Contextual Design and Innovations in Automotive HMI

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International Advanced School on Automotive Software Engineering Conference
"Software Engineering for Automotive Innovation"

The Challenge…

Drive “innovation” into the HMI design of future infotainment and telematics systems

Our Focus…

Gain a deeper understanding of how today's drivers entertain, communicate, navigate, and get information while traveling in their vehicles

In addition…

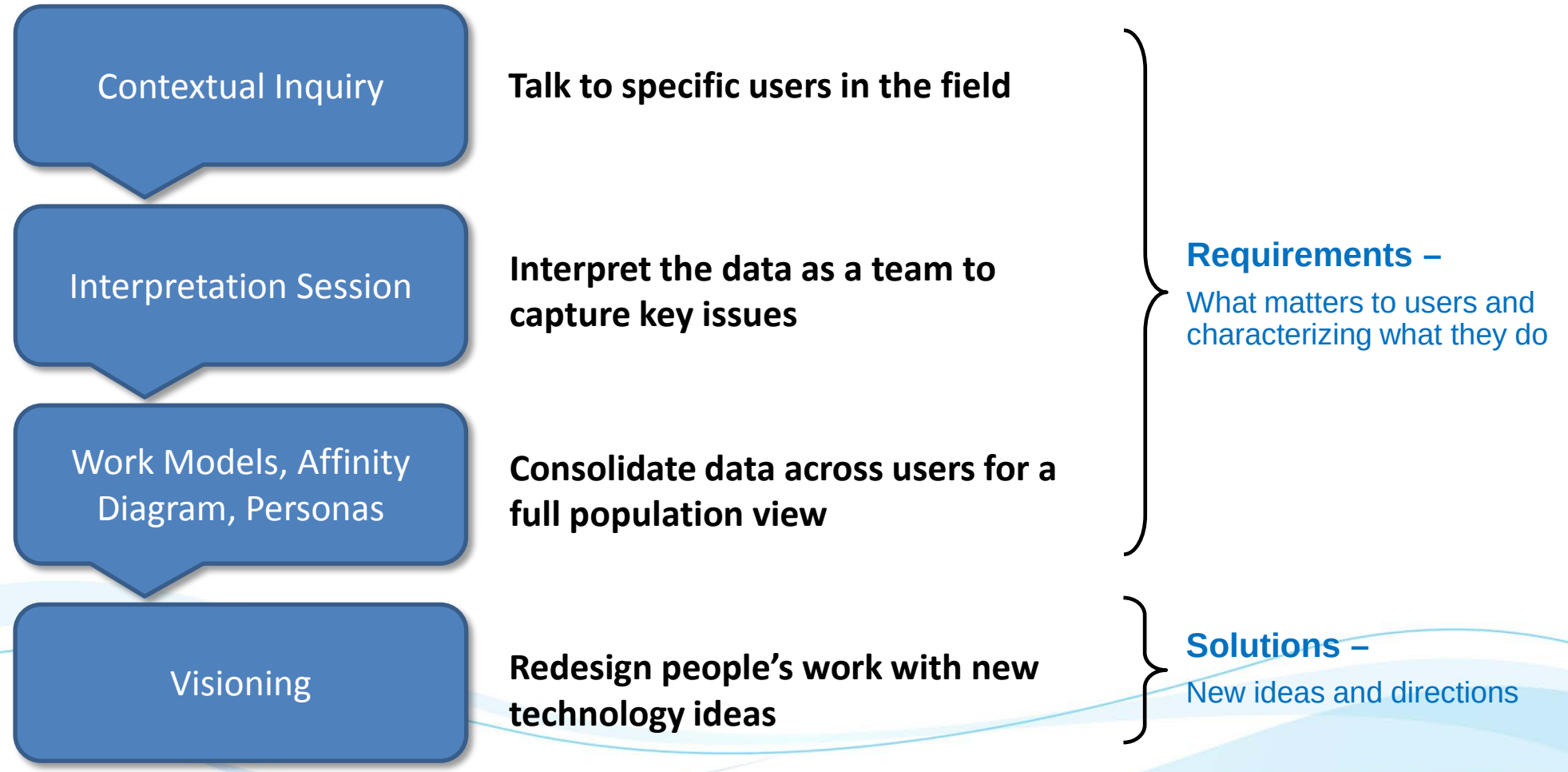
Understand how people learn about the various features and functions in their vehicles

Finally…

Learn about different driver populations and how we might tailor innovations to their unique needs and wants

The Process…

Contextual Design (Phase 1)



Contextual Design

Contextual Inquiry

Interpretation Session

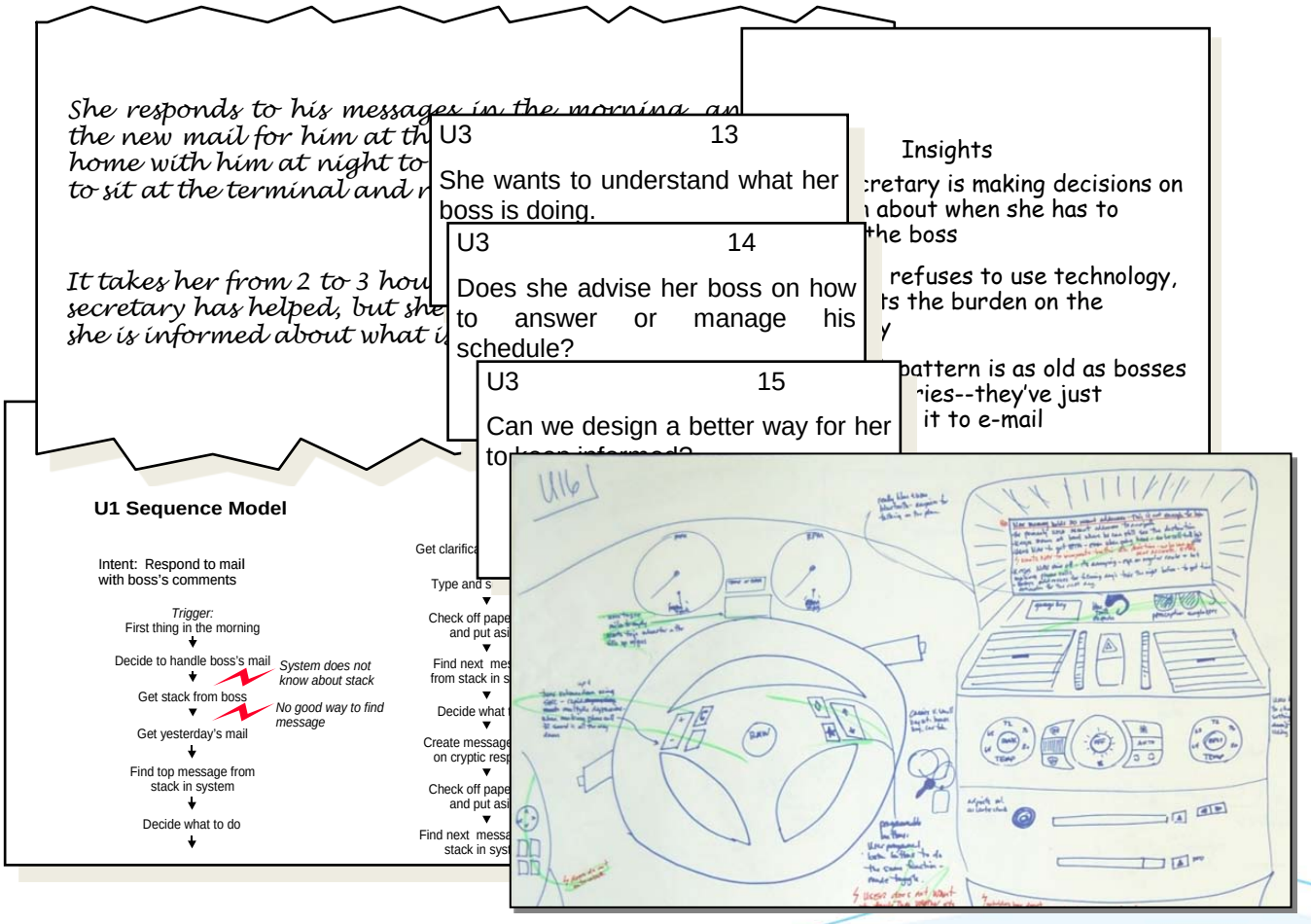
Work Models, Affinity Diagram, Personas

Visioning

Provides reliable knowledge of what users actually do and what they really care about

Contextual Design

- Contextual Inquiry
- **Interpretation Session**
- Work Models, Affinity Diagram, Personas
- Visioning



Creates a shared perspective of the data

Contextual Design

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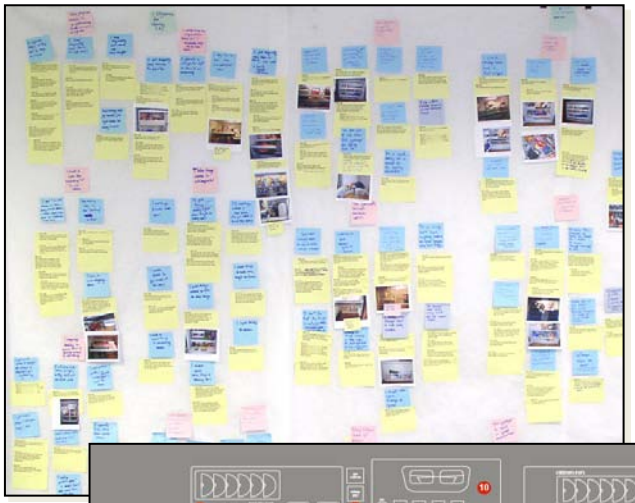

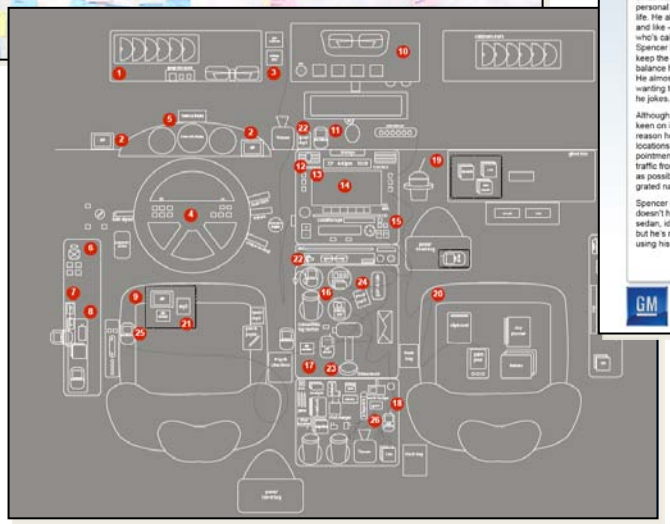

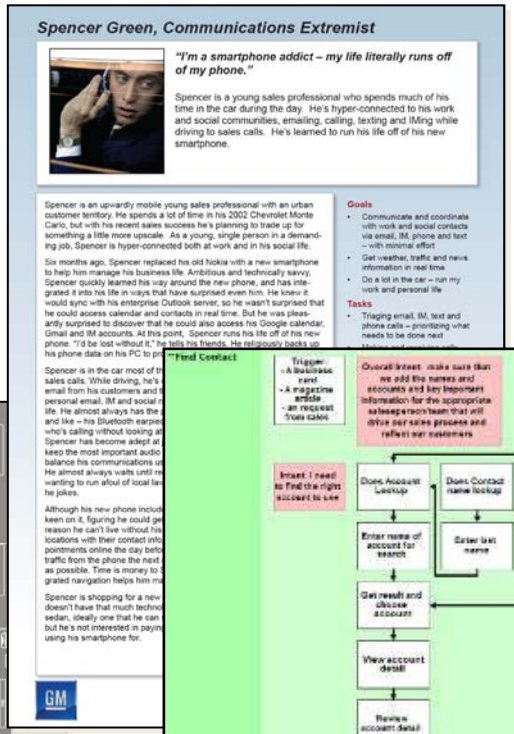

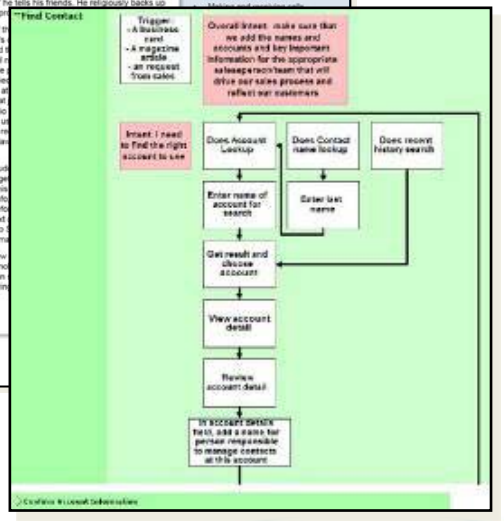

Creates a single statement of work practice

Contextual Design

- Contextual Inquiry
- Interpretation Session
- Work Models, Affinity Diagram, Personas
- **Visioning**

A structured ideation process to imagine and develop new product concepts

Some details about our work…

Our initial CD project…

- **Contextual Inquiry**
- Interpretation Session
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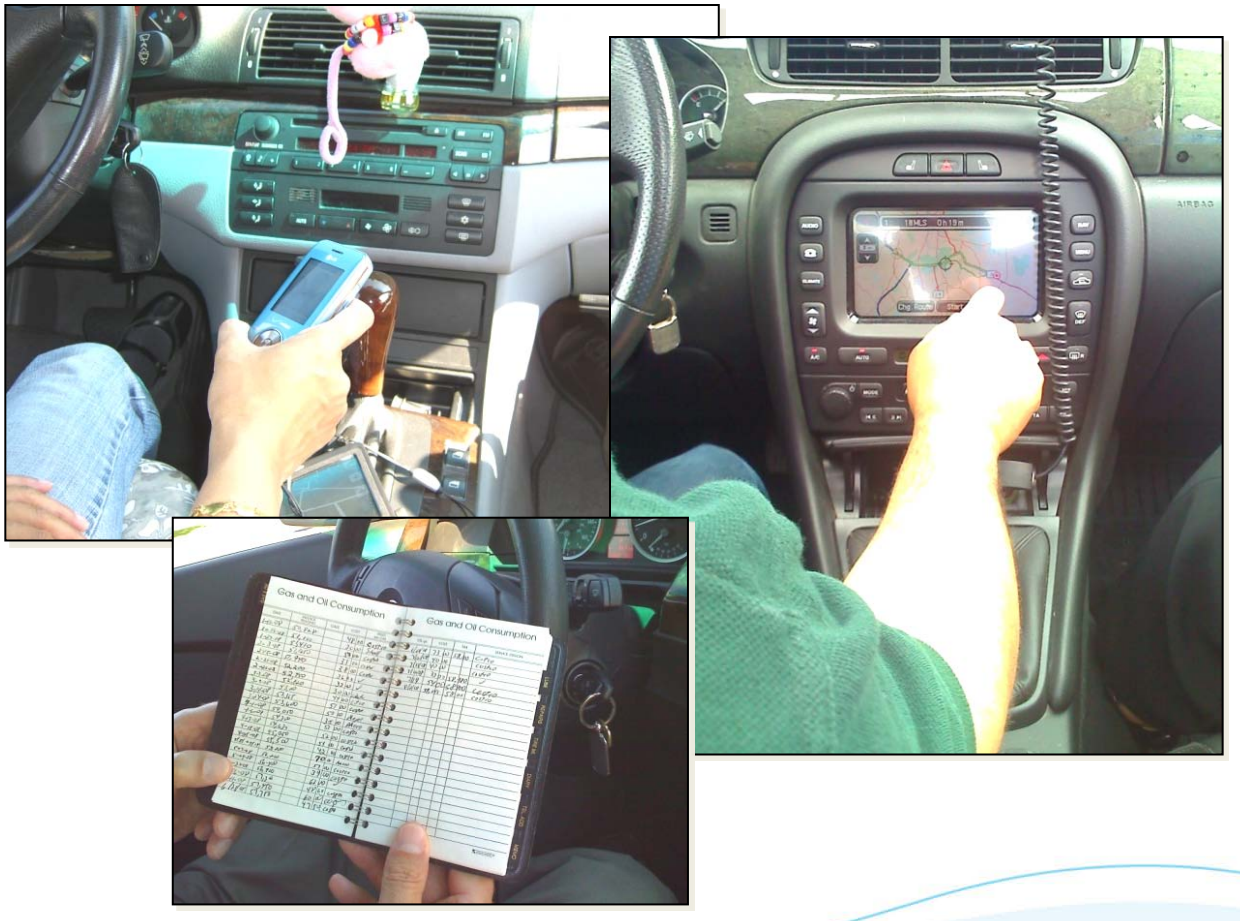

Provide reliable knowledge of what users actually do and what they really care about

Our initial CD project…

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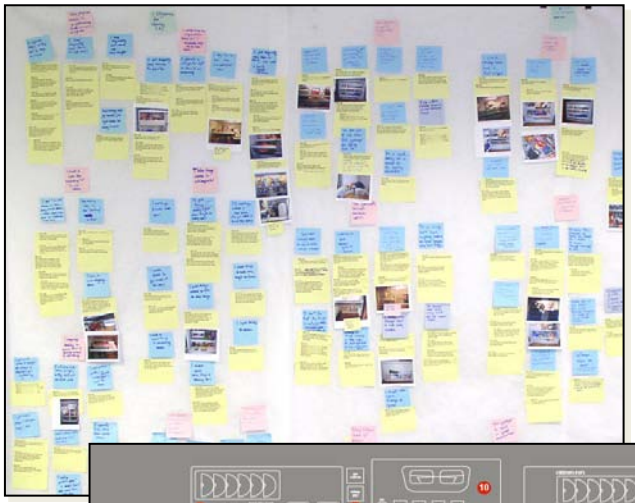
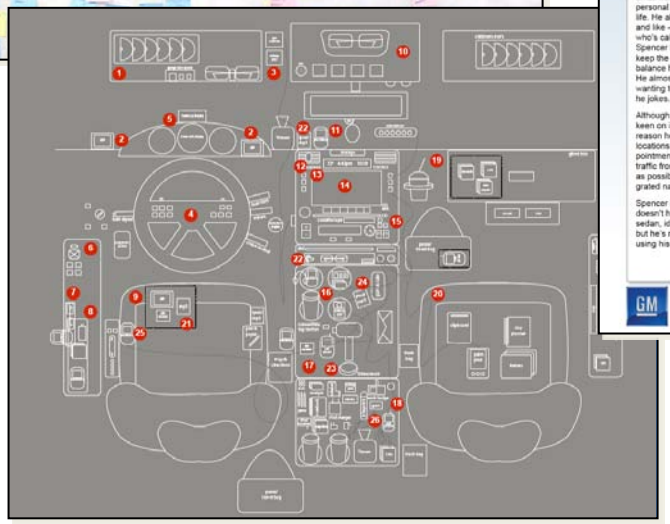
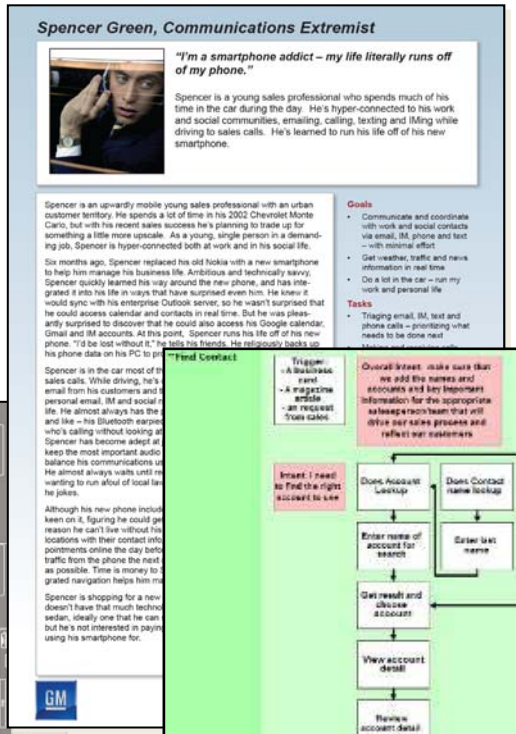
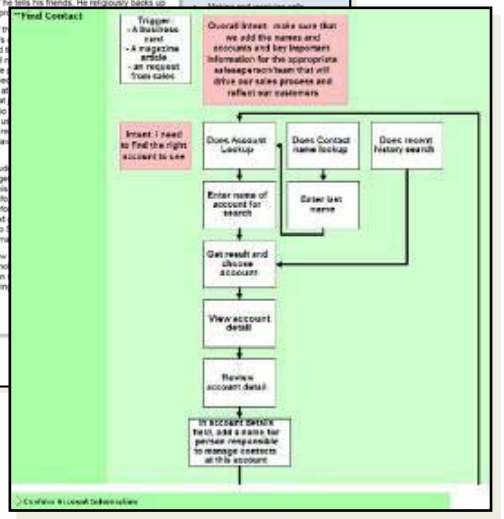


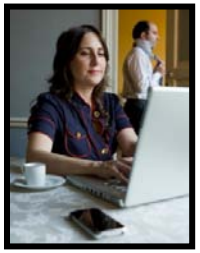






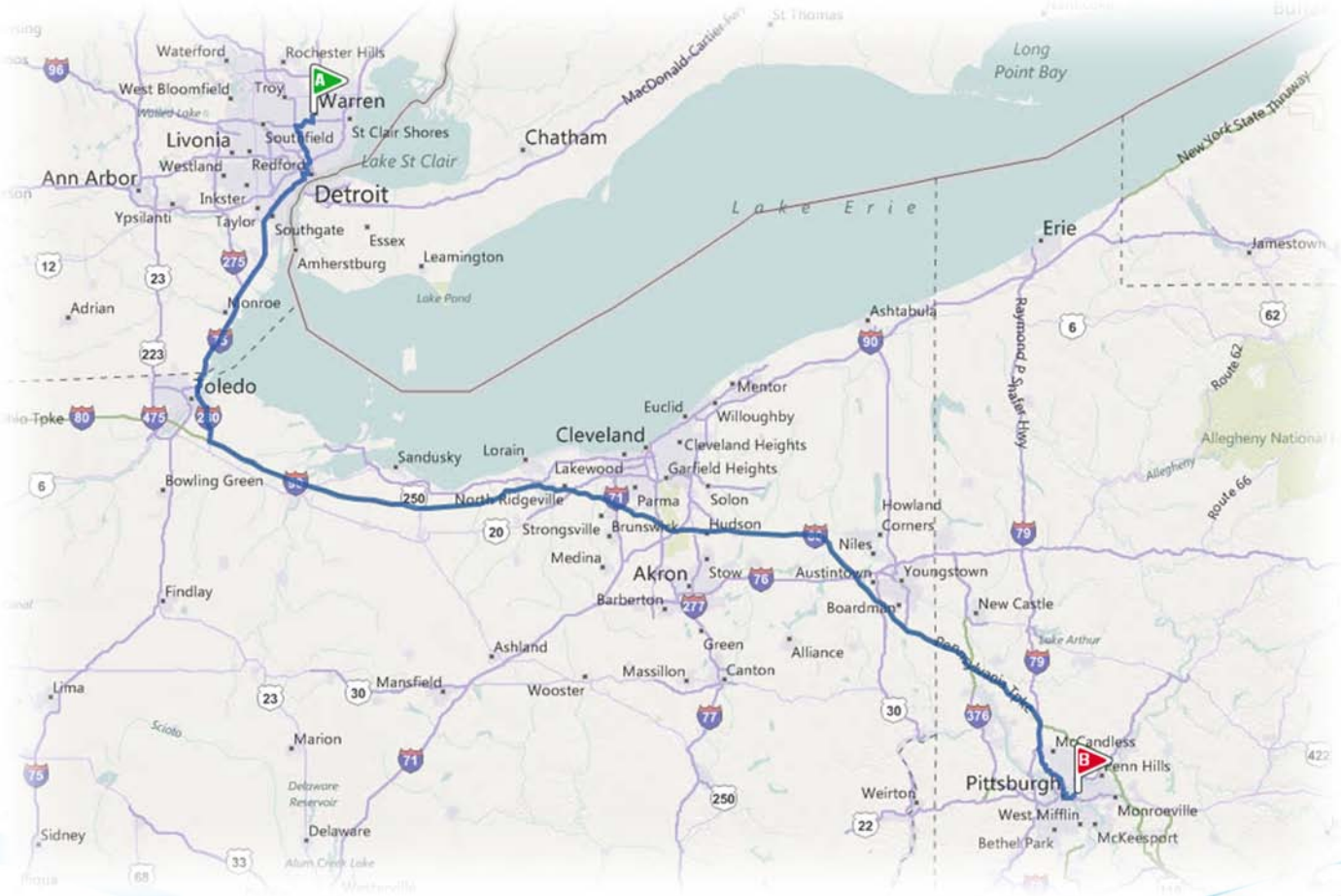
Create a single statement of work practice

What we learned…



I take my life context into the car

An HMI “i”nnovation example…



The navigation system doesn’t know what I know…

A second CD project…

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Provide reliable knowledge of what users actually do and what they really care about

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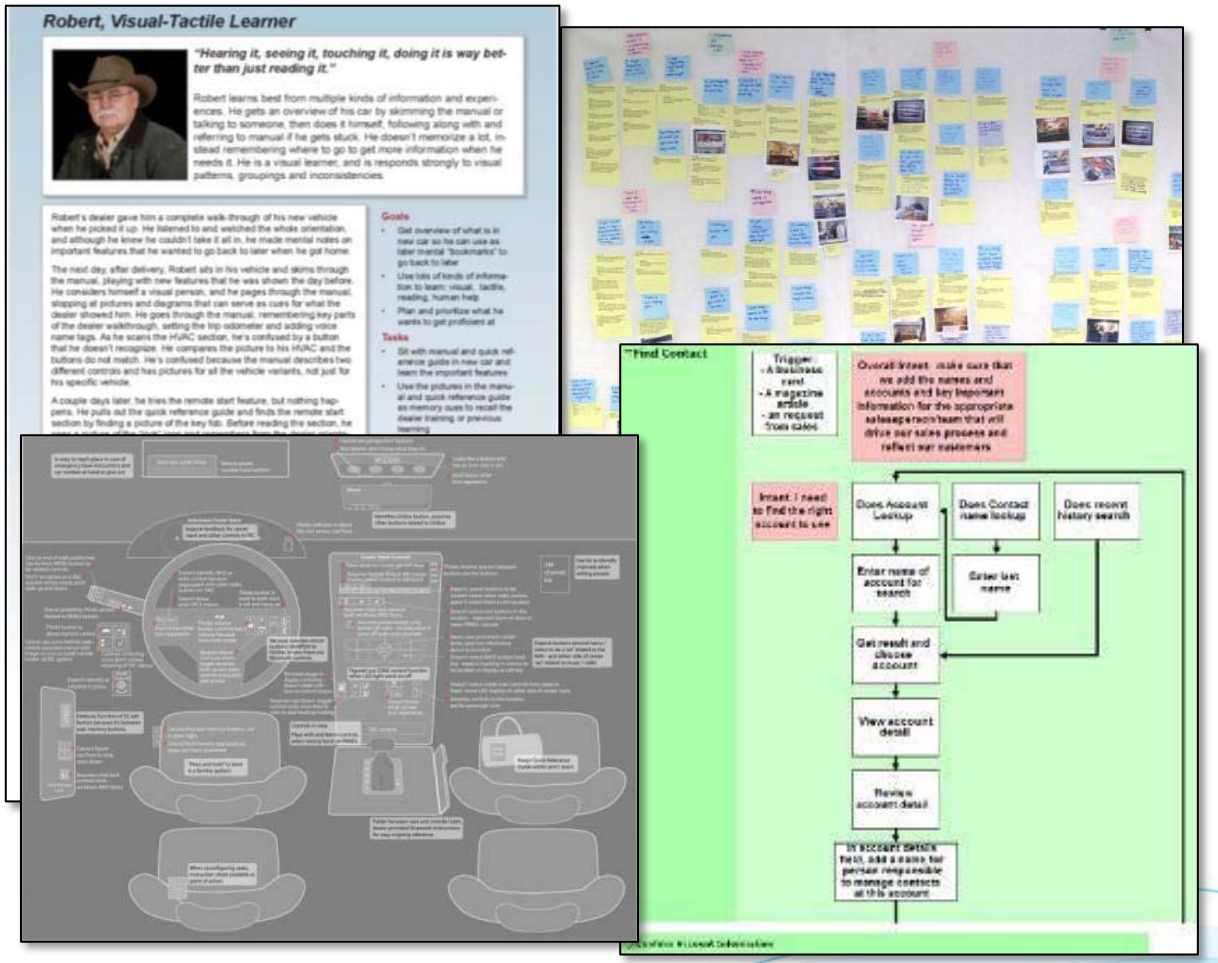


Create a single statement of work practice

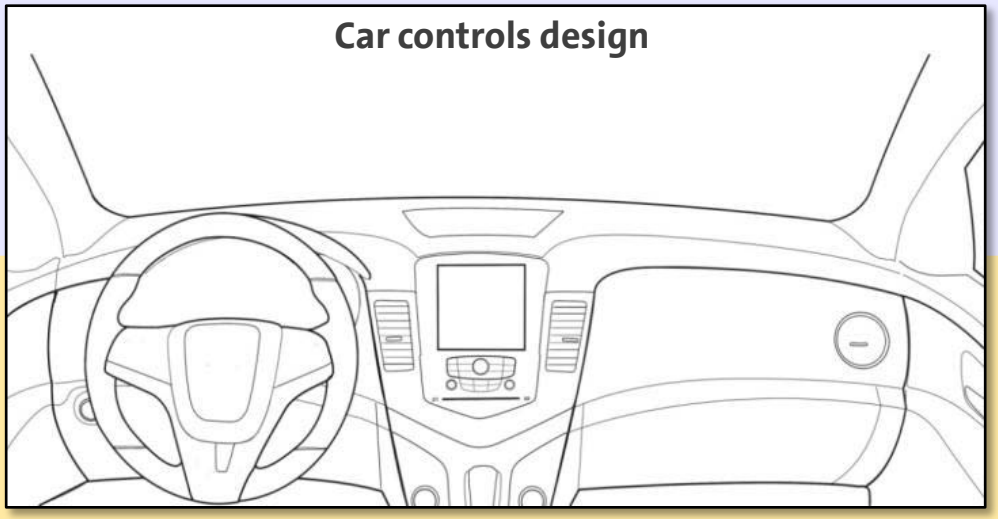
What we also learned…

Past experience / User expectation

Customer

Customer

Car controls design



Show me

Play/feedback

Owner's manual

Study/search

Different learning styles

I can be overwhelmed by the new car learning task

Another “i”nnovation example…

How did you learn to operate an iPhone or iPad?

A third CD project…

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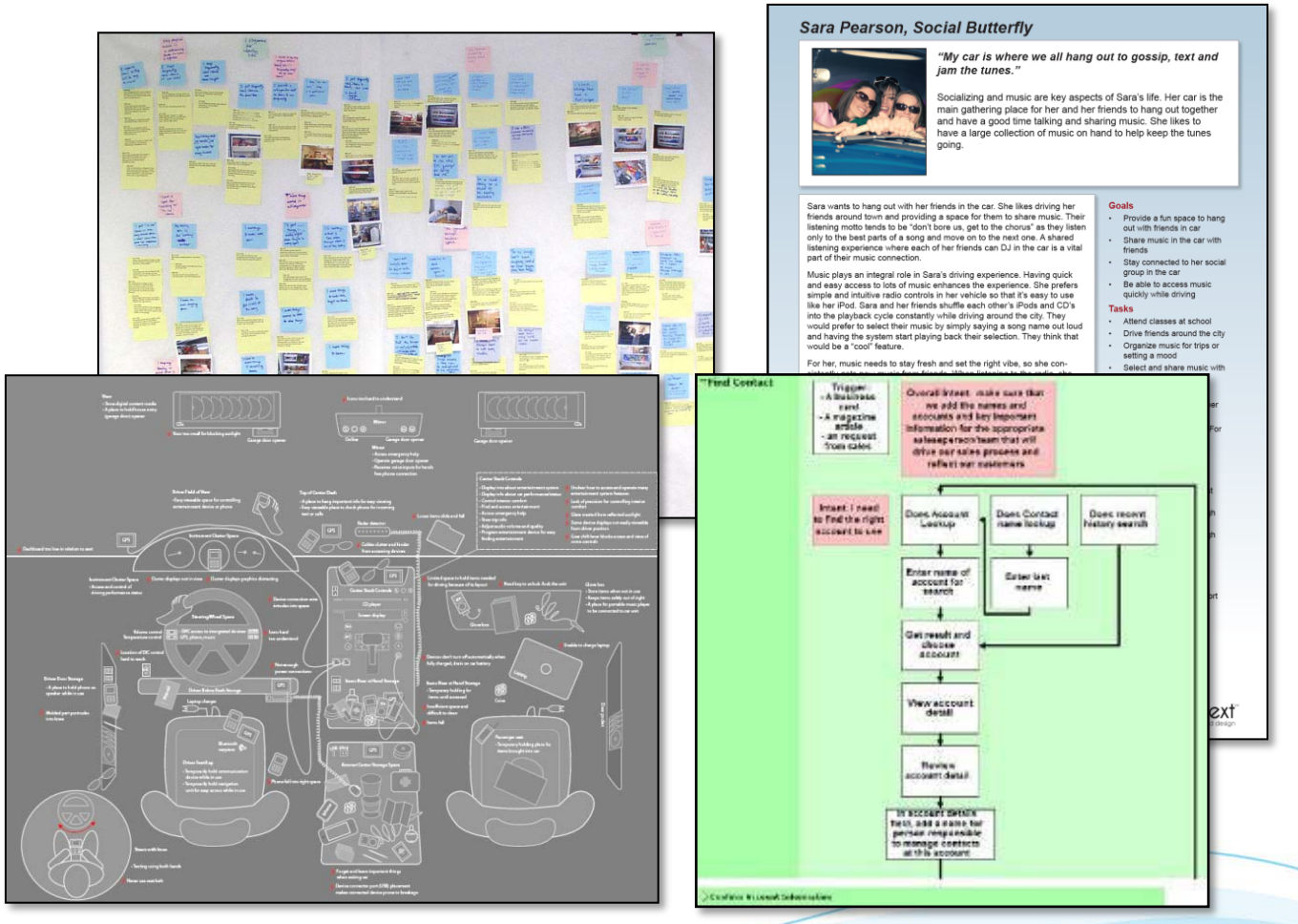
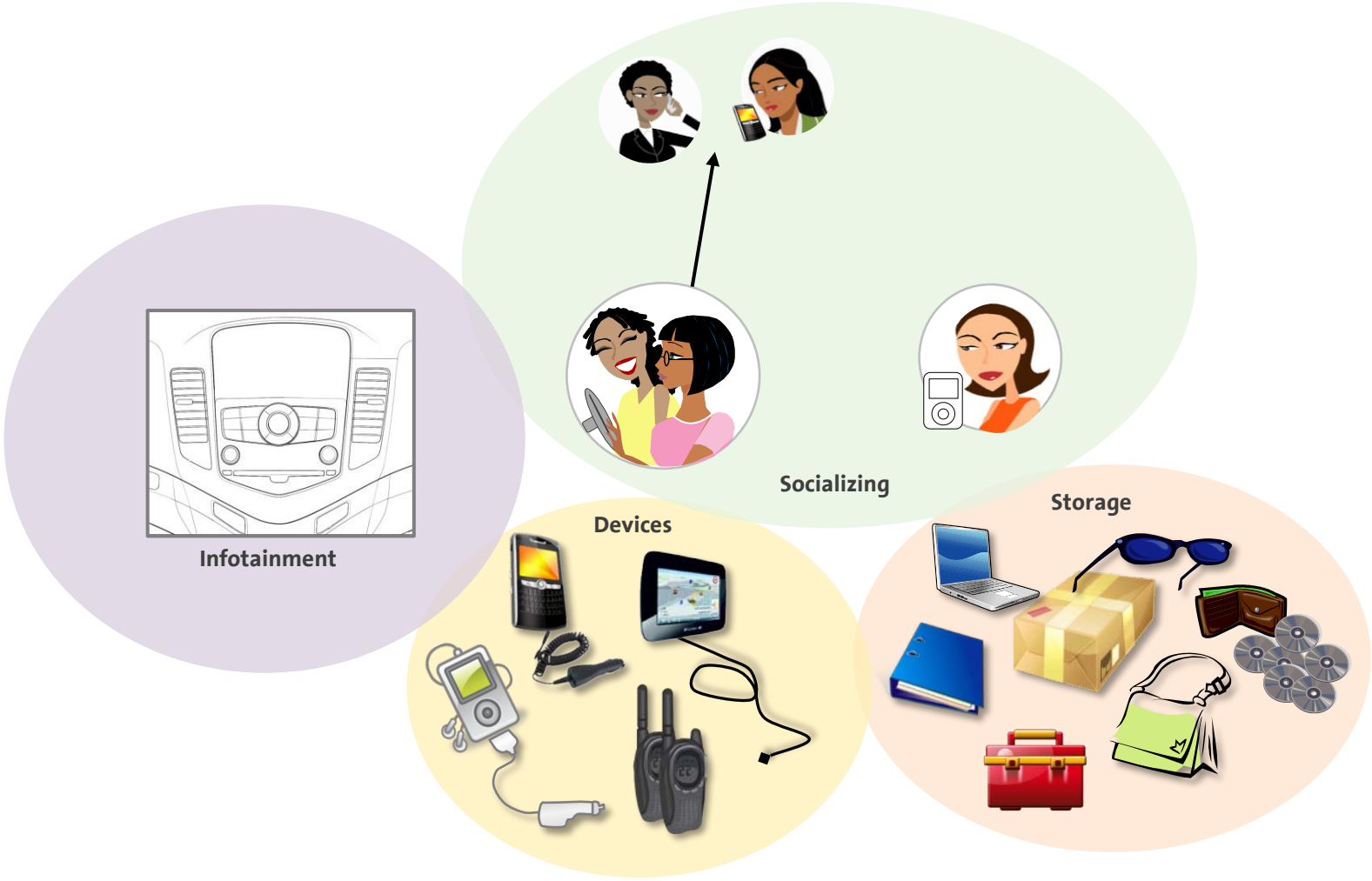


Create a single statement of work practice

What more we learned…



Keep me safely connected to my world when I am in the car

A final HMI example…

Help me to stay connected… but I want my messages to be kept private

In Conclusion…

- Adapted Contextual Design methods for driving environments
- Learned how people interact with technologies that would have been impossible in a driving simulator or naturalistic driving study
- Netted over 300 design ideas, 48 patent ideas, 12 patent submissions, and 5 defensive publications
- Revolutionized GM's design process for innovation in infotainment, telematics, and active safety systems

For your reference…

Automotive UI 2010 Paper

- Gellatly, A.W., Hansen, C., Highstrom, M., and Weiss J.P. (2010). Journey: General Motors' Move to Incorporate Contextual Design Into Its Next Generation of Automotive HMI Designs. In Proceedings of the Second International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI 2010), November 11-12, 2010, Pittsburgh, Pennsylvania. Association for Computing Machinery.

Contextual Design References

- Beyer, H. and Holtzblatt, K. (1997). Contextual Design: Defining Customer-Centered Systems. Morgan Kaufmann, San Francisco, CA.
- Holztblatt, K., Wendell, J.B., and Wood, S. (2004). Rapid Contextual Design: A How-to Guide to Key Techniques for User-Centered Design. Morgan Kaufmann, San Francisco, CA.

Contact Information

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