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EXECUTIVE SUMMARY

Situation and Background

Agilent's General Purpose Instrument Accessories business sells thousands of low cost, technically complex products to engineers worldwide. These measurement-critical products grossed $110 million in 1999. In 2000, sales increased 45% and projected increases for 2001 are expected to be at 12.5+%. A key business strategy is to minimize involvement of expensive field sales and call center resources to sell and support accessories while ensuring continued order growth. The web should be the ideal tool to reach these goals, but Agilent's Accessories' site has been described by customers as "cumbersome", "cryptic", "frustrating" "inconsistent", and "obscure".

A redesign of the web site was initiated to improve the quality of the user experience and its functionality. Surveys have proven that engineers prefer to do their own research before committing to a purchase, demonstrating the need for a "top of the industry" site that fulfills the potential customer's needs. Viewmark was engaged to redesign the Accessories site and conduct usability testing of the new solution to ensure the best possible use experience.

Objectives

The objectives of the redesign and the usability testing were to create a site that would serve as a conduit to Agilent.com's database of accessories product information. To accomplish this, Viewmark developed and tested "The Sorter". This new product selection solution offers "sort and search" capability and search by entering model numbers. This navigation points the customer to pertinent accessory information (key specs, overviews, images, PDF downloads) available on the Agilent.com site. The Sorter is compatible with the Agilent.com look and feel, and it features immediate access to technical support and customer service.

{Insert sidebars "method1", "method2", and "method3" here}

Methodology

Usability testing was conducted throughout the development of The Sorter, starting with a Heuristic Study followed by a Qualifying Questionnaire and a two-phased Performance Measurement Testing. The charts at the left summarizes these fundamental usability process steps. While some of the results were expected and synonymous with prior analyses, many of the comments and experiences resulting from each phase of discovery exposed potentially critical barriers. Those barriers were assessed, prioritized and addressed. The customized usability timeline allowed for several iterations of the website and The Sorter as the testing progressed.

Results and Recommendations

During the Questionnaire portion of the testing, a crucial response recounted that 88% of the engineers used a 3rd party for the actual purchasing (including administrative assistants, purchasing agents and procurement engineers). This knowledge emphasized the need for more general terminology on the site that would accommodate a wider audience than initially considered.

Changes that were suggested and immediately implemented after the 1st phase of lab testing were:

- Make contact and telephone information more available,
- Improve the color scheme on the web page for consistency across web browsers,
- Reduce instructional text,
- Improve response times,
- Make the navigation layout and function consistent among pages,
- Rename key products for greater understanding,
- Reorganize product categories and the product data model to match user expectations.

Changes that were suggested and immediately implemented after the 2nd phase of lab testing were:

- To reduce time spent searching for functions, make "clickable" elements more prominent,
- For greater simplicity, minimize navigation choices on the page,
- Further emphasize key results of searches and sorts,
- Further refine the product data model,
- Significantly improve the response time,
- Enhance compatibility with other web browsers.

Outcomes

The findings of the usability testing were implemented in The Sorter resulting in significant increase in successful task completions within the time benchmark. Statistically, this translated into a 98% increase in successful task completion. The outcome of this two-phased approach resulted in an easily understandable, streamlined web experience. The first phase of lab testing had an average success rate of 27.86%; the second phase showed a 53% average success rate. In addition, the average times for each task decreased with each task the user completed. Finally, once the process for searching was understood, the times decreased steadily for each user.

With the tests, the recommendations, and the dedication of the web team, the site was launched on March 7, 2001 with most of the proposed changes implemented, and the balance to be implemented in future phases.

METHODOLOGY: THE USABILITY PLAN

To conduct a thorough usability testing program of this web-based solution, the following process was followed for the following reasons:

1. **Heuristic Study:** Establish areas of focus by testing the existing web site using people knowledgeable in test equipment**,**
2. **Qualifying Questionnaire:** Profile the broader user base, answer specific questions for the testing phase and identify testers for the Lab Testing**,**
3. **Usability Lab Testing:** Observe users in real-life scenarios performing specific tasks with The Sorter**.**

The Heuristic Study

This form of testing is meant to give insight to the current experience of researching and/or purchasing accessories on line. It helps identify areas of focus. A set of tasks was mailed to seven engineers, along with a five-point rating scale. The engineers were instructed to do the tasks on their own time, in their own locations, and record their results and impressions. These tests were done on the old accessories web site, prior to the implementation of The Sorter.

Summary of Results

Navigation

- Difficult to navigate the site without using the quick search function.
- Able to navigate backwards following the breadcrumb trails
- Most users had trouble navigating from the agilent.com home page to the intended area
- Confusing language used on the home page; hyperlinks in "body" of the home page unclear

Loading Time

- Downloading Product Specifications took too long (specs, pdf, etc.)
- Users couldn't view information first before downloading

"Couldn't there be information on the site without the pdf, with an option to download if the information is what we are searching for?"
"It took a very long time to download the 16 page "Infiniium Probes and Accessories Datasheet" over a dial-up line. This information needs to be broken into smaller chunks..."

Product Information and Identification

- Users said this needs the most improvement
- Information provided for the products was not specific enough
- Detailed product information and product comparisons not easily located, not available to help make a decision
- Users want to view specifications comparisons (between similar models) before having to download information to their hard-drive, and they ask that the data be consistent

"Product comparisons would be extremely helpful in making final decisions."
"The catalog has been the way to research what accessories/parts are needed."

Look and Feel

"Color scheme is good except for the dark blue on the upper page. I think a lighter shade would soften it a bit."
"Carrying the box banner on the left side (alliances, education, etc.) through more than one level is distracting. I would use the space for something else."
"The first column choices were somewhat removed from me from being helpful."
"Aesthetics are OK. The site has no pizzazz and may not need it."

Summary

The navigation and product information are areas that need the most improvement according to the subjects in this initial evaluation. Site "look and feel" seemed to be low priorities for the subjects.

The Qualifying Questionnaire

To gather a group of test users with the qualities and characteristics similar to the intended audience of the Agilent Accessories website, a carefully worded questionnaire was sent out to 1400+ engineers. The questions were formed to gather not only profiling data, but also to fill in some knowledge blanks and also to confirm or adjust current beliefs about that audience. The results were enlightening and priceless.

To view the results of the questionnaire, see "Qualifying Questionnaire Results" in Supporting Data. To view the Questionnaire, see Artifacts.

Usability Lab Testing

Usability lab testing places real engineers in a controlled lab environment with a set of assigned tasks. As they do the tasks, they are observed, videotaped, offered minimal coaching, and asked to "talk their way" through the tasks to verbalize their impressions and frustrations.

The testing took place in two locations: at Agilent's Santa Rosa site's Usability Lab and in the Viewmark Lab in the Denver Tech Center. In Santa Rosa, the first phase of testing was conducted with eight users and five tasks (Task #1-4,6); a week later, after a Source of Errors Analysis was completed and Recommendations reviewed and implemented, the 2nd phase was conducted with six more users, completing six tasks (Task #1-6).

In the Lab Testing phase, the testers used The Sorter integrated with the Agilent web site and accessories content database.

See Artifacts for the introduction, tasks, and the Post-test Questionnaire that were given to the testers.

RESULTS AND RECOMMENDATIONS FROM USABILITY LAB TESTING

In the 2-phase Lab Testing, a number of improvements to The Sorter were identified, implemented, and retested. To view the detailed results of each phase, see "Results and Recommendations Detail" in Supporting Data. The key results of each phase of testing were:

1st phase changes of were:

1. On the home page:
   - Bring link(s) **"Call an Engineer"** and **"Contact Us"** above the fold and rename the link to **"talk to an engineer or order by phone"** (right below the picture)
   - Base the **web colors on the 256 standard palette** so that colors appear consistent across browsers and platforms

2. On The Sorter page:
   - **shorten the text in the Directions** to the bare minimum, emphasize the number in **the "# of matches"**, and **increase response time** when selecting items in boxes.
   - Change the look of the **secondary navigation** at the right upper corner to **look like the Browse Accessories/Find it Fast** on the Accessories home page

3. Within The Sorter:
   - Change **Testmobile** to **Cart/Testmobile**
   - Put the same list in both Adapters/**Connector 1 and Connector 2** (so search criteria can work both ways.)
   - Redo the categories The Sorter **to give prominence to major areas** such as cables, adapters, carts
   - Maintain **uniformity in lists of sub-categories** in all product groups that pertain to that category (for example: cables belong in every category of accessory that uses cables)
   - **Alphabetize** all lists, for ease of searching

2nd phase changes of were:

1. On the home page:
   - Make the **links in the What's New box** ("Learn more", "Check it out" and "Find out more") look like **live links** (red)
   - **Add a GO or FIND button** after the "Find by Model #" field

2. On The Sorter and Selection List pages:
   - **Remove the secondary navigation** on the right side of page completely
   - **Keep emphasis** on # in "Number of matching accessories" **but keep in the general look** and feel of the pages
   - **Update the sorters** with the latest spreadsheets
   - Significantly **improve the response time** on the sorter
   - Adapt the java applet (the Sorter) to be **usable on Netscape**
   - **Move** "Call An Engineer" and pictures **up; align tabs**
   - **Remove image** from rotation of engineers: call2.gif

CONCLUSION

Even with misunderstanding about how to use The Sorter, and with a user who never ventured beyond the Selection Guide page, everyone felt the tool was a vast improvement over the existing Accessories web site. They couldn't wait to have access to it and to use it in their day-to-day work. Their baseline was very low – each improvement and upgrade will likely also please them.

People develop patterns on the web very quickly – once they have established their impressions of locations of critical information on a site, it's very unlikely they will deviate. Throughout the testing, the users repeatedly went BACK to the Home Page to begin again with the Browse Accessories button. Their first impressions are strong and instinctive.

Key to the testing and successful results were the communication about each new addition or change, with at least two weeks in between changes. Customers like consistency and need enough time to learn and feel comfortable.

SUPPORTING DATA

Heuristic Study Results Details

	Comments	Rating
Five-point rating scale **1** Cosmetic, will not affect the usability of the system, fix if possible. **2** Minor, users can easily work around the problem, fixing this should be given low priority. **3** Medium, users stumble over the problem, but quickly adapt to it, fixing this should be given medium priority **4** Major, users have difficulty, but are able to find workarounds, fixing this should be mandatory before the system is launched. If the problem cannot be fixed before launch, ensure that the documentation clearly shows the user a workaround **5** Catastrophic, users are unable to do their work, fixing this is mandatory		
1.**Visibility of system status**. "The system should always keep users informed about what is going on, through appropriate feedback within reasonable time."	o Response time very slow (+45 seconds) o Drop down menus helped in navigating o Breadcrumb trail helps to know where you are o Language appropriate to engineers o Task #4: clicked on Products & Services > Look up by model Number > 8761B -- received cryptic message with no way out (looked like an error page, explaining how to use search field)	3 + + + + + 4
2. Match between system and the real world. "The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order."	o Names in columns (in last exercise) not pertinent or helpful o Main navigation choices on site not clear in content o (task#2) After navigating through ELECTRONICS >Test & Measurement > On Line Purchases, resorted to Search Engine o Price not available until clicking on Buy On Line (it would be like going to the checkout line in a grocery store, and after the clerk has rung up your choices, you begin to choose what you want) o Could not easily discern paths to SPDT switches – came to a choice of 2, with information not comprehensive enough to make a choice.	5 3 4 3,4,4 4
3. User control and freedom. "Users often choose system functions by mistake and will need a clearly marked 'emergency exit' to leave the unwanted state without having to go through an extended dialogue. Support undo and redo."	o Too many “layers” to get to accessories o (task #6) Could not view catalog or download – image was a dead link o Accessory list for probes – all were discontinued except the kit, which was last on the list o Phone # for help was after “Buy On Line” too far into process o In Buy On Line pages – descriptions in blue, giving expectation of clicking to get more information, expanded descriptions	3 4 3 4 4 3

	or data sheet – but was sent to a Test & Measurement page instead. BROKEN! o When using the BACK button to go back to do task #4, went back one click too many, then couldn't correct by going FORWARD one click – got errors	
4. Consistency and standards. "Users should not have to wonder whether different words, situations or actions mean the same thing. Follow platform conventions." o Is there consistency between links, page titles and page headings, to avoid confusion?	o Search field not large enough to put information needed	3
5. Error prevention. "Even better than good error messages is a careful design which prevents a problem from occurring in the first place."	o System leaves you hanging eg. Downloading the catalog. o Extremely slow, no icon to show actions, to gauge remaining time o PDFs too large, download took +9 minutes for 16 pages o High level of frustration when using links to find information, going either to wrong info or a broken link	5 5 4,4,4,2 3
6. Recognition rather than recall. "Make objects, actions and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate."	o Very obscure, links not clear (communication: a product line? PR? Email links?) o Not intuitive in finding information – some links gave anticipated information, others not o In making choice to buy switch, choices are not clearly explained (#000 or #555 no charge connection option) – no idea which is which o Choice of calibration services options – no explanation o No idea of size other than own knowledge – not told on site o Not intuitive in explaining difference between "Low Mass" and "Miniature" passive probe – clicked on both to find out	3 3 4 3 3 3
7. **Flexibility and efficiency of use**. Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users.	o Inflexible, inefficient – too many click-throughs, load time much too slow on dial-up o (task #5) path taken: Electronics > R&D > RF & Microwave Test Accessories > Shopping Cart > Specifications. If goal	4,4 4 3

Allow users to tailor frequent actions.	was simply to buy (and not test), would have given up o Looking for help is too far into the site o Took over 60 seconds to get to goal in task #2 o When in Switches, had to look into every group to find correct one for task o Contact info not available until much later in experience o 6 clicks to find accessory for probes o After those 6 clicks, only found superficial information, no specs as needed (found same accessory at www.tek.com with specs in 2 clicks) o Used search field for task #5 – "microwave + accessories", limited search to "Test & Measurement", got 10 choices. Selected "RF & Microwave Test Accessories > Switches > "Coaxial Switches", got 6 selections, but not the 8761B being searched for.	3 3 3 5 5 4
8. **Aesthetic and minimalist design**. Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.	o Here to search, not see "pizzazz" – want functionality o Inconsistent look and feel o Did not have correct version of Adobe to download pdfs (had to get newer version) o Data sheet info in Oscilloscope area not consistent. o Probe info were 2 tables, key specs and unreachable data sheet o Bottom of descriptions such as in Accessories "Agilent 1164A 10:1 2m passive probe has "FEATURES" in bold with nothing following. o After clicking on PRODUCTS categories, get list of types of products with brief description. At the bottom is a product list, some same as the first list, some different. Creates confusion about groupings. o Navigation on left (alliances, education, etc.) distracting, blurred focus of task at hand	1 2 2 3 3 2 1 2
OPTIONAL CRITERIA TO CONSIDER:		
9. Help users recognize, diagnose, and recover from errors. Error	o Didn't receive error message or solution when hitting "dead ends"	2

messages should be expressed in plain language (no code), precisely indicate the problem and constructively suggest a solution.		
10. Help and documentation. Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out and not be too large.	o Could not open parts catalog o Recommendations for searching, outline of how site is laid out would have been helpful	3 3

Summary of Feedback from Heuristic Evaluation

Navigation:
The from the test subjects in this study showed that most subjects found it difficult to navigate the site without using the quick search function. However once they found the correct page using the quick search function, they were able to navigate backwards through the "logical" path by following the breadcrumb trails. It seems that most users had trouble navigating from the Agilent.com home page to the intended area. Most of this confusion appears to be from the language used on the home page; possibly from the general language used there. It seems as if only one of the subjects used the drop-down menus in the Agilent template to get to the intended area. Most subjects used the hyperlinks located in the "body" of the home page to get to the intended area and had much difficulty. Most subjects attempting to navigate the site this way eventually resorted to the quick search or the site map. (4)

Loading Time:
Downloading Product Specifications:
Download time seems to be a problem for at least half of the subjects. When asked to download a product specification, most people had difficulty waiting for this process, and felt that it may be too long. Some subjects felt that they would rather view the specifications first to see if this is what they needed before waiting to downloading it to their hard-drive. (3)

Page load time:
Most users had little problem with page load time. (1)

Exception:
PDFs were too long in coming up as well as downloading.
Comments:
"Couldn't there be information on the site without the PDFs, with an option to download if the information is what we are searching for?"
"It took a very long time to download the 16 page "Infiniium Probes and Accessories Datasheet" over a dial-up line. This information needs to be broken into smaller chunks..."

Product Information and Identification:
This area seems to need the most improvement according to the subjects. Most subjects felt that the

information provided for the products was not specific enough according to their needs. Detailed product information as well as product comparisons (between similar models) are not easily located or not available to the users in order to make a confident decision. Users felt that they should be able to view these specifications/comparisons (between similar models) before having to download information to their hard-drive, and that the data provided, if found, was presented in inconsistent formats, or missing. (4-5)

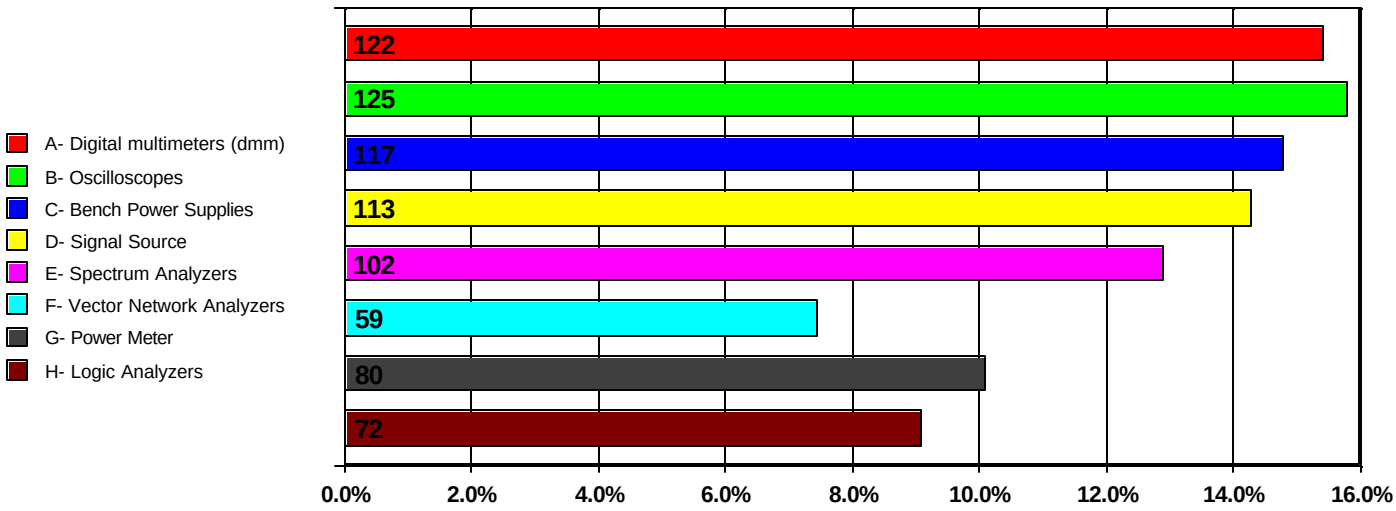
Comments:
“Product comparisons would be extremely helpful in making final decisions.”
“The catalog has been the way to research what accessories/parts are needed.”

Look and Feel:
Comments made by the subjects were:
”Color scheme is good except for the dark blue on the upper page. I think a lighter shade would soften it a bit.”
”Carrying the box banner on the left side (alliances, education, etc.) thru more than one level is distracting. I would use the space for something else.”
”The first column choices were somewhat removed from me from being helpful.”
”Aesthetics are OK. The site has no pizzazz and may not need it.”(1)

Summary
The navigation and product information are areas that need the most improvement according to the subjects in this initial evaluation. Site “look and feel” seems to be low priorities for the subjects.

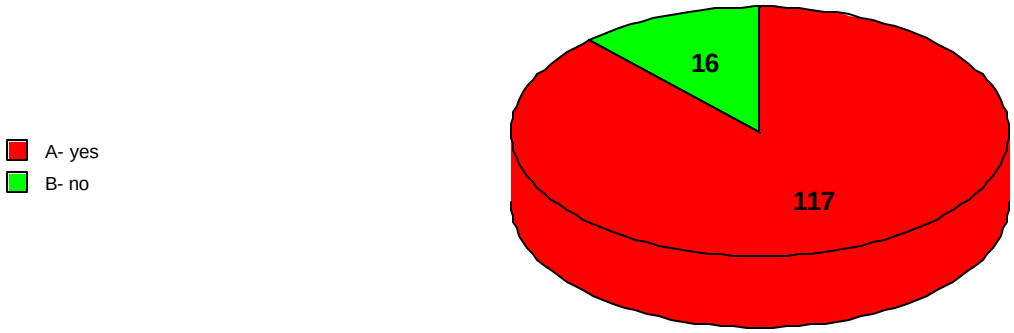
Qualifying Questionnaire Results

Please check the type(s) of equipment that you have used in the past:



No Filter
Number of responses: 130

Have you used any of these types of equipment in the past year?

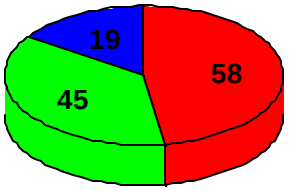


No Filter
Number of responses: 133

{Insert sidebar “data2” here}

Please select what best describes your normal exposure to the test equipment you checked in Question #1:

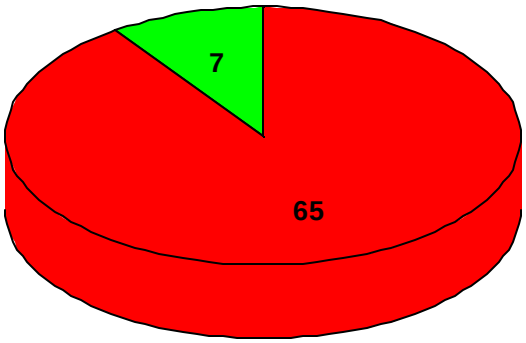
A- I operate in "burst mode" - I typically work at my desk, but sometimes will use test equipment "hands-on" in debug si
B- A significant portion of my job responsibilities requires regular direct handling and using of the test equipment.
C- I do not have regular direct contact with test equipment.



No Filter
Number of responses: 122

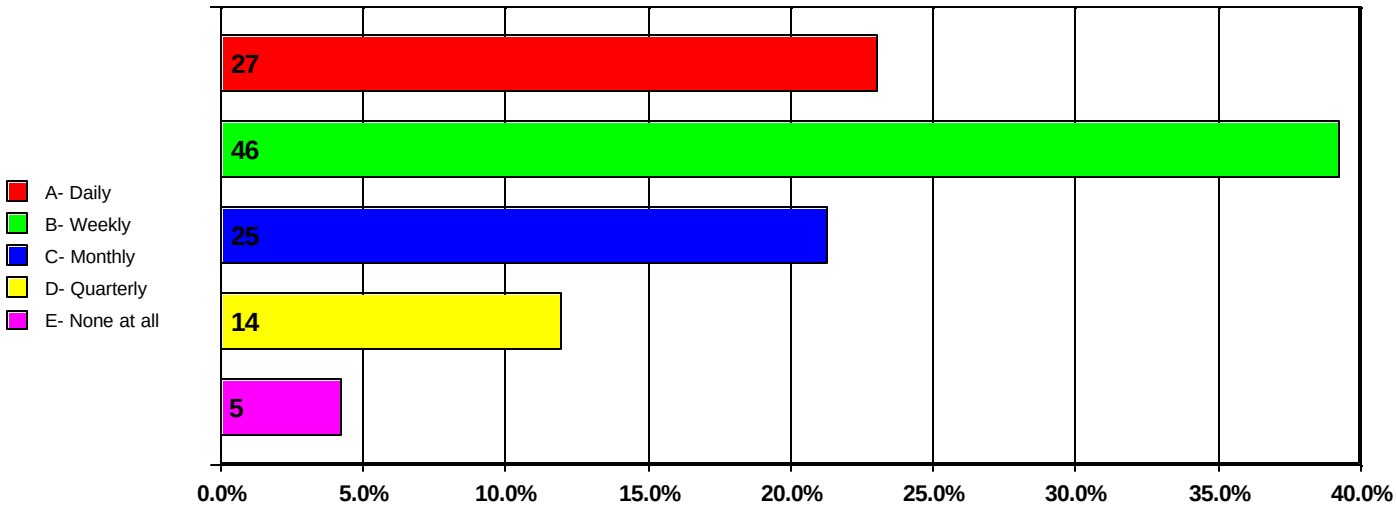
If you checked "I operate in burst mode", have you used the test equipment intensely in the past six (6) months?

A- yes
B- no



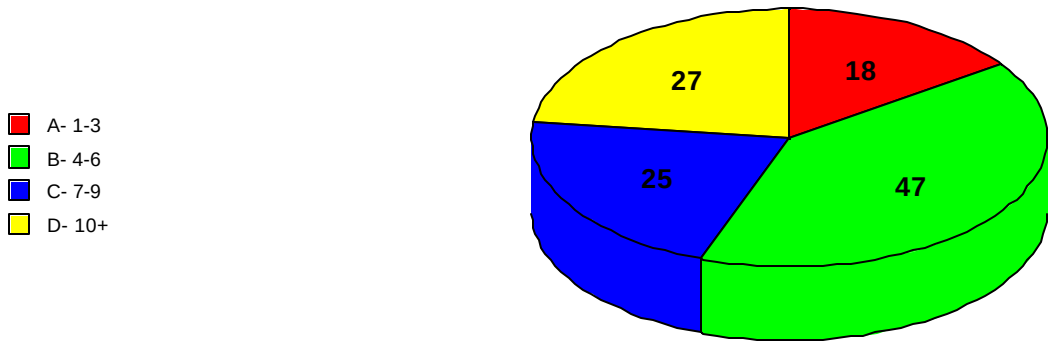
No Filter
Number of responses: 72

How often do you use the test equipment you checked in Question #1?



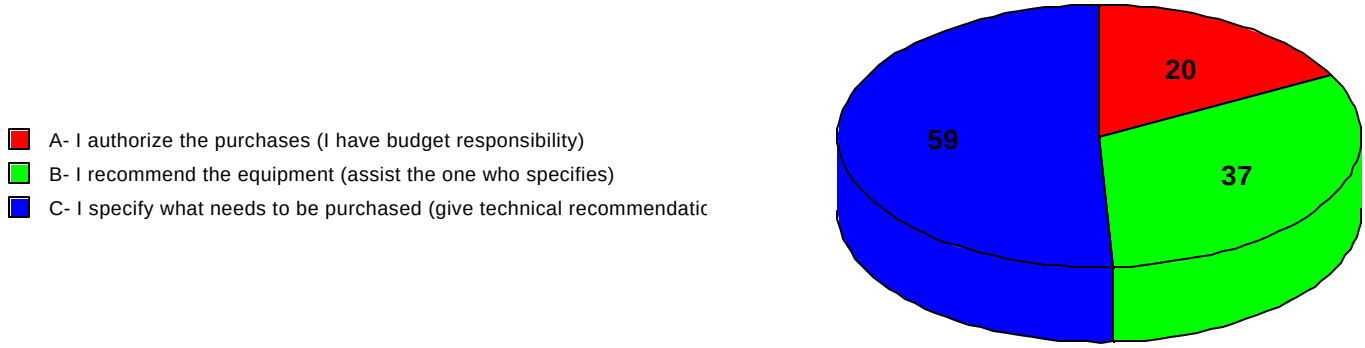
No Filter
Number of responses: 117

How many of the different types of equipment that you checked in question 1 have you used in the past 6 months?



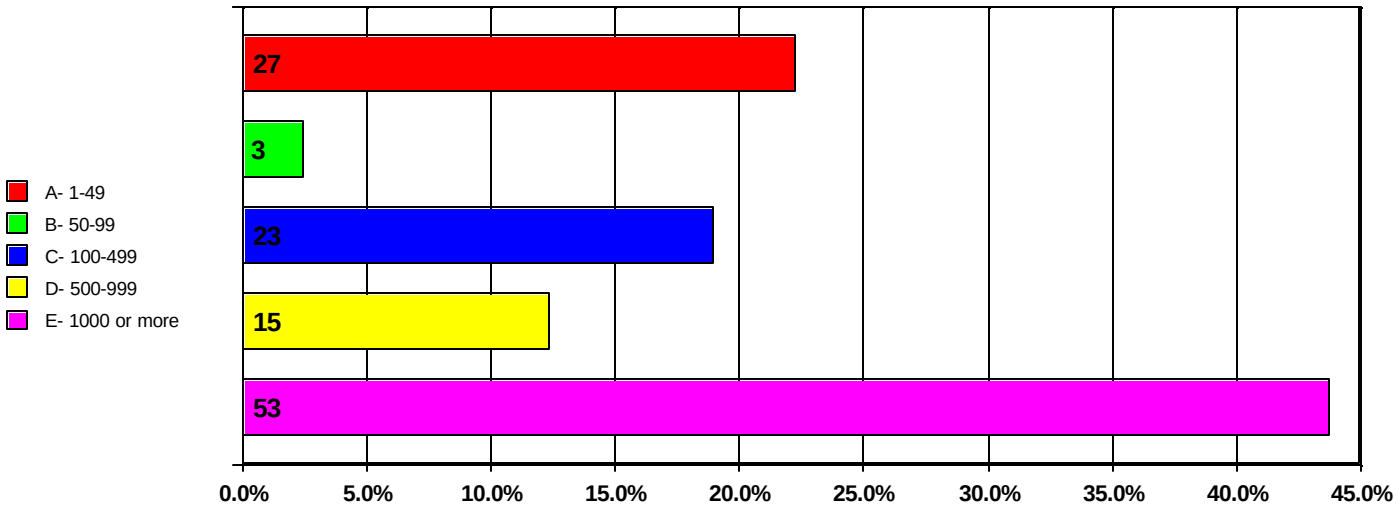
No Filter
Number of responses: 11

What is your role in the purchasing of any test equipment or accessory?



No Filter
Number of responses: 116

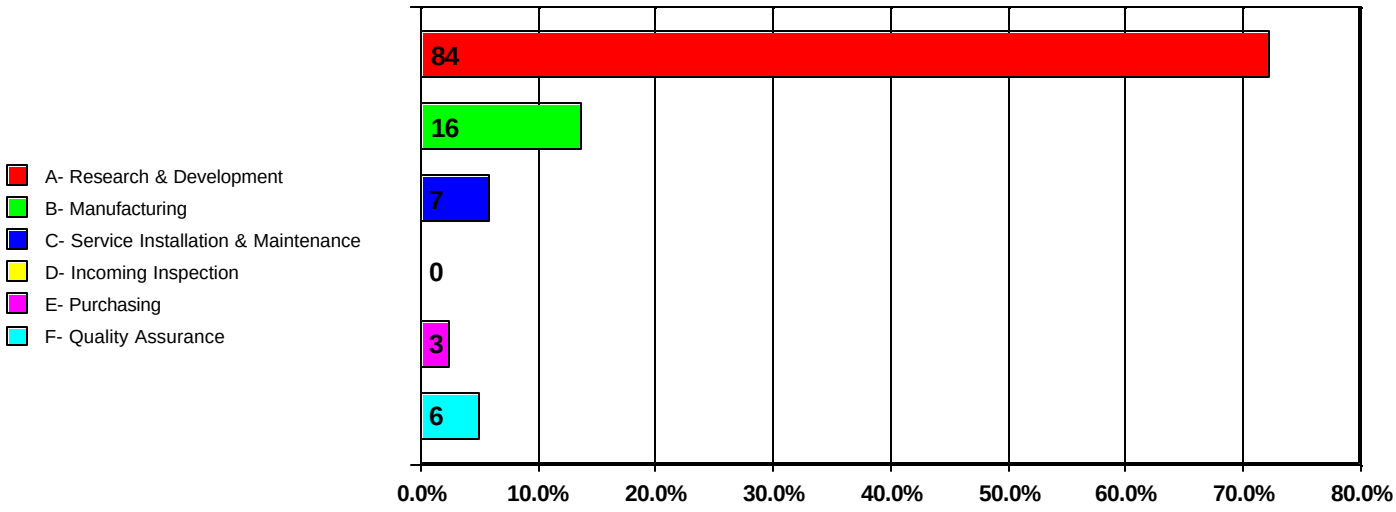
Please indicate the number of employees at your location:



No Filter
Number of responses: 121

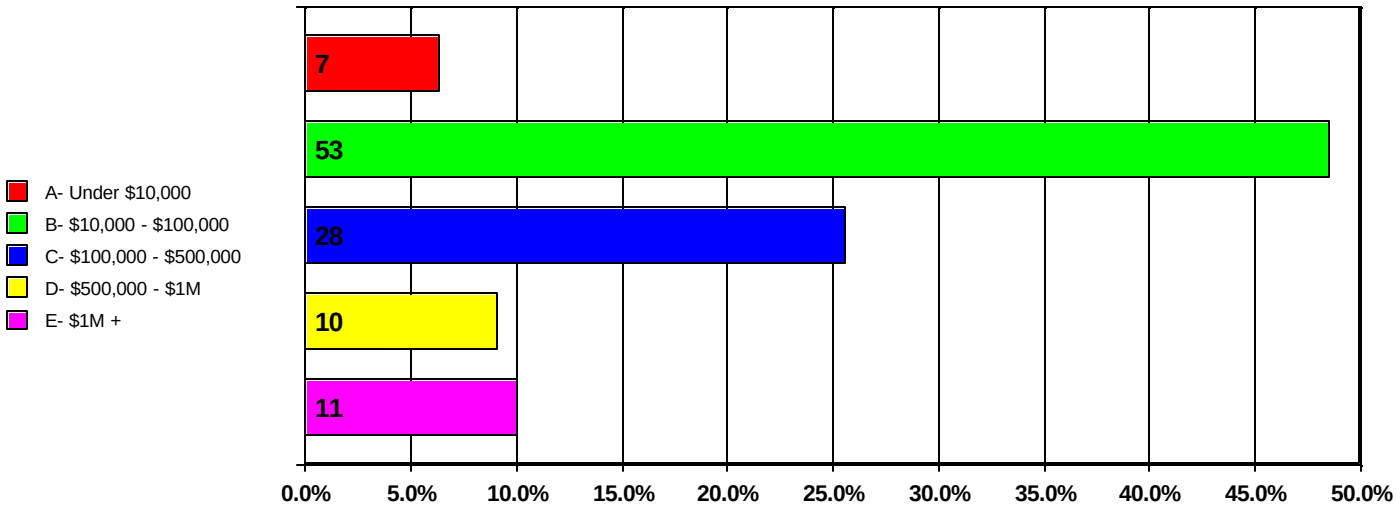
{Insert sidebar “data3” here}

What department do you work in?



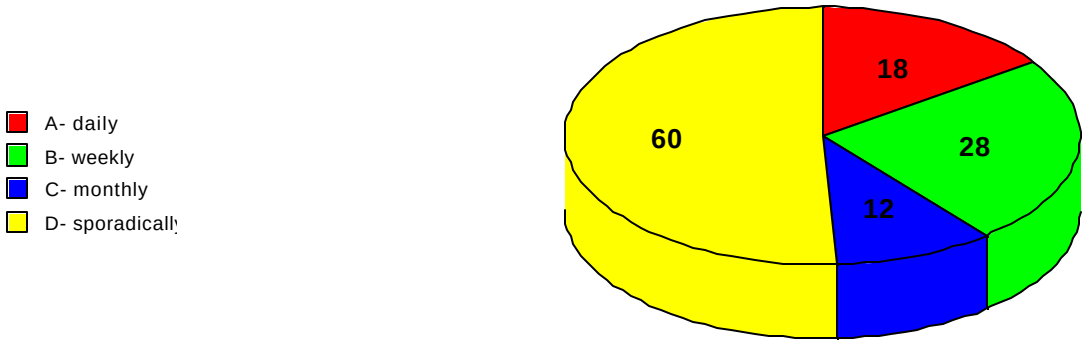
No Filter
Number of responses: 116

How much did your department spend on test equipment last year?



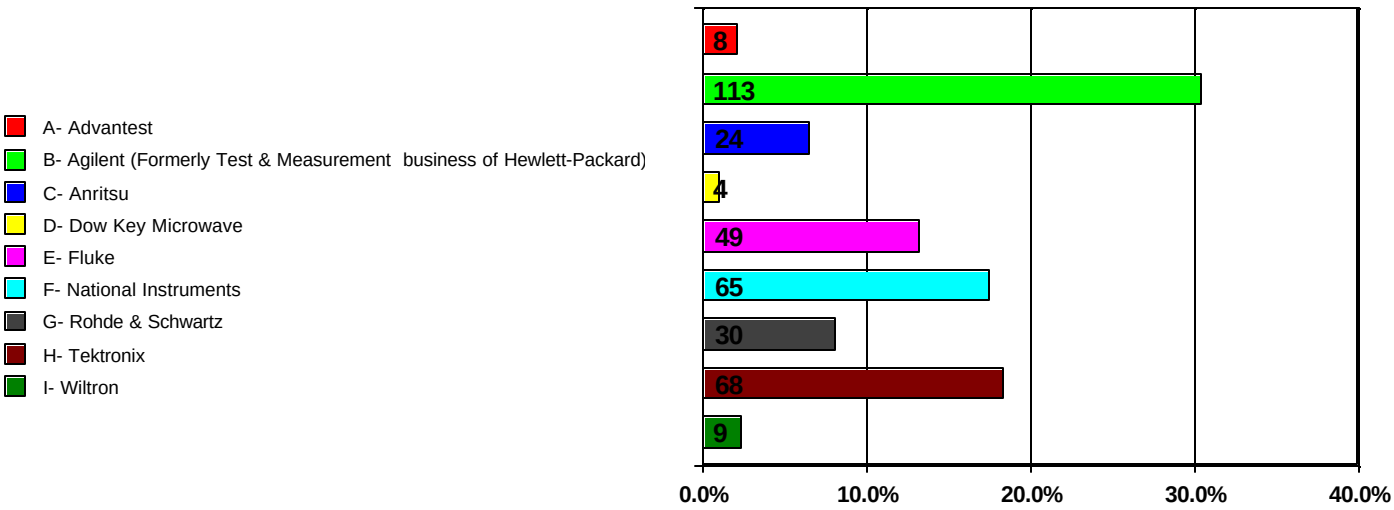
No Filter
Number of responses: 109

How often do you use the Internet to do research/purchase/gather information on testing equipment and accessories?



No Filter
Number of responses: 11

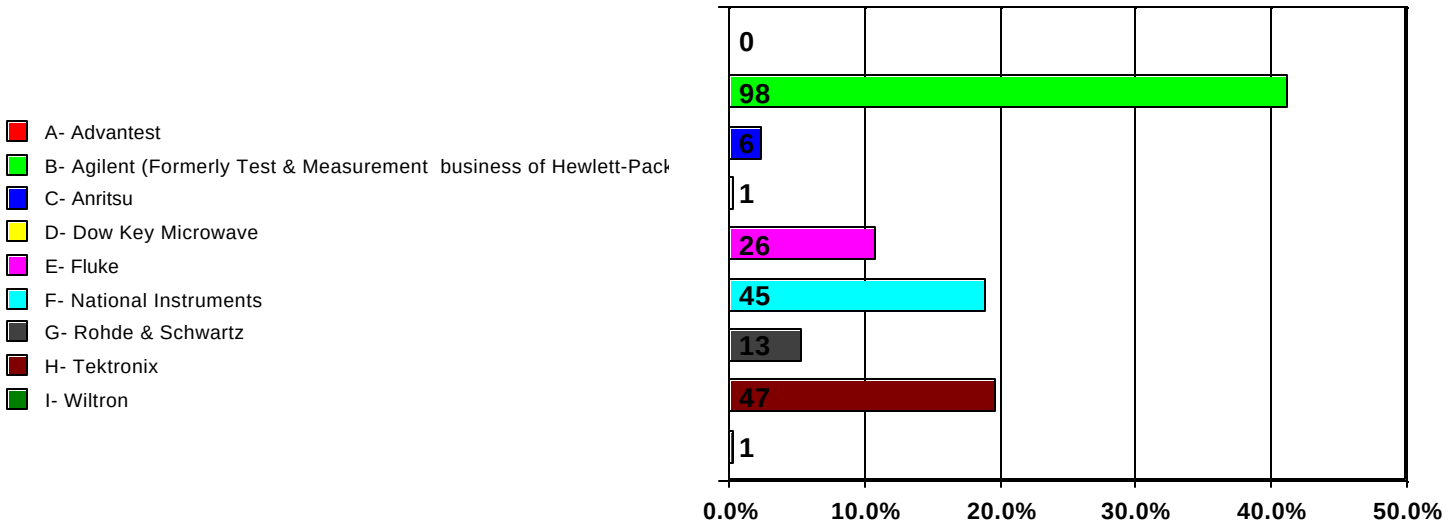
What company's sites do you go to for information?



No Filter
Number of responses: 114

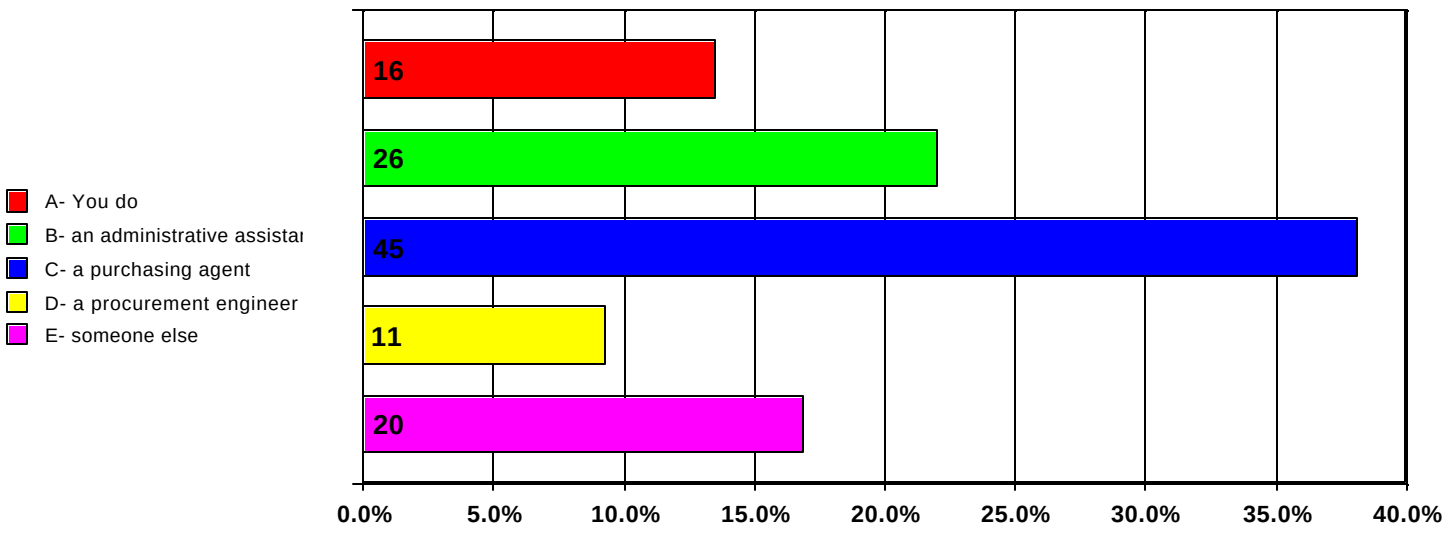
{Insert sidebar “data1” here}

Of those that you checked, please tell us the top three that you find most useful:



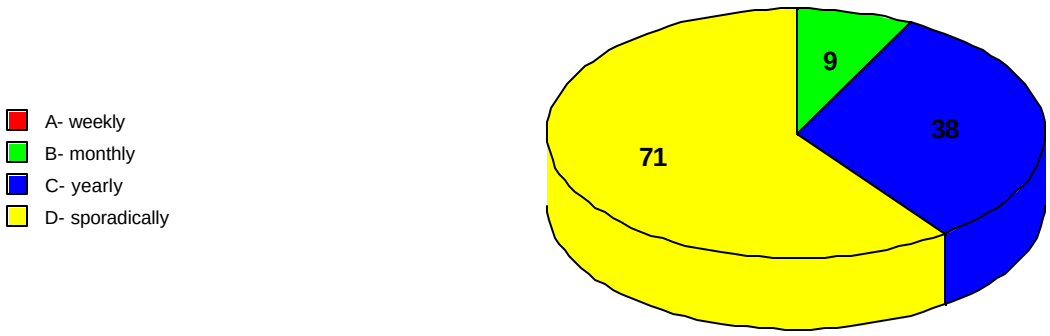
No Filter
Number of responses: 11

Who primarily makes your purchases?



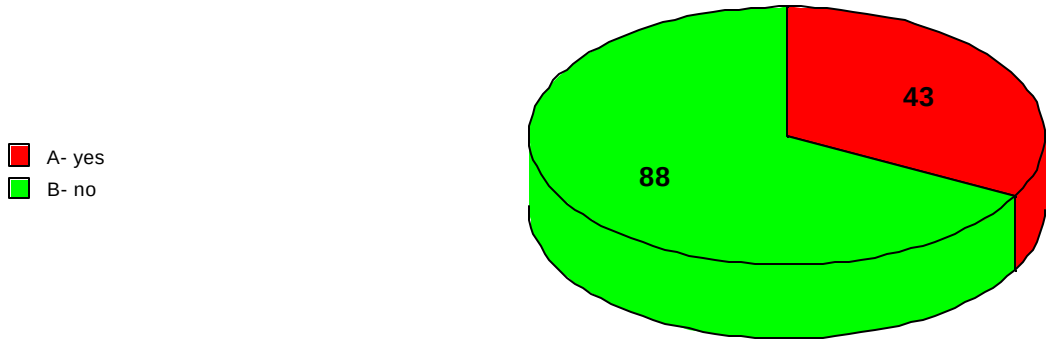
No Filter
Number of responses: 11

How often do you buy test equipment?



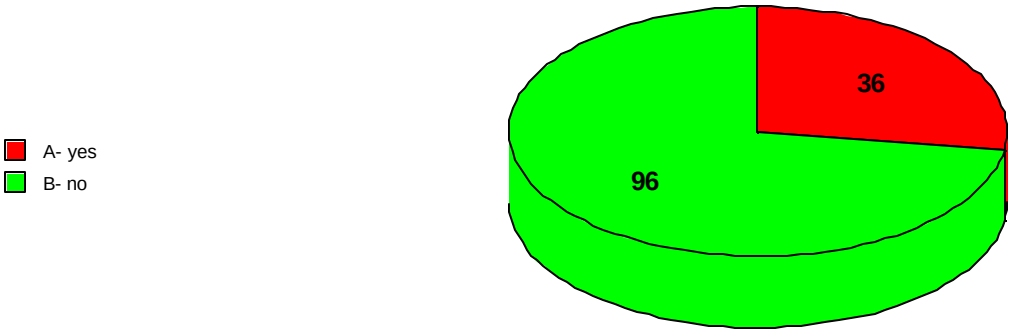
No Filter
Number of responses: 118

Would you be interested in participating in usability testing in our labs and/or in focus groups?



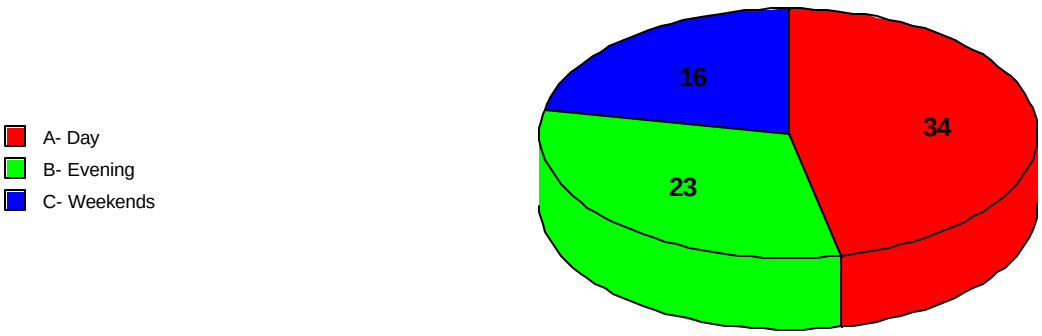
No Filter
Number of responses: 13.

Would you be willing to participate in a telephone interview?



No Filter
Number of responses: 132

I would be available for on-site testing during the:



No Filter
Number of responses: 58

User Profiles And Patterns From Pre-Test Questionnaires

Agilent Accessories Usability Testing – Phase 1 Feb. 8-12, 2000								
PARTICIPANT PROFILES (PRE-TEST QUESTIONNAIRE)								
	User 1	**User 2**	**User 3**	**User 4**	**User 5**	**User 6**	**User 7**	**User 8**
Job Title	Technical writer	Engineer	Engineer	ESA Product Manager	Engineer	SSPGU Product Manager	Engineer	Product Manager
Computer Experience								
Mac/PC	PC / 15y	PC/ 10y	MAC/1y	PC/9y	MAC/1y	PC/15y	PC/6 years	PC/15y
How Long			PC/ 15y		PC/14y			
Browser use/how long								
Netscape	2 years	8+ years	1 year	6 years	3 years	5 years	1 year	5 years
IE	10 years	5 + years	2 years	6 years	3 years	5 years	4 years	
AOL		Sporadically	6 months		2 years			
Operating System								
Windows	95/2000/NT	95/98/NT	95/98/NT	NT/2000	NT/98	2000	yes	95/98/2000/NT
Mac/Other			7		UNIX			
Hours spent on computer								
Home	3	5+	30	3	7	10	20	2
Work	40	20+	30	40	20	30	20	15
Use Computer for:								
Games/Fun	Yes	Yes		Yes			Yes	
Accounting	Yes	Yes	Yes	Yes	Yes			
Word Processing	yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decision Support		Yes		Yes	Yes	yes		Yes
Graphics				Yes	Yes	Yes		
Data Storage		Yes			Yes		Yes	Yes
Other			Surfing		EDA, Modeling	Surfing, email	Manage-ment	Presentations

{Insert sidebar “browsers” here}

Agilent Accessories Usability Testing – Phase 2 Feb. 16-22, 2000						
PARTICIPANT PROFILES (PRE-TEST QUESTIONNAIRE)						
	User 9	**User 10**	**User 11**	**User 12**	**User 13**	**User 14**
Job Title	Software engineer	Engineer	EMC App Engineer	Engineer/ Technical Lead	PME Product Manager	Engineer
Computer Experience						
Mac/PC	PC / 10y	PC/ 12y	PC/ 15y	PC/9y	MAC/3y	PC/12y
How Long	Other/20y			MAC/1y	PC/16y	
Browser use/how long						
Netscape	10 years	4 years	8 years	1 year	5 years	7 years
IE	6 years	2 years	2 years	7 years	2 years	4 years
AOL		3 mos			6 mos	
Operating System						
Windows	2000/NT	95/98/NT	95/98/NT	98	95/98/2000	95/98/NT
Mac/Other	linux					
Hours spent on computer						
Home	10+	2	5	20	20	5
Work	30+	20- 30	30+	30	20	30
Use Computer for:						
Games/Fun		Yes			Yes	
Accounting	Yes				Yes	Yes
Word Processing	Yes	Yes	Yes	Yes	Yes	Yes
Decision Support	Yes		Yes			
Graphics					Yes	Yes
Data Storage		Yes	Yes	Yes	Yes	Yes
		Email, research	Research, parts and equipment search	research	Web design	

{Insert sidebars “hours” and “problems” here}

User Performance Data – Phase 1

USABILITY TEST PHASE 1
Agilent - Santa Rosa, Feb 9-12, 2001

	Task 1 Calibration kits, price, availability	**Task 2** Oscilloscope probes differences, call for more information	**Task 3** External Mixer and Spectrum Analyzer, Adapter, model #	**Task 4** Move the Spectrum Analyzer, find back-up information	**Task 6** Make your own task
User 1	14.75[1]	17.75[2]	24.01[3]		15.00[4]
User 2	14.50[5]	11.00	21.75[6]	19.00[7]	1.00
User 3	6.50	10.50	8.00	4.50	2.25
User 4	11.50	13.00	9.75	11.00	6.25
User 5	11.00	7.50	7.25	7.00	8.25
User 6	8.75	10.50	6.00	17.00[8]	2.00
User 7	3.75	7.00	6.75	5.50	4.00
User 8	7.00	3.27	7.50	10.00	7.25
Mean	9.72	10.07	11.38	10.57	5.75
Median	9.88	10.50	7.75	10.00	5.13
SD	3.92	4.33	7.21	5.60	4.57
Benchmark 1	5.00	8.00	3.00	7.00	5.00
Benchmark 2	7.00	3.27	7.50	10.00	7.25
Benchmark Mean	6.00	5.64	5.25	8.50	6.13
Median	6.00	5.64	5.25	8.50	6.13
SD	1.41	3.34	3.18	2.12	1.59

% Users performing successfully within benchmark					
Tasks		% who were successful	Benchmark (minutes)	Mean time (minutes)	SD (minutes)
1	Calibration kits, price, availability	12.50	6.00	9.72	3.92
2	Oscilloscope probes differences, call for more information	12.50	5.64	10.07	4.33
3	External Mixer and Spectrum Analyzer, Adapter, model #	0.00	5.25	11.30	7.21
4	Move the Spectrum Analyzer, find back-up information	42.80	8.50	10.57	5.60
5	Make your own task	71.50	5.00	5.54	4.57

[1] Didn't understand the use of all the sorter boxes; very slow load time
[2] Waited nearly 3 minutes for PDF to download
[3] Very slow response between clicks in boxes (adapters); closed windows thinking they were going nowhere; did not finish task
[4] Went into agilent.com to use search; slow load time
[5] Very nervous at first
[6] Waited 30 seconds for each page to load (i.e. data sheets, key specs, etc.)
[7] Wandered a lot looking for possible answers; plus found a dead link within Agilent.com when going to "Racks & Enclosures"
[8] Name not familiar; looking through every category to eliminate

User Performance Data – Phase 2

USABILITY TEST PHASE 2

Viewmark Lab, Denver Feb 16 – 22, 2001

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
	Calibra-tion kits, price, availa-bility	Oscilloscope probes differences, call for more information	External Mixer and Spectrum Analyzer, Adapter, model #	Move the Spectrum Analyzer, find back-up information	Find oscilloscope(s) will this work for time correlating	Make your own task
User 9	13.25[9]	5.00	7.00	9.25[10]	4.25	3.00
User 10	14.50[11]	6.75	6.25	6.75	7.75[12]	7.75
User 11	6.25	4.00	8.00[13]	2.50	2.00	11.25[14]
User 12[15]	6.25	4.00	4.75	4.50	3.50	4.25
User 13[16]	14.25	10.50	9.00	8.50	8.75	3.75
User 14[17]	16.50[18]	5.75	4.50	4.00	5.00	11.75[19]
Mean	11.83	6.00	6.58	5.92	5.41	6.96
Median	13.75	5.38	6.63	5.63	4.62	6.00
SD	4.45	2.44	1.78	2.68	2.86	3.88
Benchmark 1	5.00	8.00	3.00	7.00	3.00	5.00
Benchmark 2	7.00	3.27	7.50	10.00	3.00	7.25
Mean	6.00	5.64	5.25	8.50	3.00	6.13
Median	6.00	5.64	5.25	8.50	3.00	6.13
SD	1.41	3.34	3.18	2.12	0.00	1.59

[9] User visually scrolled through 53 choices in list (4:42m), found 1st kit in 3:10m, did a 2nd kit (1:17m)
Net based on 1 kit: 10:45 minutes
*Total page load time (white space) 1:32 minutes.

[10] User closed all the browser windows; 53 sec. for test monitor to log in/password; user spent 4:53 min looking for information about testmobiles – found the page with all the information but since it had a completely different look and feel and font (Courier) didn't think it was at the same site.

[11] User searched for data for 5 kits: kit#1/2:03 min., kit#2/1:32 min., kit#3 took/1:17 min; kit #4/0:52, kit#5/1:43. Kits#2-5 total minutes 7:18 minutes.
Net time based on 1 kit: 7:01 minutes
*Total page load time 2:17 minutes.

[12] *Total page load time 1:12 minutes.

[13] User closed all browser windows; 35 sec to log back in
*Total page load time 43 seconds

[14] Couldn't find the accessory through the sorter; found the component that he would need an accessory for, then in its PDF got the model #, then did a search (5:19 minutes to search for component in agilent.com).

[15] User did not realize that there was information beyond the Selection Guide page – so each time, stopped and said he would call an engineer or technical support or sales.

[16] User was very, very chatty and curious, and wandered around "wondering" what would happen with certain searches. Beginning and end was never clear; test monitor's perspective of completing task different from user's feeling of accomplishment.

[17] User gave critiques and comments about site consistently through the tasks; 30% of time can be attributed to this commentary.

[18] Comments and critiques 5:15 minutes
*Total page load time: 2:22 minutes

[19] User found the sorter to be lacking in pertinent/correct/ample information for his search (logic analyzers).

{Insert Sidebar “loadtimes” here}

% Users performing successfully within benchmark					
Tasks		% who were successful	Benchmark (minutes)	Mean time (minutes)	SD (minutes)
1	Calibration kits, price, availability	34	6.00	11.83	4.45
2	Oscilloscope probes differences, call for more information	67	5.64	6.00	2.44
3	External Mixer and Spectrum Analyzer, Adapter, model #	34	5.25	6.58	1.78
4	Move the Spectrum Analyzer, find back-up information	83	8.50	5.92	2.68
5	find oscilloscope(s) will this work for time correlating	50		5.21	2.58
6	Make your own task	50	5.00	6.96	3.88

User Responses and Comments – Phase 1

POST TEST QUESTIONNAIRE – Phase 1 of Usability Testing

RATING: 1 Very Easy 2 Easy 3 Neither Easy Nor Difficult 4 Difficult 5 Very Difficult

	USER 1	USER 2	USER 3	USER 4	USER 5	USER 6	USER 7	USER 8	
Using the Agilent Accessories website was:	**3**[20]	**3**[21]	**2**	**3**[22]	**3**[23]	**2**[24]	**3**	**2**[25]	
Finding information about key elements was:	**2**	**2**[26]	**2**[27]	**2**[28]	**3**	**2**	**2**	**2**	
If asked, would you recommend that your colleagues use the website to:									
a. Find important data specs of accessories	Y	Y	Y	Y	Y	Y	Y	Y	
b. Order accessories online	Y	?[29]	Y	Y	Y	Y	Y	N	
c. Find help with application needs	N	N	Y	Y	N	Y	N	Y	
d. Keep up with state-of-the-art test & measurement equipment	Y	N	N	Y	Y	N	Y	N	
e. To learn more about measurement techniques	N	N	N	Y	N	N	Y	N	
f. Participate in dialogue with your peers (share ideas and problems)	N	N	N	N	N	N	Y	N	
g. Other					get prices				
If I could change the website to better suit my needs, I would:	Faster!	Speed up!	Not so slow	Add search engine	Have product compar-isons	Speed it up!			

[20] “Easy but slow”
[21] “The interface was for the most part intuitive, but the speed made it frustrating to work with.”
[22] “Some terms are not intuitive. Product pages seem to be incomplete – pictures, app notes, ordering instructions are not consistent or not always there.”
[23] “It was doable. Some things were intuitive, others not.”
[24] “It got easier after doing it a few times.”
[25] “Good navigation structure.”
[26] “If I knew specifically what I was looking for, it was easy, but if I wasn’t sure and needed information to determine what to get, it was difficult. It would be good to be able to browse or view a brochure.”
[27] List prices in the same row as the parts, so I don’t have to go to several places to get it.”
[28] “The information is there; you actually have to sort through multiple product pages to find what you want. This is painful especially if your connection is slow.”
[29] “If I felt that it would work, I would recommend it.”

User Responses and Comments – Phase 2

POST TEST QUESTIONNAIRE – Phase 2 of Usability Testing RATING: 1 Very Easy 2 Easy 3 Neither Easy Nor Difficult 4 Difficult 5 Very Difficult						
	USER 9	**USER 10**	**USER 11**	**USER 12**	**USER 13**	**USER 14**
Using the Agilent Accessories website was:	**3**	**2**[30]	**2**[31]	**1**	**2**[32]	**2**
Finding information about key elements was:	**3**[33]	**2**[34]	**2**	**2**	**2**	**3**
If asked, would you recommend that your colleagues use the website to:						
h. Find important data specs of accessories	**N**	**Y**	**Y**	**Y**	**Y**	**Y**
i. Order accessories online	**N**	**Y**	**Y**	**Y**	**Y**	**Y**
j. Find help with application needs	**N**	**Y**	**Y**	**Y**	**N**	**N**
k. Keep up with state-of-the-art test & measurement equipment	**Y**	**Y**	**Y**	**Y**	**Y**	**N**
l. To learn more about measurement techniques	**Y**	**N**	**N**	**Y**	**Y**	**N**
m. Participate in dialogue with your peers (share ideas and problems)	**N**	**N**	**N**	**N**	**N**	**N**
n. Other						
If I could change the website to better suit my needs, I would:	Speed it up, fix broken links, have examples/app notes	Add more functionality[35] and information[36]	Easier way to compare separate searches	Show more information about specific items chosen	Have more information like competitors[37]	See below[38]

[30] "Site relied on users' experience to maximize its use. After figuring out the Browse Menu it was simple."
[31] "With a little time for familiarity, this will be very easy to use."
[32] "The only reason I didn't pick 1 was that I had to stumble through a bit, and there was no easy way back."
[33] Too many steps
[34] "Components were placed in 'bins' for the use that Agilent saw and designed them. Often I will want to know ALL of a component that Agilent sells. If I didn't see it on the page I expected to fine it, I would assume that Agilent does not sell it."
[35] "Move the BROWSE button higher, add a SEARCH button for generic types of equipment such as connectors, make page information within the screen without having to scroll horizontally."
[36] "Technical bulletins would be very nice, as well as access to a catalog at any time."
[37] "Work examples, app notes, data sheets like at Tektronix, Wavetek, Fluke."
[38] "Eliminate marketing and product links from product specifications and features pages
Don't use multiple windows, stick to one window and let me move backward and forward.
Give me technical specifications on product datasheet. If specifications are pages long, give me a PDF file to download and print out.
If you have a tab (Additional Information) let me click on it, don't make me hunt for the link elsewhere.
Use pictures to show accessories."

User Comments

Phase 1 Testing Comments

"I didn't really like that this [Buy on line page] was the only place to find prices."

The need for information that is under different types of documents and links is "inconvenient and frustrating".

[About the Call an Engineer link] "Purchasing agents will have an issue with needing more specific information – they will need to call to research before finding equipment to purchase."

"If it wasn't so slow, this would be a neat idea."

"The interface is neat and looks simple."

"It was hard to read the product's description with in the list. Repetitive description should be at the top of the column and the unique identifiers in the individual product boxes."

[About the pdf downloads] "There should be a window to tell you how much time it will take to download the datasheet and give you the option (yes/no) as to whether you want to take the time to download it."

"After using the selection tool a few times, I found it easy to use."

"Seeing the number of results on the category page, which I didn't notice the first few times, was really neat and useful to see."

"A matrix of product comparisons would be very good to see."

"I would call someone for help… I would rather sit on the phone for 10 minutes than spend time searching a site and going off in the wrong direction and ending up without getting any results. I have had that experience many times here."

"FE's would really use this site – but they are either wireless or on a land line, and the page load time is so long."

"I would like to be able to compare prices. I would like to see the prices soon in the product description area rather than to wait for the end when you want to buy."

[When figuring out how to use the sorting function) "Cool, I didn't realize before that I could select two different categories to narrow the field."

"[Agilent] should up America at the top of the call list. Most users are probably American."

"This works pretty well. I like that I can narrow down the fields by selecting different configurations."

"It's not always easy to find specs on cables… nice to find them here, and easily."

"The Categories and Fields are great. This will make everyone's life easier – hurry up and get this done!"

"The categories are well laid out – the staircasing out to the other options works."

"The Auto-Eliminator definitely makes your choices easier."

"A lot easier than using the catalog, with hundreds of pages and pictures that are not clear. This is a lot easier than what I go through now, it takes less time."

"This was reasonable to navigate, straight forward. However, the waiting for pages to pop up was agonizing."

"Matching categories helps you to sort quickly through a lot of information."

"Real easy to navigate, very quick, much quicker than the Agilent site now which is very slow."

"Description by Model # is not meaningful to customers at this level. It will really be for in-house use only."

[When at Buy on line for Instrument Testmobile] "What's 'not to be hotlined'? "

"Engineers would usually check out specifications on all the products available; they would not leap to a conclusion without getting all the data available."

"I like the navigation – it's interactive. An excellent job has been done for the user."

"Why not change the 'buy on line' link to 'get more information'?"

"More information is better than less when buying accessories. I would want to be clear about it and get all the information to make sure it will work with the piece of equipment I have."

"For someone [like me] who does not use the Internet very often, I found this very easy to work through."

Phase 2 Testing Comments

"Depending on what my needs are for the application I would need to check each possible [calibration kit] for the best fit and also the most for my budget."

"I don't have all day to wait for the information to show up."

"I go to sites like Agilent [or competitors] for technical bulletins – either a white paper on how to use something or "how to information. This would bring me back to a site over and over."

"Budget considerations are a very big concern of engineers; we [customer service] get calls regularly about their specifications and budget, and we have to help them get what they need within their budget constraints. They call us because we can do a lot of the research and footwork for them. A call may take up to 3 hours, but they know they are getting answers, as opposed to the website."

"Most of the small customers will have left by now to go somewhere else. It's a disaster; if a site does not work it reflects on their perception of the company. Because they do big purchases but not on a regular basis, it's a missed opportunity."

"Time is money – the accessory they are searching for will cost more than the purchase price when you take into account the time it takes to order or find information on the site."

"This works well – I would bookmark it [the Sorter] and use it on a regular basis."

"I have found the Agilent website pretty awkward to use; I would use the catalog to order instead of the site. It has significantly improved over what was out there. I think it works pretty well."

"These days, when I get the trade magazines, I would see the ads and come to a site like this and look for the it."

"Oh, I see… when you click the right buttons… yes, I would use this site."

"I know that a lot of pages are often broken on the Agilent site – so when I find one that is broken, I feel resigned to it…. And that they don't care to help me find the information I need, through suggestions or a link to another option. If I was a new customer and found a broken link and couldn't find the information I needed, I would assume that they [Agilent] didn't sell it or didn't know anything about it."

"The secondary navigation is not where I would need it. I would need it after I had completed a search, not when I am going forward to research the results I just pulled up."

"I would expect this slow load if I was at home on a land line; but on a T1 or DSL I would assume there is a problem with the site or page since it is taking so long."

"I have never met a customer who knew his model # right off the bat. I talk to customers everyday their response … is a physical description or the application they use it for. Also, since there are different companies with the same products with their own product numbers, that can get confusing too."

"This sorter is good – I just need to learn how to drive it."

"If I know what I want when I am on the list page, I would like to go to purchase it now – why isn't there a "buy" link on that page?"

"I really like the sorter – especially with accessories, where there is an incredible level of complexity. It's very intuitive, and I would absolutely use this regularly."

[while searching for testmobiles] "Easy! This has been impossible to find in the past – this is great!"

"The process and the flow is very good….this helps to narrow down and zero in… the design is good… the ability to find the carts was incredibly powerful."

"The populating of the pages needs a lot of work."

Results and Recommendations Detail

KEY: [P1] Phase 1 of Lab Testing [P2] Phase 2 of Lab Testing

USE the Home Page			
Task	Finding and Explanation	Recommendation	Solution
Search by using the "Find by model #"	[P1] Customers more often identify their need by description of the equipment or the application they are using. Also, there are many manufacturers - model #s may not be the same on each piece. [P2] No FIND or GO button – the user must assume that the Enter key will start the search	Create an Accessories specific search function to search by keyword, partial descriptions, application use, and/or physical attributes.	[Deferred to a later iteration] 1] Create an Accessories-specific search that operates with database with all possible words and use a SQL query 2] Allow a Plain Text Search of all available files [P2] Add a FIND or GO button next to the field
Task	Finding and Explanation	Recommendation	Solution
Find "What's new" information	[P1] Links do not look like live links; the web standard is one color for a link, a second color for a visited link. [P2] Users read the information, commented on it, and then went to the Browse Accessories button to search for that information – didn't realize that there were "live" links in that box.	Have the links to react the same way as web users are accustomed. Change the links to the Agilent web standard of red for unvisited, gray for visited links.	[P1] More input is requested in Phase 2 of lab testing before any changes are made. [P2] Since it is a graphic, this cannot react like a normal live link. The links will be changed to red to bring attention to them.
Task	Finding and Explanation	Recommendation	Solution
Find information about "Call an Engineer"	[P1] "Call an Engineer" is below the fold; many users did not see it during the first couple of tasks. The links to both "Call an Engineer" and "Call to Order" have the same destination, so diminished the "special" feeling of reaching an expert. [P2] The tab above the picture implies that is clickable – standard web design. Users did figure out that the link below the picture was live, but initial reaction is to go to the tab. It was not readily apparent to users that this linked to a phone #. One user kept looking at the bottom of the page for a phone #; he expected it at the bottom *"just like it is in the catalog".*	[P1] Bring the links up into view so that user does not have to scroll to look for it. Combine the links into one sentence. Make the link even more noticeable so users see it easily. Make the picture of the engineer a live link. *"Would be a lot better if the picture was clickable, or the link further up."* [P2] Make the tab a live link, or change the look to a bar or some other graphic that does not imply a link.	[P1] Create a link Talk to an experienced test and measurement engineer or order by phone and bring it up to the picture (before the text). [P2] Agilent.com issue – not completely resolvable by Agilent Accessories. .

KEY: [P1] Phase 1 of Lab Testing [P2] Phase 2 of Lab Testing

USE the Sorter page			
Task	Finding and Explanation	Recommendation	Solution
Use the Sorter to find your accessory	[P1] Users do not want to read instructions, just go where they feel they should go based on first impressions. Number that changed to reflect the matching accessories amount was next to the instructions, which few read. Also, the font size is small and not contrasting in color to emphasize it.	Cut direction text to the bare minimum Focus more emphasis on the number by using a brighter color, larger font size.	[P1] Change text at the top of the Sorter to "Select from any or all windows", and make # bigger, brighter
Task	Finding and Explanation	Recommendation	Solution
Use the sorting capability to help narrow your search for an accessory. Take full advantage of that capability – choose which of the boxes to click in, how many in each box	[P1] Users either felt that they had to click in each box - or they felt the sorter implied "OR" (pick from one or the other, but not both). They felt that they had to select the right category/box to click on based on their existing knowledge of the equipment. Selecting more than one item in the box didn't require a CTRL + command, so clicking on more than one item did not eliminate the 1st choice. If the 1st choice clicked was below the "fold", the resulting choices may not be accurate. Double clicking on item in box de-selected it, and slow response in boxes made it hard to know what was selected	Have selections be "unselected" automatically unless using a specific key. * Increase response time when selecting items in boxes.	[To be considered for in a future phase of site additions] Add a "Can't find it? Click here for help with your search" link that will give hints and ideas on how to narrow the search and use the boxes more effectively. ** Optimize code to eliminate unnecessary looping of information.

	When the sorting involved clicking boxes that stacked one on top of another, users did not realize that they could select items in each window. By the 2nd (4 users) or 3rd task (2 users), it was understood. When the sorting involved clicking boxes that stacked vertically, users did not initially realize that they could select items in each window. (When they were presented with 2 boxes, side by side, selections were made in both boxes with no thought or hesitation.)	Change the layout of boxes in the sorter to follow the eye's natural path – left to right. Use graphics to illustrate how to use the boxes (like "Find it Fast" on home page) with arrows, bright text.	[Further consideration and research is recommended]
Task	Finding and Explanation	Recommendation	Solution
Find adapters for equipment	[P1] Connector 1 + Connector 2 did not necessarily offer the same results as Connector 2 + Connector 1 Slow response made selecting items in each of the 5 boxes difficult	Redo the content of those 2 boxes to have the same lists in both – so choices can work both ways. See recommendation above *	*** [P1] Create new spreadsheets updated to reflect the accessories in each category. See solution above **
Task	Finding and Explanation	Recommendation	Solution
Find a carrier for a Spectrum Analyzer	[P1] Users searched for "carts" or "rolling racks" or "trolleys". Critical information such as dimensions and limitations were hard to locate. Users went to Spectrum Analyzer first to find this accessory	Change the category name to a more recognizable one, and put links to Testmobiles in the categories that could potentially need it. Add size/dimensions to the Selector Guide page	[P1] Name this category Carts/Testmobiles (add to spreadsheets – see above **) and put Carts/Testmobiles in all the categories of equipment that would have use of it. Further consideration and research is recommended to determine details to be added to the Selector Guide.
Task	Finding and Explanation	Recommendation	Solution
Find GPIB cables	[P1] Users scrolled up and down looking for Cables. Their placement was inconsistent within the categories.	Place a link to Cables in more of the categories, as well on the main category list.	[P1] Place link to Cables in all categories of equipment that need cables and give Cables its own category (add to spreadsheets – see above ***)
Task	Finding and Explanation	Recommendation	Solution
Find your own accessory	[P1] Categories and sub-categories are not alphabetical, slowing the user's search.	Alphabetize the categories and sub-categories	[P1] Revise the spreadsheets and alphabetize the lists. (add to spreadsheets – see above ***)

KEY: [P1] Phase 1 of Lab Testing [P2] Phase 2 of Lab Testing

USE The Selection Guide (list) page			
Task	Finding and Explanation	Recommendation	Solution
Select the appropriate accessory from the Selection Guide	[P1&2] Information is redundant, and there is an implied waste of space with the redundant information, while the desired information was not available Users felt that the product # was unnecessary for searching, only for reference. Clutter of data distracting when searching for critical information	Take out columns that repeat information already in the description column, add information that aids in comparisons (price, contents, size, etc.) *"Top of list should have the common words, and within the list should have unique identifiers."*	[Further research is recommended to determine what information is considered critical to the users] [P1&2] Add columns for critical information; Put Product # in same column as description, have the entire description in that column be the live link to the data pages.
Task	Finding and Explanation	Recommendation	Solution
Use the secondary navigation	[P1] Users did not recognize this navigation tool to be the same as the one on the Home Page. *"I thought it was part of the graphic, just another pretty picture."* Patterns are set easily – since the Browse Accessories on the home page worked well, it was no problem to go "Back" to that page to start a new search. [P2] The natural path would be to check in the Sorter to begin narrowing search. If no potential parameters are showing, the next step would be to narrow that search even more – the secondary navigation was looked at to accomplish that task. When in that navigation, users did not notice it was the same as the Home page navigation – just saw that it did not help in their current search.	Change the look of the secondary navigation box to look very similar to the Home Page navigation Put the navigation tool on the Product information pages User's mindset is in its current search, not a new search. Place the navigation box on the pages that would be most naturally be used – on the product information pages *"When I saw this [navigation tool] I was on my way to researching the accessory – when I am done with that search is when I would use that nav box, but it's not on the page I am at [data sheet]."*	[P1] Re-design this navigation box to look like the Home Page – Orange text, lines, arrows, etc. Separate the navigation box from the graphic(s) Concerning placement of the secondary navigation box on other pages: Agilent.com template – not able to change from the Accessories perspective. Discussion with the Agilent.com web team the users' desire of the secondary navigation box being on more pages is recommended.

Task	Finding and Explanation	Recommendation	Solution
Research the accessories listed	[P1&2] Each time "View List" is clicked, a new window is opened, which became very confusing to the user. When the user tried to "clean up their desktop" by closing some windows, the confusion escalated. In some instances, the user lost their Home Page (and the main navigation tool).	The Sorter's function is to help the user search and refine that search with different combinations of search criteria. If The Sorter displayed its results in the same window, it resets itself when user goes back to view previous choices. This eliminates the ability to adjust the search – so a 2nd window is the best alternative. If that window stayed open and the lists that were generated opened in the same window, the user would have only 2 windows open at one time.	[To be considered for in a future phase of site additions] [P1&2] Adjust the code so the Selection Guide (list of results) opens in a new window, and the ensuing searches open in that same window.

KEY: [P1] Phase 1 of Lab Testing [P2] Phase 2 of Lab Testing

OTHER TASKS			
Task	Finding and Explanation	Recommendation	Solution
Find price and availability	[P1&2] No prices were immediately available on list, data sheets, key specs; the user would have to go to "buy online". Users expressed extreme reluctance to commit to that "click". While there is text at the top of each Selection Guide page indicating that there is no commitment involved when clicking on that link, no one read it during this testing.	Make price available on The Selection Guide in one of the columns. Change the link to read "For pricing information, Click here"	[P1&2] Further research in recommended in finding options of importing pricing information into the tables. Agilent.com decision [not determinable by Agilent Accessories]
Task	Finding and Explanation	Recommendation	Solution

Gather any information needed (key specs, data sheets, prices, etc.) to help in making a decision about the accessory you wish to purchase	[P1&2] Slow page load time frustrated all the users; the waiting, plus the inconsistent information on groups of pages (i.e., all data sheets, all key specs) added to the frustration that perhaps they might be waiting for nothing. *"I would rather sit on the phone for 10 minutes than spend time searching a site and going off in the wrong direction… I have had that experience many times here."* Download time for information documents such as PDFs too long with no warning or expectation Users wanted pictures of the accessory and equipment – together. This would help them inn making the best determination of the accessory to purchase. No picture to view like in the catalog, which normally helps in choosing accessories; pictures throughout the site are small and pertinent details are undistinguishable	*"It would be nice if I could view the document in HTML first, and choose to download the PDF if I needed it still. And, if I could download the PDF in sections, so that it would not take so long, that would also work."* *"A 'warning' of time to download would be good, so the user can choose whether to download it now or later."* Have pictures available (like in the catalog) on the data sheets, the key specs, or as a link from the Selection Guide in one of the columns. Links to additional information, if 10 lines or less, could be anchor links on the same page; all pages should have specific data included Picture that would be enlarged when you click on it would be helpful. (Items such as kits have options and upgrades; seeing what the kit includes would help in purchases of additional tools.) List of contents will serve the same purpose helping in deciding on its appropriateness for your app needs Consistent look is important – when a user finds a page that looks different (i.e. Testmobile page), they feel that they are in the wrong place, so continued looking for the information, although the information they needed was on that page. Make sure all pages in the site have the same look and feel.	Agilent.com decision [not determinable by Agilent Accessories] Additional research is recommended to discover the needs and possibilities.
Task	Finding and Explanation	Recommendation	Solution

Get Contact Information	[P1] Contact us list of countries not second nature to users in this test. The users felt that the order in which continents were listed was not pertinent; America's should be at top, with US being the default link. Contact Us section gives times in unfamiliar time zones; not all time zones are clear	While users felt that the US was the main country using the website, statistics show that 2/3 of the users are International. There is no recommendation to change this format. Have times in different time zones (EST, PST)	[P1] Agilent.com decision [not determinable by Agilent Accessories] More research is recommended to validate the statistics.

ARTIFACTS

Why Usability: A detailed approach

Usability addresses the relationship between a tool and its user. In order for a tool to be effective, it must allow the intended users to accomplish their tasks in the best way possible. The same principle applies to computers, websites, and other software. In order for these systems to work, their users must be able to employ them effectively.
What makes a website or piece of software usable? It depends on a number of factors including how well the functionality fits the user's needs, how well the flow through the application fits the user's tasks, and how well the response of the application fits the user's expectations. We can learn to be better user interface designers by learning design principles and design guidelines. But even the most insightful designer can only create a highly-usable system through a process that involves getting information from actual users. Usability is the quality of a system that makes it easy to learn, easy to use, easy to remember, error tolerant, and subjectively pleasing.

Why is usability important?

From the user's perspective usability is important because it can make the difference between performing a task accurately and completely or not, and enjoying the process or being frustrated. From the developer's perspective usability is important because it can mean the difference between the success or failure of a system. From a management point of view, software with poor usability can reduce the productivity of the workforce to a level of performance worse than without the system. In all cases, lack of usability can cost time and effort, and can greatly determine success or failure of a system. Given a choice, people will tend to buy systems that are more user-friendly.

How do you achieve a high level of usability?

The key principle for maximizing usability is to employ iterative design, which progressively refines the design through evaluation from the early stages of design. The evaluation steps enable the designers and developers to incorporate user and client feedback until the system reaches an acceptable level of usability.

Heuristic Study Materials – Heuristic Evaluation Criteria

December 12, 2000

Thank you for agreeing to be a part of our heuristic evaluation phase of Usability testing of the Agilent Accessories site. You will be employing a diagnostic method in which you will take the role of less experienced users and describe the potential problems you see arising in a system or interface for those users.

Please go through the site one time as a viewer, not engaging in any tasks – simply to see what is out there. The 2nd time, navigate through the site, and use the following criteria in rating the site as you complete the tasks listed below, and use the following rating system to critique the navigation and experience. As you record your findings, please be sure to clearly describe what is found, including where in the site it was found.

Five-point rating scale

1	Cosmetic, will not affect the usability of the system, fix if possible.
2	Minor, users can easily work around the problem, fixing this should be given low priority.
3	Medium, users stumble over the problem, but quickly adapt to it, fixing this should be given medium priority
4	Major, users have difficulty, but are able to find workarounds, fixing this should be mandatory before the system is launched. If the problem cannot be fixed before launch, ensure that the documentation clearly shows the user a workaround
5	Catastrophic, users are unable to do their work, fixing this is mandatory

Heuristic Evaluation Criteria

1.**Visibility of system status**. "The system should always keep users informed about what is going on, through appropriate feedback within reasonable time."

- Do you know where you are?
- Do you know where you can go?
- Can you predict where the links on the page will take you?

2.Match between system and the real world. "The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order."

- Are the commands clear and logical?
- Are the words that are used triggering the same reaction on the site as it would in real life?
- Is there more than one path to make an order, thus creating confusion as to where to go?
- Does the site convey a clear sense of its intended audience?
- Does it use language in a way that is familiar to and comfortable for its readers?
- Is it conversational in its tone?

3. User control and freedom. "Users often choose system functions by mistake and will need a clearly marked 'emergency exit' to leave the unwanted state without having to go through an extended dialogue. Support undo and redo."

- Are you able to trace your path back to correct a wrong turn?
- If the product you selected was not what you wanted, is there a clear path to find the right one?
- Is there information to help you select the right accessory?
- Does the site make effective use of hyperlinks to tie related items together?
- Are there dead links? Broken CGI scripts? Functionless forms?
- Is page length appropriate to site content?

4. Consistency and standards. "Users should not have to wonder whether different words, situations or actions mean the same thing. Follow platform conventions."

- Are there established web conventions to make the navigation intuitive?
- Is there a consistent set of navigation tools at the top of the page?
- Are they repeated or summarized at the bottom?
- Are the text links are blue and underlined?
- Is there consistency between links, page titles and page headings, to avoid confusion?

5. Error prevention. "Even better than good error messages is a careful design which prevents a problem from occurring in the first place."

- Did you end up somewhere you did not intend to go?
- Were the links you clicked on predictable?
- Did the page load quickly enough?
- Were you able to tell whether you were where you wanted to be as the page loaded?

6. Recognition rather than recall. "Make objects, actions and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate."

- Are there cues anticipating your needs?
- Does the site use (approximately) standard link colors?
- Are the links obvious in their intent and destination?
- Is there a convenient, obvious way to maneuver among related pages, and between different sections?

7. **Flexibility and efficiency of use**. Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

- Were you able to use an acceptable number of “clicks” to reach your goal?
- Were you able to correct a wrong “click” with an acceptable number of “clicks”?
- Is load time appropriate to content, even on a slow dial-in connection?
- Is it accessible to readers with physical impairments?
- Is there an easily discoverable means of communicating with the author or administrator?

8. **Aesthetic and minimalist design**. Dialogues should not contain information that is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

- Was there content/text that made your search more difficult?
- Were there distracting graphics that prolonged your visit and made your goals more difficult to reach?
  Does the site have a consistent, clearly recognizable "look-&-feel"?
- Does it make effective use of repeating visual themes to unify the site?
- Is it visually consistent even *without* graphics?
  Is the site moderate in its use of color?
- Does it avoid juxtaposing text and animations?
- Does it provide feedback whenever possible?

OPTIONAL CRITERIA TO CONSIDER:

9. **Help users recognize, diagnose, and recover from errors**. Error messages should be expressed in plain language (no code), precisely indicate the problem and constructively suggest a solution.

10. **Help and documentation**. Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out and not be too large.

VIEWMARK

Agilent Technologies
Innovating the HP Way

TASKS

1. **Locate the Agilent website using your web browser. (http://www.agilent.com)**

2. **Once you find the Agilent website, locate the section(s) where they offer accessories for microwave test equipment.**

3. **Find a SPDT (single-throw, double-pole), 18 GHz switch**

4. **Find your way back to your starting point for accessories for microwave test equipment.**

5. **Now, using a different path/method, find that same SPDT (single-throw, double-pole), 18 GHz3 switch**

6. **Locate the technical datasheet for this switch, view it and find the physical dimensions of the switch, then download the datasheet to the hard drive.**

7. **Find a 10X passive probe that will work with the "Infiniium" oscilloscopes.**

8. **Find the price of that probe.**

9. **Determine if you can order it on line.**

10. **Locate a phone number where you can ask questions about ordering the accessory.**

Personal Profile

NAME

ADDRESS

EMAIL ADDRESS

PHONE #

1. **What type of activities do you use your computer for (personal, work, volunteer)?**

2. **Where do/did you work? What was your title, job responsibilities?**

3. **Which if the following best describes you?**
   - o **Hands-on user of testing tools**
   - o **Other engineering professional**
   - o **Purchase agent/buyer of test equipment**

4. **Which operating environments do you use (Linux, Unix, Windows, MacOS, etc)?**

5. **How would you describe your level of expertise on the web (novice, decent, expert)?**

6. **What browser are you using today? Please specify type and version (e.g., IE 5.5, Netscape 4.5)**

Qualifying Questionnaire Materials - Introduction Letter

Greetings!

You have received this email because you were recommended and/or referred as a credible, active resource in the professional engineering community. Please read through this email in its entirety, and if you choose not to participate in our on-line survey, thank you for taking the time to consider our request.

Founded in 1993, Viewmark is an award winning new media communications company based in Denver, Colorado. We create powerful new media solutions for today's business challenges by combining the creative strategy of a traditional advertising agency with the technical expertise of an information technology firm. We are conducting a series of user surveys and usability testing of websites whose goal is to provide information for the purchasing of test equipment and accessories. Too often, websites are created from the "inside out", instead of building a site that gives the user an intuitive experience. As a knowledgeable expert in the field, and a potential user of such a website, your opinions are critical.

The survey may be accessed at www.viewmark.com/survey/survey.html. It is a web-based survey, and consists of 19 questions, 15 of which pertain to your working environment and usage of the equipment, and 4 of which are general questions for our demographic statistics.

Thank you,

The User Site Experience Research Group (The U.S.E.R. Group)
Viewmark, Inc.
4582 S. Ulster Street, Suite 1200
Denver, CO 80237
www.viewmark.com

Qualifying Questionnaire – A copy of a web-based form

Founded in 1993, Viewmark is an award winning new media communications company based in Colorado.

We create powerful new media solutions for today's business challenges by combining the creative strategy of a traditional advertising agency with the technical expertise of an information technology firm.

In our efforts to create a world-class, intuitive shopping/research experience for the engineers, purchasing agents, procurement engineers and others in the test equipment arena, we have been tasked with ensuring, through intensive usability testing, a site that will fulfill the ongoing research and ordering needs while significantly decreasing the degree of frustration many encounter. Your input, as a professional in this field, is necessary and critical - thank you very much for taking a portion of your valuable time to answer the following questions.

1. Please check the type(s) of equipment that you have used in the past:

Choose all that apply:

- ☐ Digital multimeters (dmm)
- ☐ Oscilloscopes
- ☐ Bench Power Supplies
- ☐ Signal Source
- ☐ Spectrum Analyzers
- ☐ Vector Network Analyzers
- ☐ Power Meter
- ☐ Logic Analyzers

2. Have you used any of these types of equipment in the past year?

- ☐ yes
- ☐ no If you chose "no", Please skip to Question #16.

3. Please select what best describes your normal exposure to the test equipment you checked in Question #1:

- ☐ "I operate in burst mode" - I typically work at my desk, but sometimes will use test equipment "hands-on" in debug situations
- ☐ A significant portion of my job responsibilities requires regular direct handling and using of the test equipment.

- ☐ I do not have regular direct contact with test equipment.

4. If you checked "I operate in burst mode"**, have you used the test equipment intensely at least one time in the past six (6) months?**

- ☐ yes
- ☐ no If you chose "no", Please skip to Question #16.

5. How often do you use the test equipment you checked in question 1?

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Quarterly
- ☐ None at all If you chose "no", Please skip to Question #16.

6. How many of the different types of equipment that you checked in question 1 have you used in the past 6 months?

- ☐ 1-2
- ☐ 3-4
- ☐ 5-6
- ☐ 7-8
- ☐ None If you chose "no", Please skip to Question #16.

7. What is your role in the purchasing of any test equipment or accessory?

- ☐ I authorize the purchases (I have budget responsibility)
- ☐ I recommend the equipment (assist the one who specifies)
- ☐ I specify what needs to be purchased (give technical recommendations)

8. Please indicate the number of employees at your location:

- ☐ 1-49
- ☐ 50-99
- ☐ 100-499
- ☐ 500-999
- ☐ 1000 or more

9. What department do you work in?

- ☐ Research & Development
- ☐ Manufacturing
- ☐ Service Installation & Maintenance
- ☐ Incoming Inspection
- ☐ Purchasing
- ☐ Quality Assurance

10. How much did your department spend on test equipment last year?

- ☐ Under $10,000
- ☐ $10,000 - $100,000
- ☐ $100,000 - $500,000
- ☐ $500,000 - $1M
- ☐ $1M +

11. How often do you use the Internet to do research/purchase/gather information on test equipment and accessories?

- ☐ daily
- ☐ weekly
- ☐ monthly
- ☐ sporadically

12. What company's sites do you go to for information?

Choose all that apply:

- ☐ Advantest
- ☐ Agilent Agilent (formerly Test& Measurement business of Hewlett-Packard)
- ☐ Anritsu
- ☐ Dow Key Microwave
- ☐ Fluke
- ☐ National Instruments
- ☐ Rohde & Schwartz
- ☐ Tektronix
- ☐ Wiltron

13. Of those that you checked, please tell us the top three that you find most useful:

Choose three that apply:

- ☐ Advantest
- ☐ Agilent (formerly Test& Measurement business of Hewlett-Packard)
- ☐ Anritsu
- ☐ Dow Key Microwave
- ☐ Fluke
- ☐ National Instruments
- ☐ Rohde & Schwartz
- ☐ Tektronix
- ☐ Wiltron

14. Who makes your purchases?

Choose one:

- ○ You do
- ○ an administrative assistant
- ○ a purchasing agent
- ○ a procurement engineer
- ○ someone else

15. How often do you buy test equipment?

- ○ weekly
- ○ monthly
- ○ yearly
- ○ sporadically

Thank you for answering these questions! Now, if we could ask you to answer a few more questions that will help us in demographic statistics and further research:

16. Would you be interested in participating in usability testing in our labs and/or in focus groups?

Choose one:

- ○ yes
- ○ no

17. Would you be willing to participate in a telephone interview?

Choose one:

- yes
- no

18. Please provide the following personal information:

First name:

Last name:

City of Residence:

State/Country of Residence:

Phone number (with area code):

E-mail address:

19. I would be available for on-site testing during the:

- Day
- Evening
- Weekends

Thank you for participating in this survey.

Submit Response | Reset Survey

www.viewmark.com
4582 S. Ulster Street, Suite 1200
Denver, CO 80237
303.771.2575

Usability Lab Testing Materials

The Usability Process

Usability evaluations seek to determine if the people who use this site can do so quickly and easily (with minimum frustration!) to accomplish their own tasks. Usability applies to every aspect of the website in which a person interacts, such as menu clarity, icon recognition, messages - both overt and hidden, documentation, and help, functionality and acceptable load times. Evaluations are designed to solicit feedback from participants, focusing on areas of concern identified by our customers. An evaluation typically involves several participants, each of whom represents a typical user.

Once all evaluation sessions are completed, we compile the feedback received from each participant, along with our notes. We then prepare a final analysis report and a highlight tape, which we present to the customer for review.

Our analysis is not a mandate for changes to the website. Our intent is to provide a base of information from which our customers can make decisions to resolve problem areas in the interface and the work process. We also note positive feedback from participants, to indicate those areas in which the design is successful.

The Agilent Accessories Website review

The Agilent Accessories website allows individuals involved with the purchase of test equipment (as an advisor, actual buyer or the one responsible for the financial implications) to find the information - in a timely manner - needed to specify and/or recommend accessories for test equipment. This site will serve as a conduit to that detailed information.

This website should provide at your fingertips the links you would need to the information where you will also find information to complete your order.

The Setting

You are about to embark on a new project, and are making sure that you have all the equipment necessary to complete the project with as little interruption as possible.

Task 1

You have an 8510 network analyzer, with which you are testing devices that have a Type-N connector. Your new components have 3.5 mm connectors. Starting with the Browse Accessories button, please find:

a) How many calibration kits are offered on this site?
b) Locate the appropriate kit, and record the price and availability.

Task 2

Oscilloscope active probes have the least effect on probing high speed signals. Knowing the differences between the probes for the Infiniium family is important.

a) Where can this information be found?
b) You would like even more information than you are able to find on the site about purchasing the probe – where do you call? What is the phone #?

Task 3

You have a pre-selected external mixer in the 26.5 – 40 GHz frequency range to work with your spectrum analyzer. You have a 2.4 mm cable.

a) Find the adapter needed.
b) Give the Model #.

Task 4

The 8590 eSeries spectrum analyzers are 427 mm deep. This will be shared among all the engineers in your lab.

a) Where is the information for the most appropriate equipment to move the analyzers easily?
b) Make your recommendation, and specify what information has helped you to decide.

Task 5 (only in Phase 2)

Agilent is now offering a way to time correlate the results between its oscilloscope and logic analyzers.

a) Which oscilloscope(s) will this work for?
b) Find the price, availability and warranty. **Please tell us when you have completed this task.**

Wait until we tell you to continue with Task 6. While you are waiting, please consider and answer this question:

In your role as an engineer/engineer support/manager, what is an accessory that you would use the site for research and purchase?

Task 6

Please use the site now to search for the product you listed above, list the stats needed, and document your search.

Non Disclosure Agreement

VIEWMARK

Understanding Your Participation

Please read this page carefully.

Viewmark Inc is asking you to participate in evaluating a website for Agilent Technologies. By participating in this evaluation, you will help us improve this and Agilent's other websites.

We will observe you and record information about how you navigate the website. We may also ask you to fill out questionnaires and answer interview questions.

We will videotape all or some of the interview and your work. By signing this form, you give your permission to Viewmark to use your voice, verbal statements, and videotaped pictures for the purposes of evaluating the website and showing the results of these evaluations. We will not use your full name.

You will be working with a website that is in development. Any information you acquire about this site is confidential and proprietary and is being disclosed to you only so that you can participate in the evaluation. By signing this form, you agree not to talk about this website to anyone. You may tell them that you helped to evaluate an upcoming site.

If you need a break, just tell us.

You may withdraw from this evaluation at any time.

If you have any questions, you may ask now or at any time.

If you agree with these terms, please indicate your agreement by signing here:

Please print your name _____

Signature _____

Date _____

Post-test Questionnaire

PostTest Questionnaire For the Agilent Accessories Website

This questionnaire is designed to tell us how you feel about the site you used today. Please circle the number that most clearly expresses how you feel about a particular statement. Write in any comments you have below each question.

1. Using the Agilent Accessories website was:

1	2	3	4	5
Very Easy	Easy	Neither Easy Nor Difficult	Difficult	Very Difficult

Comment: _____

_____.

2. Finding information about key elements was:

1	2	3	4	5
Very Easy	Easy	Neither Easy Nor Difficult	Difficult	Very Difficult

Comment: _____

_____.

3. If asked, would you recommend that your colleagues use the website to:

a) Find important data specs of accessories ___ Yes ___ No
b) Order accessories online ___ Yes ___ No
c) Find help with application needs ___ Yes ___ No
d) Keep up with state-of-the-art test & measurement equipment ___ Yes ___ No
e) To learn more about measurement techniques ___ Yes ___ No
f) Participate in dialogue with your peers (share ideas and problems) ___ Yes ___ No
g) Other _____ ___ Yes ___ No

4. Which of the competitors' sites do you go? What do you like/dislike about those other sites?

_____

_____

_____.

5. If I could change the website to better suit my needs, I would :

_____

_____

_____

Thank You Letter

Thank You!

We appreciate the time you have taken to participate in the evaluation of the Agilent Accessories website. Please anticipate the e-delivery of an Amazon.com gift certificate as an expression of our gratitude.

Your participation in the Agilent Accessories website evaluation assists in the development of an effective and usable site. The comments and observations you expressed during this evaluation will be reviewed by the development team and included in our final report.

If you have any questions or we may be of assistance to you, please feel free to contact us.

Sincerely,

Lisa Mullinaux, Usability Manager
The User Site Experience Research Group (The U.S.E.R. Group)
Viewmark, Inc.
4582 S. Ulster Street, Suite 1200
Denver, CO 80237
303-771-2575
lisa@viewmark.com
http://www.viewmark.com

Usability Participant Questionnaire

(Please print or write legibly)

PART 1

Name: _____ Contact #: _____

Email: _____

Your current position: _____

Company_____

PART 2

How much experience have you had with the following types of computers and computer devices?

COMPUTER	Y / N	HOW LONG	BROWSER USE	Y / N	HOW LONG	VERSION	OS	TYPE
MAC			NETSCAPE				WINDOWS	
PC			IE				MAC	
OTHER			AOL				OTHER	

About how many hours a week do you use a computer?

At home: _____ At work: _____

What do you typically use your computer for?

___ Games and Pleasure
___ Accounting/Finance
___ Word Processing
___ Decision Support
___ Graphics
___ Data storage (i.e., data bases)
___ Other _____
___ Other _____