User Experience / Human Centered Design Portfolio

Paul Daly
linkedin.com/in/pkdaly
pkdaly.com
pkdaly@yahoo.com

User Centered Design Process Planning and Implementation

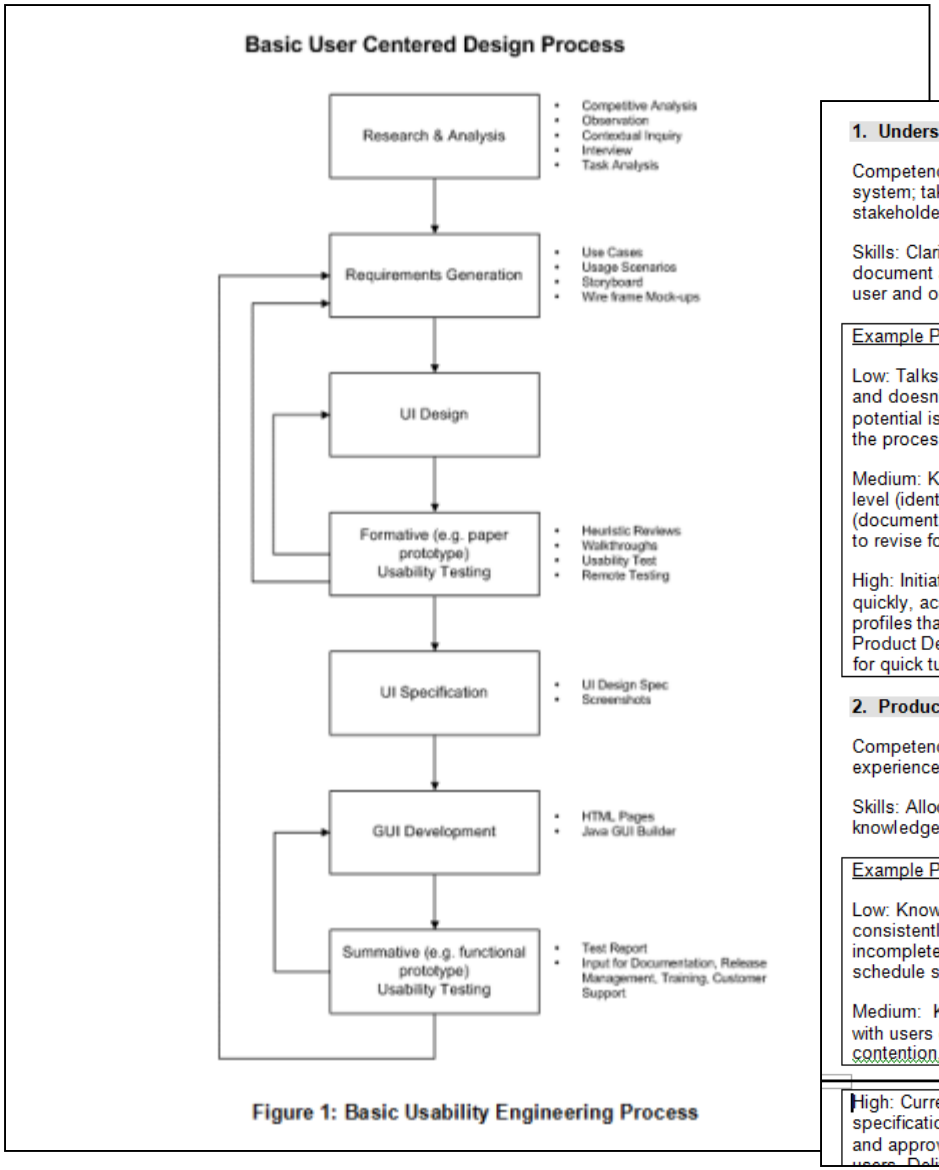
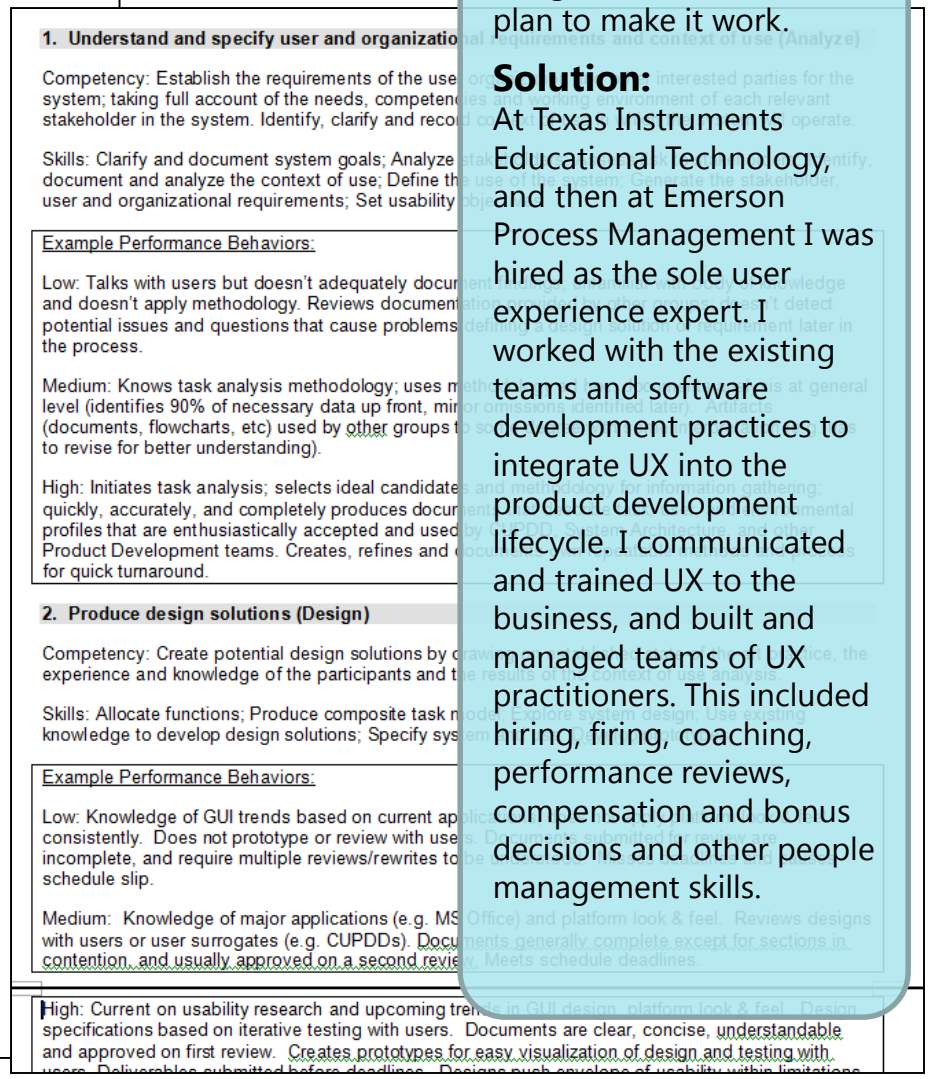


Figure 1: Basic Usability Engineering Process



1. Understand and specify user and organizatio

Competency: Establish the requirements of the use
system; taking full account of the needs, competen
stakeholder in the system. Identify, clarify and reco

Skills: Clarify and document system goals; Analyze
document and analyze the context of use; Define th
user and organizational requirements; Set usability

Example Performance Behaviors:

Low: Talks with users but doesn't adequately docu
and doesn't apply methodology. Reviews document
potential issues and questions that cause problems
the process.

Medium: Knows task analysis methodology; uses m
level (identifies 90% of necessary data up front, mi
(documents, flowcharts, etc) used by other groups t
to revise for better understanding).

High: Initiates task analysis; selects ideal candidate
quickly, accurately, and completely produces docu
profiles that are enthusiastically accepted and used
Product Development teams. Creates, refines and
for quick turnaround.

2. Produce design solutions (Design)

Competency: Create potential design solutions by
experience and knowledge of the participants and t

Skills: Allocate functions; Produce composite task
knowledge to develop design solutions; Specify sys

Example Performance Behaviors:

Low: Knowledge of GUI trends based on current ap
consistently. Does not prototype or review with use
incomplete, and require multiple reviews/rewrites to
schedule slip.

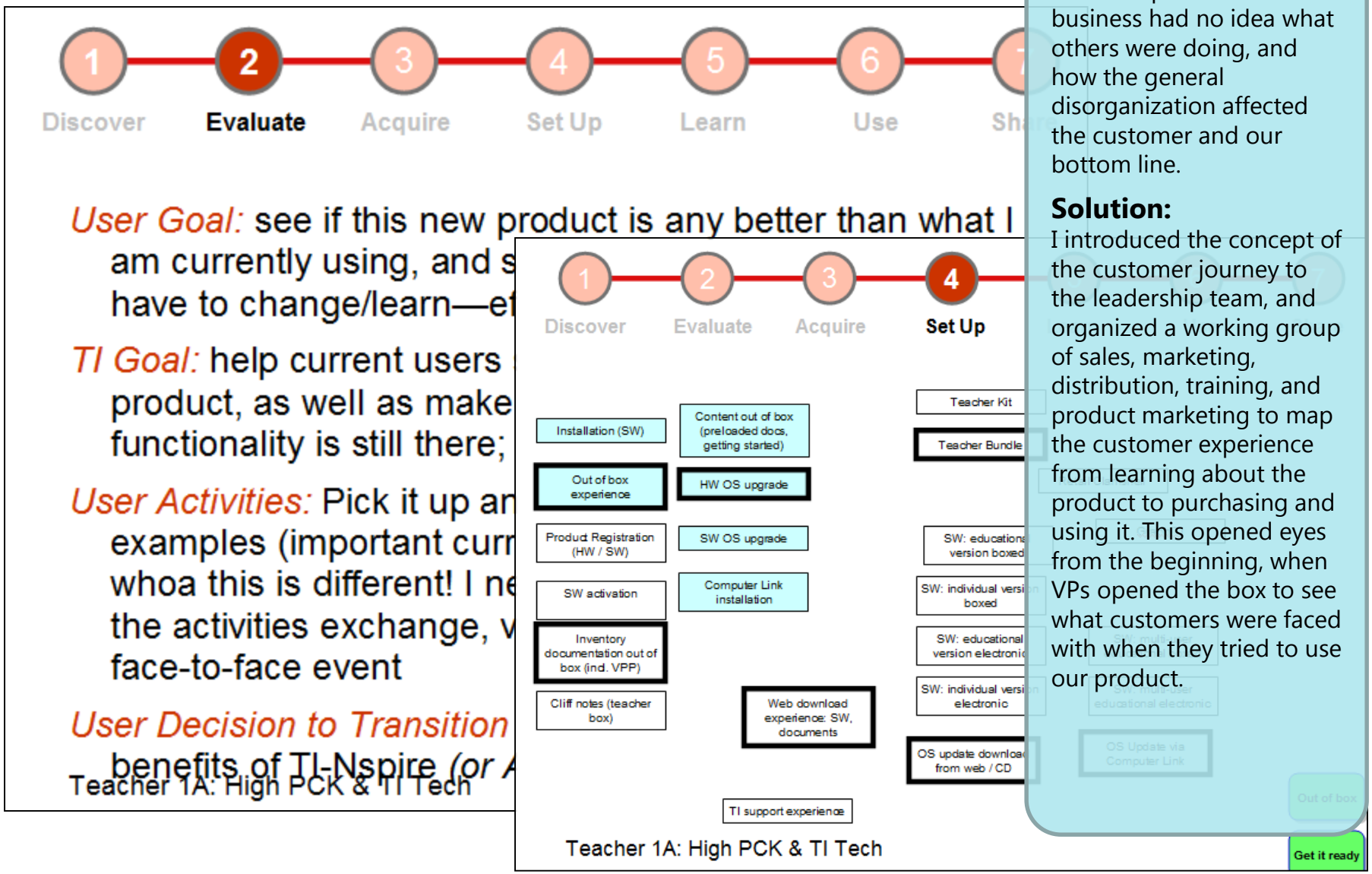
Medium: Knowledge of major applications (e.g. MS
with users or user surrogates (e.g. CUPDDs). Docu
contention, and usually approved on a second revie

High: Current on usability research and upcoming tre
specifications based on iterative testing with users. Documents are clear, concise, understandable
and approved on first review. Creates prototypes for easy visualization of design and testing with

Problem:
Management knew they needed user centered design, but didn't have a plan to make it work.

Solution:
At Texas Instruments Educational Technology, and then at Emerson Process Management I was hired as the sole user experience expert. I worked with the existing teams and software development practices to integrate UX into the product development lifecycle. I communicated and trained UX to the business, and built and managed teams of UX practitioners. This included hiring, firing, coaching, performance reviews, compensation and bonus decisions and other people management skills.

Customer Experience Mapping and Gap Analysis



Problem:
Different parts of the business had no idea what others were doing, and how the general disorganization affected the customer and our bottom line.

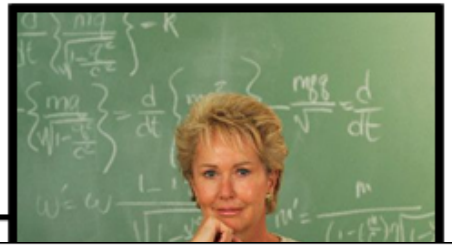
Solution:
I introduced the concept of the customer journey to the leadership team, and organized a working group of sales, marketing, distribution, training, and product marketing to map the customer experience from learning about the product to purchasing and using it. This opened eyes from the beginning, when VPs opened the box to see what customers were faced with when they tried to use our product.

Personas

Janice P. Richards
Algebra II and Trigonometry Teacher

- 59 years old
- Married, 2 Children, 2 Grandchildren
- Ph.D. in …
- Comfortable using a computer, intermediate Internet user

Teacher Segment 1
High pedagogical knowledge & Positive about use of technology in math instruction.



Deciding for themselves
Influencing the institution
Talented
Trained in mathematics
Probably teaching with tec
Have been teaching for at
Comfortable in the classro
Has used a variety of prod
Curious about new technol
Some knowledge of compe
Finds value in math softwa
because can make their ow
Self-reliant in their use of
Reads math teacher public
Influential with district-lev
Likely to be department c
Often have a reputation, k
TI is more aware of this se
often approach TI or are re
This segment is involved

Jenny

Control System Engineer

Work Experience:
- Total: 15 years
- Same/Similar Job: 10 years

Work Environment:
- Workplace: Works between an office/cubicle and the plant control room/production area.
- People: Supports plant operations by interacting directly with operators, process engineers, production managers, maintenance supervisors and personnel. Works with Corporate Engineering to implement standards. Communicates with Technical Support to troubleshoot control system issues.

Skills & Education:
- Academic: Bachelor's Degree in Electrical or Chemical Engineering
- Training/OJT: Control System training courses. Has worked a rotating shift to learn plant operations.
- Background: Worked their way up from instrumentation engineering in the plant or experience working as a system integrator. May also have project experience with control system vendors.

WORK PROFILE

KEY RESPONSIBILITIES/GOALS
- Support production from a control system perspective, make sure its performing correctly.
- Control system and PLC configuration, advanced applications, and display enhancement projects.

MAIN TASKS

Tasks	Frequency
Design, implement, and test configuration (control, graphics and machinery protection).	4-8 hours per week
Troubleshoot production problems to determine if control system related (e.g. interlocks, device not responding, security/user access, etc.).	90 minutes 1-2 times per day
Alarm rationalization (e.g. nuisance, conditional alarms, limits).	2-3 hours per month
Maintain control strategies (troubleshoot advanced applications, maintain production reporting, tune loops, adjust timers, etc.).	1 hour 4-5 times per week
Review work requests and determine best course of action (e.g. control system vs. device).	90 minutes 2-3 times per week
Contact vendor technical support for trouble shooting assistance and information.	4-8 hours 3-4 times per year
Add new control system hardware and software.	1-2 weeks every 2-3 years
Identify small process control improvements and additions (e.g. manage small projects, provide minor operator displays/trends enhancements).	2-3 hours per week
Attend user group meetings and read technical publications to keep up on latest technologies.	2-4 days 1-2 times per year
Plan and implement system upgrades.	2-4 weeks every 2-3 years
Consult with control system vendor project leads on functional requirements and configuration standards.	1 hour per day during projects
Work with instrument engineer or technician to range and connect (commission) devices.	2-4 hours per day(project) / 1-2 hours per week (production)
Configure and maintain external communication links (e.g. OPC, serial link, etc.).	2 hours per month

CHARACTERISTIC

MOTIVATIONS & ATTITUDES
- Dedicated, always available to help
- Comfortable troubleshooting complex p
- Practical, sharp and well rounded
- Attuned to operator needs

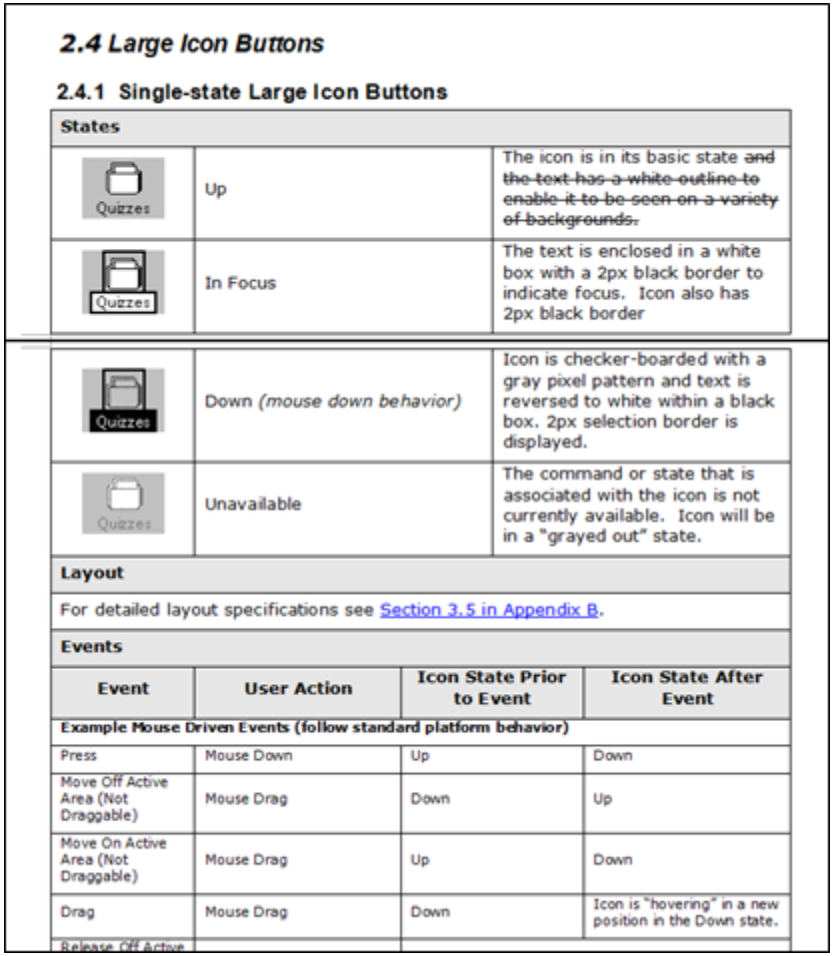
ATTRIBUTE MAP

ENVIRONMENT:				
Process Area	Control Room	W		
10%	40%			
MOBILITY:				
Stationary		X		
ROLE:				
Technology focused		X		
Designer/definer			X	
TECHNOLOGY:				
Asset hardware interaction				X
Control hardware interaction				X
Technology averse				
Non-computer user				
HARDWARE:				
Standard PC, and control system engine radio, pager.				
SOFTWARE:				
Browser, email, MS-Excel, MS-Word, control tools, advanced control applications, and system diagnostic programs.				

Problem:
When the business 'designs it for everyone', it is typically usable by no one…

Solution:
We mapped out a number of user personas and communicated them to the business, especially the developers who were now able to answer the question 'Who is ever going to use this feature?' I employed personas early on in requirements review to strip out vague feature requests and focus on meeting real user needs. At Emerson this is was so ingrained every developer and marketer knew who 'Jenny' was. I combined personas with task analyses to write **usage scenarios** that kicked off design activities.

GUI Control Set Specification



2.4 Large Icon Buttons

2.4.1 Single-state Large Icon Buttons

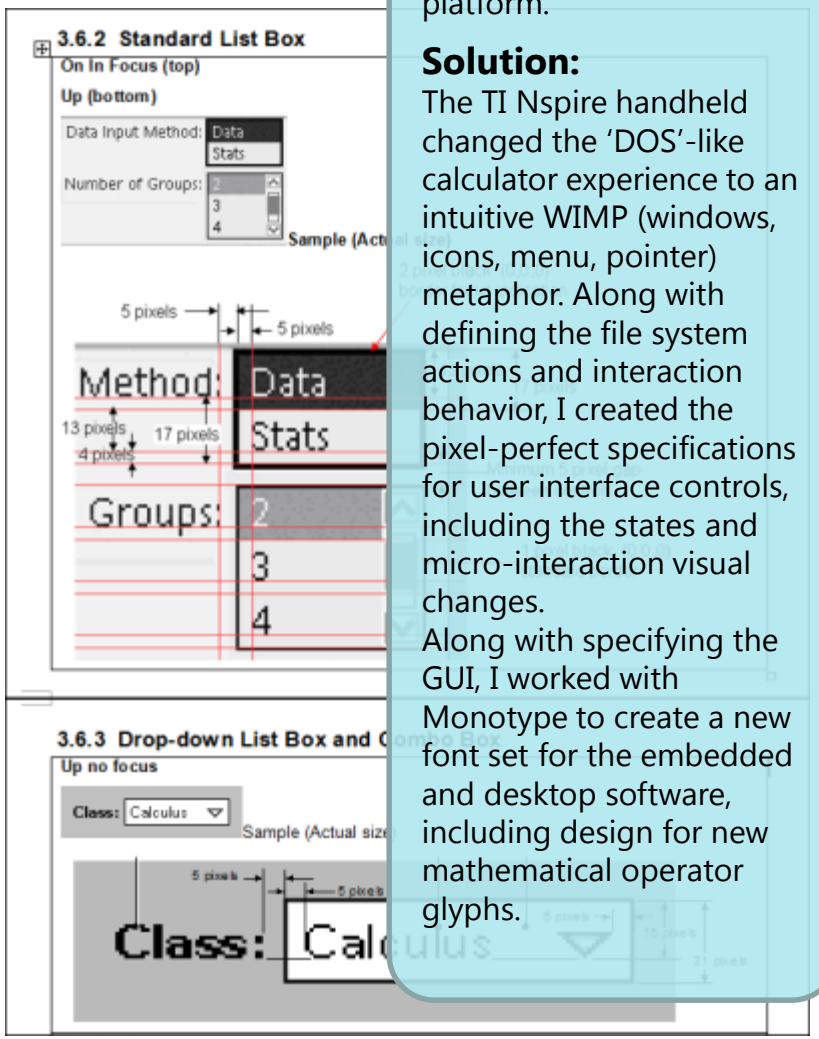
States		
Quizzes	Up	The icon is in its basic state ~~and the text has a white outline to enable it to be seen on a variety of backgrounds.~~
Quizzes	In Focus	The text is enclosed in a white box with a 2px black border to indicate focus. Icon also has 2px black border
Quizzes	Down *(mouse down behavior)*	Icon is checker-boarded with a gray pixel pattern and text is reversed to white within a black box. 2px selection border is displayed.
Quizzes	Unavailable	The command or state that is associated with the icon is not currently available. Icon will be in a "grayed out" state.

Layout

For detailed layout specifications see Section 3.5 in Appendix B.

Events

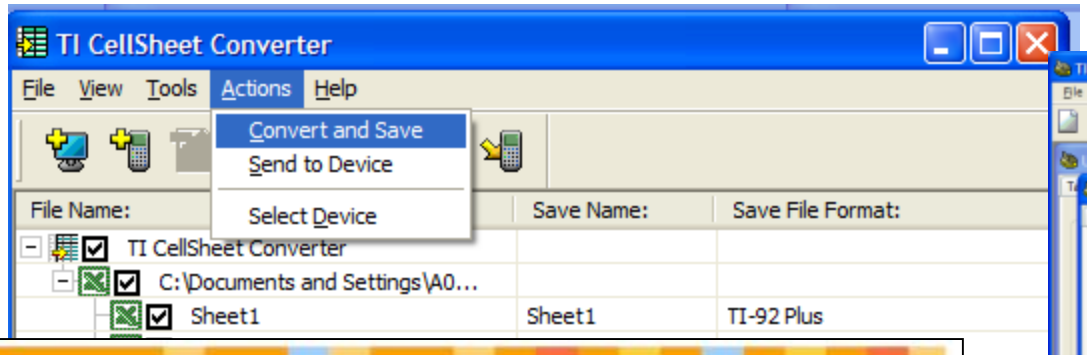
Event	User Action	Icon State Prior to Event	Icon State After Event
Example Mouse Driven Events (follow standard platform behavior)			
Press	Mouse Down	Up	Down
Move Off Active Area (Not Draggable)	Mouse Drag	Down	Up
Move On Active Area (Not Draggable)	Mouse Drag	Up	Down
Drag	Mouse Drag	Down	Icon is "hovering" in a new position in the Down state.
Release Off Active			

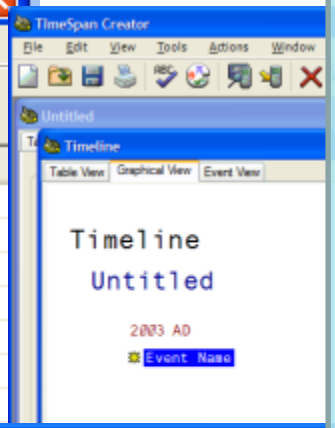


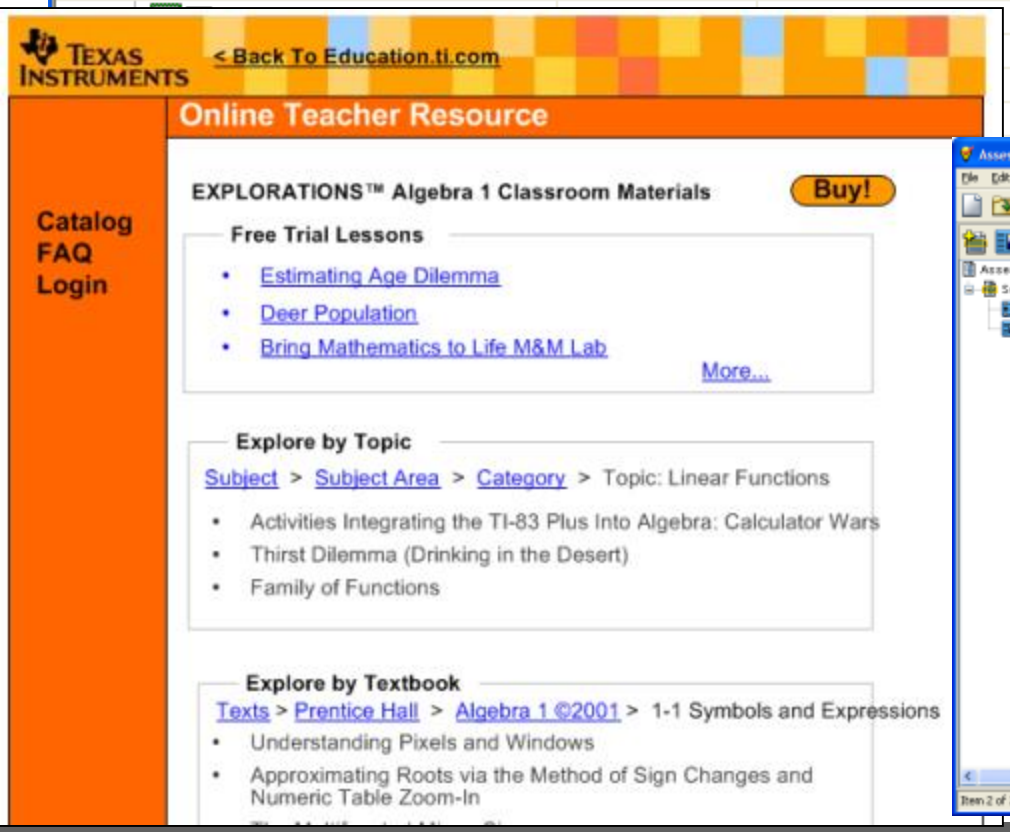
Problem:
Creating a next-generation handheld calculator without an existing platform.

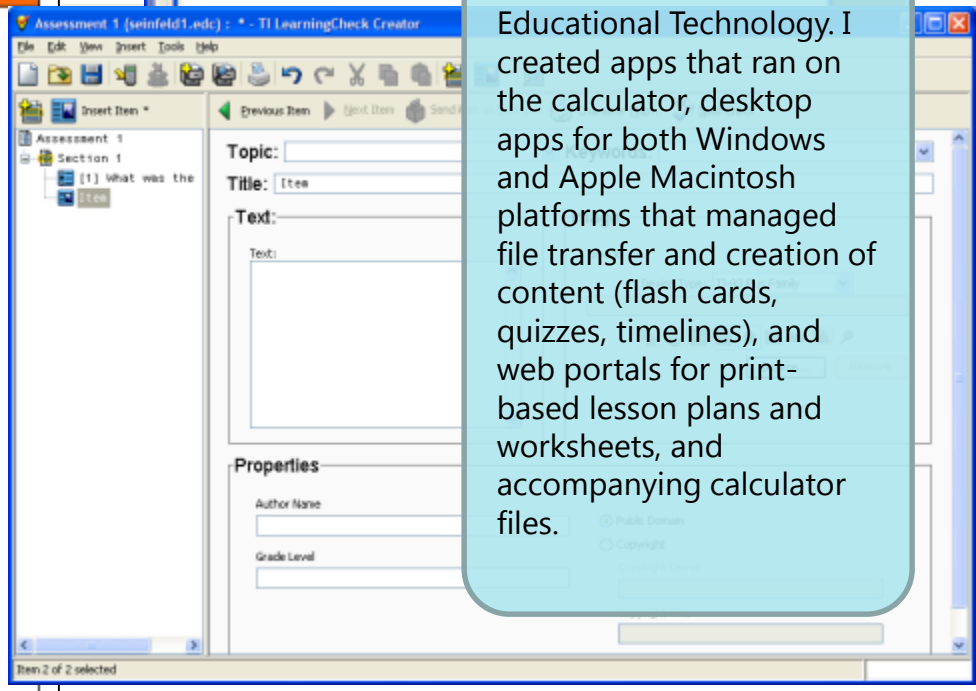
Solution:
The TI Nspire handheld changed the 'DOS'-like calculator experience to an intuitive WIMP (windows, icons, menu, pointer) metaphor. Along with defining the file system actions and interaction behavior, I created the pixel-perfect specifications for user interface controls, including the states and micro-interaction visual changes.
Along with specifying the GUI, I worked with Monotype to create a new font set for the embedded and desktop software, including design for new mathematical operator glyphs.

Interaction Design – TI-graphing calculator content applications









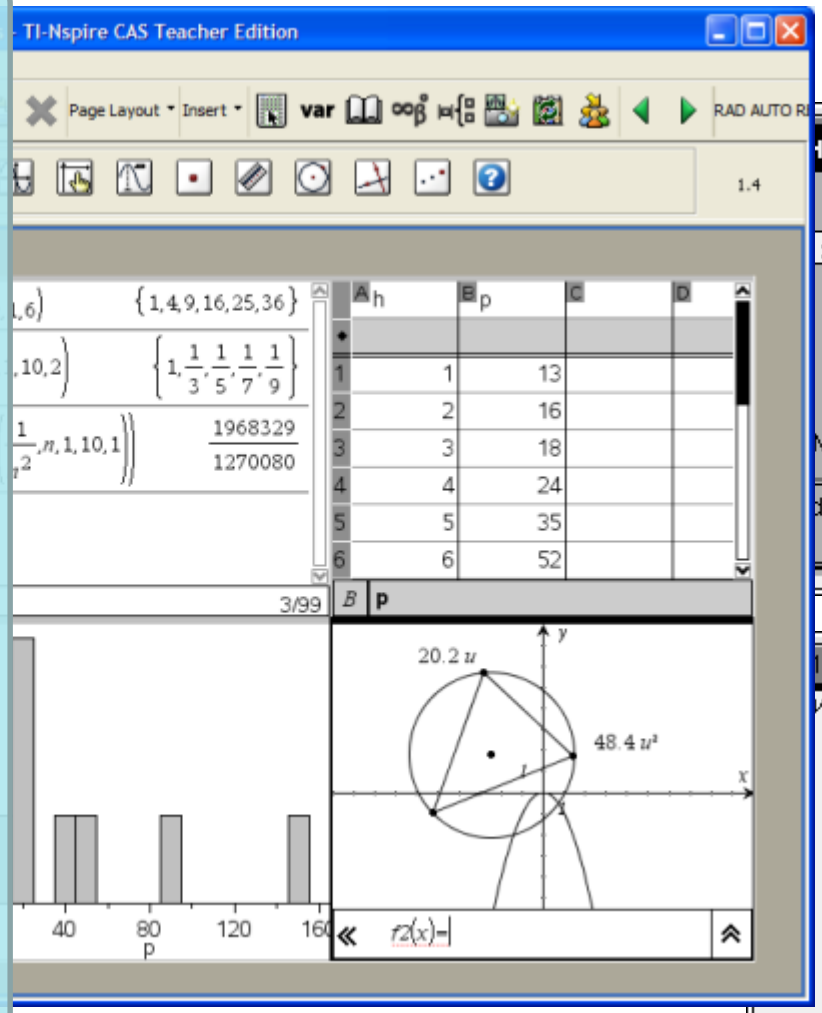
Problem:
Taking a set of disparate features and expectations and crafting an intuitive and integrated experience.

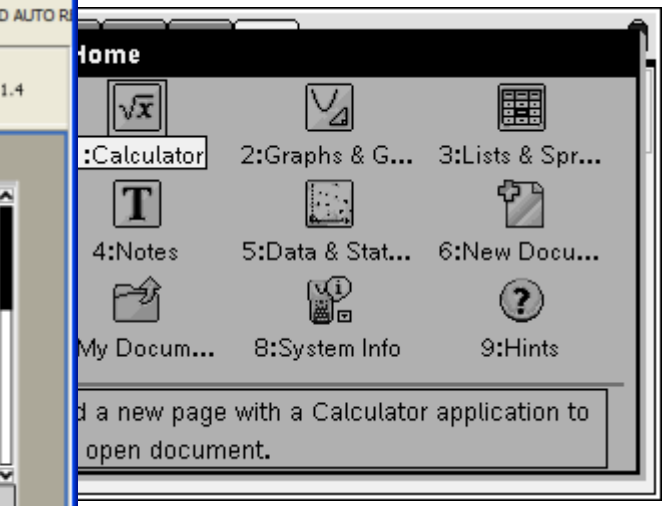
Solution:
Although the majority of my work is interaction design – I have created web, desktop, embedded, mobile, print and physical hardware designs – I'll highlight the work done for Texas Instruments Educational Technology. I created apps that ran on the calculator, desktop apps for both Windows and Apple Macintosh platforms that managed file transfer and creation of content (flash cards, quizzes, timelines), and web portals for print-based lesson plans and worksheets, and accompanying calculator files.

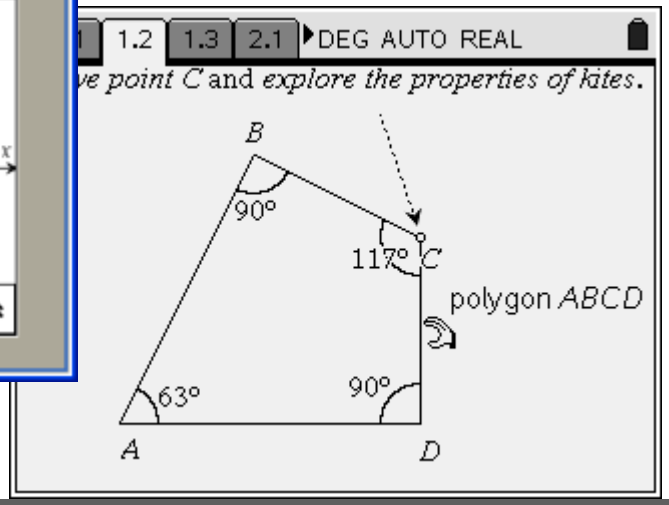
Interaction Design – TI-Nspire desktop and embedded software for handheld

Problem:
How to craft a consistent, intuitive experience across desktop and handheld.

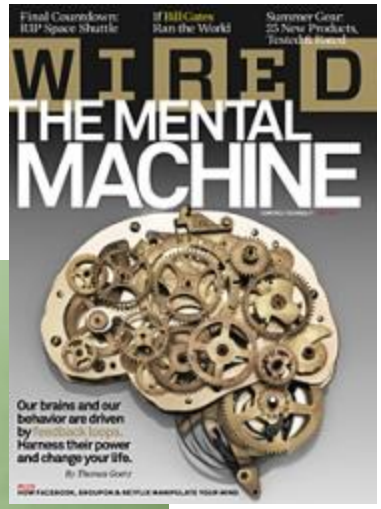
Solution:
The TI Nspire solution included both handheld and desktop software. The documents created on one would be used seamlessly on the other. Throw into the mix that desktop software was both Windows and Macintosh, and that the handheld was both greyscale and color (and with computer algebra system [CAS] or not) and QVGA led to some interesting design challenges. We also had a 'teachers edition' of the desktop software with additional features including collation of several student files at the same time.

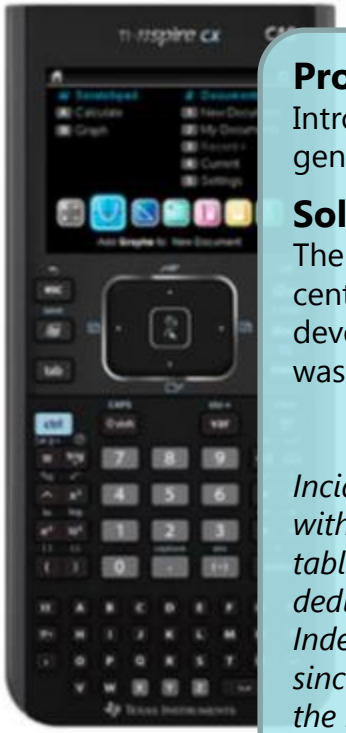






TI-Nspire handheld ‘Wired’ 8 of 10 rating…





2. TI-Nspire CX CAS

Need a heavy-lifting calculator for diff eq? The rechargeable C… graphing 3-D models or doing matrix operations. The 100 MB … and graphs to view on the 3.2-inch display.

WIRED Hundreds of preprogrammed equations. Color screen el…

TIRED Tiny touchpad can be unresponsive. $175 Texas Instrum…

1 2 3 4 5 6 7 8 9 10

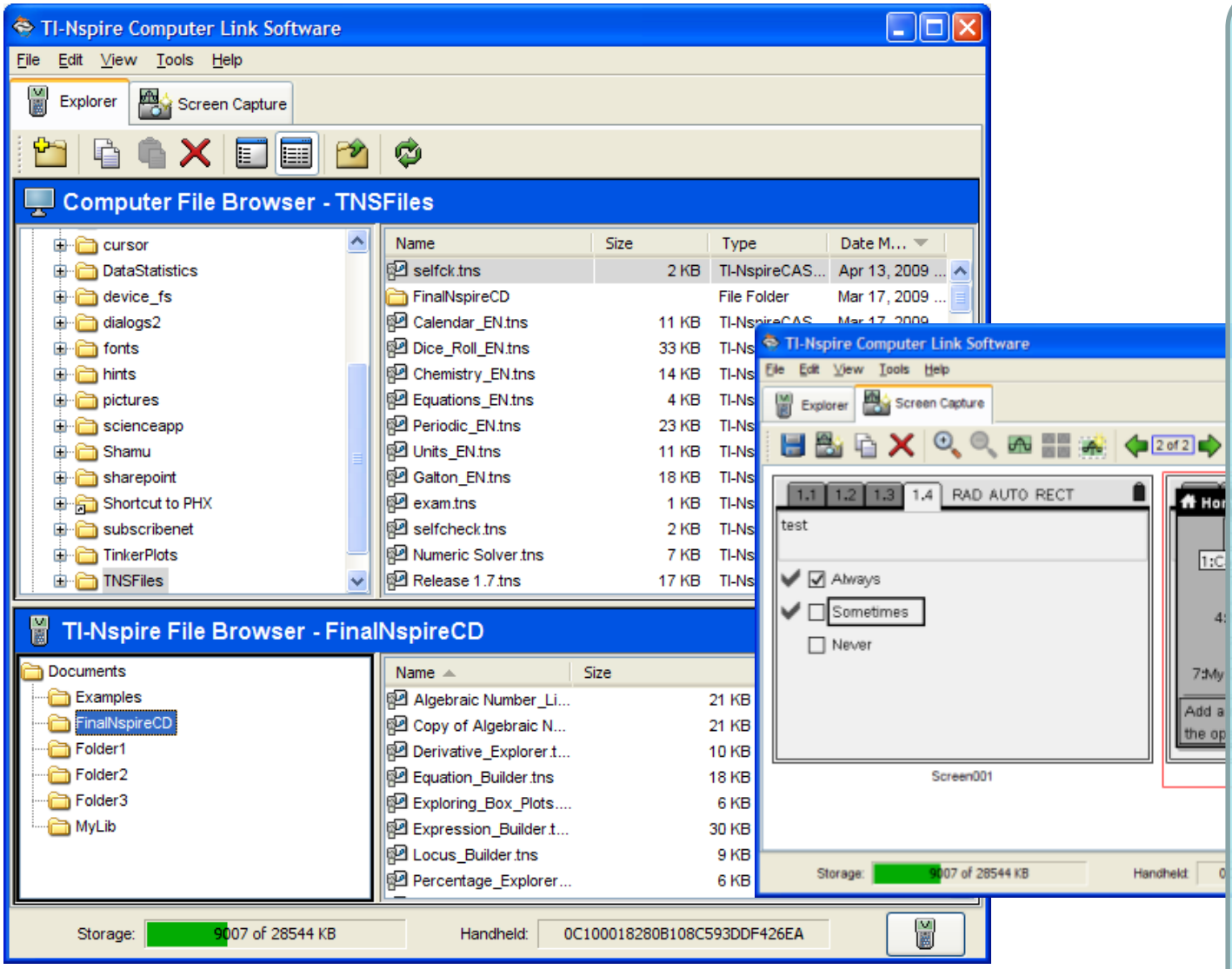
Problem:
Introducing the next generation calculator

Solution:
The result of all the user centered design and development challenges was a ‘Wired’ product…

Incidentally, one may ask with smartphones and tablet ‘apps’ now, why a dedicated handheld? Indeed, an iOS app has since been developed, but the main reason for a standalone is that it can be used on standardized tests like SAT and ACT, where smartphones and tablets cannot.
This requirement added additional constraints to the interaction design, e.g. forbidding QWERTY keyboard layout per testing agency rules.

http://www.wired.com/reviews/2011/07/reviews_backtoschool/?pid=948

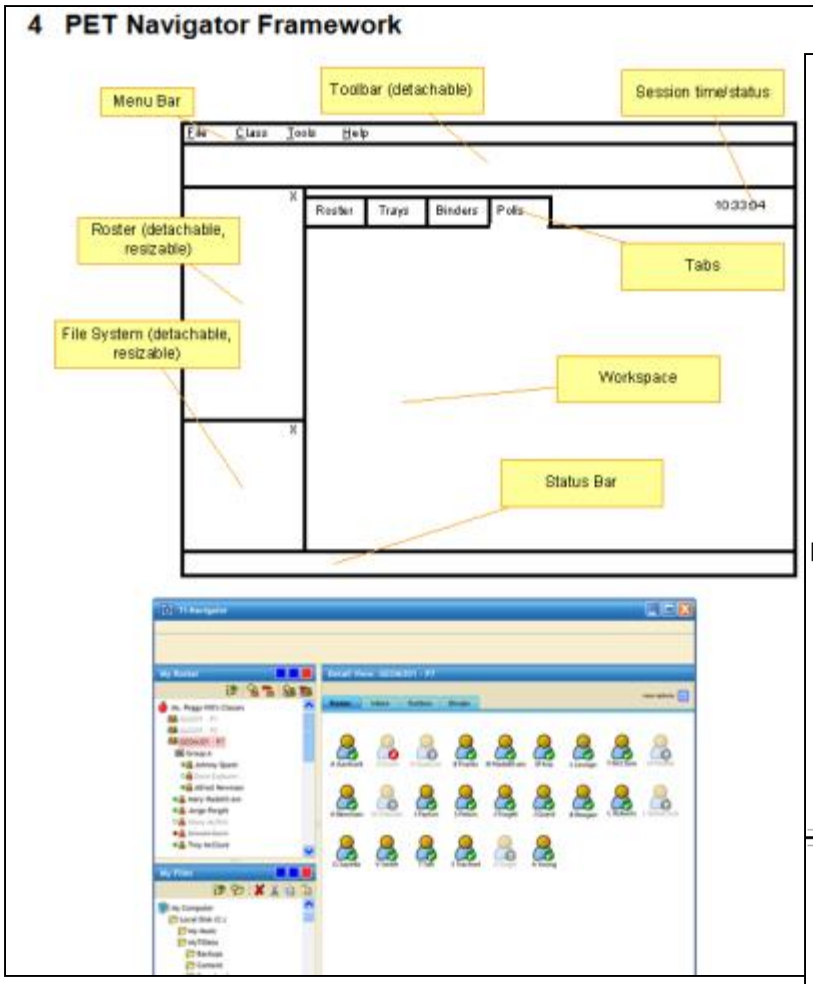
Interaction Design – TI-Nspire ancillary applications



Problem:
How to transfer documents between the handheld and desktop; between teacher and student.

Solution:
Wireless communication on the handheld was constrained by testing agency rules and cost factors, so applications for browsing and syncing documents between handheld and desktop had to be created.
I also worked on a classroom product called TI Navigator that involved accessory 'sleds' to send data wirelessly to the teacher for collecting assignments, and for real-time polling and testing. This allowed the teacher to send out a question and score it immediately to gauge student understanding.

Design Specifications



4.5.2.2 Deleting Class or Student: Warning Dialog

(Per Change Request PET Nav 09- Edit Student/Edit
- Deleting roster object will delete all associated dat
- If student or class objects are selected from the ro prompted to save the data.

Title: Delete Roster Items
Screen Type: Secondary dialog box, non-modal, not r

Delete Roster Items

Deleting items from the rost information and associated roster, inbox, outbox, and hi

- **Save and Delete** will save t on your computer and delete
- **Delete** will delete all data wi
- **Cancel** will return to Navigat

Save and Delete

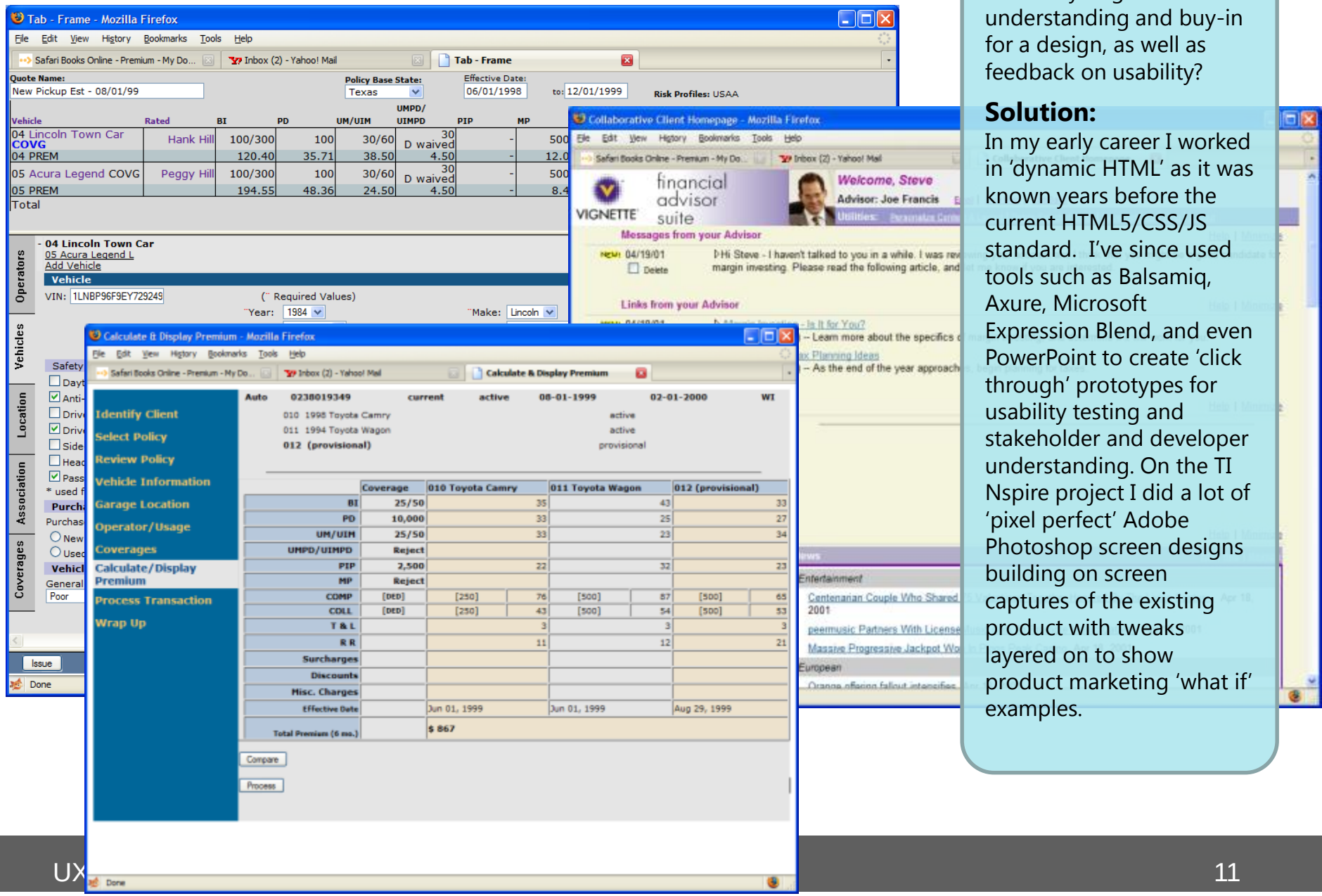
Description: (CAC-108,109) Prompts user to save or
Field/Element Descriptions:

Field/Element Label	Type	Mnemonic/ Accelerator Key	Va
(window title)	Text		De
(window commands)	Window buttons		Clo
(Message)	Read only text		"D inf ros •
			•
Save and Delete	Command button	S	La Co br Fil loc co fro
Delete	Command button	D, Default button = Enter	De Na

Problem:
How do you get developers to build your design?

Solution:
Throughout my career I've created a lot of product design specifications, ranging in depth from one page screen shot with callouts on behavior, to 100+ page detailed specifications with tracking to requirement documents and change requests.
The highly detailed specifications are well received by Quality Assurance testers, who appreciate knowing exactly what interaction is expected by the user.
However, there is a inverse ratio of the number of pages to the probability of the thing being read by a developer, which is why I augment (or replace) specs with prototypes…

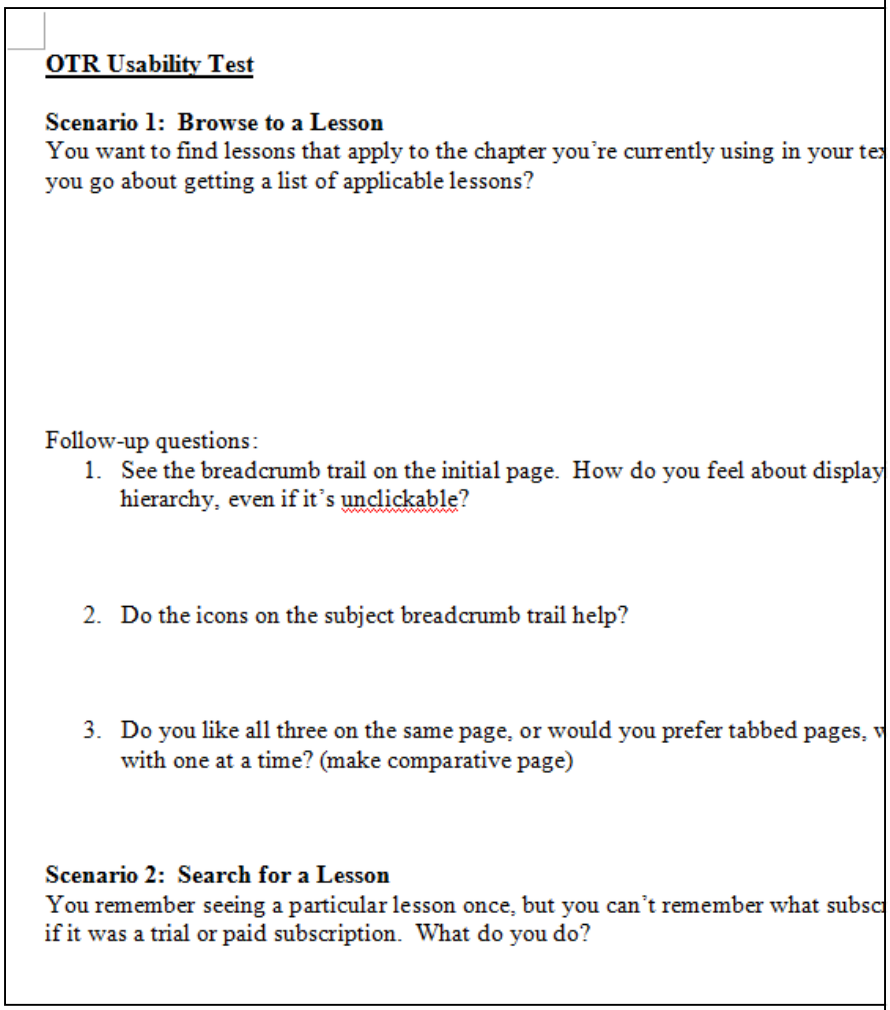
Prototyping



Problem:
How do you get understanding and buy-in for a design, as well as feedback on usability?

Solution:
In my early career I worked in 'dynamic HTML' as it was known years before the current HTML5/CSS/JS standard. I've since used tools such as Balsamiq, Axure, Microsoft Expression Blend, and even PowerPoint to create 'click through' prototypes for usability testing and stakeholder and developer understanding. On the TI Nspire project I did a lot of 'pixel perfect' Adobe Photoshop screen designs building on screen captures of the existing product with tweaks layered on to show product marketing 'what if' examples.

Usability Test Preparation, Facilitation, Analysis, and Reporting



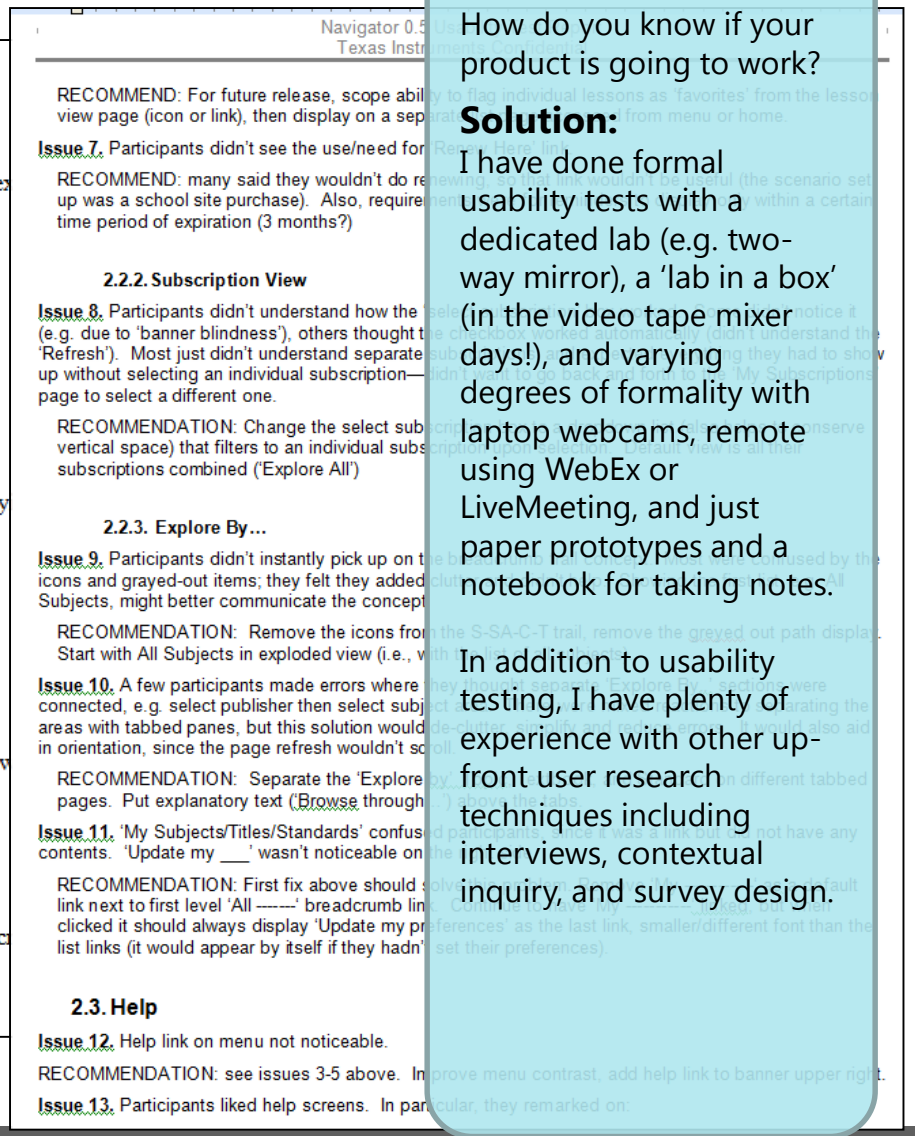
OTR Usability Test

Scenario 1: Browse to a Lesson
You want to find lessons that apply to the chapter you're currently using in your tex
you go about getting a list of applicable lessons?

Follow-up questions:

1. See the breadcrumb trail on the initial page. How do you feel about display
   hierarchy, even if it's unclickable?
2. Do the icons on the subject breadcrumb trail help?
3. Do you like all three on the same page, or would you prefer tabbed pages, v
   with one at a time? (make comparative page)

Scenario 2: Search for a Lesson
You remember seeing a particular lesson once, but you can't remember what subsc
if it was a trial or paid subscription. What do you do?



RECOMMEND: For future release, scope abil
view page (icon or link), then display on a sep

Issue 7. Participants didn't see the use/need for

RECOMMEND: many said they wouldn't do re
up was a school site purchase). Also, require
time period of expiration (3 months?)

2.2.2. Subscription View

Issue 8. Participants didn't understand how the
(e.g. due to 'banner blindness'), others thought t
'Refresh'). Most just didn't understand separate
up without selecting an individual subscription—
page to select a different one.

RECOMMENDATION: Change the select sub
vertical space) that filters to an individual subs
subscriptions combined ('Explore All')

2.2.3. Explore By…

Issue 9. Participants didn't instantly pick up on t
icons and grayed-out items; they felt they added
Subjects, might better communicate the concept

RECOMMENDATION: Remove the icons fro
Start with All Subjects in exploded view (i.e., v

Issue 10. A few participants made errors where
connected, e.g. select publisher then select subj
areas with tabbed panes, but this solution would
in orientation, since the page refresh wouldn't sc

RECOMMENDATION: Separate the 'Explore
pages. Put explanatory text ('Browse through

Issue 11. 'My Subjects/Titles/Standards' confus
contents. 'Update my ___' wasn't noticeable on

RECOMMENDATION: First fix above should
link next to first level 'All -------' breadcrumb lin
clicked it should always display 'Update my pr
list links (it would appear by itself if they hadn'

2.3. Help

Issue 12. Help link on menu not noticeable.

RECOMMENDATION: see issues 3-5 above. In

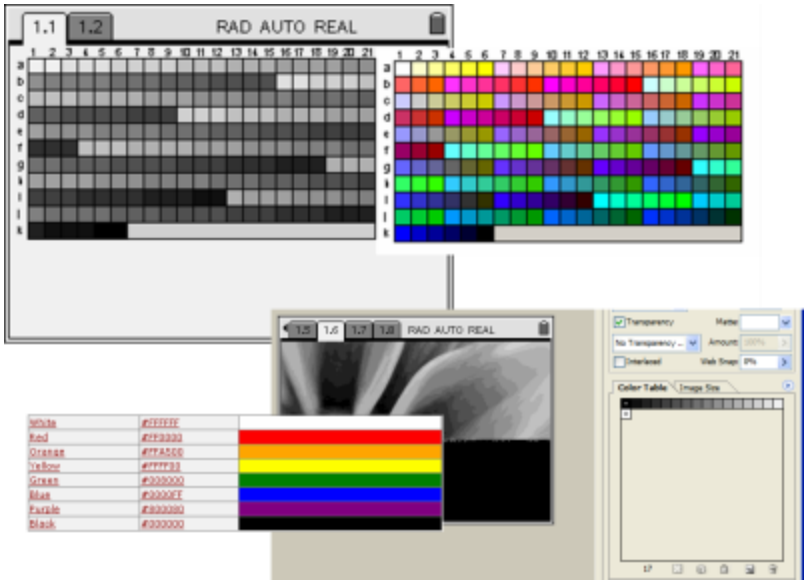
Issue 13. Participants liked help screens. In par

Problem:
How do you know if your product is going to work?

Solution:
I have done formal usability tests with a dedicated lab (e.g. two-way mirror), a 'lab in a box' (in the video tape mixer days!), and varying degrees of formality with laptop webcams, remote using WebEx or LiveMeeting, and just paper prototypes and a notebook for taking notes.

In addition to usability testing, I have plenty of experience with other up-front user research techniques including interviews, contextual inquiry, and survey design.

Research



Implementing Dual Mou… Handheld

Definitions:
Mouse/Pointer: continuous free-movi… selection, dragging
Cursor: 'I-beam' (text input) or discre…
Continuous-primary apps: Graphs & …
Collection/Science
Discrete-primary apps/utilities: Calcul… Editor,
Mixed usage: Catalog, Symbol Palette…

History

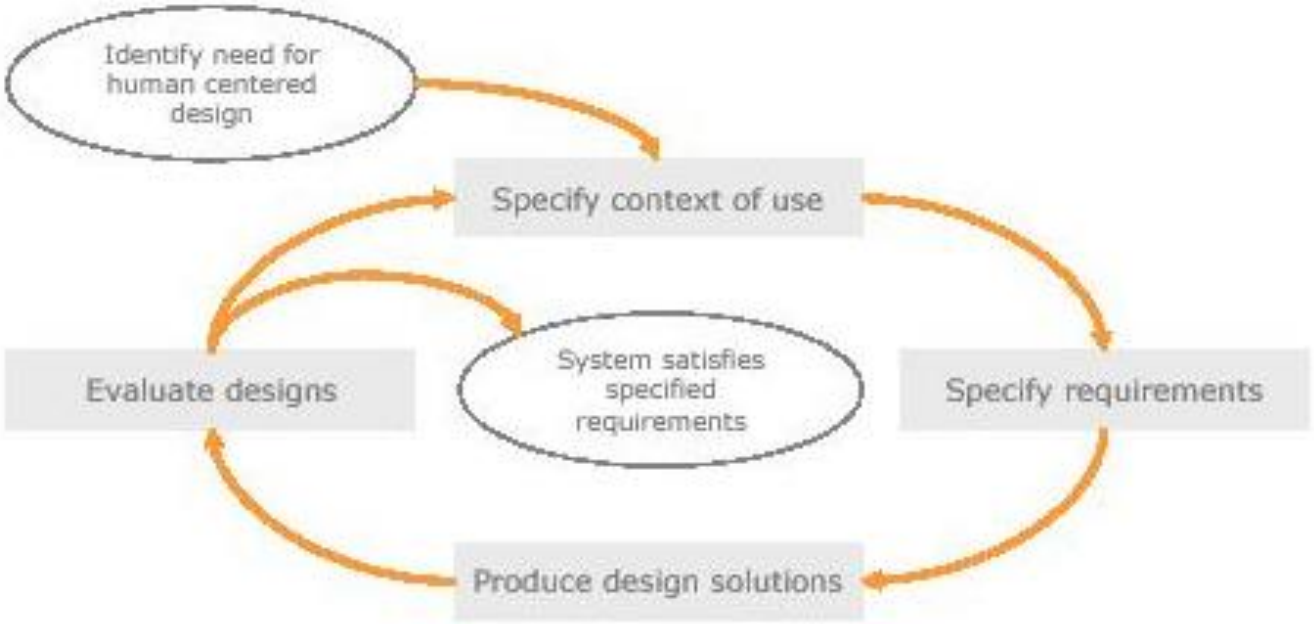
TI-Nspire was originally designed as a… had a navigation control (raised butto…) The navigation 'button' allowed for 16… pointer. The arrows navigated the te…

The GUI was designed to accommoda… top 'toolbar' that accessed system me… Menu). Early testing showed that the… jerky—so we added features to 'get a… small in P1R1) and menu key. Howev… navigate to the toolbar and around di… navigation keys, which led to impress… Another big problem with the navigati… down behavior, but this action was re…

Problem:
What about <insert frustrating technical issue here>?

Solution:
Along with the standard user research, task analysis, and interaction design and specification work typical of projects, some projects will require more advance human computer interaction research. For the TI Nspire we had to come up with a set of colors that were distinctive from each other in grayscale as well as color. We had to evaluate various cursor control pads for speed & accuracy. Introducing a 'mouse'-like control on a handheld, which used left-right-up-down cursor control before, introduced a number of challenges. My background in experimental design comes into play to both identify the problem to be resolved, and the means to resolve it.

Questions?



Solution:
Paul Daly – depth and breadth in human centered design.

Experience in large Fortune 500 and small startup companies.

Worked in government, financial, educational, industrial, and internet technology domains.

Desktop, mobile, web, and hardware experience

Built and managed successful UX teams and ongoing practices.

pkdaly@yahoo.com

linkedin.com/in/pkdaly