Project Goals

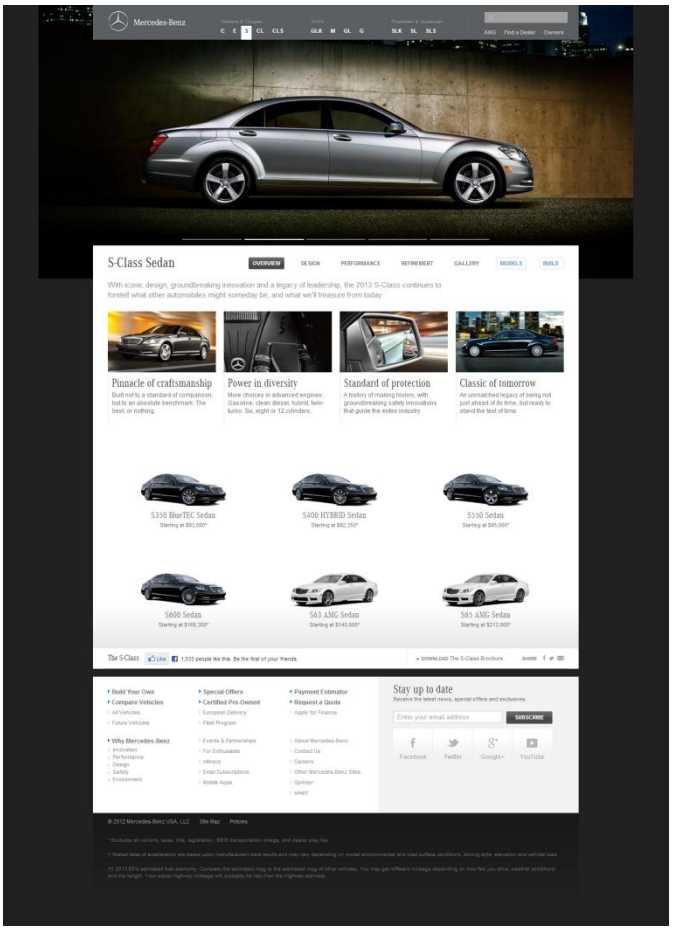
The main goal of the project is to inform the design through a **heuristic evaluation** so that a **useful, usable, and desireable** interface can be achieved.

Critical elements of good website design

Useful
- Provides value
- Fulfils user purpose(s)
- Beneficial to the user
- Clear value proposition

Usable
- Easy to use & understand
- Learnable
- Efficient
- Prevents errors
- Intuitive

Desireable
- Aesthetically pleasing
- Delights user
- Motivates interaction

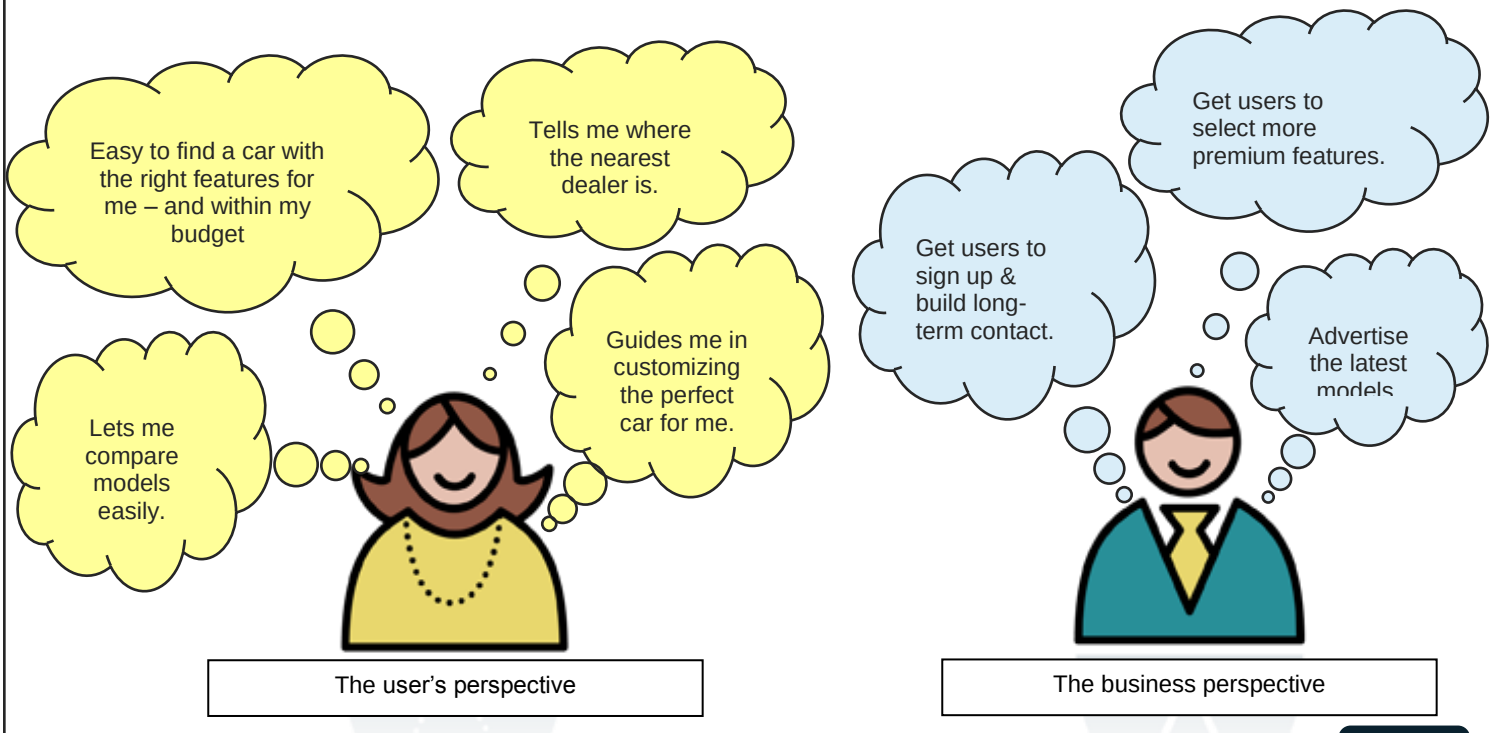


Website Goals

Users are often task-focused, and elements of the interface that aid task completion are essential. Attention is a limited resource, and cognitive processing to suppress non-task-relevant elements in an interface requires mental effort. Additionally, the amount of attention required depends on the complexity of the tasks, the similarity between tasks, the physiological factors (visual elements such as contrast and size) as well as familiarity with the interface (practice effects). A pleasant user experience should aid the effective completion of tasks with a minimal amount of mental effort.

Business goals are typically geared towards increasing revenue by motivating customers to purchase items or to increase brand value and brand loyalty by promoting continuous and positive engagement with the brand.

Though user goals and business goals are not often completely aligned, there should be an effective balance between both.



User Goals

- **Identify which model of car includes features that best suits their needs**
    - Compare features between models
    - Compare prices between models
- **Customize their ideal car within a budget**
    - Customize exterior features
    - Customize interior features
    - Customize performance features
    - Customize service packages
    - Find saved customized builds
- **Locate a dealer**
    - Nearest dealer
    - Dealer based in another location
- **Obtain service information in the event of a break-down or emergency**
- **Buy or replace a specific part of a car**

- **Motivate users to buy a Mercedez-Benz**
    - Promote special offers and new models
    - Motivate users to schedule a test drive
    - Encourage word-of-mouth through social media
- **Support Mercedez-Benz owners**
    - Nearest service location
    - Puchase parts and accessories
- **Register users so long-term contact can be established to foster brand loyalty**

Figure 3: Scheduling a test drive for a Mercedes-Benz is already an indicator of purchase intentions. During a test drive, potential owners get a first-hand feel for the car & features, as well as develop an emotional attachment to the car. Therefore, the test drive is a critical part of the complete car sales process.

Users & Personas

In this project, we conducted market research of current owners and target buyers. Based on the demographics of current users and target buyers, we composed personas to reflect the different perspectives as users navigate through the website.

Car Experts are particularly knowledgeable about cars, are concerned with (and understand) performance and other measures of vehicle quality, and frequent car websites to read reviews and news. They could also be previous or current owners of Mercedes-Benz vehicles, and therefore have depth of familiarity with the brand and the selection of models. A persona profile for the car expert, David, is on the following page.

Car Novices are less knowledgeable about cars, and are less concerned with performance though they expect a high degree of reliability. They are unlikely to be acquainted with standard vehicle quality measures, and are not likely to frequent websites dedicated to cars. They are most probably unfamiliar with the selection of Mercedes-Benz models and the differences in features offered by each model. A profile for our car novice persona, Melanie, is provided on the following page.

David, Car Expert

I care about what a car says about me – respectable, reliable, and successful. When I'm on a car website, I want to know what is under the hood, and all the details that make a car great.

Name:	**David**
Age:	50, middle-aged professional
Household income:	>$250k/year
Car purchase history:	Current owner of a BMW 3 sedan, previously an Audi A4
Knowledge of cars:	High – understands mechanics of performance, subscribes to Automobile magazine and MotorTrend.
Related browsing behavior:	Frequently visits websites dedicated to cars, member of an online car enthusiast forum
Key concerns when purchasing a vehicle:	• Performance • Aesthetics • Interior features • Technology

Melanie, Car Novice

I'd like a car that suits my roles as a professional and a mother, but also looks good. It needs to fit within my budget and require minimal maintenance.

Name:	**Melanie**
Age:	35, young professional
Household income:	$200k/year
Car purchase history:	Current owner of a Toyota Camry and looking to upgrade
Knowledge of cars:	Average – understands the basics, but relies on others for recommendations and information
Related browsing behavior:	Frequents luxury shopping websites, compares prices and features of products for value
Key concerns when purchasing a vehicle:	• Aesthetics • Features • Price • Reliability • Good service/warranty packages

Contextual Inquiry

Two contextual inquiry methods were chosen for this project with a focus on assessing if the website met the goals of being **useful, usable and desirable**. Two types of users were recruited participate in one of two contextual inquiry methods – participants either fit the “Car Expert” user group characteristics, or the “Car Novice” group.

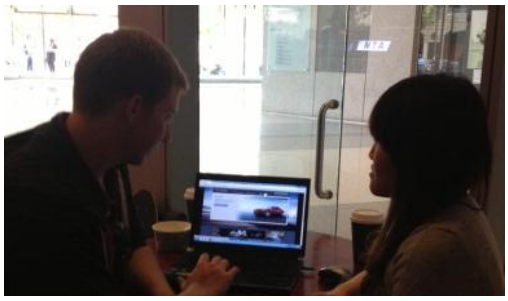


Figure 4: A semi-structured interview with Russell W.

First, **semi-structured interviews** were conducted with a preselected set of questions to understand what the needs and goals of a website about cars should deliver. This method served as a **method to ascertain if the website was useful**.

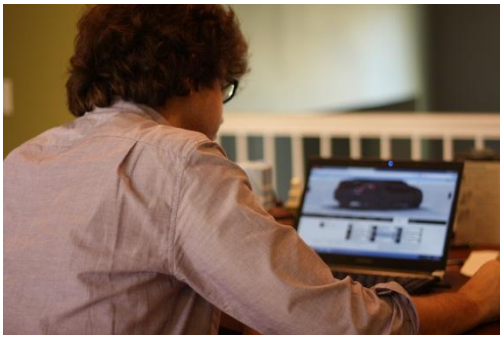


Figure 5: Joe B. completing tasks during an informal usability test

Analysis of the results led to development of the **informal usability tests** using a task-based approach to determine if interactions within the website were error-free, efficient and effective. The usability tests allowed us to obtain **measures for usability** and to **observe if the website delivered on aspects deemed desirable** for a pleasant interactive experience.

Semi-structured Interviews

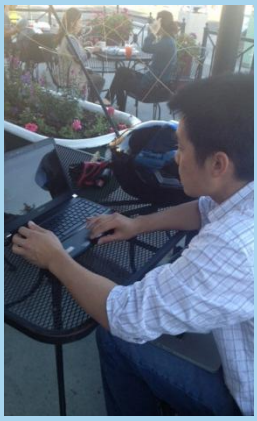
Participants were interviewed in-person in a comfortable setting regarding their knowledge about cars, usage of car websites and needs and goals from interactions with car websites. Factors influencing purchasing decisions were also determined from the interviews. Analysis of data revealed some common patterns in users wants, needs and goals on a luxury car website.

Key Questions:

- *Walk me through your process of how you buy a car – from the moment you determine that you want a new car until you sign the paperwork.*
- *What do you look for when you are going to buy a car?*
- *What features are most important to you?*
- *What are your favorite luxury sedan brand(s)? Why?*
- *Do you do research before you purchase cars? How?*
- *Do you use any online resources? Which sites? How often?*

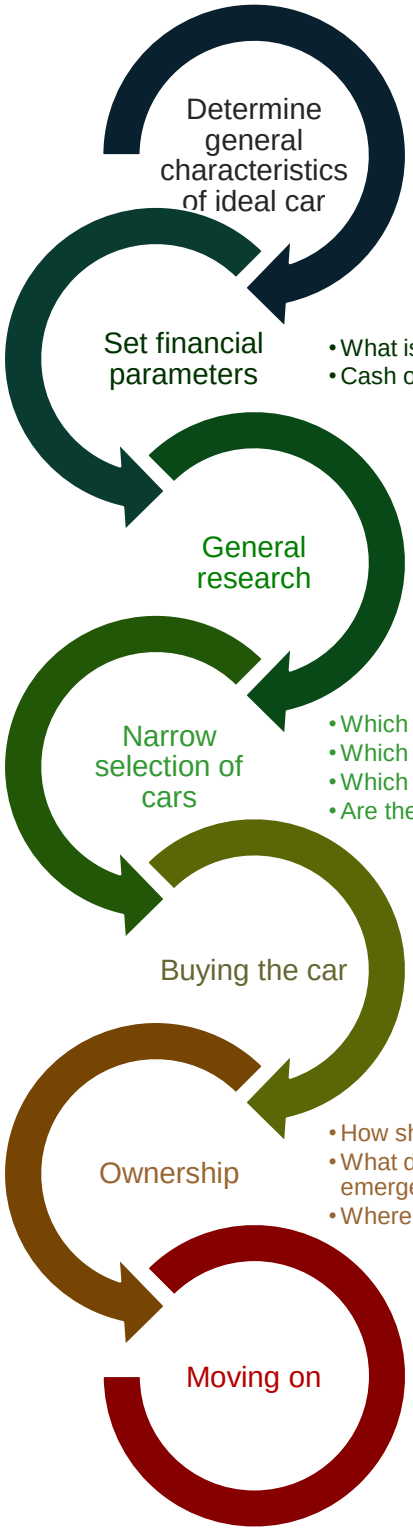
Interview Participants

Participants were all volunteers recruited through online advertising on social networking sites (Facebook and Twitter). All participants were given a $10 Starbucks gift card for their participation in a 40-minute session.

User Group	Car Expert		Car Novice	
Name	 Michael L.	Russell W.	Tilia W.	Cory S.
Age	32	25	27	28
Occupation	Interaction Designer	Graduate Student	Business Consultant	Software Engineer
Current Vehicle	Yamaha FZ8 (motorcycle)	Nissan 240SX	None	Nissan Cube
Previous Vehicle	Subaru Impreza	Honda Civic	Hyundai Elantra	Subaru Outback
Knowledge about cars	Deep	Deep	Shallow	Shallow
Reads car magazines or visits websites/blogs regularly	Yes	Yes	No	No

Walk-through of car-buying process

Stages of the buying process



- What are my needs?
- New or pre-owned?
- Which type of car? Do I want a sports car, an SUV or sedan?
- Which car brands do I like?
- What are my must-haves and nice-to-haves?

- What is my budget?
- Cash or monthly payments?

- Which brands and models fit withinr my budget?
- What are the current trends?
- What do reviews and experts say?
- Which cars are most visually appealing to me?

- Which car is the best value?
- Which car fits "my style" the most?
- Which car did I like best in a test drive?
- Are there special deals or service packages?

- What is the transaction process?
- What are my payment options?

- How should I maintain my car?
- What do I do when I need service or am in an emergency?
- Where can I buy parts?

- How should I sell my car?
- Can my previous dealer assist me?
- Is there a servicing or maintenance procedure I do before I sell my car?
- What happens to my warranty or service package? Is it transferable?

Typical questions asked by users at each stage.
An ideal interface would anticipate and assist the successful effective completion of tasks at each stage.

Importance of details & features on a luxury car website

Most important website features

Car Expert	Car Novice
Exterior visualizations	Exterior visualizations
Comparison tools	Interior features & visuals
Customization tools	Comparison tools
Access to independent reviews	
Information on technological features (GPS, cruise controls, entertainment system)	Price information
Performance details – particularly speed-related (torque, horsepower, acceleration)	Customization tools
	Information on technological features (GPS, cruise controls, entertainment system)
	Safety features
Price information	General performance details – efficiency (mpg), reliability
Interior visualizations and information on options	Dealer & service information
Safety features	Access to independent reviews

Less important website features

Summary

Heavy attention to details, will scan and dive deep into information. Very important to support model-comparison tasks and customization tasks.	**Focus on visuals and surface-level features. Seeks information in digestible pieces (avoid information overload). Appreciates guidance during process.**

Users will pay attention to details relevant that are important to them. **An ideal interface would provide access to the details where appropriate and reduce complexity so that information can be digested with minimal effort.**

Related web-browsing behaviors

Car Experts

- Understands technical details of cars
- Visits popular magazines & Websites: AutoTrader, Kelly Blue Book, eBay Motors
- Familiar with standard navigation layouts of car websites - comes with structural expectations
- Seeks expert opinions
- **Details > Overviews**

Car Novices

- Shallow understanding of technical details
- Doesn't frequent car websites, but familiar with online shopping navigation - likes to browse and compare at-a-glance
- Will look to others for recommendations at advice more heavily (seeks social validation)
- **Overviews >Details**

Informal Usability Tests

Participants were asked to perform several key tasks that were identified as critical use cases on the website. Errors and navigation patterns were analyzed to discover usability problems while using the interface.

Key tasks:

- *Identify value proposition from a first impression test*
- *Build a car under a budget of $120,000*
    - *Find a dealer and schedule for a test drive for the car that was built.*
- *Save and compare between saved builds*
- *Find out how many models start at below $70,000*
- *Obtain service information*
    - *Where to get serviced*
    - *What to do,*
    - *How often*
- *Sell an owned Mercedes-Benz*

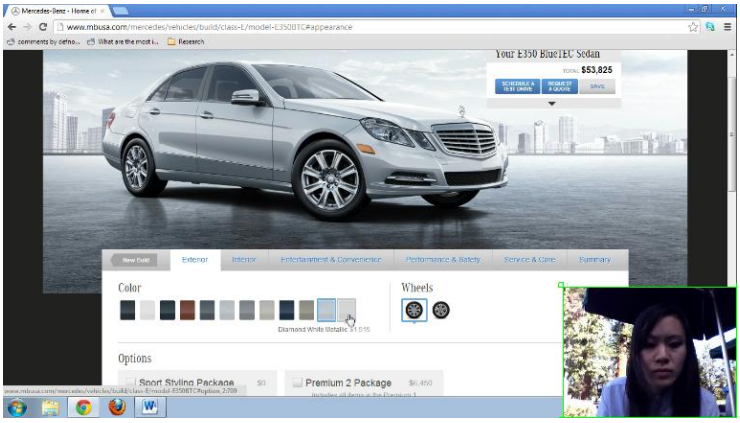


Figure 6: Rask progress and facial expressions were recorded during the sessions

Usability Test Participants

Participants were all volunteers recruited through online advertising on social networking sites (Facebook and Twitter). All participants were given a $10 Starbucks gift card for participating in a 30-minute session.

User Group	Car Expert		Car Novice	
Name	Joe B.	Ken C.	Tiffany L.	Kevin M.
Age	27	26	23	27
Occupation	Software Engineer	Mechanical Engineer	Graduate Student	Statistician
Current Vehicle	Mazda 3	Mazda Miata	Toyota Camry 2004	Ford Falcon 1993
Previous Vehicle	Subaru Impreza	Ford Taurus	None	Ford Laser 1999
Knowledge about cars	Deep	Deep	Shallow	Average
Reads car magazines or visits websites/blogs regularly	Yes	Yes	No	Occasionally

Value Proposition

The first impression task gave participants a brief exposure to the website. The purpose of this task was to understand if the website delivered a clear value proposition to users.

Most participants were **able to identify** that the website:

- ✓ Has a large variety of models
- ✓ Has details on all the Mercedes-Benz models
- ✓ Has special deals
- ✓ Has a customization tool

Most participants **did not identify**

- × How Mercedes-Bens is superior to other car brands
- × Each model has customization options
- × Has a selection of pre-owned cars
- × Allows comparisons between models
- × Has resources for current owners

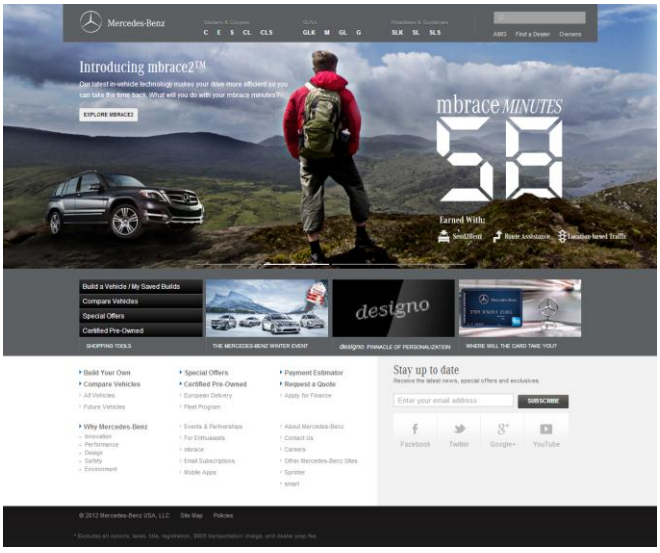


Figure 7: Fifteen seconds on this front page doesn't convey much value to users

Other General First-Impression Comments

Car Novices' Comments

- *It looks **pretty**, I guess.*
- *There's a **large variety**. I didn't know Mercedes had so many models.*
- *It's alright – **looks like any other website.***
- ***What's with the tiny text?***
- *I get that the letters, C, E, S, whatever… those are the models. **Doesn't tell me what is the difference.** Does C mean Classy and E mean Elegant?*
- ***Seems like a lot of ads**. And the ads were jumping. Annoying.*

Car Experts' Comments

- ***Colors and layout look professional.***
- *It's pretty **standard for a manufacturer site.***
- *That whole first page **seems useless** to me. It's more like a TV than a website.*
- *Would've been **nice if it focused more on what makes Mercedes-Benz the best** for the money.*
- *It's kind of **too much and nothing at the same time.***

Car-building Task

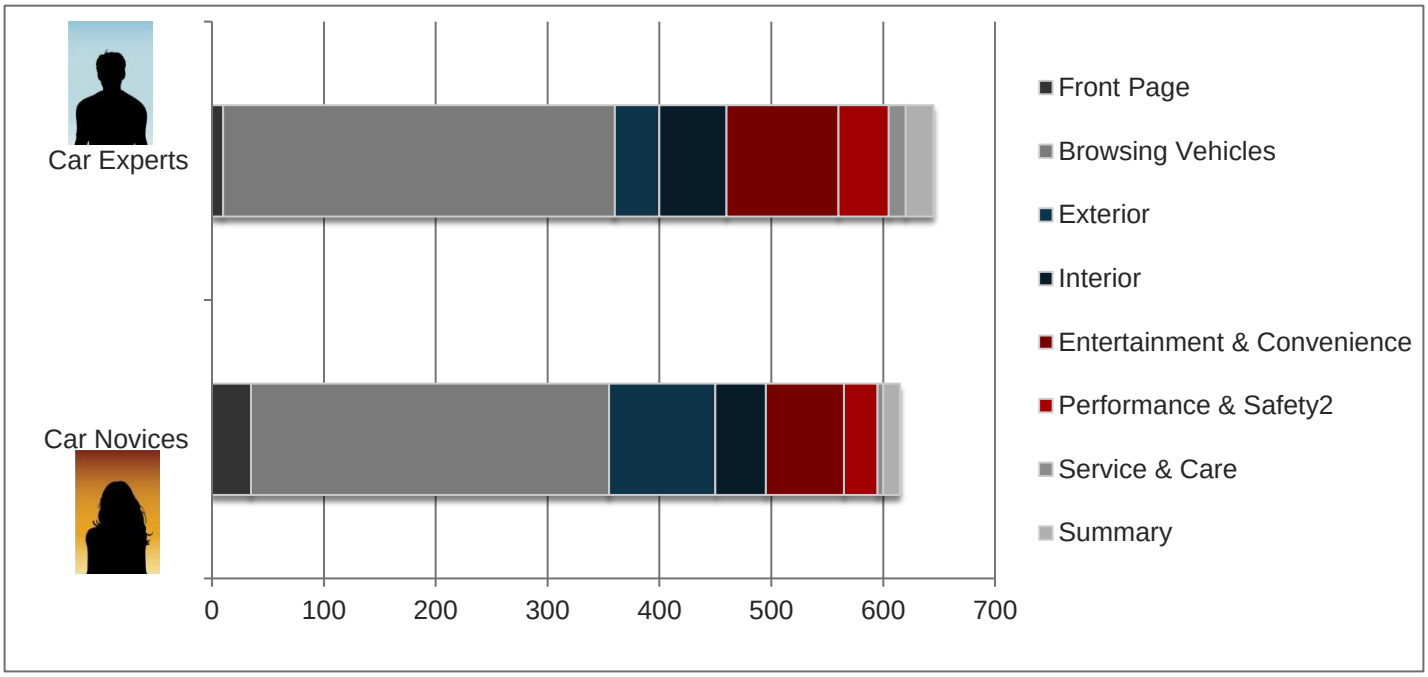


Figure 8: Time on task by page (in seconds)

Users were spending an **unusual and unnecessarily large amount of time comparing between models**. The interface did not adequately allow the users to compare efficiently. Additionally, **feedback was not placed in appropriate proximity** to input areas – users did not notice changes in price as they built their car, for example.

Information overload on local pages overwhelmed users. Users disliked the extremely copy-heavy descriptions and found them **difficult to understand**, and users confessed that they barely read any of the text.

Additional **usability issues** were uncovered and are discussed in detail in chapters on Global Issues & Local Issues.

Task Completion

Most participants were **able to complete** these tasks without much difficulty:

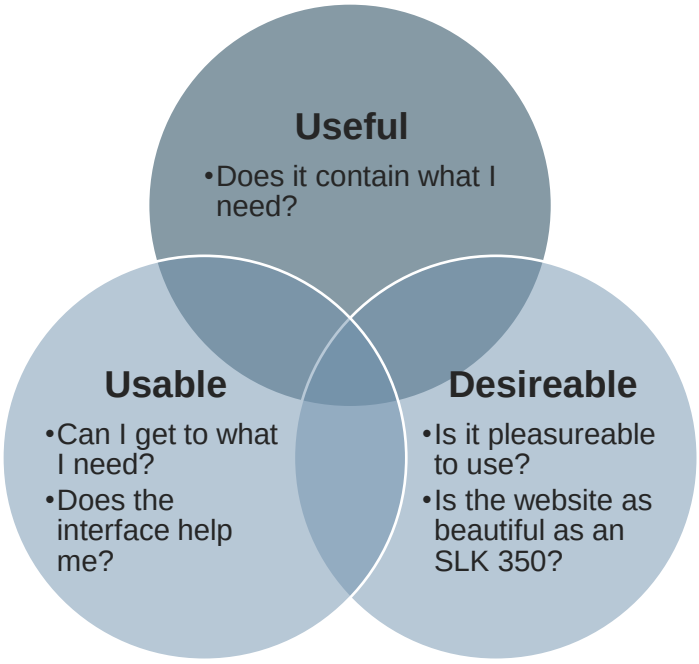
- ✓ Find option to start building car

Most participants **were able to complete** these tasks with some difficulty:

- × Build the car while keeping the budget in check
- × Select visual features (color, wheel style, interior details)
- × Use search function to find car models
- × Compare between models

Most participants **were not able complete** these tasks:

- × Find a list of all cars of a certain type – Sedan, Coupe, SUV, Roadster & Supercar
- × Find a list of all cars that fit within a certain budget



In order for an interface to be useful:

The website needs to provide value to the user. Value proposition is important because it gives the user the reasons they would use the website (as opposed to other websites, such as Kelly Blue Book). A useful website **contains all the information and interactions they need** from Mercedes Benz that might not be available on other websites. A good website will **anticipate and deliver** on every touchpoint of the Mercedes-Benz experience – from the pre-purchase to ownership to selling of the vehicle.

In order for an interface to be usable:

The interface should **support and aid all tasks and user goals**. Car novices are in particular need for an interface that **provides guidance** throughout the browsing process. Users place particular value on **comparison tools** that allow efficient comparisons between models. Additionally, all areas of website should **aid scanning behavior** but allow for depth where appropriate for car experts. **Easy access to details** is important, and a clean interface will allow users to find and direct attention on features important to them efficiently and effectively.

In order for the website to be desireable:

Convey the message of luxury and quality through **pleasant and smooth interactions** as well as **appealing aesthetics**. The entire browsing experience should feel no less enjoyable than driving a luxury sedan. Give users a **sense of control and security**, and **provide delight** by anticipating needs and fulfilling them.

Global Usability Issues

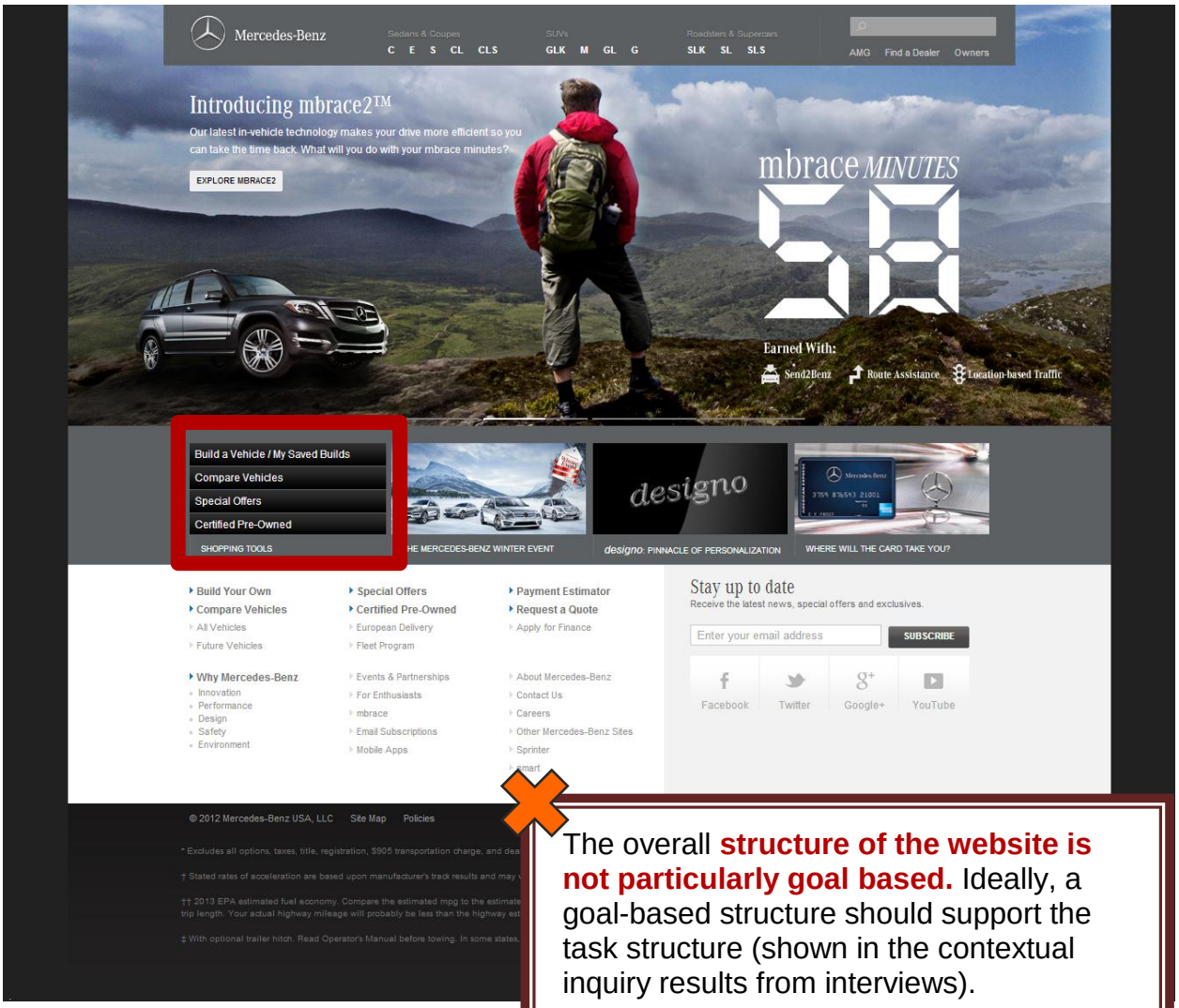
The following section defines **usability issues persistent throughout the interface** and present impediments to successful, efficient and enjoyable use of the website as users complete their tasks. Global issues in this interface primarily stemmed from an inefficient architecture and poor application of design principles on the entire site resulting in navigational errors and task-errors.

Each section is titled by the design principle or scientific principles that are violated on the website. Sections include definitions of the principles as well as examples of violations occurring on the website.

Goal-Based Design

Interfaces should support known user goals so that users are will find greater usefulness and effectiveness in their experience of the website. When user goals and procedural tasks are known, then user should be able to achieve those goals easily through proper design of the architecture, navigation and elements of the interface.

Additionally, all important tasks for goal-achievement should contain emergent features to prevent users from failing to attend to them. A good interface aids successful and efficient goal completion, while a badly designed interface prevents it.



The overall **structure of the website is not particularly goal based.** Ideally, a goal-based structure should support the task structure (shown in the contextual inquiry results from interviews).

Additionally, important functions are hidden (highlighted in red). One of the primary goals is to build a car around set parameters – this function is tucked away in a corner, on buttons that do not have emergent or distinguishing features to draw attention.

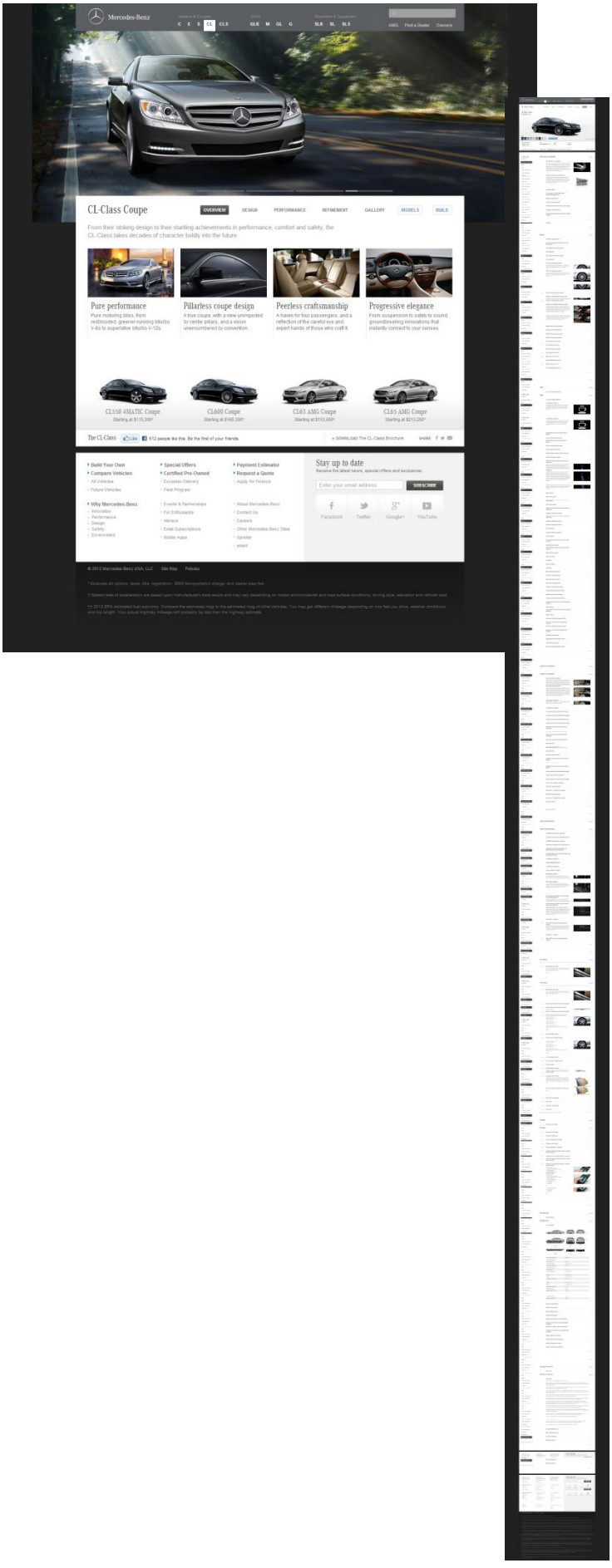
Attention

Attention is a limited resource, and users' attention are prone to distraction during tasks when an interface does not adequately take into account human's limited ability to focus. A good interface directs attention to the right information.

Selective attention occurs users have a tendency to orient attention to certain types of information. On an ineffectively designed website, this tendency could lead to failure to focus on the right information.

Focused attention occurs when a user is attending to certain information while completely ignoring others (particularly when they are undertaking a complex task). This could lead to users failing to notice important information in the periphery.

Divided attention occurs when users time-share attention between different elements or tasks. An ineffective website forces users to utilize too much divided attention when there are too many information sources, or if multiple micro-tasks need to be undertaken at the same time.



Many areas of the website **fail to direct attention to important items** appropriately. Primary cause is trying to do too much on each page.

Important details do not stand out visually – so users cannot use visual sampling to determine areas where important information is (so they can then dive into detail).Additionally, many pages are unbearably long and read like a Tolstoy-meets-Shakespeare novel (too many words and hard to understand).

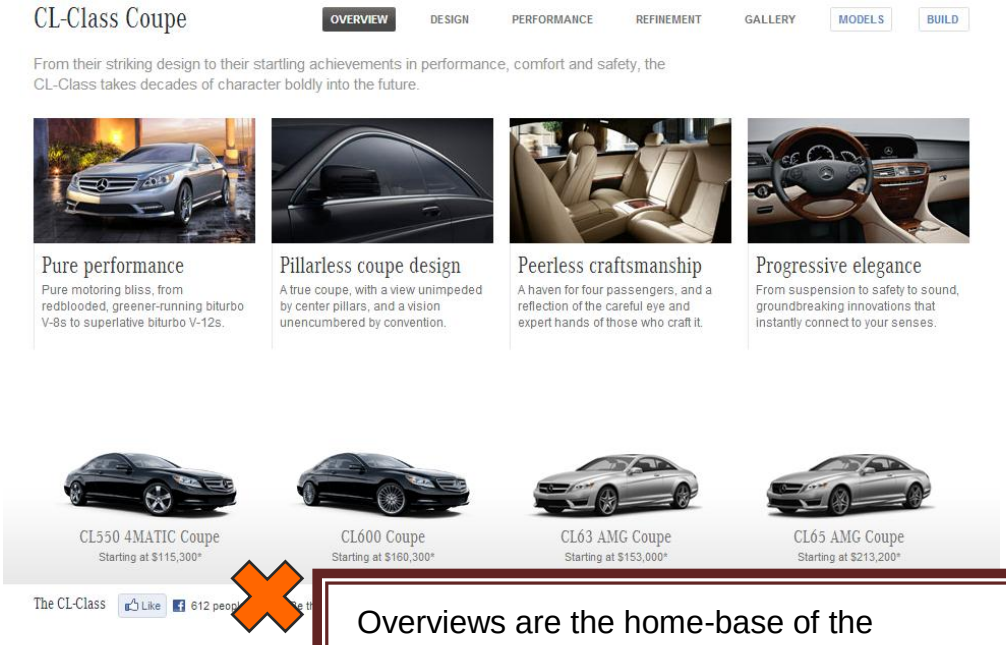
Overall design just doesn't support natural human attentional limits.

Progressive disclosure

Progressive disclosure is an interaction design technique to help maintain the focus of a user's attention by reducing clutter, confusion, and cognitive workload. This improves usability by presenting only the minimum data required for the task at hand.

Good progressive disclosure reduces feelings of being “overwhelmed”. Additionally, only revealing essentials helps users manage complexity by “breaking down” information/tasks into digestible chunks – allowing users to move from a simple to complex action.

All the information about the car is in one long page and puts **strain on a user's attention** and mental workload. Using progressive disclosure would ease the burden.



Overviews are the home-base of the progressive disclosure and should provide structure for further exploration into detail.

Overviews on the site do not use progressive disclosure correctly – none of the information and elements here seem "important" and they also do not invite users to explore further because the content doesn't have positive affordances and are not readable

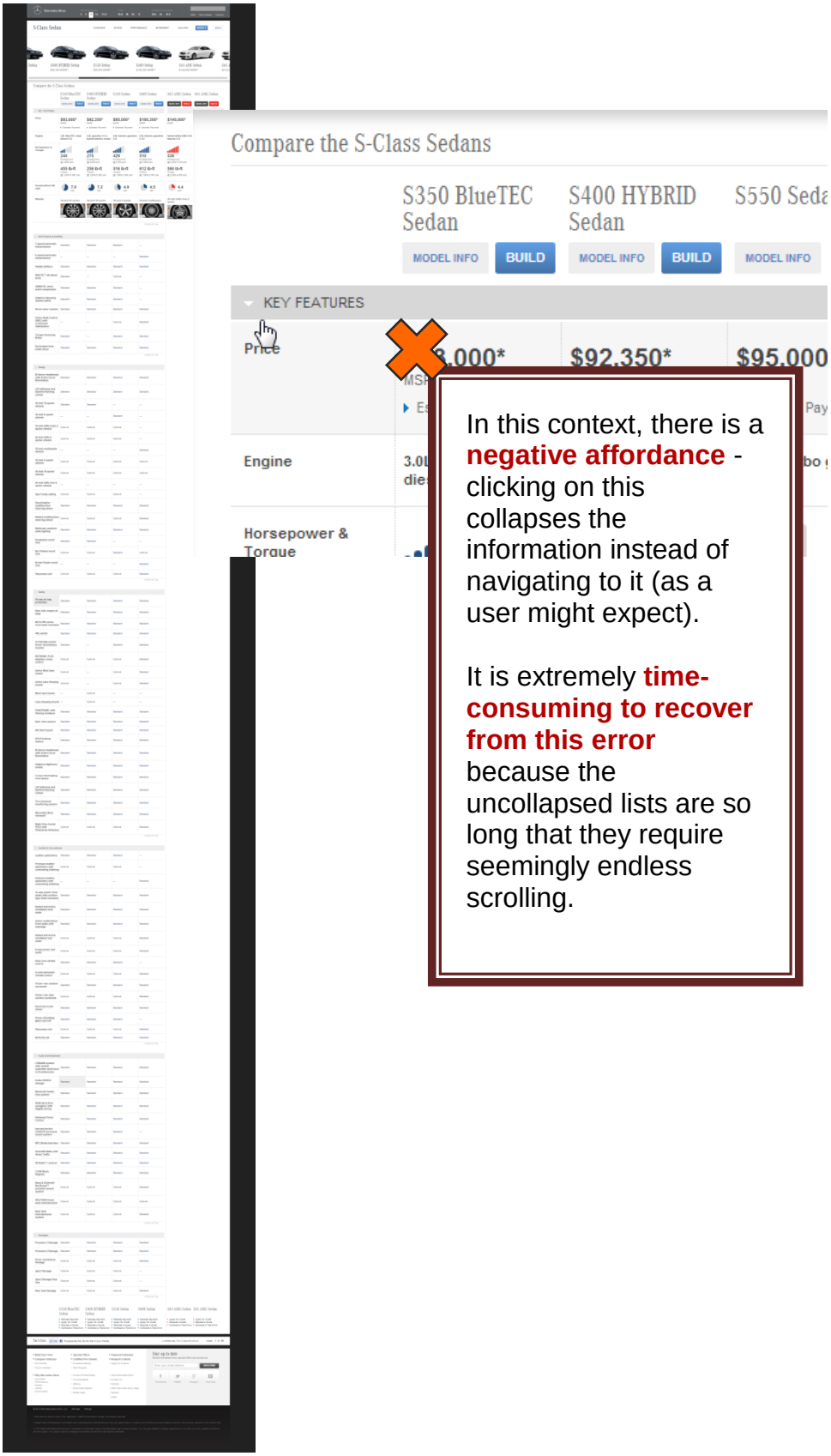
Affordances

Affordances are perceived qualities of an element that directs the use of that element (or object). Good affordances on a website communicate how an element is used or how it should be used without instructions. Perceiving affordances occurs *pre-attentively* – they cannot be mediated by instructions or training because they elicit instinctual, impulsive behaviors.

Positive affordances should be incorporated throughout an interface so that the interactions support and are compatible with the innate tendencies of users – so that all interactions are done correctly or “intuitively”.

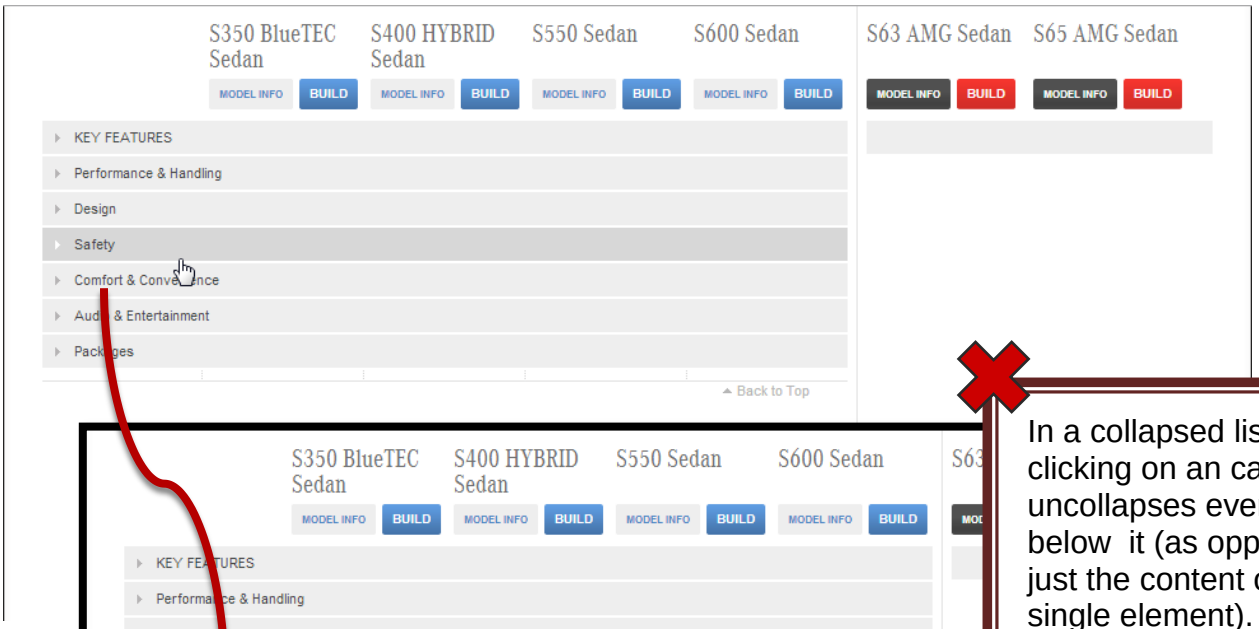
Negative affordances communicate the wrong way an element should be used. In essence, use of an item with negative affordance goes against the natural behavior that a user would perform. Thus, negative affordances cause error and must be eliminated.

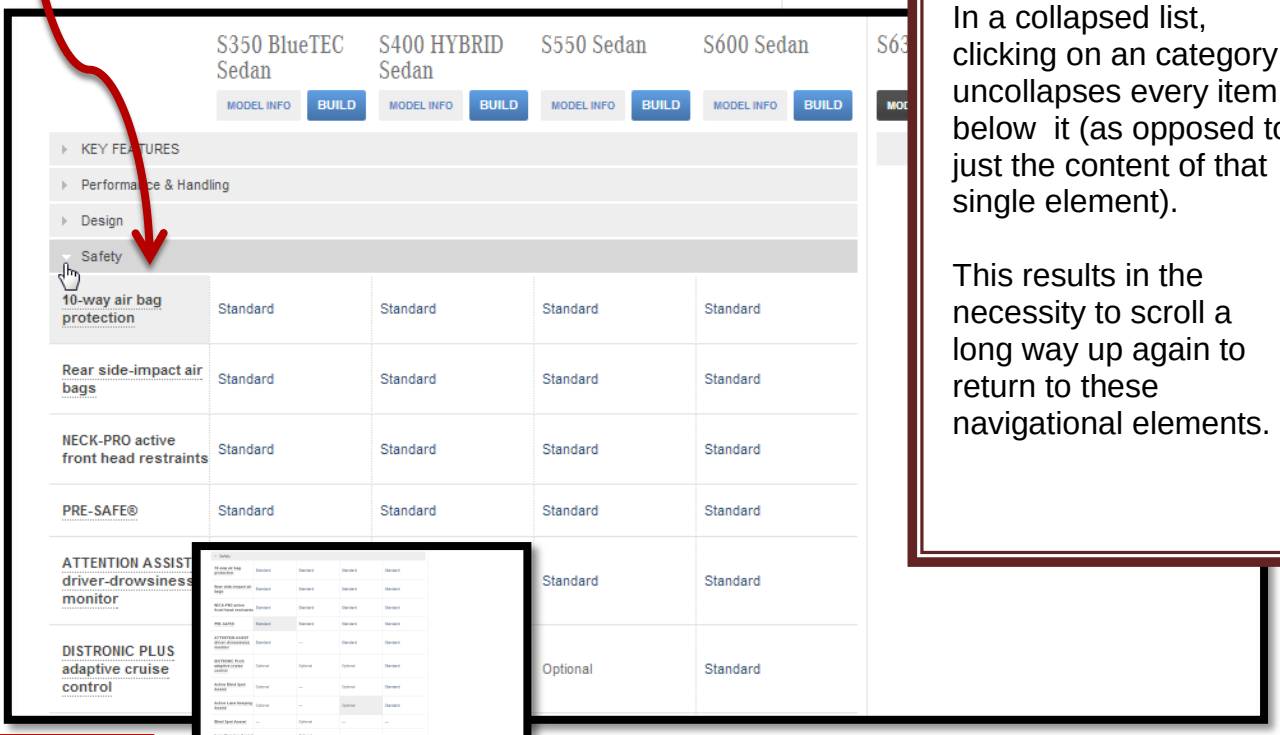
Comparison pages are extremely long and contain negative affordances which result in errors that are difficult to recover from.



In this context, there is a **negative affordance** - clicking on this collapses the information instead of navigating to it (as a user might expect).

It is extremely **time-consuming to recover from this error** because the uncollapsed lists are so long that they require seemingly endless scrolling.

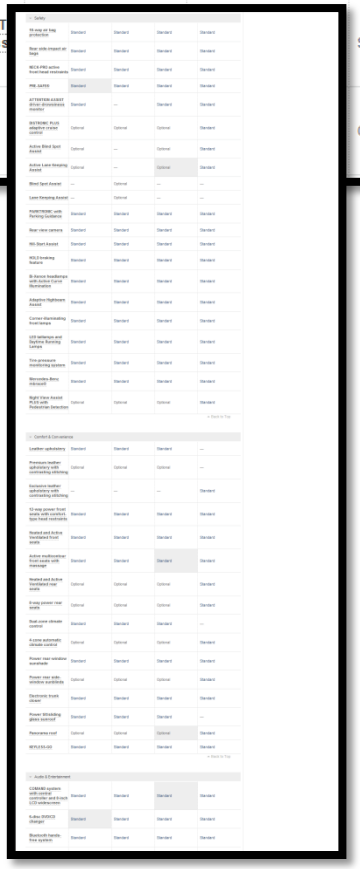


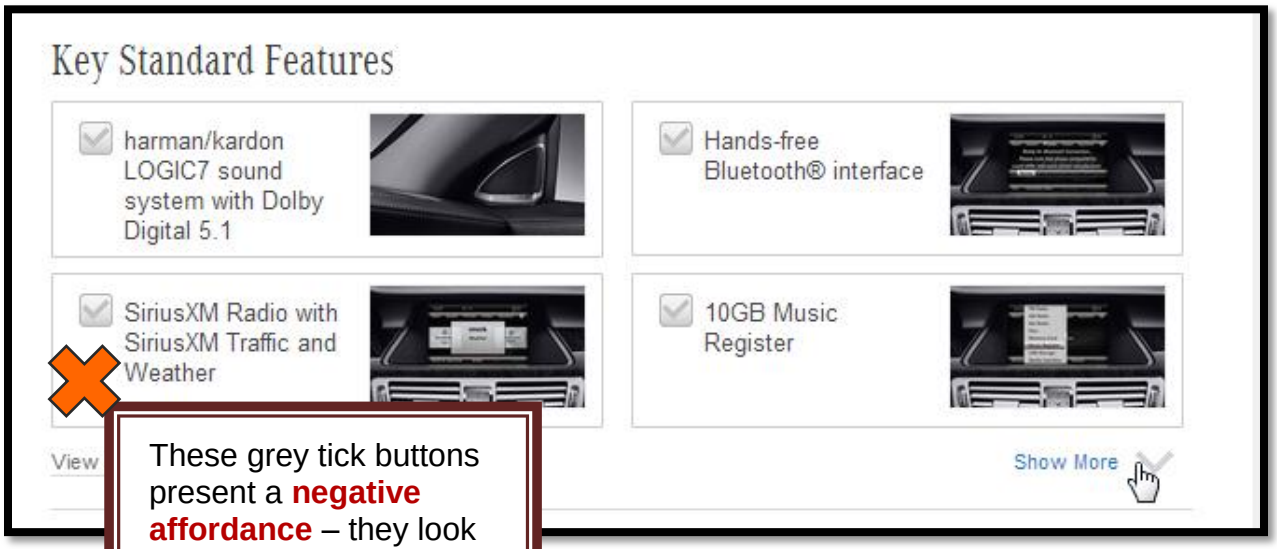


In a collapsed list, clicking on an category uncollapses every item below it (as opposed to just the content of that single element).

This results in the necessity to scroll a long way up again to return to these navigational elements.

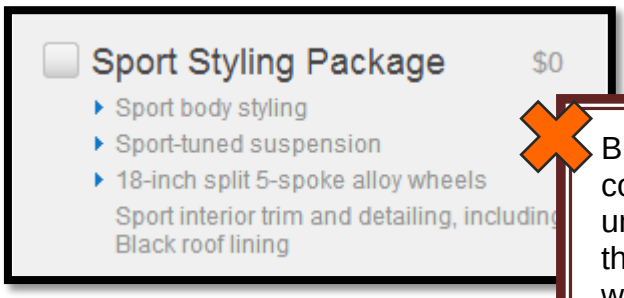
Uncollapsed elements are presented – in a very long list because every item is uncollapsed. (Partial list shown, right)





These grey tick buttons present a **negative affordance** – they look like clickable buttons but are not.

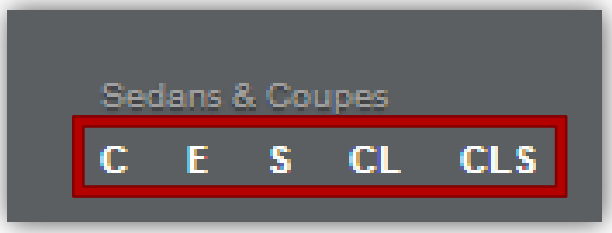
Also **visually ambiguous** – are these standard features included or not? They are key standard features – but the grey tick appears like it was not selected. Leaves users wondering.



Blue arrows here are more commonly an affordance for uncollapsing a list (as is used through some parts of the website). Unfortunately, these elements open a pop up gallery.

Salience Coding

Related to attention, areas of importance should be coded for more salience (that is, they “stand out” in some way) in the interface. If an urgent message is displayed, then it should possess emergent features that pop out such as a distinct color or a form of animation. Frequently used features should also be able to be quickly found via their saliency.



Most salient elements in navigation bar are the models – while the types (Sedans/Coupes/SUV) are **not at all salient**.

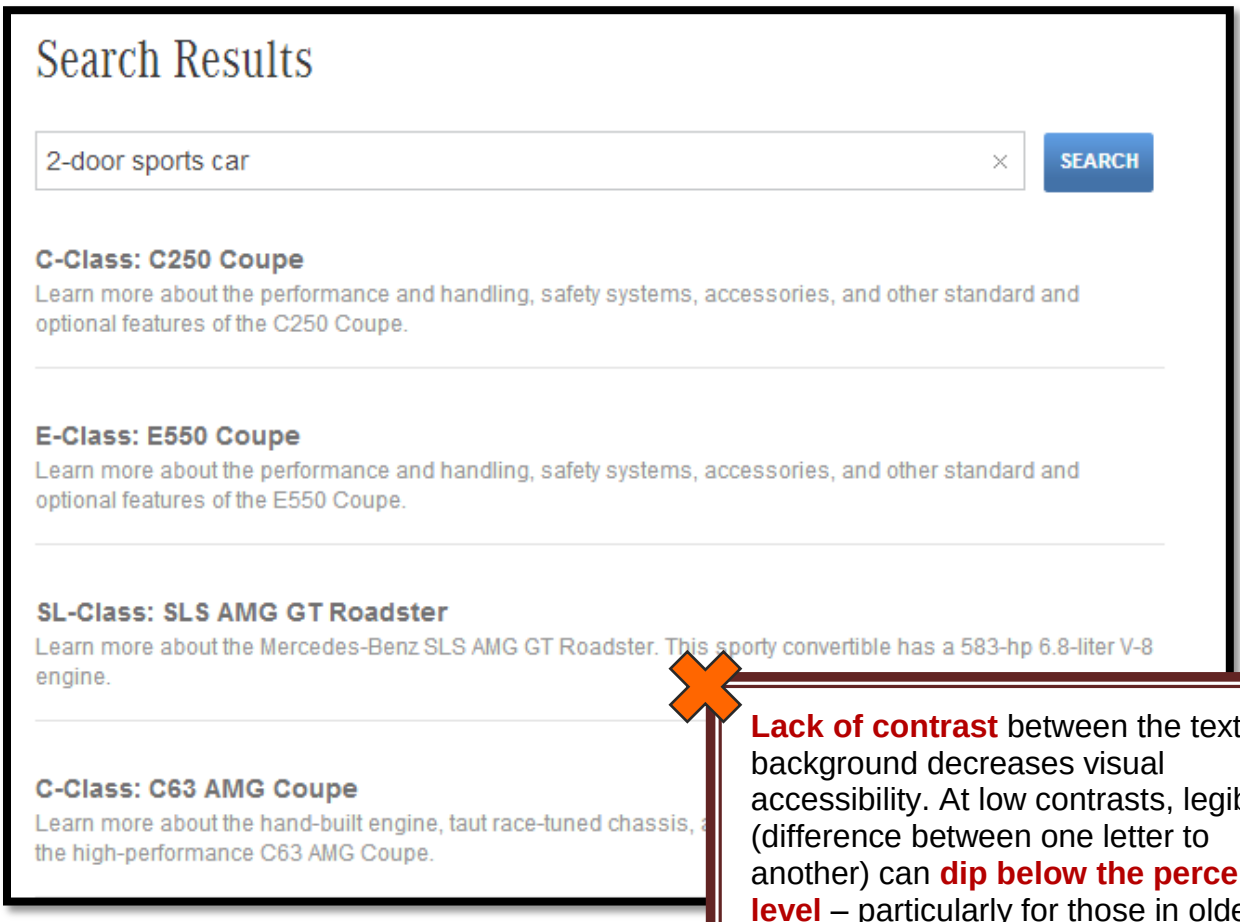
Since task analysis reveal that users mentally select a type of car first, salience coding should support that process in the correct order.

Visual Accessibility

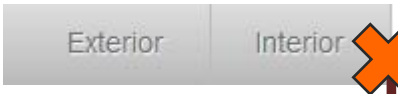
Visual elements in a design should factor in the limits of human perception. If the physical features of an element are not appropriate, it will not be perceived and thus users will not know the element is present (and will not interact with it). In other words, they cannot attend to what they do not perceive.

Visual accessibility of features takes into account the context of the element, the contrast and the color. Since the audience of a website can be large and of all ages, visual elements should pose minimal challenge to those with color blindness, low acuity or have age-related visual impairments.

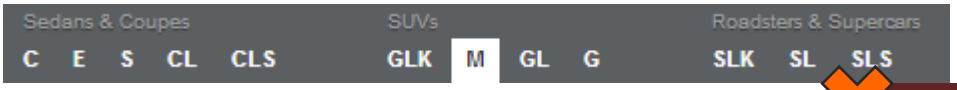
Poor visual accessibility due to choice of color and lighting **impedes users from perceiving the visual differences between cars.**



Lack of contrast between the text and background decreases visual accessibility. At low contrasts, legibility (difference between one letter to another) can **dip below the perceptual level** – particularly for those in older age groups.



Lack of contrast in navigational elements impede efficiency.



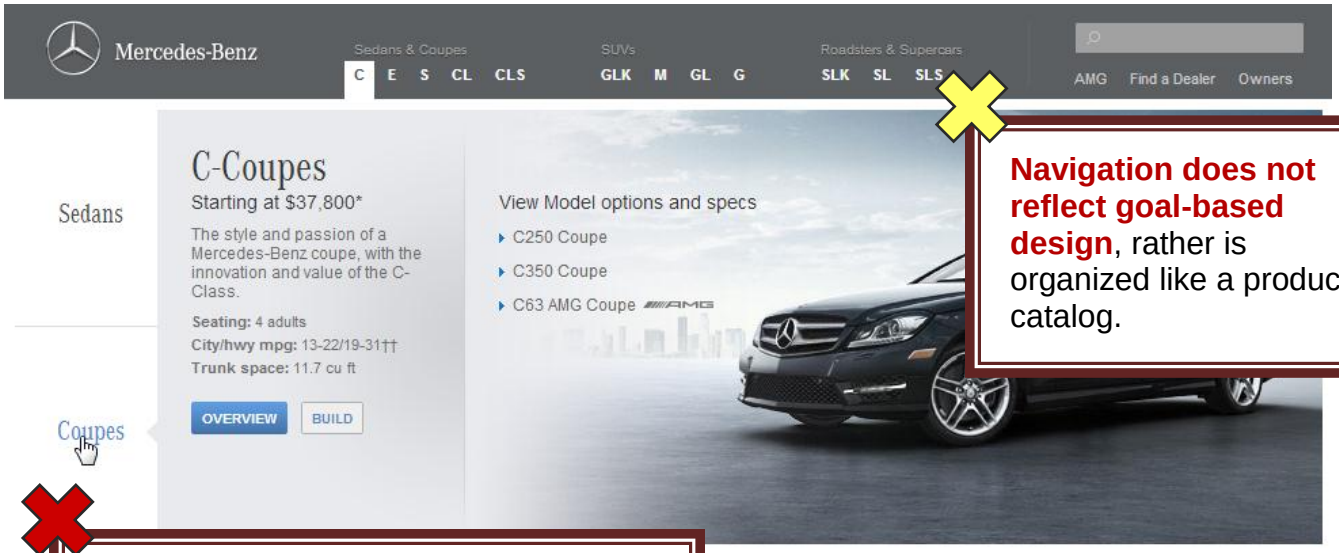
This screenshot is true-to-size. Notice the **extremely small text sizes are used** - visually inaccessible because they can barely be perceived, much less read or understood.

Navigation

Main navigation elements should be perceptually obvious in form and function. In general, navigation should tell users – where they have been, where they are, and where they can go.

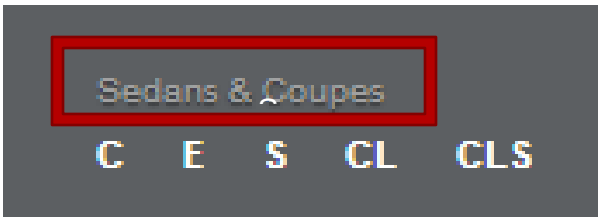
Factors influencing users' ability to navigate efficiently or effectively includes the architecture, complexity and size of the site. During navigation, use landmarks or show the routes to show users where they are in the interface (or which stage in a process) – this also aids navigational learning of the interface.

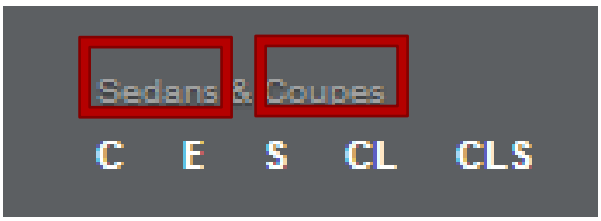
Other navigation aids include use of style differentiation (by color or other visual elements) to tell users when they are a new section that is categorically different from a previous section. Site maps are also a form of navigational aid when used effectively.



Navigation does not reflect goal-based design, rather is organized like a product catalog.

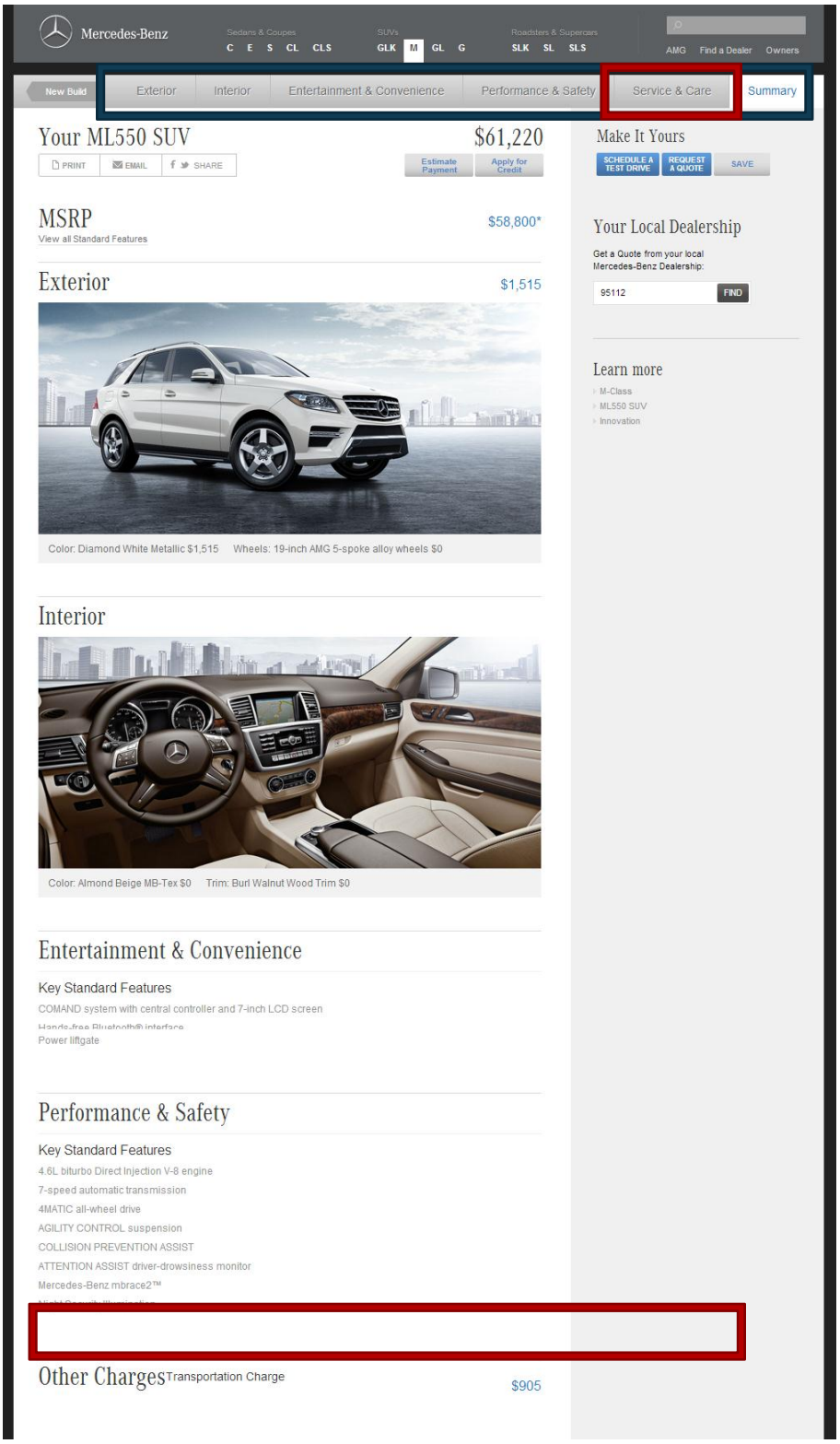
Primary navigation is categorical of products, but **secondary navigation utilities are hidden** (perceptually ambiguous) or difficult to discover (due to multiple roll-over interactions on top of each other





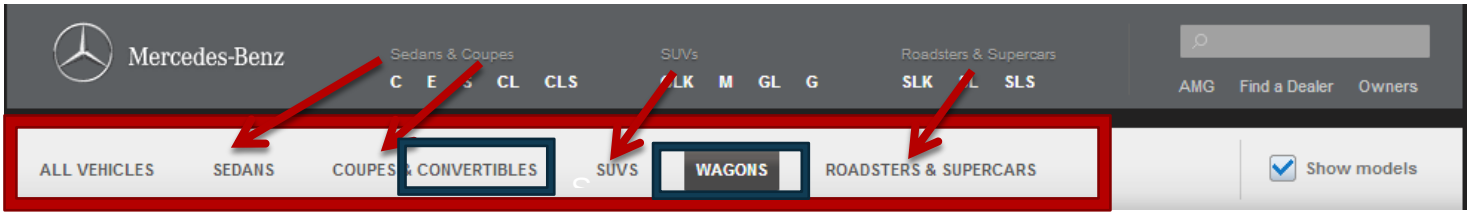
Not apparent that these are navigational elements! Reflects **lack of positive affordance and discoverability.**

Incorrect use of spatial compatibility and lack of consistency – clicking "Sedans" navigates to a different section than "Coupes", but these navigation elements these look like they point to one destination.



Navigation here does not help user prevent an error. **Navigation does not give feedback on areas travelled**.

User has skipped a necessary step (Service & Care) – navigation does not provide feedback (either through the summary, or navigational buttons) of which areas were navigated and which were not.

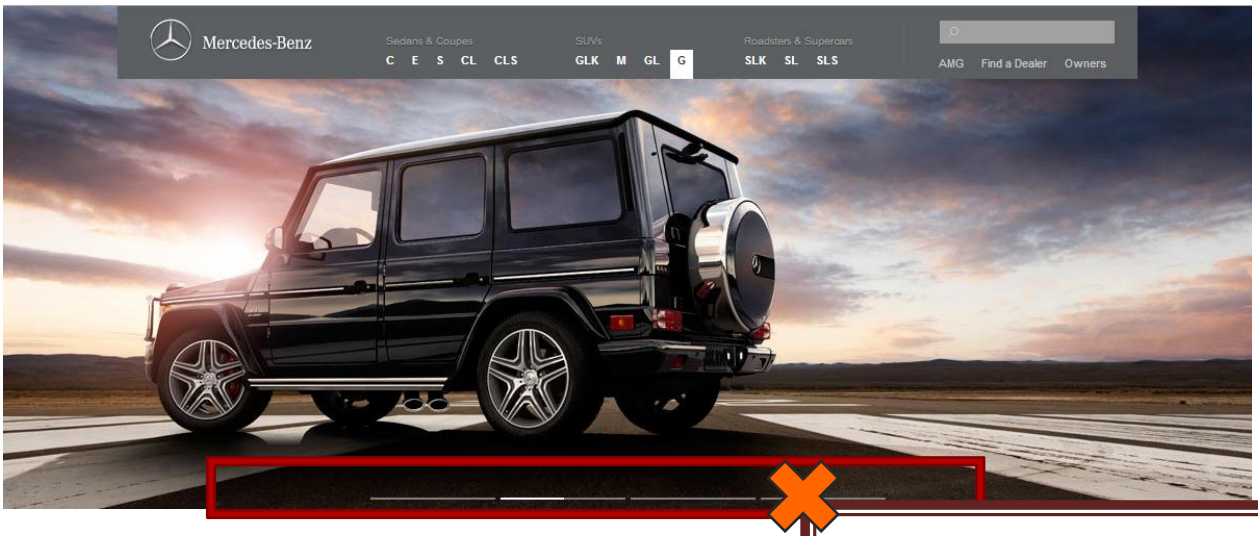


Secondary navigation here is **inconsistent with primary navigation.**

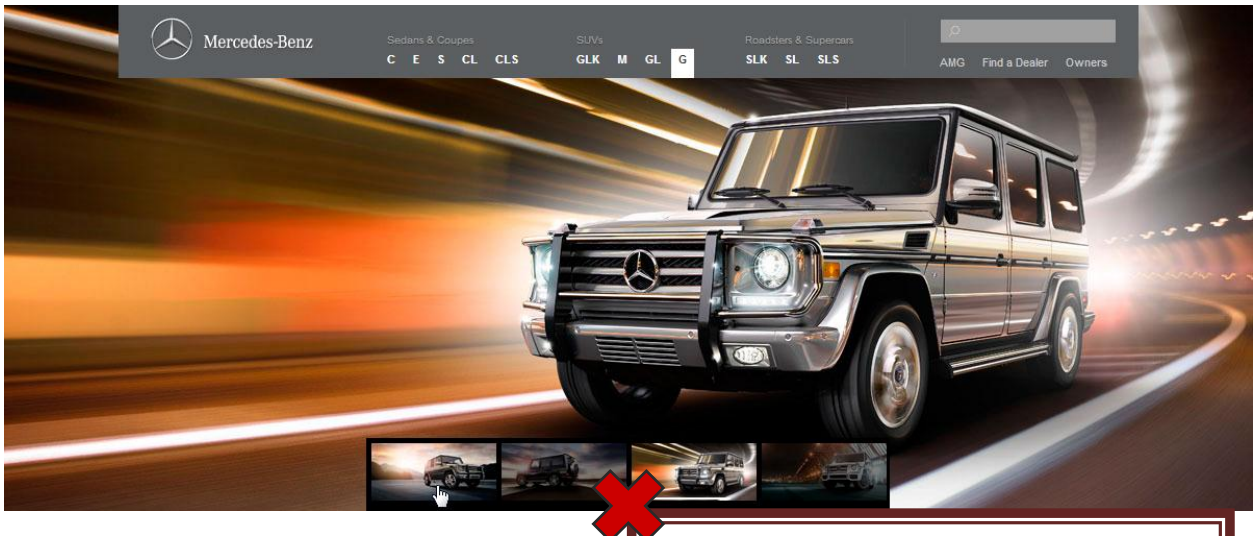
Car type navigation is hidden although it is often one of the starting points in a car-purchase search task. Blue outlines indicate elements missing from primary navigation which are orphaned by the primary navigation.

Visibility

The more visible functions are, the more likely users will be able to know what to do next and how to do it. When functions are hidden or invisible, it makes it difficult for users to control functions on an interface.



Function that controls the automatic picture carousel is **hidden & difficult to discover**.



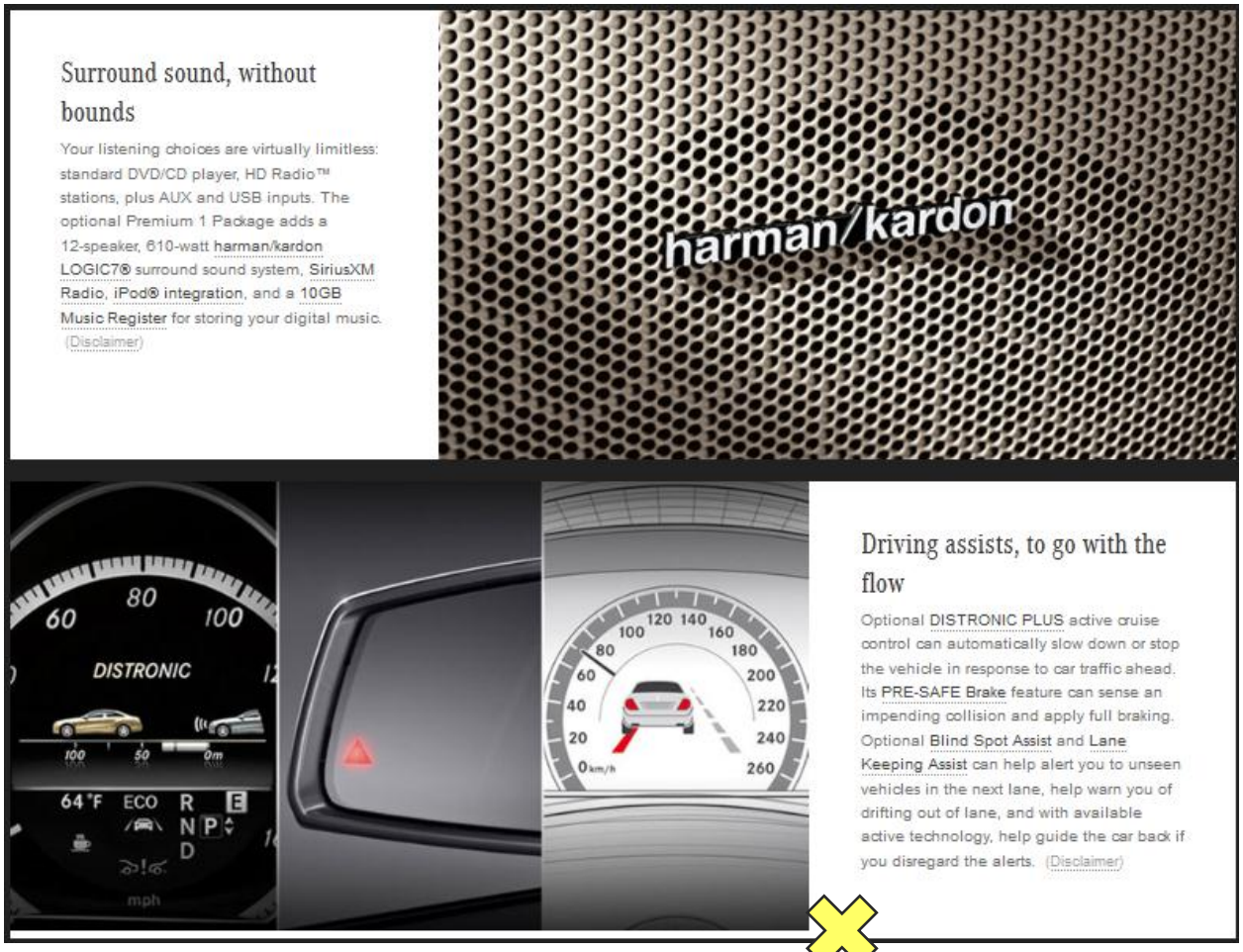
The function to stop the carousel at a particular picture is **completely invisible** (in this case “stop” occurs upon clicking on a thumbnail in the rollover,

Visual Sampling

Related to attention, people take visual snapshots as a general survey of all information prior to focusing on individual elements. Users' mental models and expectancies guide sampling. To increase efficiency, it is recommended that frequently viewed objects or operations should be placed in the center of the visual field. In addition, any tasks used sequentially should be placed next to each other.

Sampling is affected by the layout of the website. Users are prone to scan horizontally, rather than vertically. Diagonal visual scanning should be avoided. Hidden information should be avoided to prevent under-sampling (if you can't see it, you can't sample it).

Under-sampling of content also occurs if a user must manually access the information to be sampled. Therefore, previews occurring close to interactions help users because it provides an external visual representation and offloads it from memory.



Layout **does not support efficient visual sampling** – information has to be scanned in a diagonal (zig-zag) fashion.

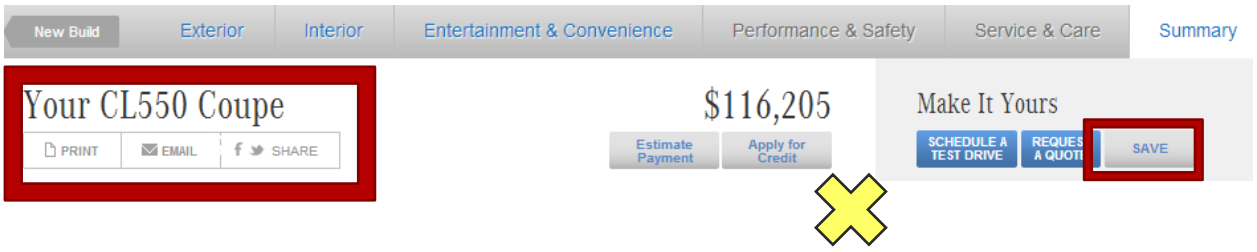
Large blocks of text are not chunked in digestible pieces that are easily identifiable.

Spatial Usage

Spatial Location

Items that are used together should be placed near each other to maximize efficiency and effectiveness.

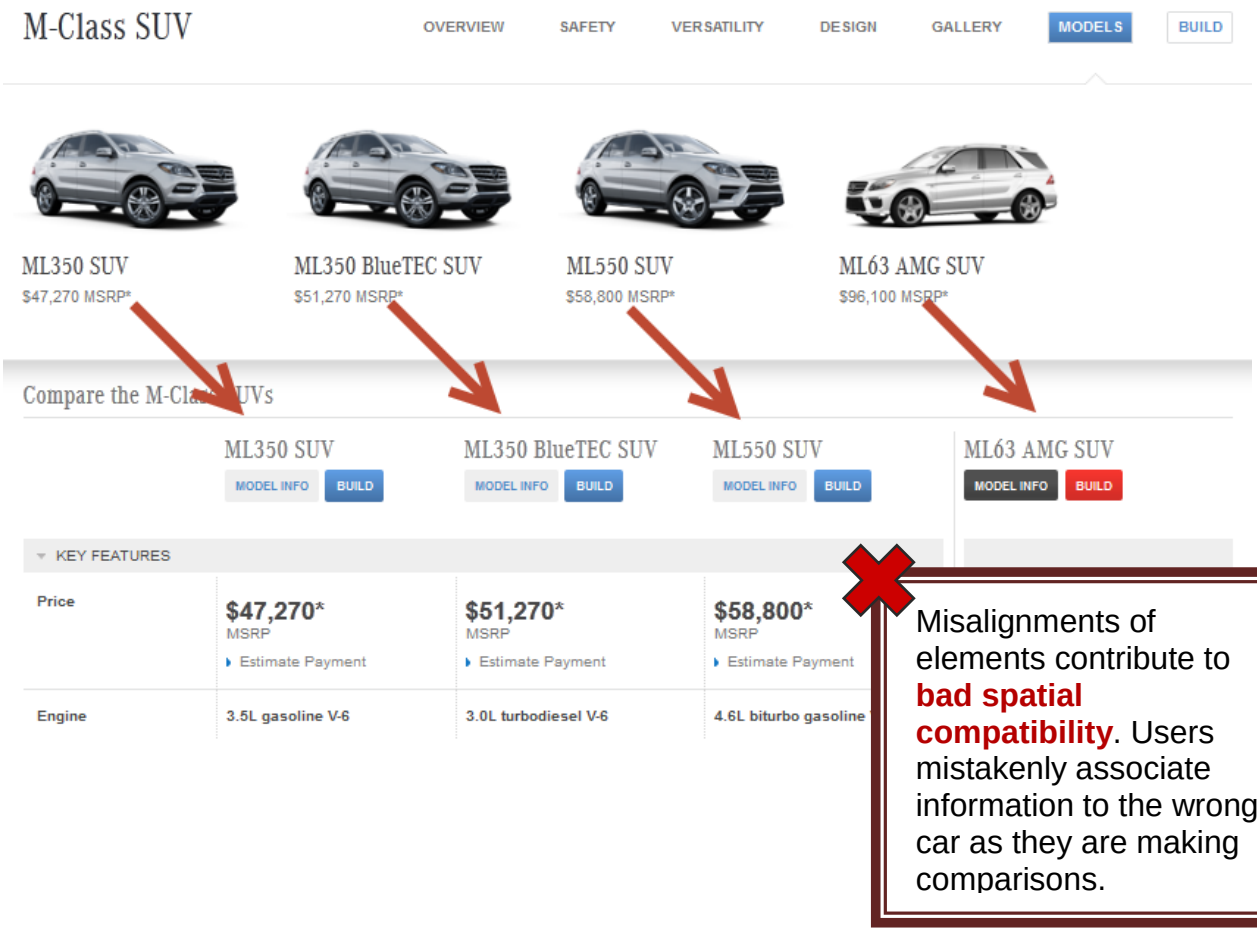
Users often perform visual sampling from the upper left to the lower right (typically in an F-shaped pattern), and therefore frequently used features should be placed higher in the interface. Important elements for performed actions (a visual workspace) should be located centrally as well.



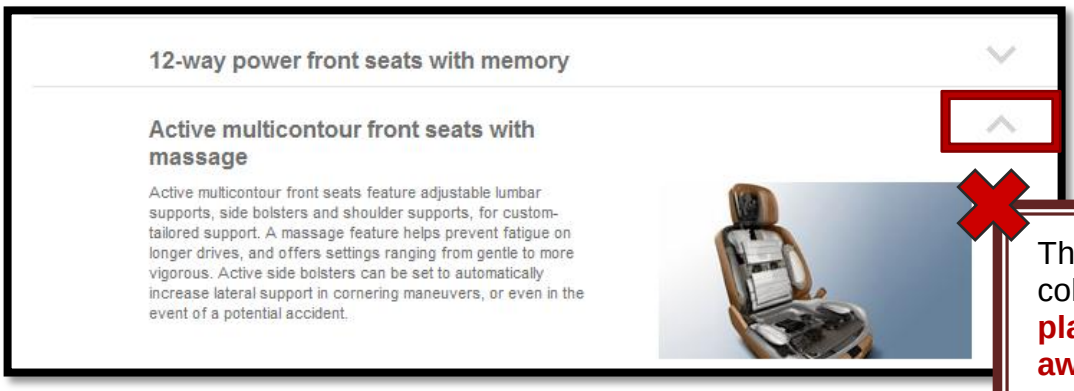
Improper spatial location of the “Save” function – it should be adjacent to the print, email and share functions since these are used together.

Spatial Compatibility

This principle refers to how closely related items are when placed in a spatial location. If certain functions are associated with certain information, those functions should be placed near that information. Bad spatial compatibility refers to elements being mistakenly associated with each other when they are not related.



Misalignments of elements contribute to **bad spatial compatibility**. Users mistakenly associate information to the wrong car as they are making comparisons.

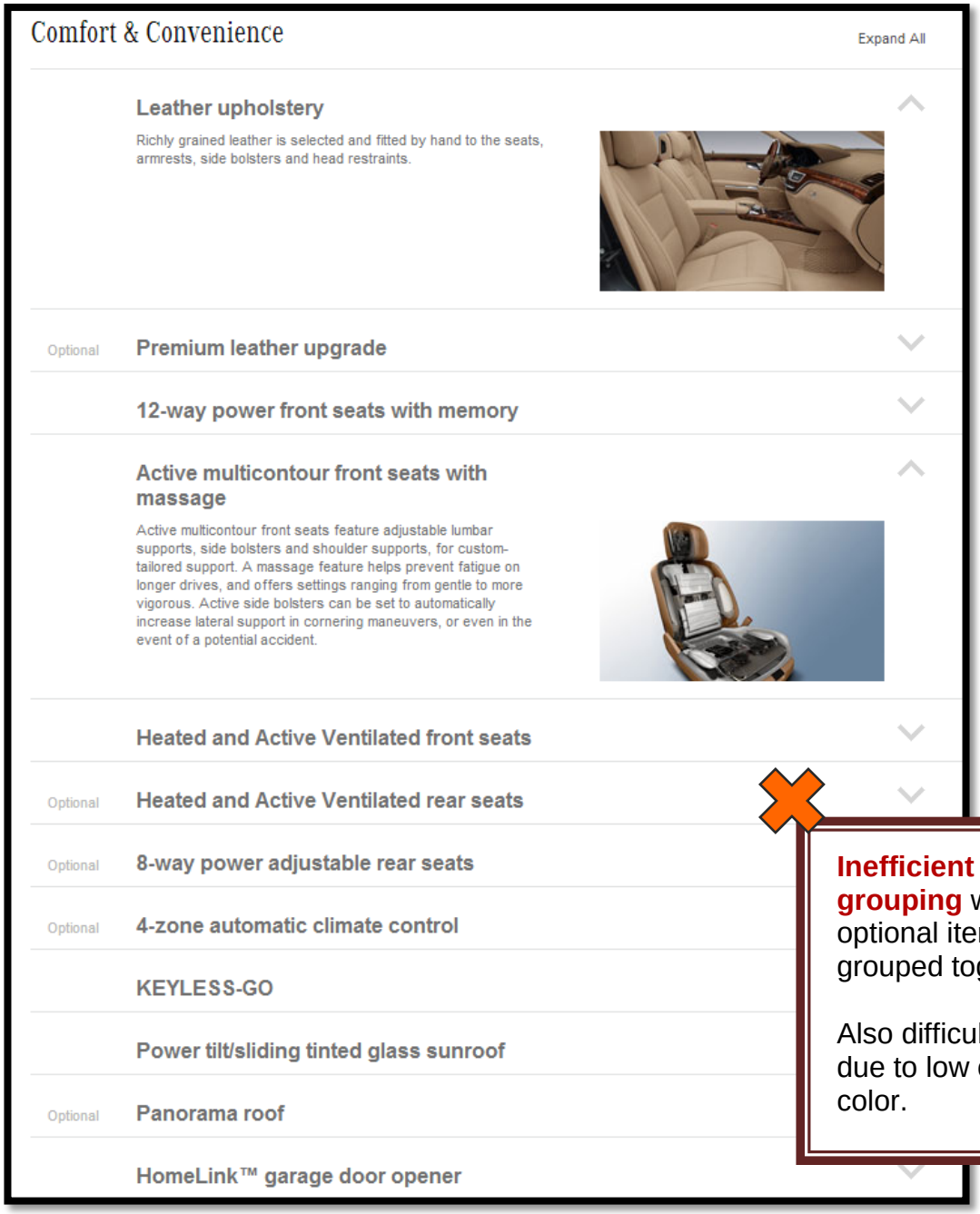


This element for collapsing is **placed very far away from the expected, relevant location.**

Collapsing functions should be placed near the information users want to collapse.

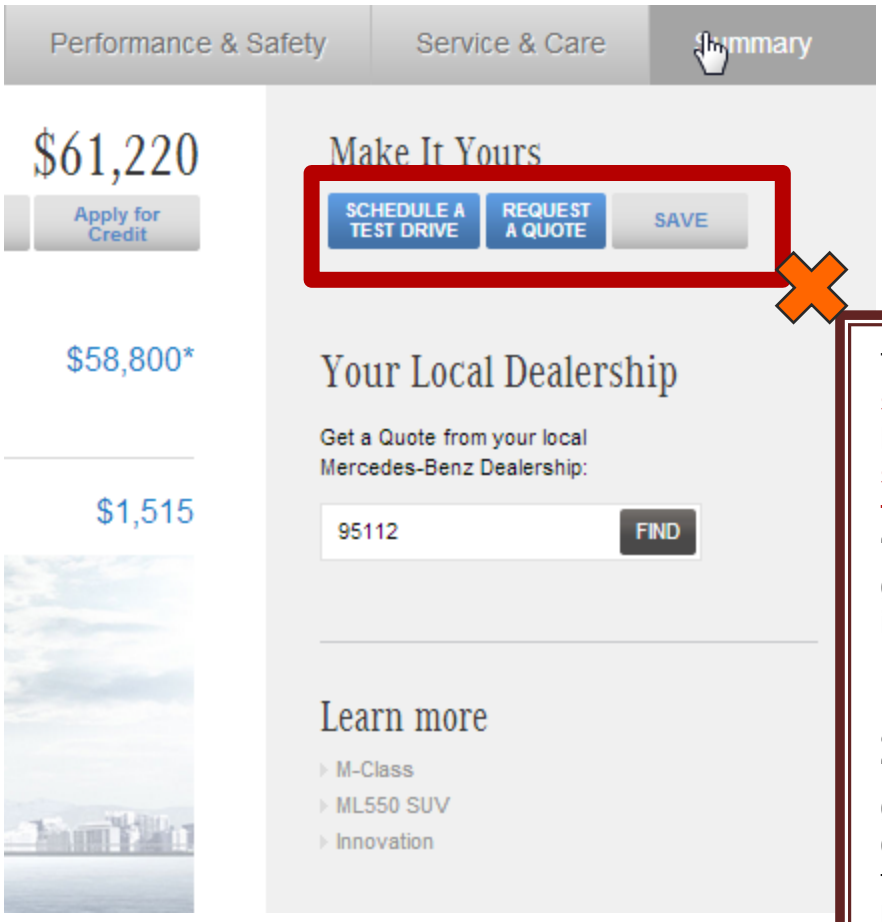
Spatial Grouping:

Grouping similar items allows users to direct their attention efficiently to groups of elements they need. Good use of spatial grouping directs attention because the sum of the elements (the group) becomes an emergent feature. All specific information and tasks that need to be performed in a process should be the same spatial group.



Inefficient spatial grouping where optional items are not grouped together.

Also difficult to perceive due to low contrast color.

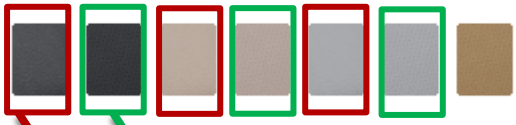


These elements **look spatially grouped. However, they do not serve similar functions** (particularly "save") nor are they grouped as linear steps in a process.

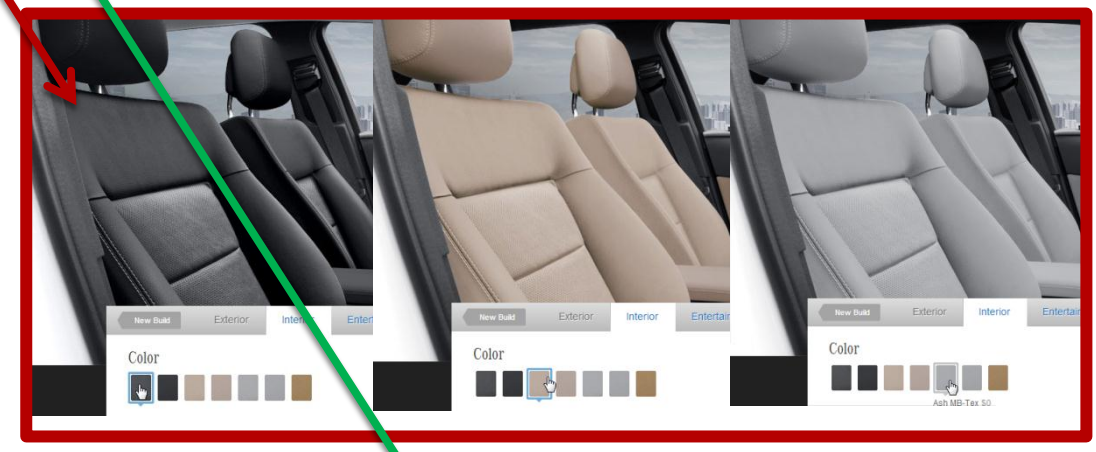
It would be more appropriate to locate "save" elsewhere and group the local dealership finder close to the relevant (blue) buttons.

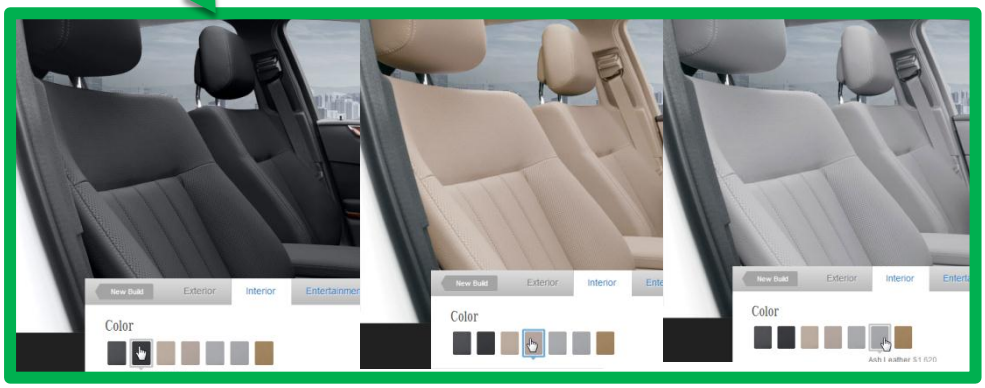
Color

Color



Incorrect spatial grouping – the color is missing a sub-group by “style of chair”. Additionally, the color buttons are inefficiently grouped – similar styles are not placed next to each other.

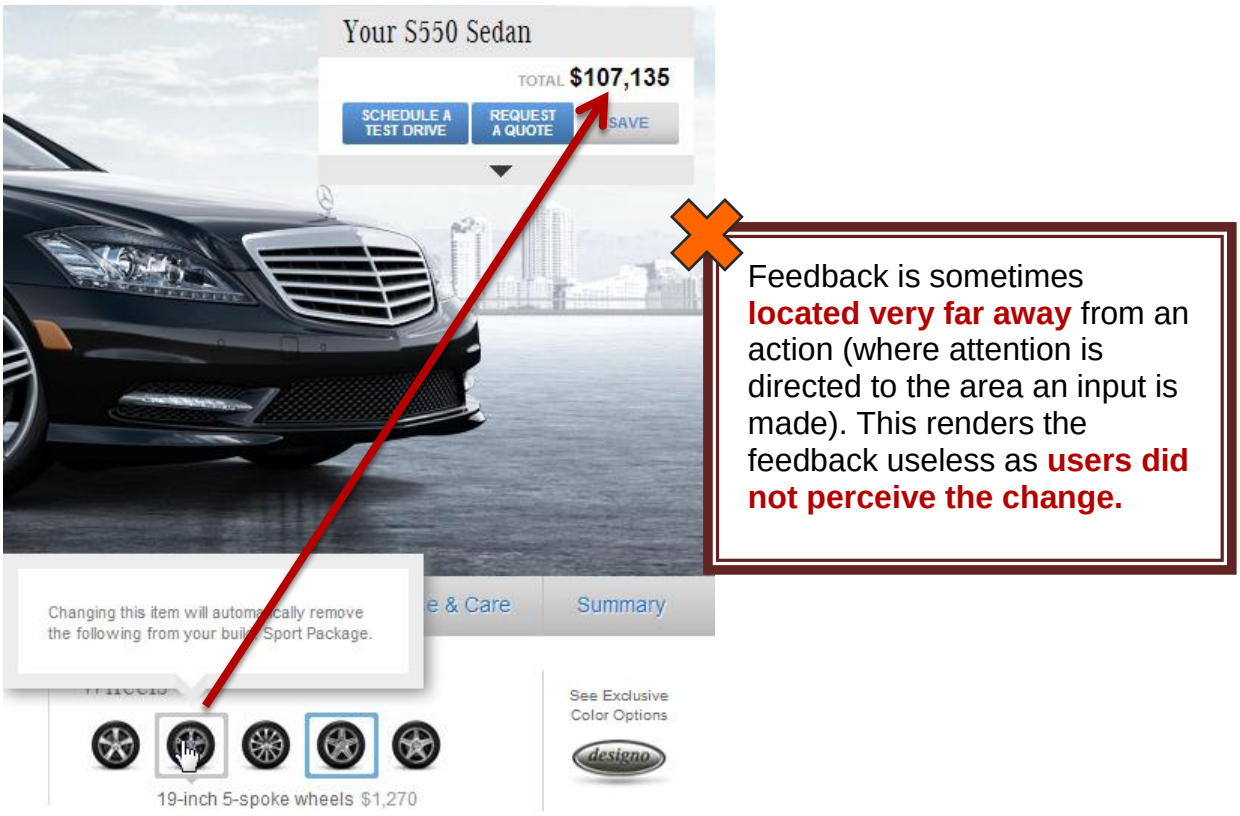




Feedback

Feedback confirms that a system has received an input (or has performed a function as a result of that input). On websites, typical examples of feedback are when a click opens a new window or when clicking a colored box changes the color of the car. Good feedback supports users by preventing frustration and promotes user confidence in their ability to navigate, negotiate and manage the application.

Proper location and physical characteristic of feedback should also be implemented so that the feedback is perceived and acknowledged by the user, particularly when it involves completion of a series of tasks. Feedback tells the user that the next step can be made.

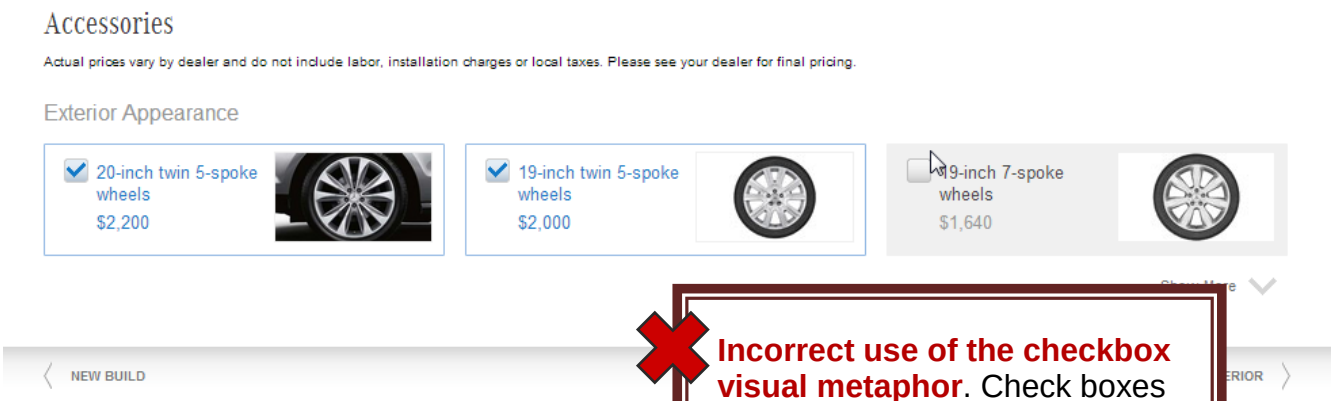


Feedback is sometimes **located very far away** from an action (where attention is directed to the area an input is made). This renders the feedback useless as **users did not perceive the change.**

Visual Metaphors

Visual metaphors are familiar symbols that are used on interfaces to draw on a user's previous knowledge to influence their interaction with the system. The most common example is the shopping cart icon on websites that holds all the items before check-out or radio buttons that signal to the user that only one option can should be picked.

.



Incorrect use of the checkbox visual metaphor. Check boxes are known to be used when selecting multiple options in a list.

In this context, where only one option out of a list should be selected, the correct visual metaphor should be a radio button.

Key Standard Features

harman/kardon LOGIC7 sound system with Dolby Digital 5.1

SiriusXM Radio with SiriusXM Traffic and Weather

A check box typically indicates a selectable option. A tick within a checkbox is a visual metaphor that an item has been selected.

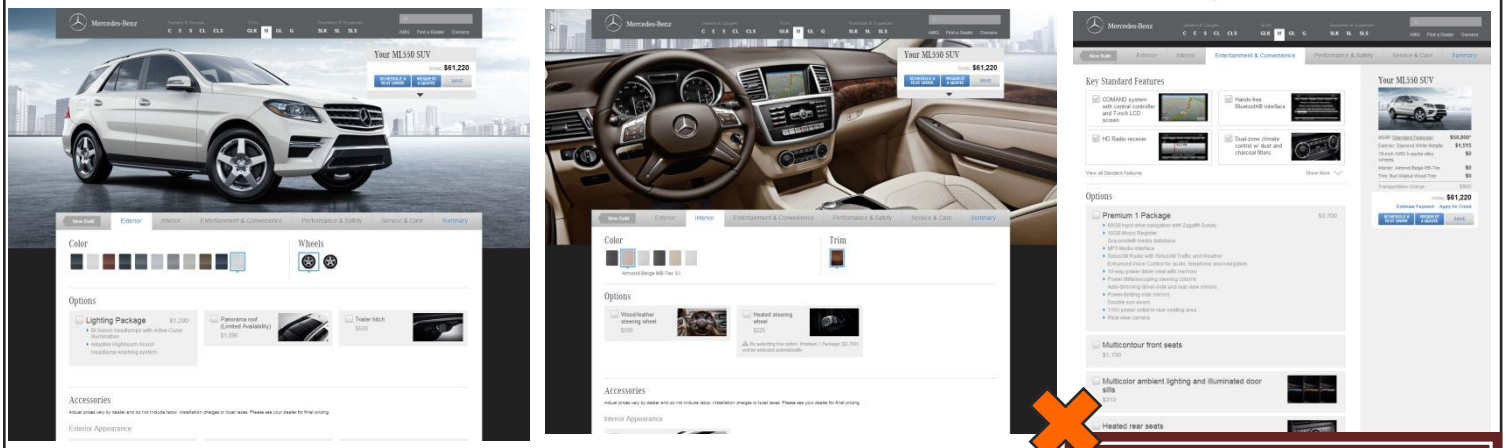
Here, the grey tick is used in what looks like an interactive checkbox (but is not). The grey tick color is ambiguous – is it already selected or does the grey check change color when selected (see previous page example where selected options are blue)

Visual Momentum

On a web interface, visual momentum is the perception of movement through a site, also commonly known as the “flow” a user experiences while navigating the system. A smooth flow factors in context, content, and transitions between pages, displays, and windows of an interface. Consistent representations (or visual anchors such as titles, logos, link names and other reminders) are the key to maintaining a graceful navigational experience.

Good visual momentum should also transfer system information (see cross-pollination) – bringing the information along with the user as they get to their destination. Feedback is also an important element of visual momentum by providing information that users are in the next step of their process.

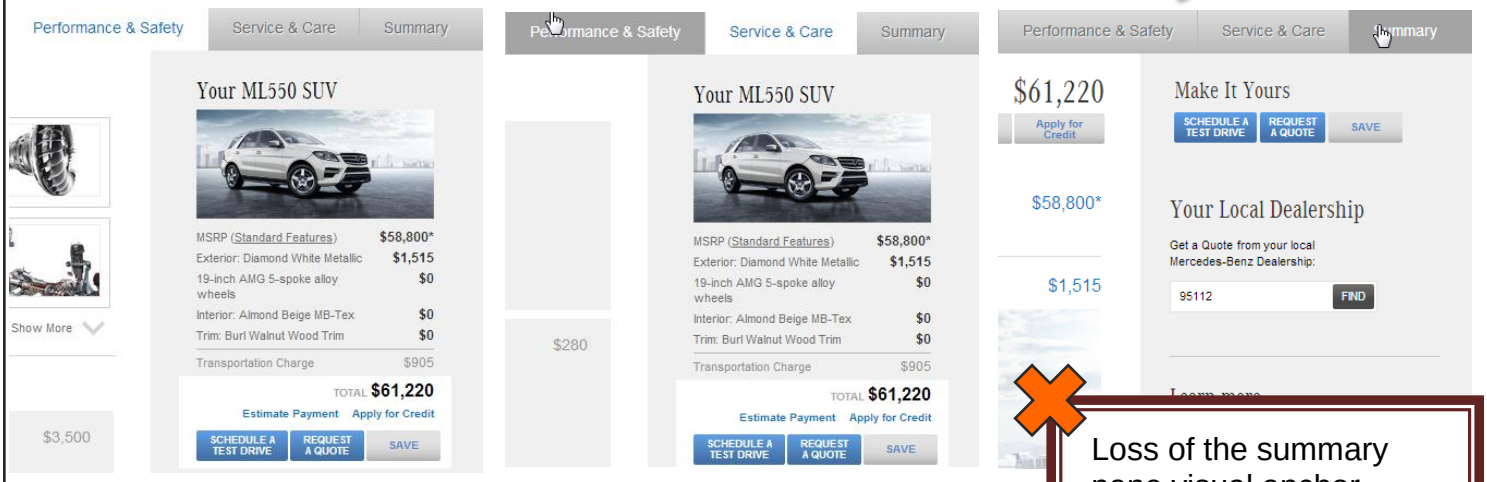
Step 1 Step 2 Step 3



Sudden loss of visual momentum occurs while attempting to build a car. Familiar layout from prior pages (Step 1 and 2) suddenly changes. Leaves user unsure if they are still on the same path towards destination/goal.

Close up of visual details on right side of screen as users progress through:

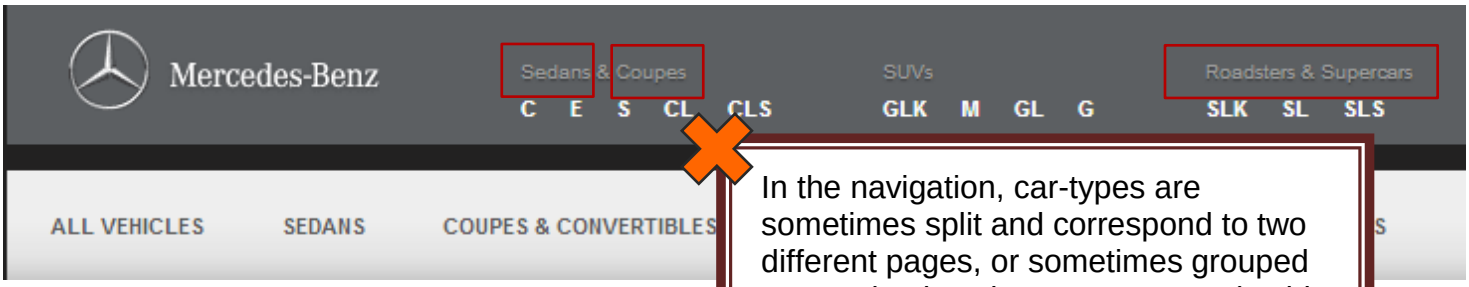
Step 4 Step 5 Step 6



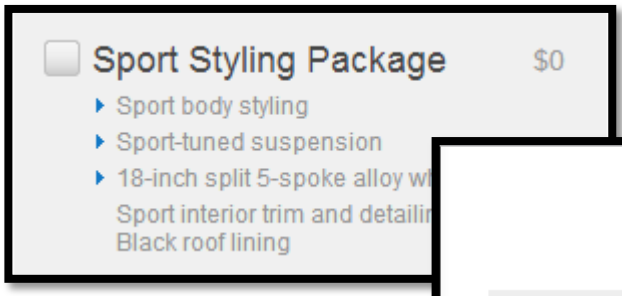
Loss of the summary pane visual anchor when users get to the summary page.

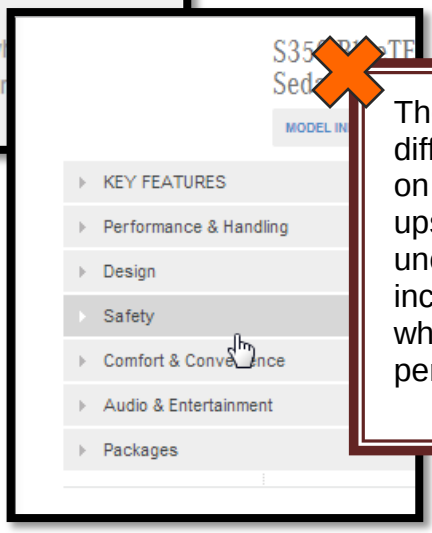
Consistency

A cohesive experience is achieved by consistent application of elements throughout an interface. Inconsistency disrupts visual momentum and decreases user confidence in the system. Additionally, an inconsistent interface results in inefficiencies because users have to re-learn aspects of the interface every time they are faced with something different.

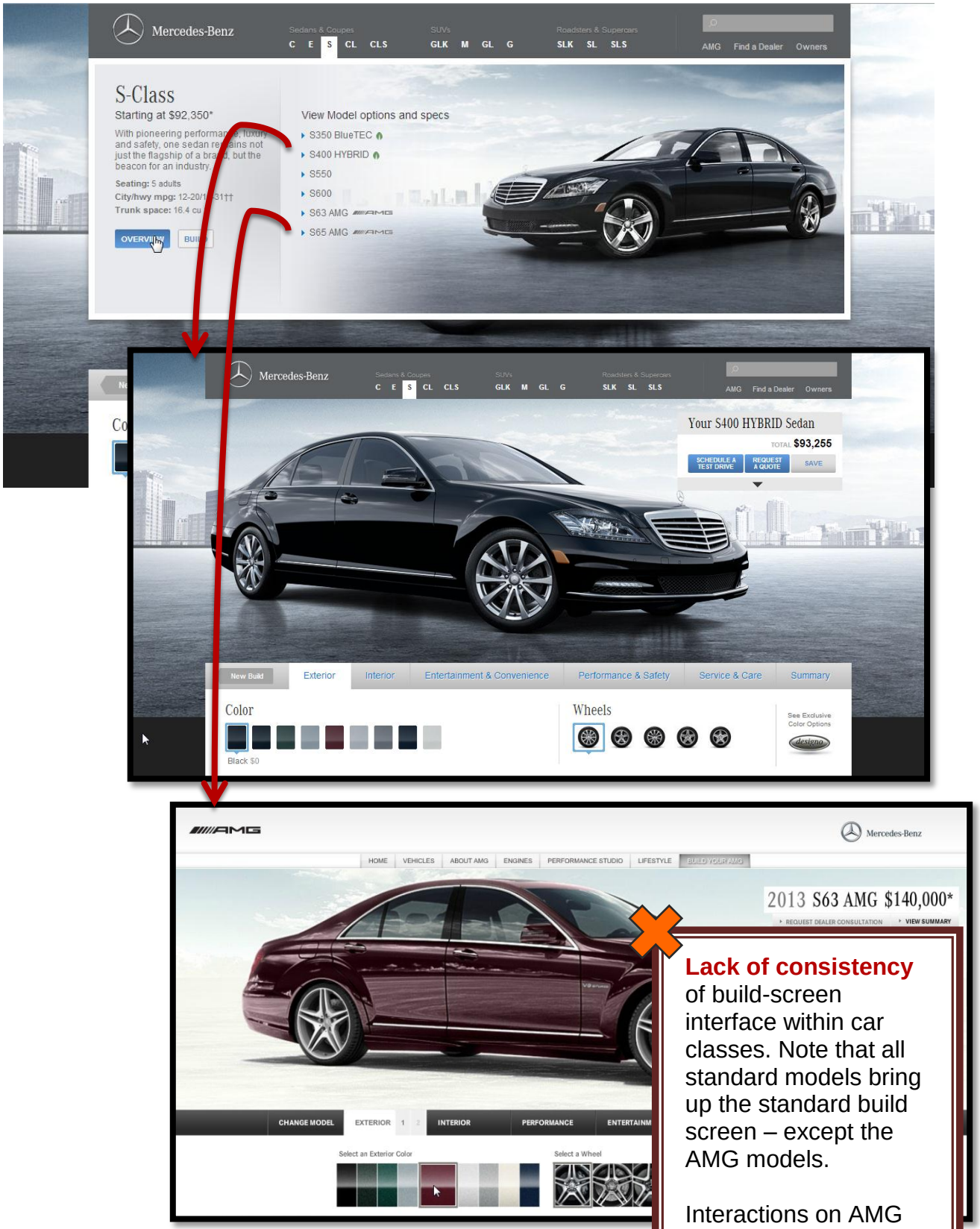


In the navigation, car-types are sometimes split and correspond to two different pages, or sometimes grouped as one (and navigate to one page). This **inconsistency results in user frustration** as similar elements do not behave the way the user expects them to.



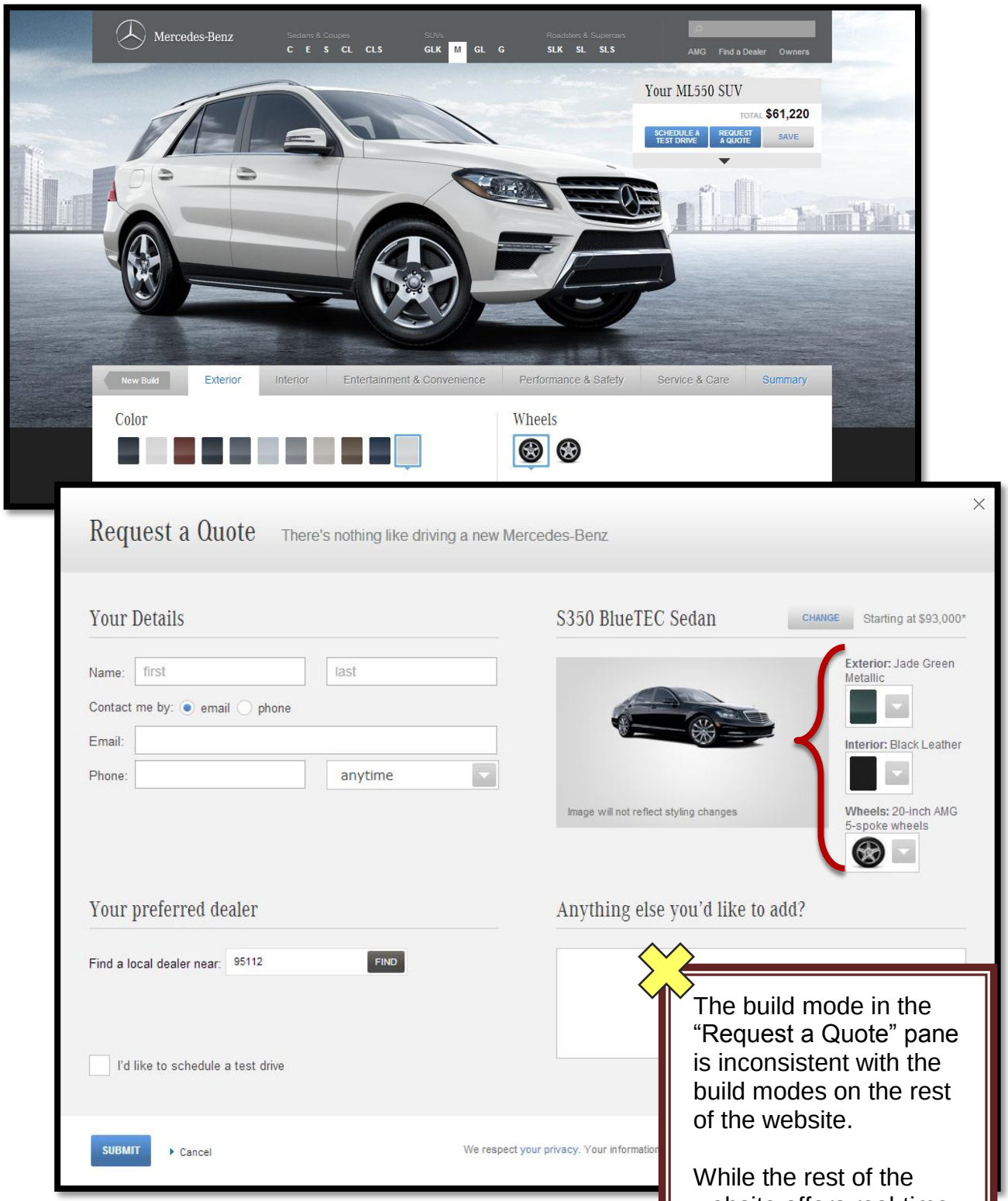


The tiny arrows afford two different types of interactions – on some pages, they open pop-ups, and in other pages they uncollapse a list. This inconsistency surprises users when an unintended function is performed.



Lack of consistency of build-screen interface within car classes. Note that all standard models bring up the standard build screen – except the AMG models.

Interactions on AMG build-screens are also inconsistent with other models – notice form of feedback differs when options are selected (blue outline vs expanded).

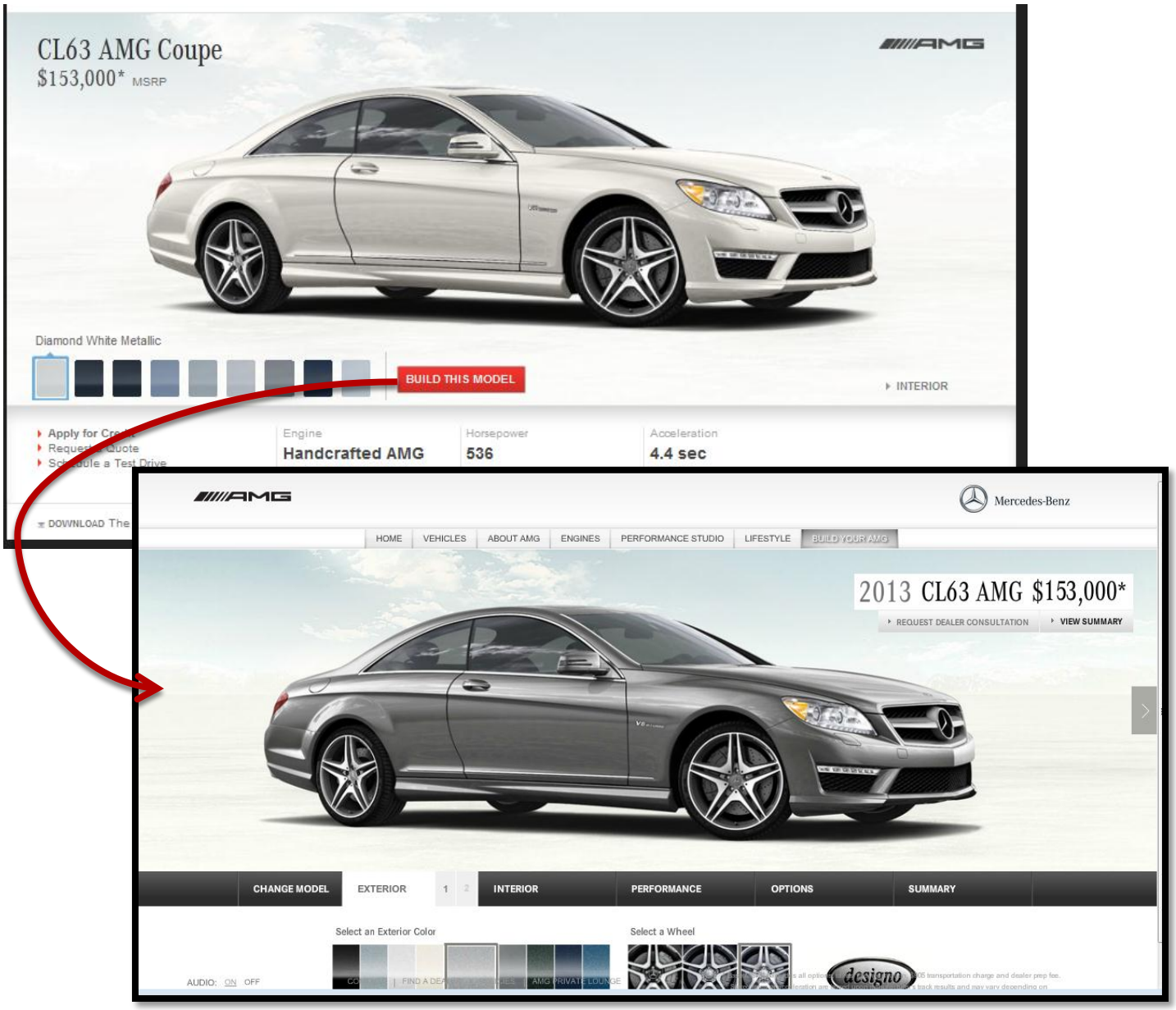


The build mode in the "Request a Quote" pane is inconsistent with the build modes on the rest of the website.

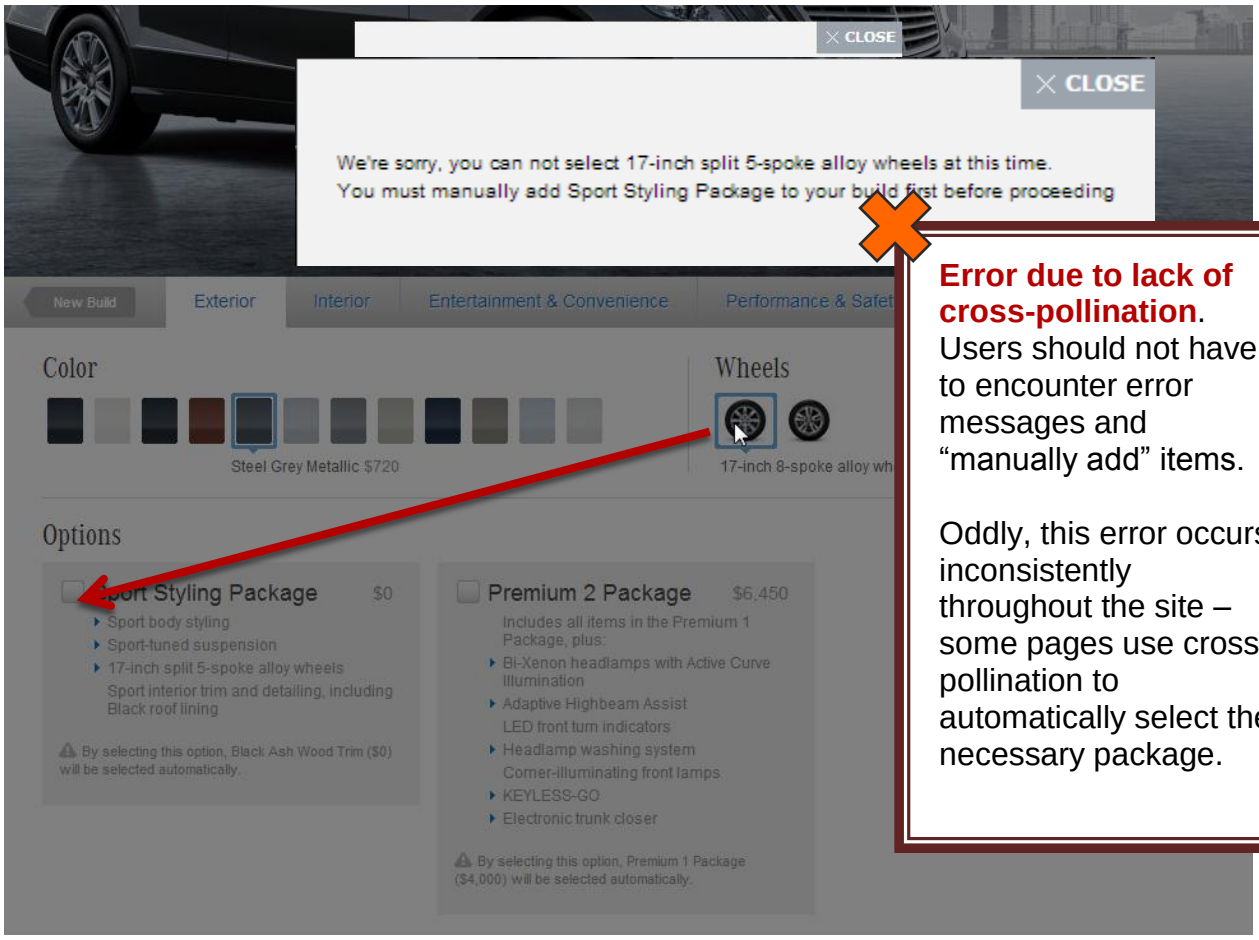
While the rest of the website offers real-time visual feedback when options are selected, "Request a Quote" shows only a static image. This is inconsistent with the experience of the rest of the website.

Cross-pollination

Cross-pollination efficiently shares information within a system to aid a user in a task. Information related to content should either be present, or easily navigated to so that minimal effort is required from the user. Essentially, cross-pollinaiton takes the workload burden off the user by using information already provided by the user.



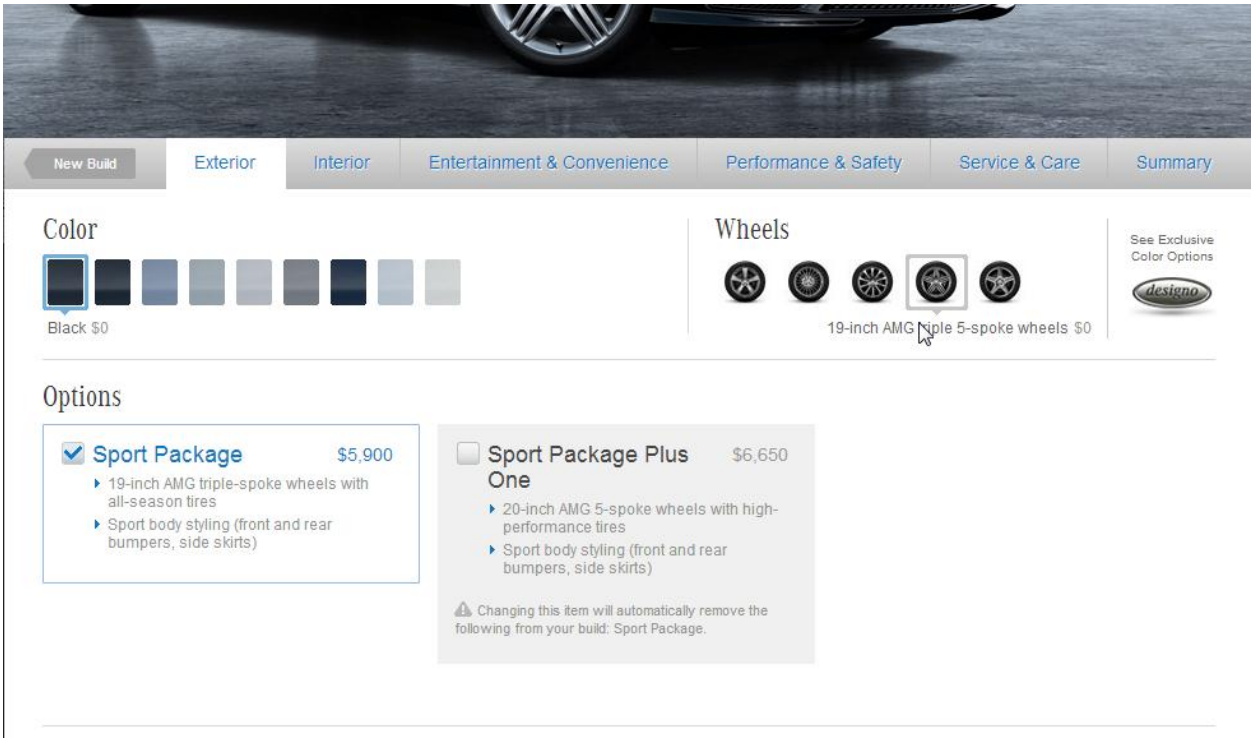
Poor cross-pollination of information. User here has already selected a color but upon hitting “Build This Model” has to go through color-selection task again.



Error due to lack of cross-pollination. Users should not have to encounter error messages and "manually add" items.

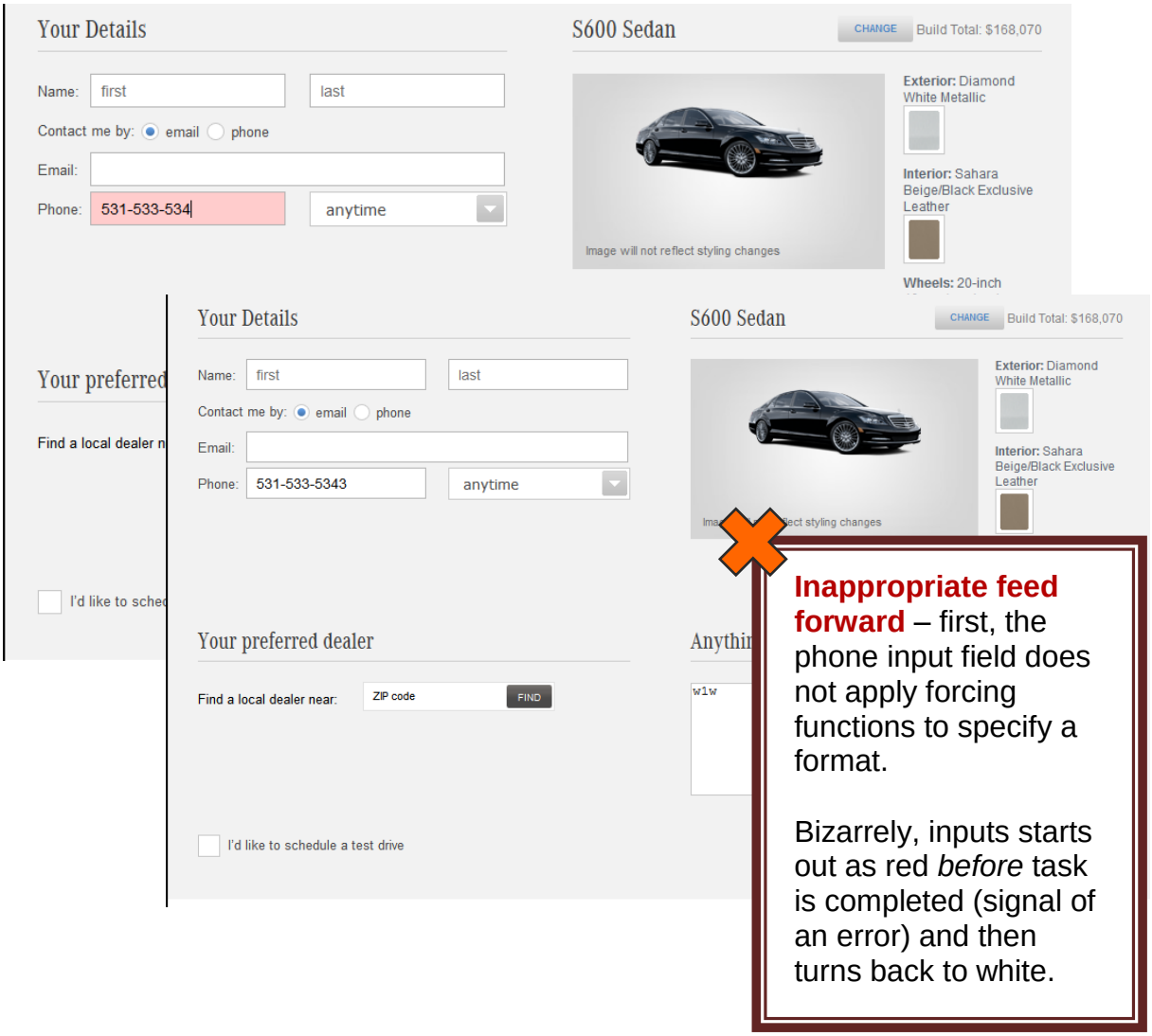
Oddly, this error occurs inconsistently throughout the site – some pages use cross-pollination to automatically select the necessary package.

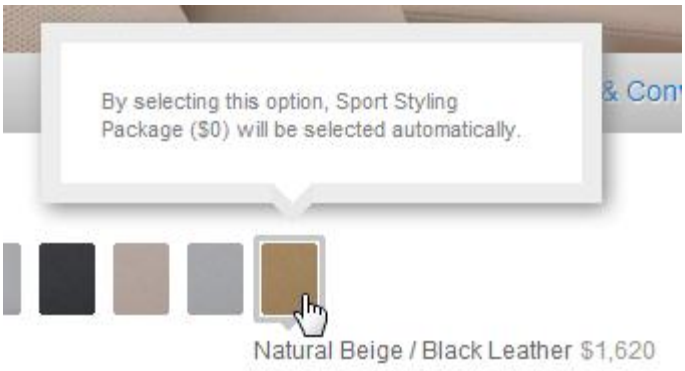
Sample below does not encounter the same error because system cross-pollinates.



Feed Forward

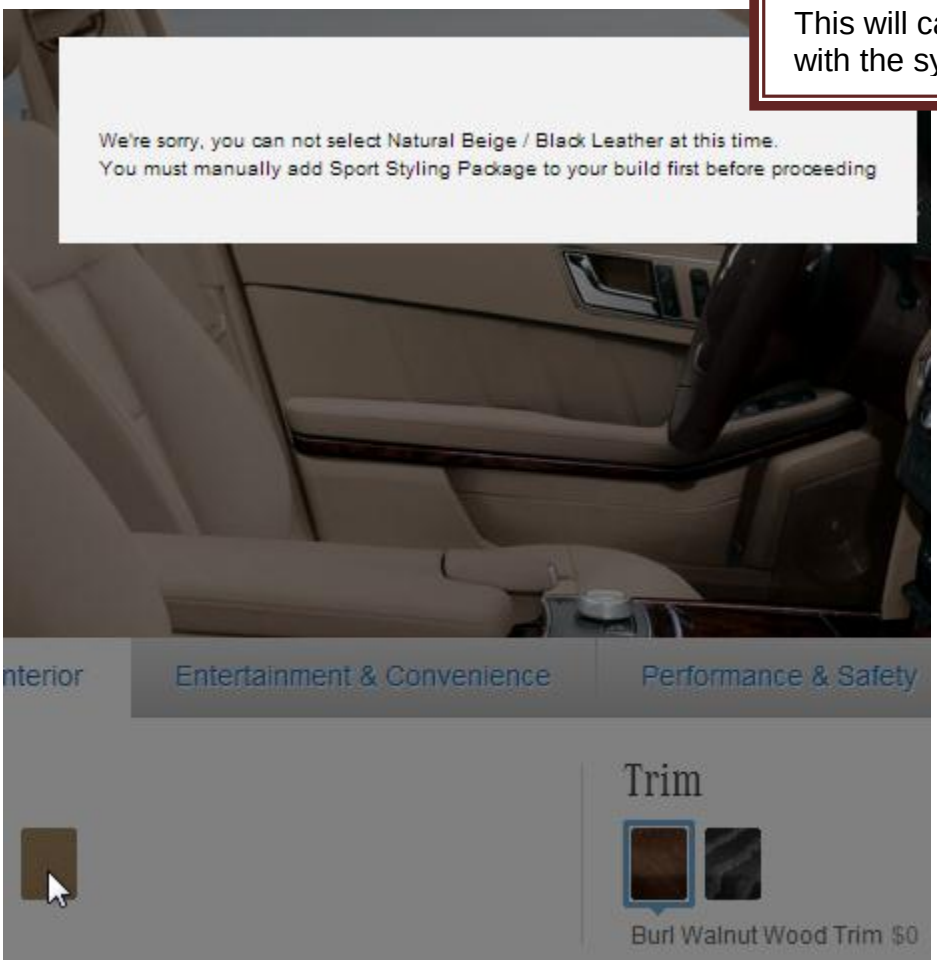
Good feed forward informs the user of the implications of an action *before* an action is undertaken. Names of links and iconography (such as arrows) should properly and universally define what information they lead to. Effective application of feed forward enhances efficiency by minimizing the use of trial and error. If a specific format is necessary for inputting information that should be made clear before a user inputs the information, not afterwards as an error message.





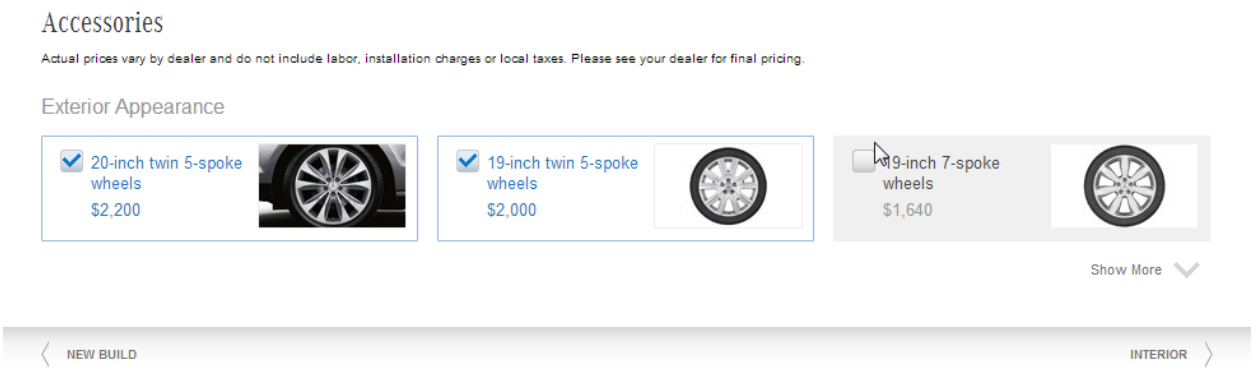
Bizarre and incompatible feedforward with the system occurs here.

Users are given feed forward that the system will perform a function when the user selects an option. However, selecting that option returns an error – because the system did not perform the function that it said it would. This will cause a loss of trust with the system.



Forcing Functions

Forcing functions promotes efficiency by limiting user actions to only those actions deemed necessary or beneficial within an interface. Forcing functions also prevent errors by only allowing a user to provide a correct response.



Lack of forcing functions here result in errors. In this example, users are not forced to select only one option.

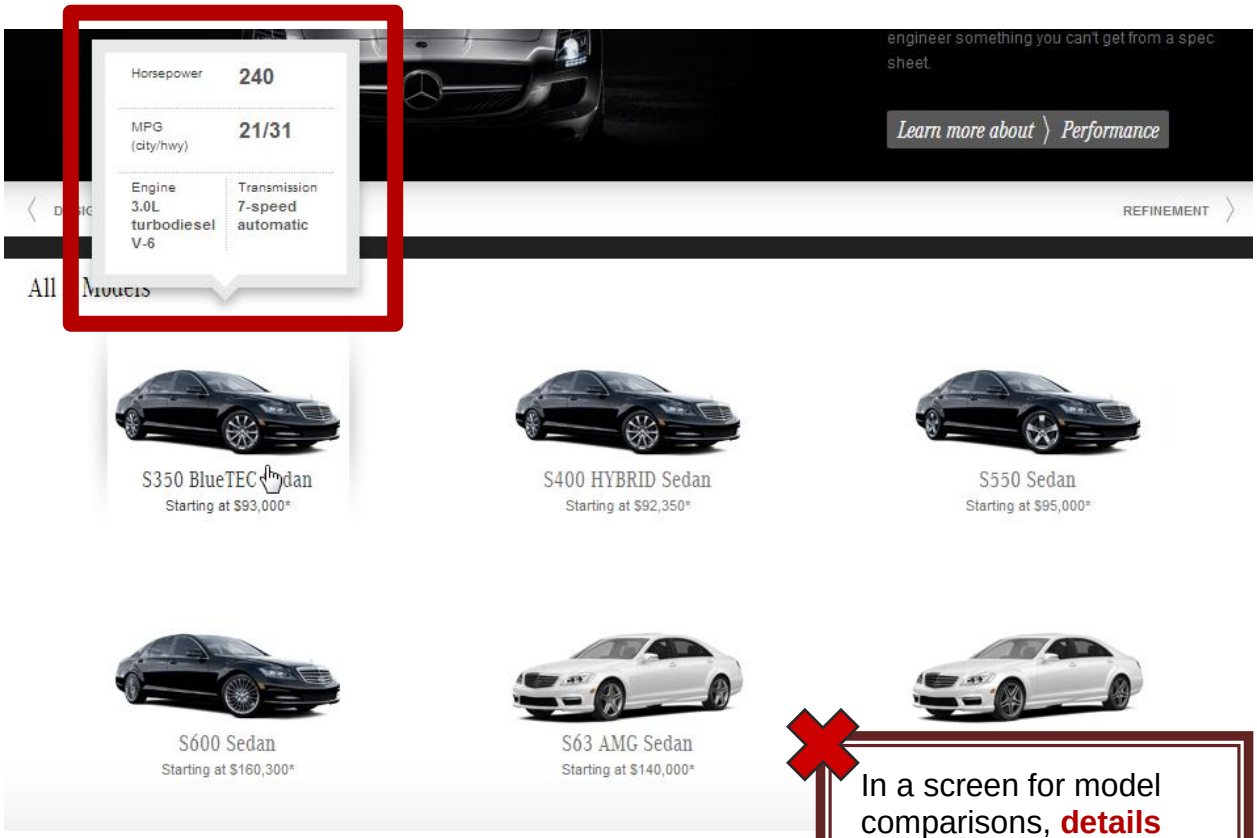
Selecting one option should deselect and visually grey-out the other options.

Also, improper use of the checkbox in this context contributes to errors.

A radio button should be used when only one option in a list of options can/should be selected.

Efficient/Effective Use of Screen Real Estate

Good use of screen real estate conveys the all the necessary information in one visual space. Bad screen management causes user frustration by requiring more effort to use and therefore amount to a disjointed experience.



In a screen for model comparisons, **details are hidden when there is ample screen real estate.**

Users have to scroll over each model (instead of having all information visually available) to make effective comparisons. This places a heavy load on working memory.

Readability

Readability is the metric for how easily text can be read and understood, and includes the perceptual factors as well as the cognitive load of the language used (vocabulary and structure). Content should be clear, easy to read, and easy to understand.

Standard measurement uses the Flesch-Kincaid Reading Ease to score how easy a text is to read. A high score implies an easy text (comics typically score around 90 while legal documents can get a score below 10).

The Flesch-Kincaid Grade level indicates the grade a person will have to have reached to be able to understand the text (for example, a Flesch-Kincaid Grade level of 7 means that a seventh grader will be able to understand the text,).

Sample1: Very complex randomly selected on site.

Flesch-Kincaid Reading Ease score: **-12**.
Flesch-Kincaid Grade level: **22**.

Extremely low readability persists throughout the site.

Most content require at least a completion of bachelors' level education to understand. Some of the most complex texts require over 20 years of education to understand.

Users miss or skip important information because they simply cannot understand the content's language!

Sample 2: Not as complex as sample 1, but still terrible considering it is about chairs.

Flesch-Kincaid Reading Ease score: **7**.
Flesch-Kincaid Grade level: **17**.

Summary of Global Usability Issues

The Mercedes Benz website suffers from many violations of global usability principles resulting in a poor user experience that could be easily improved through correct application of good design and usability principles that focus on the three most important characteristics of a good website – useful, usable and desireable.

The primary issue is the **lack of a goal-based design in the interface** . Users usually have goals and specific use-cases even when they browse and the lack of a goal-based design leaves users to explore in an unstructured and unguided manner. The structure of the website does not focus attention efficiently to the elements that aid user goals, partly due to each page attempting to “do too much”. Pages are cluttered and long, and fail to use progressive disclosure to sustain user attention. This leads to errors, wasted time, and frustration.

All important elements of navigation should stand out and be specific. The **primary navigation is not useful/informative** (C, E, S – all these seem like arbitrary letters to the Car Novice) and not goal-based. Critically, it is **difficult to perceive** due to low contrast and size of elements. The Mercedes-Benz website has poor and inconsistent secondary navigation items.

Negative affordances cause user errors because it goes against the natural tendencies of humans in the way they interact with an element. There are many examples where the website applies negative affordances, and also examples where **positive affordances are lacking** (which naturally inform users of how an element should be interacted with).

The website is **not optimized for the visual perception and behaviors**. The design and placement of text and graphics does not aid scanability and visual sampling – there are no anchors to draw attention to important items or headers. Vital details are often buried deep within cluttered pages and many **options and important details are undiscoverable** due to the sheer amount of information on each page (up to 90% below the fold!). On other pages, necessary information does not show up unless they are rolled-over one-by-one – even though there is plenty of space on the page. This shows an **ineffective use of screen real estate**. Additionally, the website should also improve the layout and placement of functions by use of spatial location, compatibility, and grouping principles - place similar options on the same levels of the interface and corresponding actions adjacent to each other to increase user efficiency.

There are **violations of visual momentum** throughout the entire interface. Screens within the progression of tasks suddenly look different, causing users to question their location in the process. As described in an interview, the website “seems choppy – things are similar, and suddenly disappear or change locations”. A **lack of consistency** throughout the interface ties adds to poor visual momentum and results in inefficient experience for the user. In combination, all of these usability principle violations create an extremely inefficient and unintuitive interface for the user to navigate.

A **lack of cross-pollination** leads the user to take unnecessary steps to complete their goals, rather than having the necessary information presented or computed automatically. The interface causes users to have to repeat inputs when the interface should deliver an effortless and enjoyable experience.

Lastly, the website is not designed for its audience – many elements are almost **visually imperceptible and inaccessible** due to color contrasts and size. Additionally, many **important details are unreadable and incomprehensible** due to the extremely difficult language used – most content calculated by Flesch-Kincaid Reading Calculator required at least 16 years of education (completion of a Bachelors' degree) to comprehend. Some of the most difficult texts require over 22-years of education to understand!

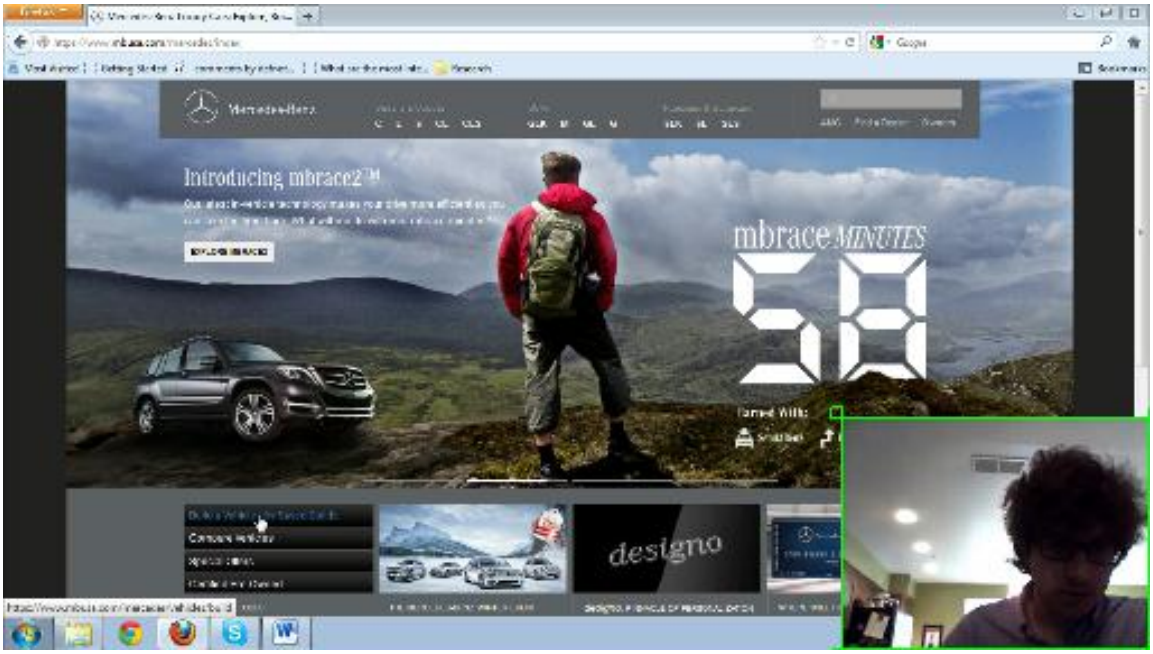
Overall, the website should be overhauled, particularly in its architecture, and take a goal-based approach to its future design to deliver a great user experience. Users coming to this website have preconceived expectations of quality and luxury from Mercedes-Benz, and the website should meet those standards.

Local Usability Issues

Local issues are issues which are specific to a certain area or page of the interface and can disrupt the user experience, causing it to be frustrating and time consuming. These are usually design-related issues, though some technical issues on parts of the interface contribute to local usability problems.

Each section is titled by section of the site with explanations of design principles or scientific principles that are violated on that screen. Definitions may also be found in the glossary.

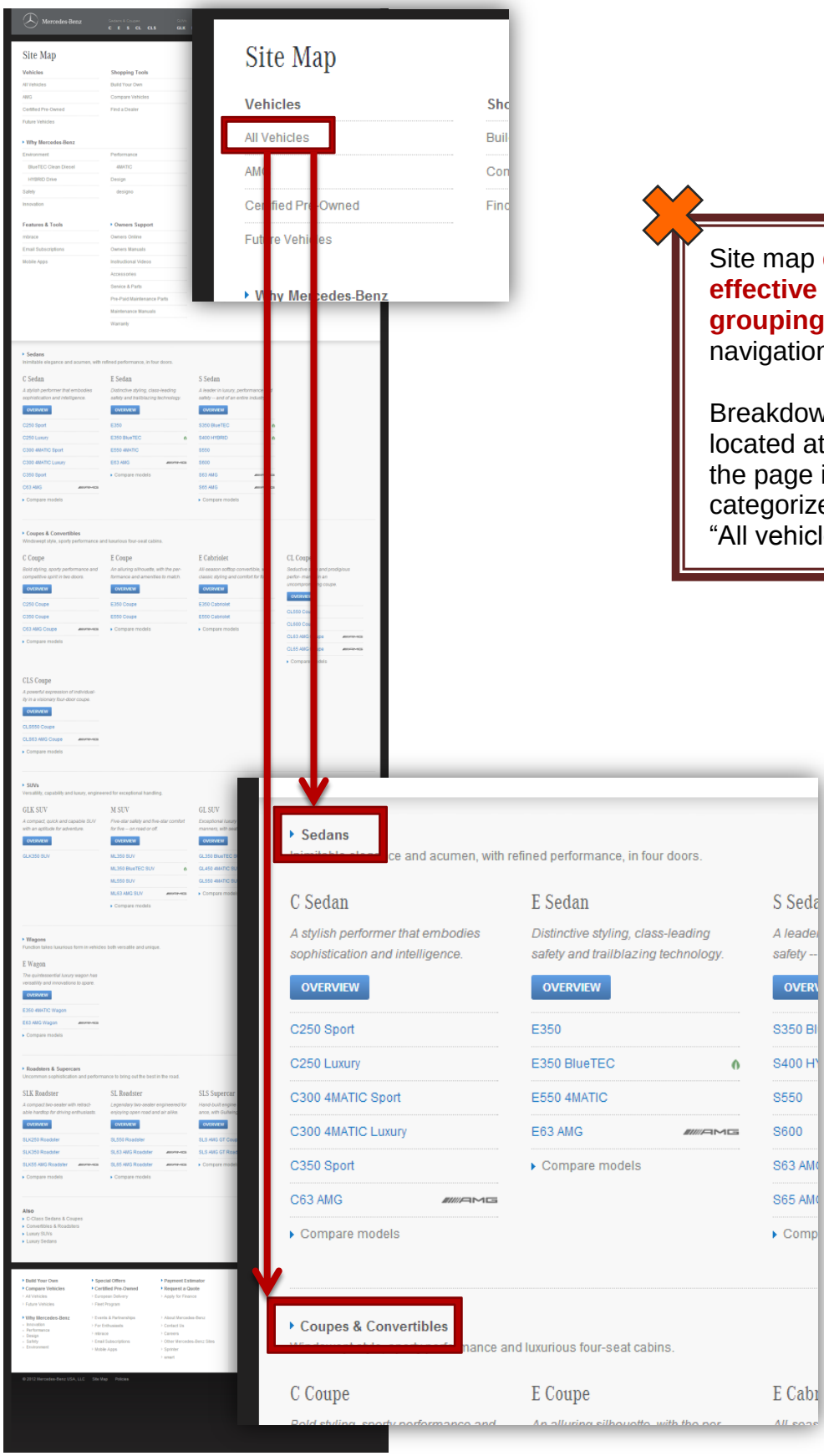
Home Page



Primarily **lacks an effective value proposition** – which allows users to quickly understand the purpose of the website and the user tasks and goals it helps support. It needs to show that the website is **relevant** to the user by showing how the website can assist users in achieving goals. Additionally, it should **convey specific benefits of using mbusa.com** and communicate **differentiation from competition**.

The homepage **fails to direct attention** to important items appropriately. Primary cause is trying to do too much on each page – **too much visual clutter**. Important details do not stand out visually – so users cannot use visual sampling to determine areas where important information is (so they can then dive into detail). Through usability testing, task inefficiency was observed due to poor design impeding efficient navigation.

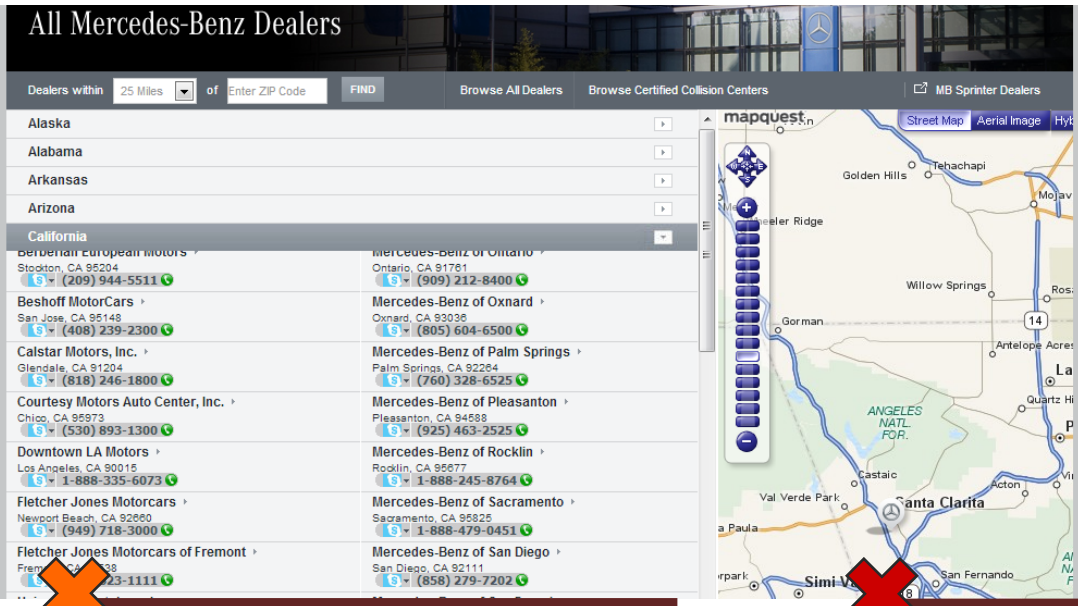
Site Map



Site map **does not use effective spatial grouping** for efficient navigation.

Breakdowns by type is located at the bottom of the page instead of categorized near/within "All vehicles"

Dealer Map



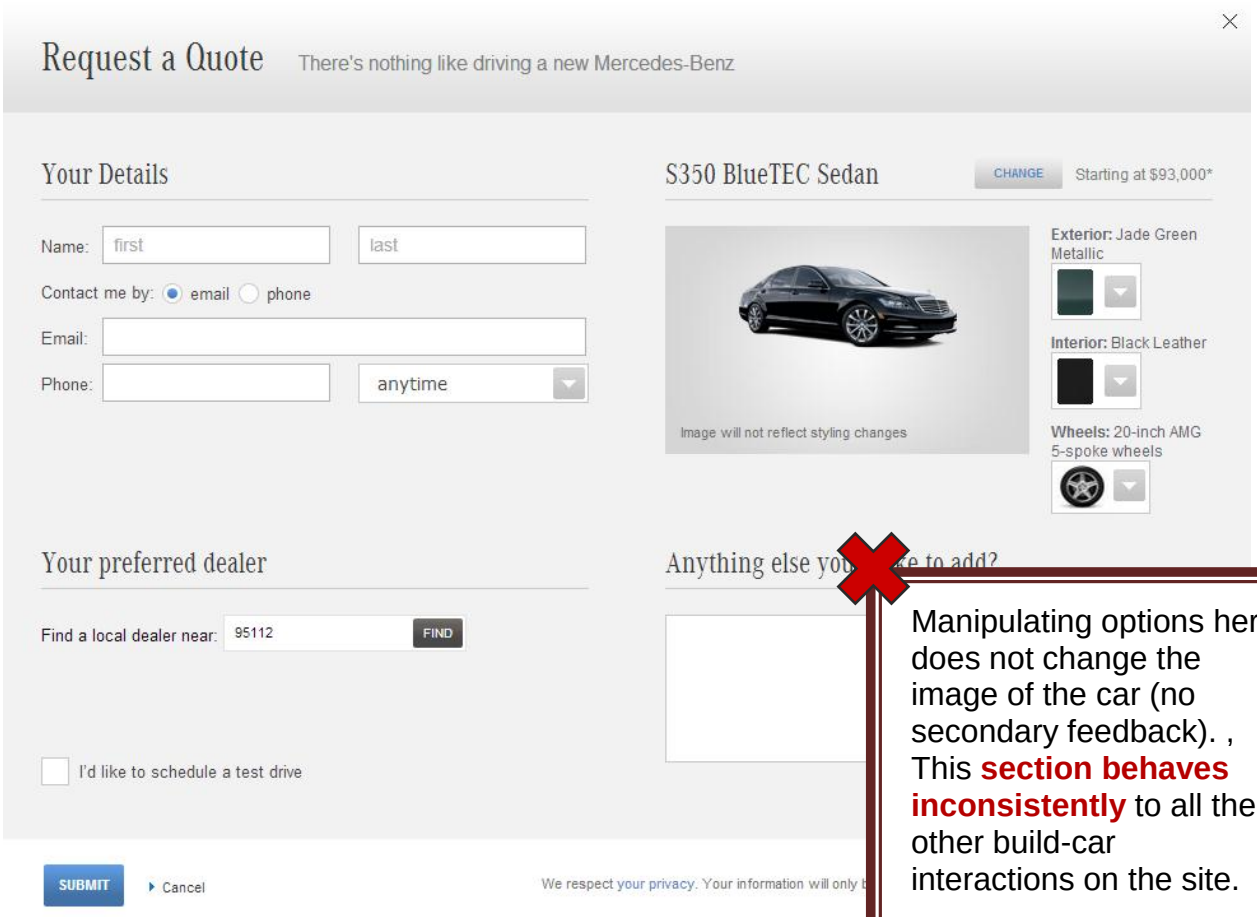
Inefficient display compatibility (This principle refers to how compatible the display is with the mental model the user has of the interface. All elements of the display should correspond with the way a user expects to see them.) .

The map does not use an effective listing method – sorting by dealership name (almost all dealers are “Mercedes-Benz of…”.

Should consider goal-based design – most people are looking for dealers in specific locations. Thus, an effective list would be alphabetical by county or by distance to user.

Tiny font size should be increased to aid visual accessibility.

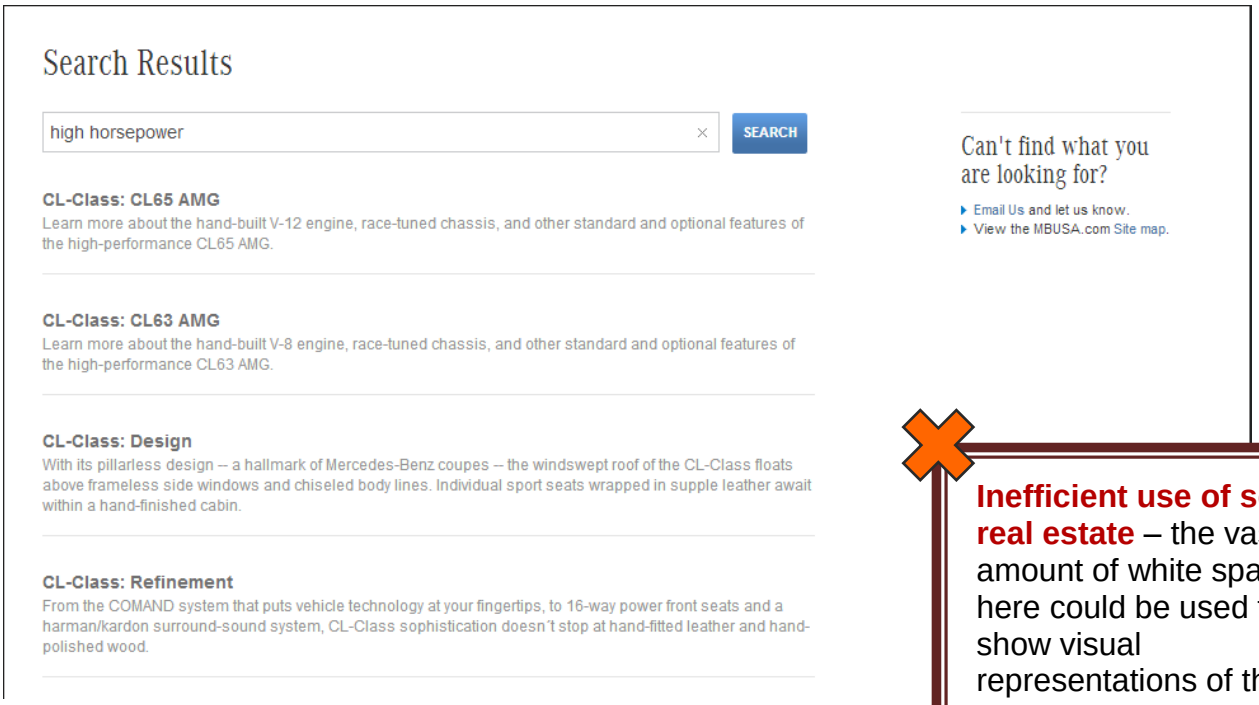
A **technical error** occurs here – notice that the map is cut off” and unusable.



Manipulating options here does not change the image of the car (no secondary feedback). , This **section behaves inconsistently** to all the other build-car interactions on the site.

Search Results

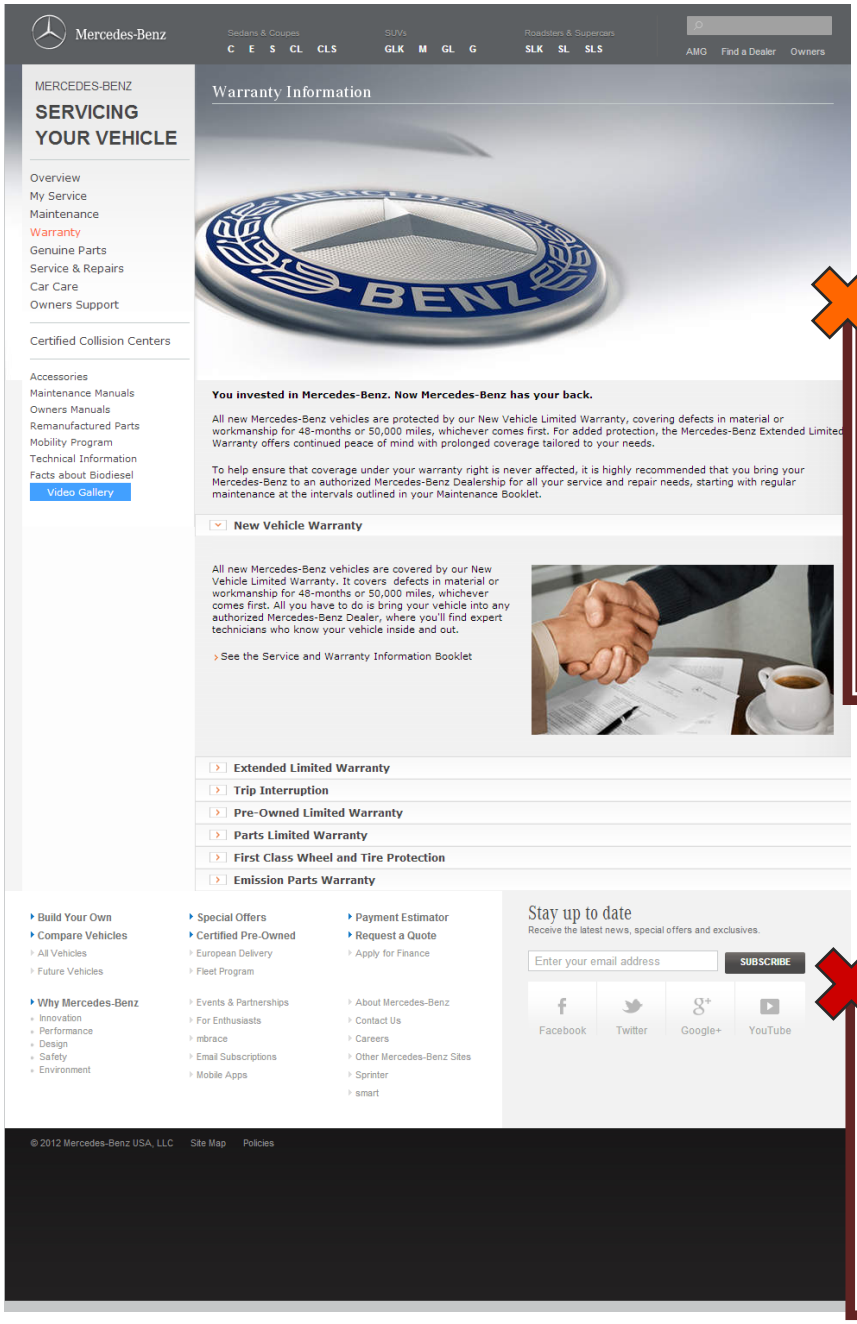
Most users will use the search results to look for cars that fit their search term. Though the results returned are relevant, there is abundance of white space that could be used more effectively.



Inefficient use of screen real estate – the vast amount of white space here could be used to show visual representations of the search result cars.

Also, low contrast makes text difficult to read.

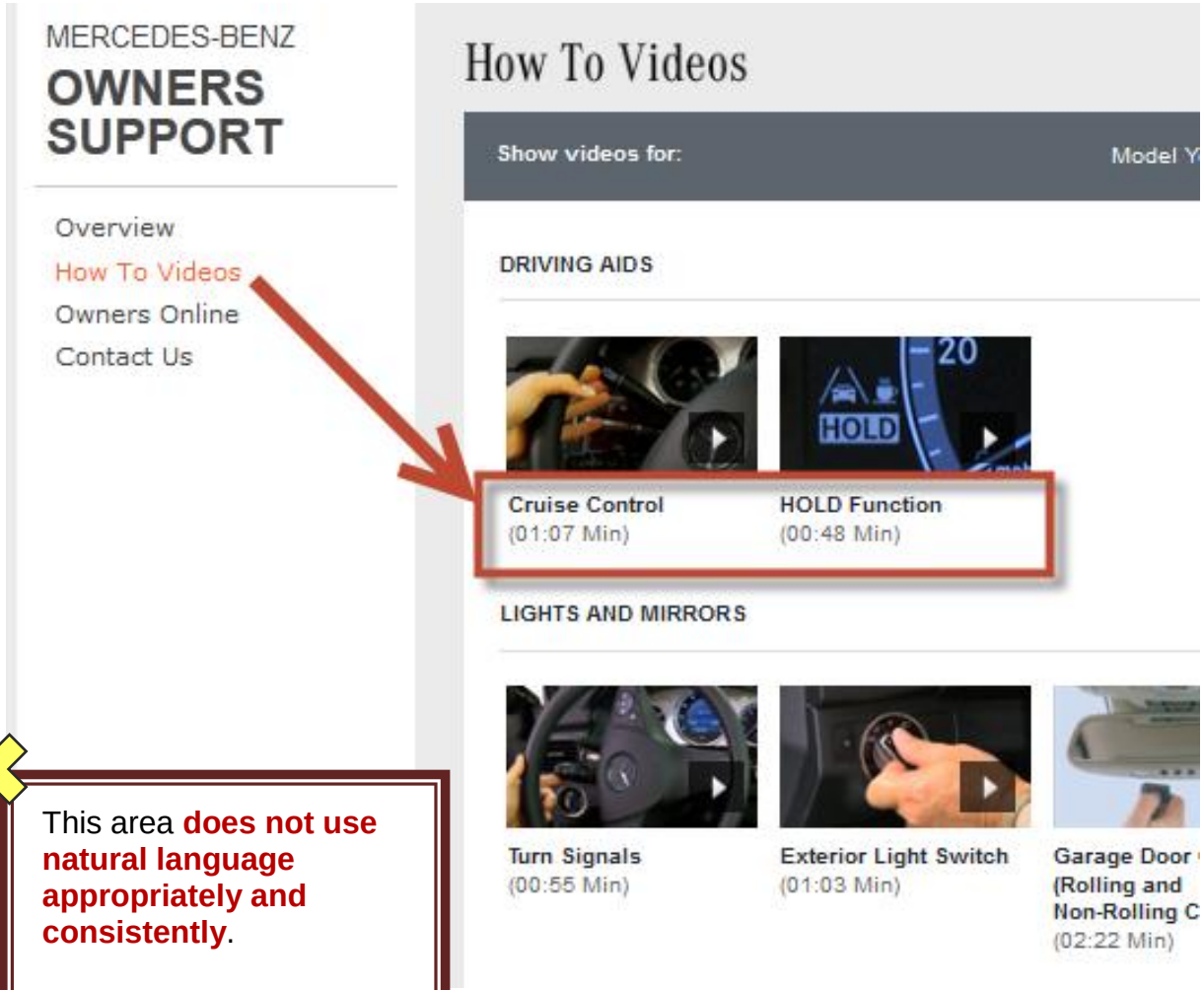
Warranty Information



Extremely large graphic **takes up too much screen real estate unnecessarily**.

Text is extremely small and **does not aid visual sampling** or scanning.

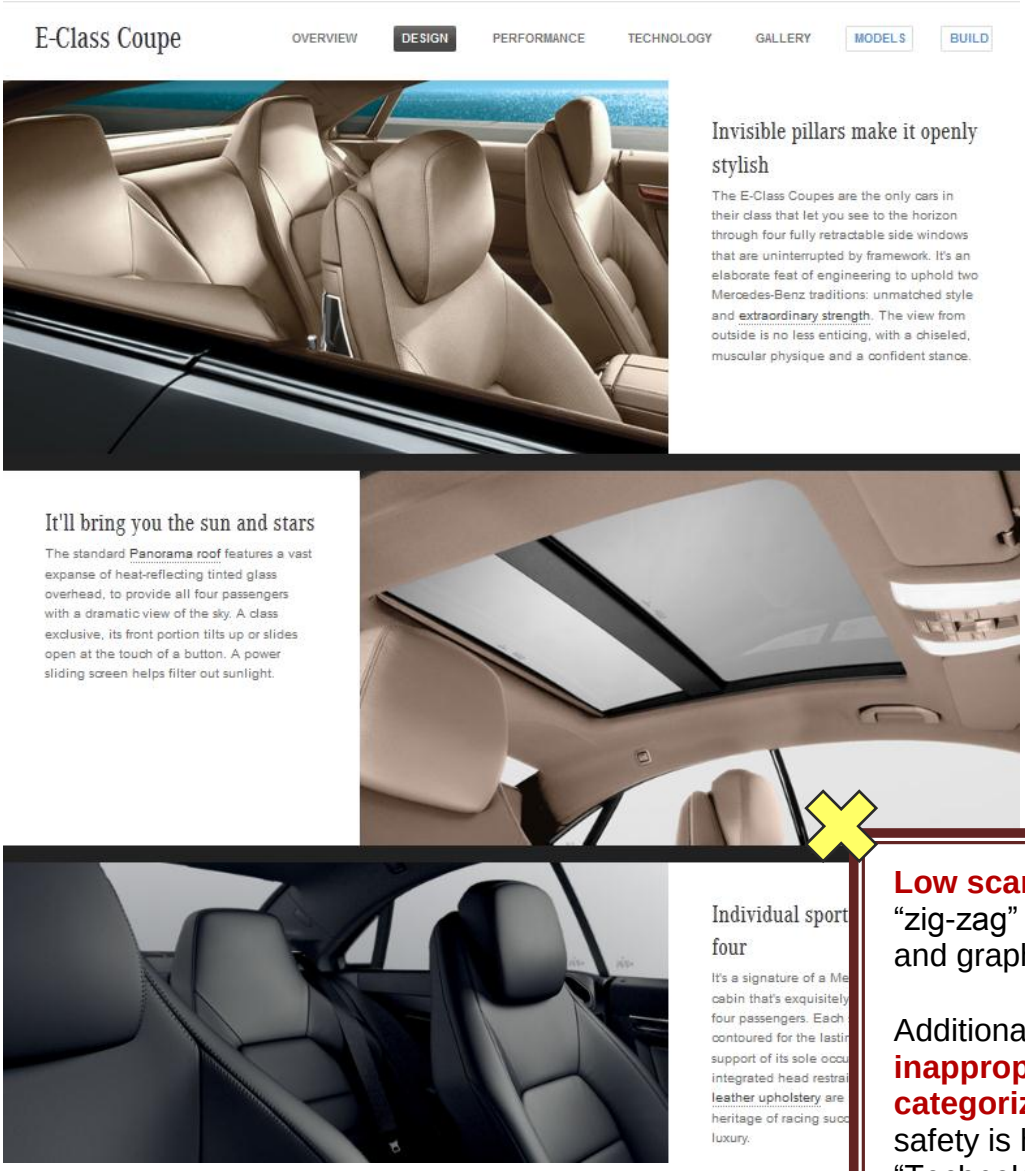
Looking to sell your Mercedes? **Information is hidden** on this page instead of on a page that is more specific to the task context.



This area **does not use natural language appropriately and consistently**.

For example, “How to…” should be followed by “enable or disable cruise control” – using verbs instead of nouns. This would provide greater visibility of what the content will be.

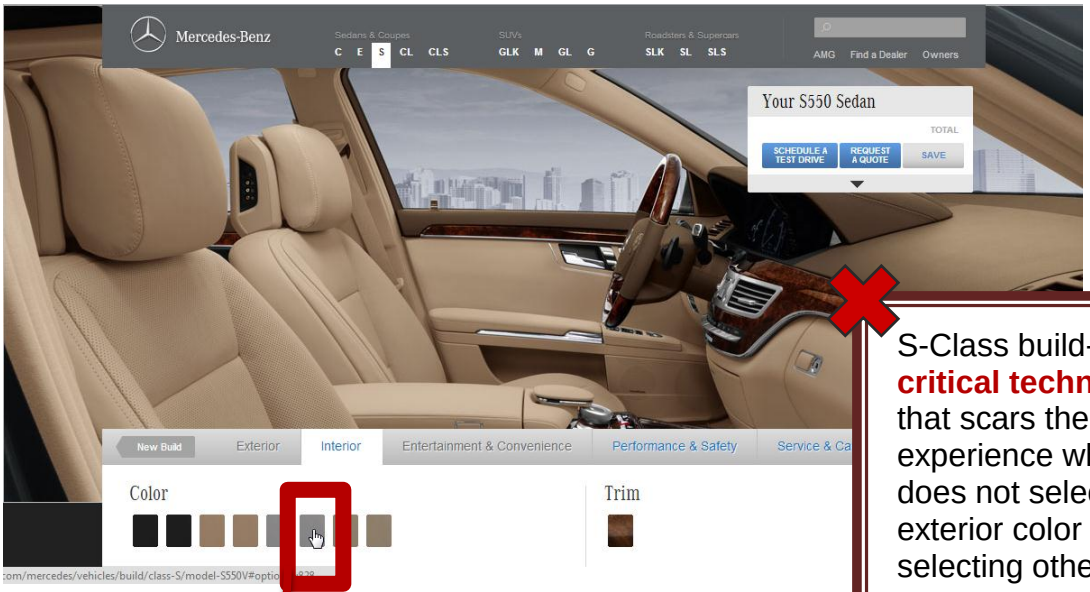
Overview and Feature Detail Page

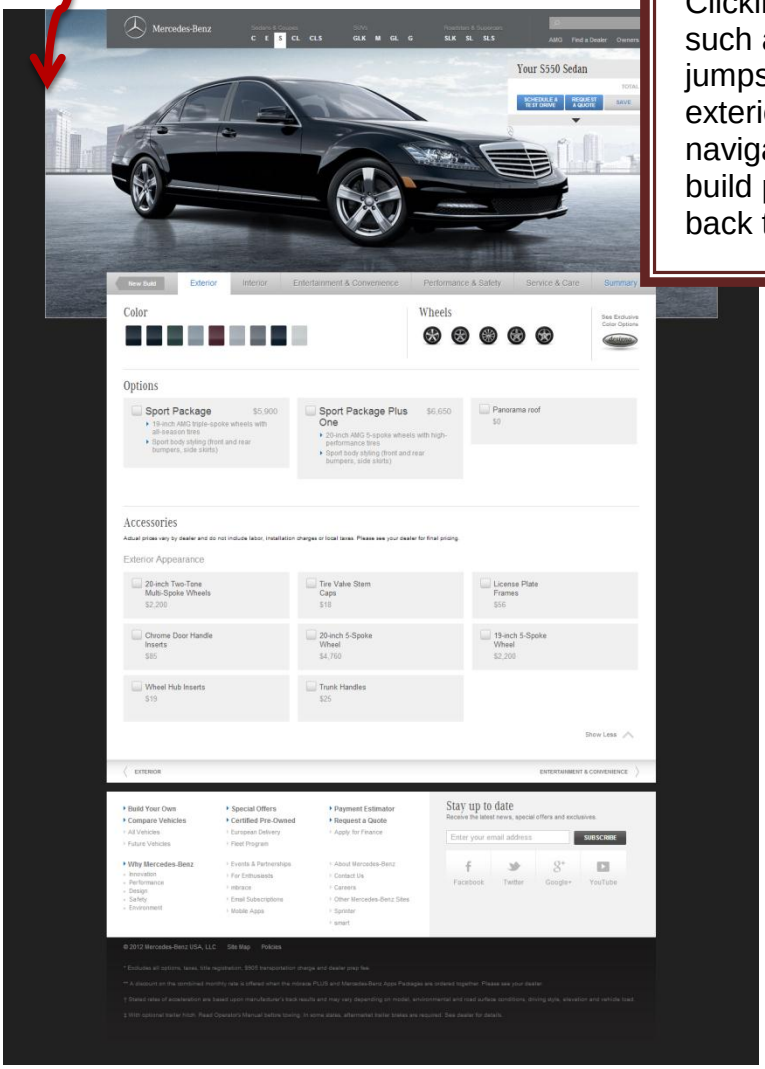


Low scannability due to "zig-zag" layout of text and graphics.

Additionally, **content is inappropriately categorized, or hidden** – safety is hidden under the "Technology" tab instead of a tab of its own.

S-Class Build Page (Technical Errors)





S-Class build-page has **critical technical errors** that scars the user experience when a user does not select an exterior color before selecting other options..

Clicking on elements such as the interior color jumps users back to the exterior. Also, any of the navigation arrows in the build pages jumps users back to the exterior.

Summary of Local Usability Issues

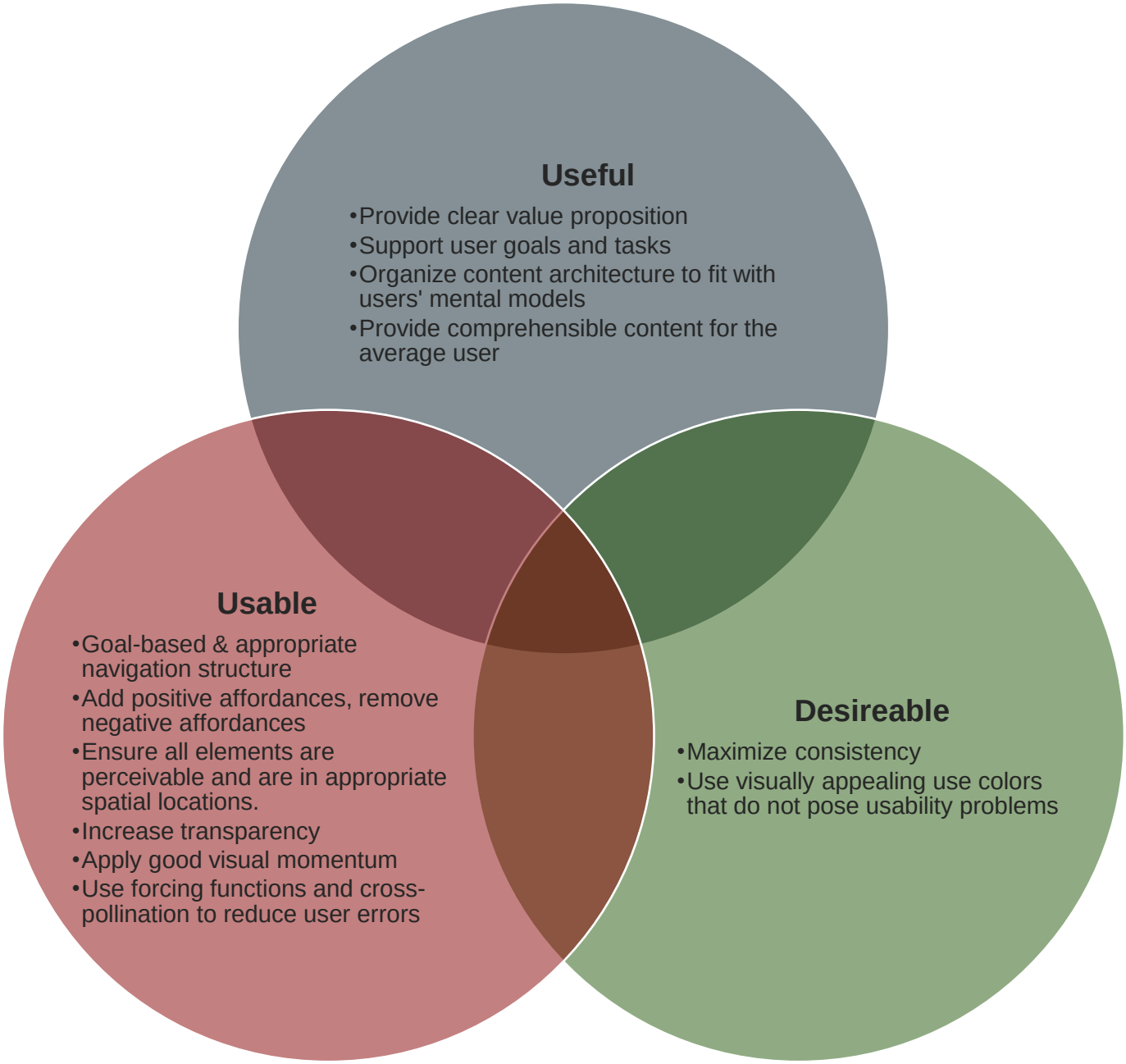
Local issues disrupt the user experience, causing errors and user frustration unnecessarily. There are numerous examples pages where content or interactive elements are not organized effectively and therefore, users are not able to direct attention to the right areas efficiently, if at all. Important details are often buried in inappropriate locations.

Technical errors also cause user frustration and will cause a loss of brand loyalty to Mercedes-Benz when web technical errors are associated to their cars. These technical errors should be fixed immediately.

Overall, local pages suffer from many of the design decisions that were made on the global level, but are incompatible for the context of the local page. Future designers should pay greater attention to detail on each page to maintain consistency and provide effective, relevant content to users.

Visual Summary of Usability Issues

To improve user experience, new designs should attempt to incorporate and fix all the issues aforementioned in this report to meet website goals of being useful, usable, and desireable.



Glossary of Terms

Terms/Phrase	Definition
Affordances	Perceived qualities of an element that directs the use of that element
Attention	Allocation of cognitive processing resources
Consistency	The inter-relational properties of an interface that does not contradict itself
Cross-pollination	System function that efficiently shares information within a system to aid a user in a task
Contextual inquiry	Process of gathering field data from users to inform analyses
Feedback	Confirms to a user that a system has received an input (or has performed a function as a result of that input)
Forcing Functions	Limiting user actions to only those actions deemed necessary or beneficial within an interface, prevents errors
Goal-based design	Interfaces that support known user goals through good architecture, navigation and visual layout
Navigation	User task to progress towards a destination or goal
Progressive disclosure	Interaction design technique that presents only the minimum data required for the task at hand
Readability	Metric for how easily text can be read and understood
Salience	Property of an element to be distinguishable from other elements
Salience coding	Technique used in user-centered interaction design to draw attention to important elements

Scanability	Property and layout of elements (usually text) that effect visual sampling
Screen Real Estate	Area of the screen available for content presentation
Spatial compatibility	Refers to how closely related items are when placed in a spatial location.
Spatial grouping	Sum of the elements (the group) that become an emergent feature and directs attention
Spatial location	Location of related items that effect the efficient use of both
System Transparency	Degree to which the interface keeps the user informed of underlying operations of the system
Usability	Degree of ease/difficulty of which a user can interact and manage a product to achieve pre-defined goals
Usability testing	Technique used in user-centered interaction design to evaluate a product by testing it on users
Visibility	Property of element that makes them discoverable and informs users of how to use it
Visual accessibility	Perceptibility of an element, or properties of an element that considers the limits of human visual perception
Visual Metaphors	Familiar symbols that are used on interfaces to draw on a user's previous knowledge to influence their interaction with the system
Visual Momentum	Perception of movement through a site, also commonly known as the "flow" a user experiences
Visual sampling	User behavior that takes a generall survey of the information before focusing on individual elements

Resources

Readability index calculator

http://www.standards-schmandards.com/exhibits/rix/index.php

New Mercedes Strategy

http://www.buyacar.co.uk/car_news/article_mercedes_b_class_5187.jhtml

Usability.gov

http://usability.gov/index.html

Useit.com

http://www.useit.com/

Contact Information

Evaluator: Sin Lee Loh

Address: 32 Ryland Park Dr, San Jose, CA95110

Phone: 408-676-8777

E-mail: sinlee@gmail.com

Website: www.sinlee.com

Twitter: www.twitter.com/sinleeloh