

# KENMORE 2621 CANISTER VACUUM CLEANER

M3 Design Heuristic Evaluation

[www.m3design.com](http://www.m3design.com)

+1.512.218.8858



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# INTRODUCTION

## M3 heuristic analysis process

### What is a heuristic evaluation?

A heuristic evaluation is an usability assessment tool that M3 utilizes early in product development. It helps researchers, designers and engineers identify usability problems related to how the product functions and interacts with the user. The evaluator meticulously inspects the product and judges its compliance to predetermined usability and design criteria – the heuristics.

### Why is it useful to you?

M3 heuristic evaluation serves 3 key purposes:

1. Learn from your competition – a method to create head-to-head comparisons to your competition, and understand the pros and cons of each product
2. Improves decision making - allows the development team to quickly and thoroughly understand how well a product performs to establish usability and design criteria for new product concepts
3. Concept evaluation tool – a highly efficient scoring tool used to assess multiple concepts during development to objectively rank concept alternatives

# INTRODUCTION

## M3 heuristic analysis process

### How does it work?

M3 experts analyze a product against 9 evaluation criteria divided into 3 key stages. Each criteria is evaluated on a 5 point scale based on how the product behaves and what it communicates to its user. The results indicate how close to the 5-point optimum the product is designed from a human-centered perspective.



*Refer to “Evaluation Data Reference” section for detailed explanation of each stage and its associated criteria*

# HEURISTIC EVALUATION

## Kenmore 2621 Canister Vacuum Cleaner



## HEURISTIC EVALUATION

### Kenmore 2621 Canister Vacuum Cleaner

It is safe to say that there are at least 101 things we would rather be doing than vacuuming. It's time consuming, changing accessories and the dust bag are a hassle, and it's simply too labor intensive, especially when the vacuum cleaner doesn't suck (no pun intended). For this reason, improving the overall user experience is probably the single most important thing that manufacturers could do to make this mundane chore just a little bit more tolerable.

We decided to perform a heuristic evaluation on a regular mid-range canister vacuum cleaner to find out how well it performs and to see if there's room to improve its usability and design.



# EVALUATION SUMMARY

## Kenmore 2621 Canister Vacuum Cleaner

EVALUATION SUMMARY		USABILITY & DESIGN CRITERIA	SCORE *
<b>IMPRESSION</b> 	The 2-piece canister design is relatively straightforward. The key interaction steps are bold and simple, but the details and use of language on this product make it unnecessarily busy and visually complicated.	<b>AESTHETICS</b>	<b>3</b>
		<b>SIMPLICITY</b>	<b>4</b>
		<b>LANGUAGE</b>	<b>2</b>
<b>ENGAGEMENT</b> 	This category is the product's weakest link. Although there are a few nice user touches that surround the surface of the product, when the user digs deeper usability is generally inefficient and inconsiderate.	<b>APPROPRIATENESS</b>	<b>1</b>
		<b>FLEXIBILITY</b>	<b>1</b>
		<b>FEEDBACK</b>	<b>2</b>
<b>EXPERIENCE</b> 	The product is not smart enough to prevent user errors. However the product is relatively simple by design and recovers from problems relatively quickly and easily. Most user touch-points were inconsistently designed and presented, making the overall experience unsatisfying.	<b>ERROR PREVENTION</b>	<b>2</b>
		<b>RECOVERY</b>	<b>4</b>
		<b>CONSISTENCY</b>	<b>3</b>

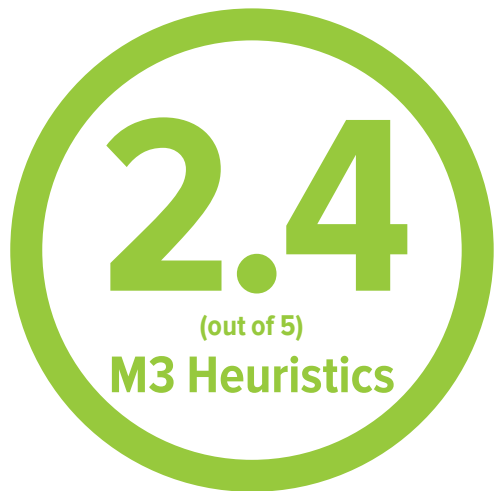
\* Scoring System

- 1 = Does not meet minimum usability and design criteria
- 2 = Almost meets the minimum usability and design criteria
- 3 = Meets minimum usability and design criteria
- 4 = Meets most of the usability and design criteria
- 5 = Meets optimum usability and design criteria

## EVALUATION SUMMARY

### Kenmore 2621 Canister Vacuum Cleaner

Final Average Score



Almost meets the minimum  
usability and design criteria





## STRENGTHS

### Key elements that should be embraced or improved upon

- Key touch-point areas like the power button and handles are boldly and simply presented
- Integrated tool-kit adds convenience and efficiency
- Integrated bumpers to protect surrounding objects during usage
- Agility and maneuverability of the canister
- Highly configurable options, and access to useful accessories to cater to a wide range of environments



*Keep key touch-points simple and highly visible.*



*Use of rubber bumpers to protect surrounding objects.*



*Maintain agility and manoeuvrability during use.*



*A well organised tool-kit improves efficiency during use.*

## OPPORTUNITIES

### Key elements that should be reconsidered and redesigned

- There should be reassuring and timely feedback on all user touch-points
- Doors and covers should be well latched until access is required
- Unnecessary design elements should be kept to a minimum, such as marketing messages, and highly stylized features
- Simplify / reduce the number of steps on how parts are detach and attach, such as the handle and the power cord
- Touch-points should be simple, meaningful, and easy to learn by unifying the look, size, location, and interaction of controls and latches
- All touch-points should be clearly labeled in simple icons or local language
- All touch-points should be purposeful, and communicates its intentions clearly without hesitation



*Ensure feedback is present on all key interaction points.*



*All touch-points should be obvious and self explanatory.*



*Keep interactions simple and with the minimum number of steps.*



*Avoid unnecessary and confusing information.*

# **EVALUATION DATA REFERENCE**



# 01 IMPRESSION

## Evaluation Guidelines

The impression stage of a product experience in where the product conveys its look, feel and functional details. At this stage users formulate an overall perception of the product. This is where certain judgments are made about the perceived level of simplicity or complexity, and initial assessments of how usable the product is for it's intended use.

AESTHETICS	SIMPLICITY	LANGUAGE
<p>Conveys appropriate look &amp; feel - functional form and purposeful details</p>	<p>Overall perception of product, visibility of information, and level of complexity in terms of product interaction</p>	<p>Use of natural and logical words, labels, meaningful colors, and logical interactions</p>
<p>Considerations:</p> <ul style="list-style-type: none"> <li>• What does the overall appearance say to you?</li> <li>• Is the form appropriate for its intended purpose?</li> <li>• Is it “form follows function” or “style over substance”?</li> </ul>	<p>Considerations:</p> <ul style="list-style-type: none"> <li>• Does the product details convey a sense of simplicity?</li> <li>• Is the product over-loaded with complex and confusing details?</li> <li>• Are product information (e.g. brand, labels, buttons) clearly visible and readable?</li> <li>• Does the product guide you through its use and operation?</li> </ul>	<p>Considerations:</p> <ul style="list-style-type: none"> <li>• Does the product communicate its use and operation in simple easy-to-understand terminology?</li> <li>• Are the touch-points all well labeled and identified in a logical concise format and language?</li> <li>• Are the product colors telling you something?</li> </ul>



# 01 IMPRESSION

## Evaluation Worksheet

### AESTHETICS

Conveys appropriate look & feel - functional form and purposeful details



- Functionally appropriate: it looks like a vacuum cleaner
- Form communicates aerodynamics, and performance
- Handle detail conveys a high-tech science-fiction look & feel
- Light on head unit is a thoughtful touch



- Skinny wheel design doesn't inspire confidence and reliability
- Height of floor level indicator too deep, and appears "cheap"
- Extra slack on power cable on the handle looks like it could get in the way, and does not convey fit and finish well
- The reset button on the head unit looks more like a badge than a button
- Head unit does not convey the same visual story as the main vacuum cleaner
- Gloss finish could get scratched over time and use
- Suction extension tube looks "old school"
- Assembly snaps are visible



# 01 IMPRESSION

## Evaluation Worksheet

### SIMPLICITY

Overall perception of product, visibility of information, and level of complexity in terms of product interaction



- Power button is simple and easy to access
- Key interaction steps look simple



- Handle design is overly stylized
- Two part canister & head design makes the product look more complex than a single upright design



# 01 IMPRESSION

## Evaluation Worksheet

### LANGUAGE

Use of natural and logical words, labels, meaningful colors, and logical interactions



- HEPA filter inspired confidence in regards to air filtration performance



- “WhisperBELT” and “12.0 AMPS” appear to be simply meaningless marketing jargon, and not helpful to user
- “Brushed Edge Cleaning” with direction pointers are unreadable during use. Question the need for such messaging, when users will position the head unit against the walls anyway
- Floor height indication label is off-centered – conveys a sense of cheapness and lack of attention to detail
- Handle removal label is upside down to the user
- Trouble call # label on product implies that it could break or fail
- Suction control – “I have no Idea what it does”
- There isn’t good contrast on the silver pad printed labels on green with gloss finish
- “Overload Protection Reset” - is that a fuse reset?
- Confused by whether the filter is disposable or not



## 02 ENGAGEMENT

### Evaluation Guidelines

The engagement stage sets out to assess specific characteristics of the product in use. Users at this stage judge how well it feels and functions in relation to its intended use. This is where users assess the object's ability to provide feedback, and adapt to changing users and/or environmental conditions.

APPROPRIATENESS	FLEXIBILITY	FEEDBACK
<p>Interaction is in context and relevant to the product - conveys a sense of familiarity and appropriate mental model</p>	<p>Use of product is efficient and adaptable, based upon different users and environmental influences</p>	<p>Product communicates its intentions at all times in regards to its state, mode, action, status, mistake and error, etc.</p>
<p>Considerations:</p> <ul style="list-style-type: none"> <li>• Does the way the product is used and operated make any logical sense in its given context?</li> <li>• Does the product feel appropriate and relevant during use?</li> </ul>	<p>Considerations:</p> <ul style="list-style-type: none"> <li>• Does the product adapt to your needs, or do you need to adapt to the product?</li> <li>• What happens if more than one person uses the same product?</li> <li>• Can the product work efficiently under other intended environments and scenarios?</li> </ul>	<p>Considerations:</p> <ul style="list-style-type: none"> <li>• Does the product validate and confirm all interactions during use?</li> <li>• Does the product notify the user on operation status?</li> <li>• Does the product notify the user when there's an error?</li> <li>• How does the product notify the user when a mistake has been made?</li> <li>• Does all touch-points communicate its state and intentions?</li> </ul>





## 02 ENGAGEMENT

### Evaluation Worksheet

#### APPROPRIATENESS

Interaction is in context and relevant to the product - conveys a sense of familiarity and appropriate mental model



- 2 piece design allows light weight handling
- Floor level adjustment pedal functions as expected
- Large power button is easy to locate and access
- Nicely integrated tool kit is useful and appropriately presented
- Integrated rubber bumper on both main canister and head unit is a great way to protect furniture and walls
- Suction is pretty good
- Washable filter



- Bag compartment doesn't communicate "pull"
- Would not read instructions
- User must lean down to pick up either units
- Yellow tint light conveys dated technology and inefficiency
- Wire is hidden on suction cord but not on front handle
- The main canister gets dragged around, and hits user's feet as the head is being pulled
- Handle and hose doesn't play nice together - gets tangled
- Head unit bounces off the floor while interacting with the floor adjustment pedal control
- Exposed cable around the neck of hose "torques" the hose in one direction
- HEPA vent outlet used as handle is unnatural
- HEPA filter arrow orientation is misleading/ confusing
- Hook-type feature on back of main unit is confusing



## 02 ENGAGEMENT

### Evaluation Worksheet

#### APPROPRIATENESS

Interaction is in context and relevant to the product - conveys a sense of familiarity and appropriate mental model



*Continue*

- Hook feature by the retractable cable outlet side is confusing
- Hose removal latch looks like a clip for something, but it's not
- Extension tube handle has misleading spout feature that doesn't detach, or do anything
- A fussy and inefficient additional step to remove power cord prior to removing head unit
- Power cable gets twisted and stretched around the extension tube handle if not unplugged prior to removing the head unit
- Did not know that there's a washable filter inside the bag compartment
- Height adjustment for roller looks like handle lock.



## 02 ENGAGEMENT

### Evaluation Worksheet

#### FLEXIBILITY

Use of product is efficient and adaptable, based upon different users and environmental influences



- Retractable cord allows you to adjust how much cord you will use
- Detachable head/ handle and various attachment nozzles allow multiple setups
- Canister unit is agile and turns efficiently in tight spots



- Handle turns one direction but not the other
- No signs of retractable cable reaching its end (canister gets tugged and flipped upside down as a result)
- Retracting cable is not intuitive, and difficult to use
- Handle won't stay upright, and falls to the ground
- Hose location directly in front of main handle is not optimal for user interaction
- Suction hose only bends a certain way, user has to reposition to orient it the right way
- Turning and maneuvering with the head unit is difficult
- Product could be turned on while bag replacement door is open without a bag



## 02 ENGAGEMENT

### Evaluation Worksheet

#### FEEDBACK

Product communicates its intentions at all times in regards to its state, mode, action, status, mistake and error, etc.



- Power button clicks and feels good
- Matte textured power button separates the touch-point to the rest of the enclosure
- Floor level adjustment pedal clicks and feels good



- Handle removal button is difficult to press and lacks travel to communicate any feedback
- Floor height adjustment bar falls off easily
- Suction control ring is too stiff to turn, and lacks tactile feedback
- Suction control ring label is difficult to read
- No “bag is full” indicator
- Confusion on handle/ head unit removal for accessories
- “Overload protection” - What the hell does that thing do?
- User must manually press for attachment to lock. Only a few attachments have the snap feature
- Power cord doesn’t always go back smoothly
- Washable filter is not intuitive



## 03 EXPERIENCE

### Evaluation Guidelines

The experience stage sets out to assess a products ability to deal with or avoid error conditions. Users at this stage assess its ability to correct its mistakes. Finally, this stage is where users judge how well the product delivers consistency across its user touch points and performance.

ERROR PREVENTION	RECOVERY	CONSISTENCY
Product prevents problems before it happens	Ability to correct mistakes - reversible actions and states	Consistent delivery of Aesthetics, Language, Relevancy, and Feedback
Considerations: <ul style="list-style-type: none"> <li>• How well does the overall product prevent user error from happening?</li> <li>• How easy does the touch-points allow mistakes to be made?</li> </ul>	Considerations: <ul style="list-style-type: none"> <li>• Is it possible to recover from the mistake?</li> <li>• How easy is it to correct the mistake?</li> </ul>	Considerations: <ul style="list-style-type: none"> <li>• Is the overall look &amp; feel and context of use consistently conveyed throughout the product(s)?</li> <li>• Is the use of language, icons, and colors consistently delivered on the product(s)?</li> <li>• Does all the interaction/ touch-points share the same or similar usability story?</li> <li>• Does the product consistently provide meaningful feedback no matter what and where the user is interacting?</li> </ul>



## 03 EXPERIENCE

### Evaluation Worksheet

#### ERROR PREVENTION

Product prevents problems before it happens



- Large over-sized power button is reassuring and obvious
- HEPA filter cover can't be removed accidentally
- Power cable plug on handle can only be inserted in one orientation



- Could run vacuum with dirty filter and while doors are opened
- Bag compartment unlatches unintentional when reaching for the main handle
- HEPA Filter insertion direction is confusing, and user will never know if incorrectly inserted
- Could be challenging and tedious to replace all accessories back to its correct receptacle
- When to press "head reset" button?
- Always grabbing on to the vent outlet instead of the latch beneath it when removing HEPA filter cover
- Power cable doesn't always retract smoothly and predictably
- Bag compartment door often binds upon opening



## 03 EXPERIENCE

### Evaluation Worksheet

#### RECOVERY

Ability to correct mistakes - reversible actions and states



- Easy to close bag compartment if accidentally opened
- Easy to close tool kit door if accidentally opened
- Canister turns if facing the wrong direction
- Easy to cycle through floor level adjustment if the user misses their intended setting
- Bag compartment door binds but easily corrected



*None*



## 03 EXPERIENCE

### Evaluation Worksheet

#### CONSISTENCY

Consistent delivery of Aesthetics, Language, Relevancy, and Feedback



- Treatment and use of brand mark



- Visual language of wheel design is not consistent in terms of color or form on the rest of the product
- All latches work and interact differently
- 1 large power button, but all the rest of the controls and switches are tiny



