INFUSING SWEETNESS INTO YOUR MEDICAL GUI

IMPROVE A PRODUCT'S
USER EXPERIENCE
WITH MODEL-BASED UI DESIGN

AGENDA

- Introduction
- Why Graphical User Interfaces?
- The Challenges
- Five Keys to Success
- Summary

OH! HOW WE’VE GROWN!

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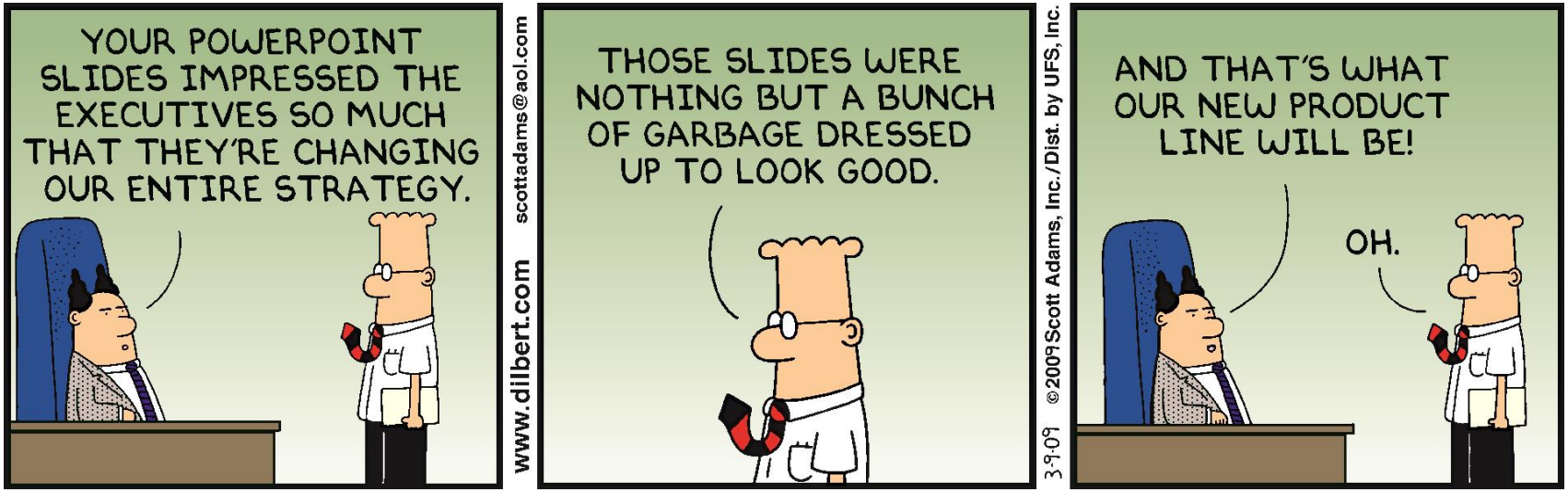
FLASHY ALONE WON'T CUT IT!



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WHY GRAPHICAL USER INTERFACES (GUI)?

The user interface **is** the product

Exciting displays

- Differentiate products
- Sell products

A great user experience

= Market Leadership

User interfaces redefine

- Your brand
- Your company

THE GREAT EXAMPLE: TANDEM DIABETES CARE®

THE CHALLENGE

Your GUI must…

- Look good
- Run fast
- Be affordable
- Be timely
- Be usable

5 Keys to Success…

KEY 1:
BE UNCOMPROMISING AT THE PRODUCT LEVEL

BE UNCOMPROMISING AT THE PRODUCT LEVEL

Data, data and more data …
same as any engineering

User-Centered Design balanced with Marketing needs

Career Examples:

-- VCR blinking

-- Bluetooth pairing

-- Cancel route

UNCOMPROMISING

Posted on March 10, 2011

Can The Blackberry Survive The Smartphone Wars?

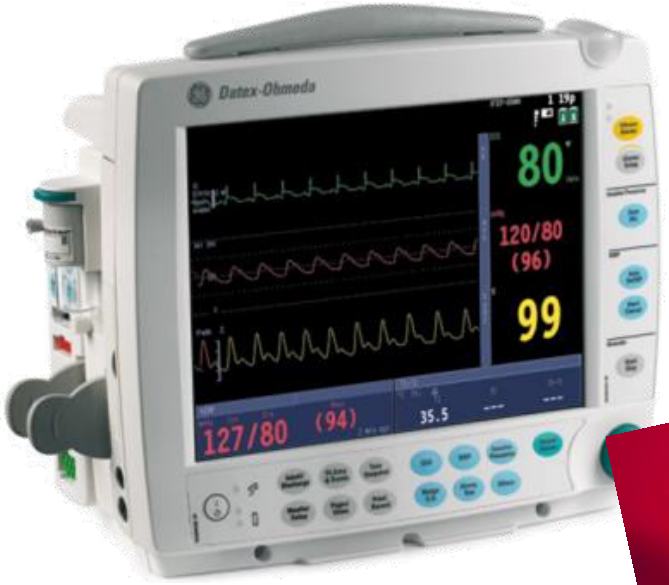
"If Blackberry hopes to realistically see a market share increase, the company must first improve their customer experience and make the devices easier to use."

J. Turner, retail sales expert

1 *http://www.bgr.com/2012/09/13/blackberry-us-sales-2012-pacific-crest/*
2 http://blog.zintro.com/2011/03/10/can-blackberry-survive-the-smartphone-wars/
3 http://cdn03.cdn.justjared.com/wp-content/uploads/2013/01/keys-blackberry/alicia-keys-blackberry-new-creative-director-03.jpg

UNCOMPROMISING

Medical GUI represents the Wild West with "attempts" at pioneering



UNCOMPROMISING

UNDERSTAND MARKET NEEDS (FEATURES)

How is YOUR GUI going to redefine the product and UX?

- Market research – needed early
- Customer focus groups – multiple cycles

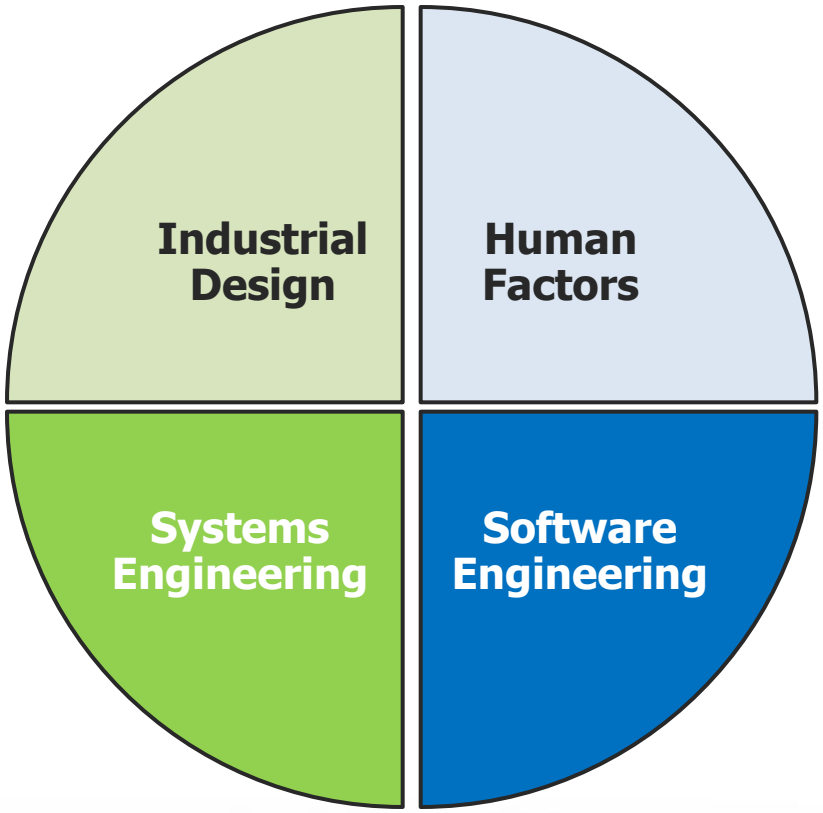
Define return on investment

- How will this impact your sales?

Collect this data early – before significant expenses

KEY 2:
BUILD A MULTI-DISCIPLINED TEAM FOR USER-CENTERED DESIGN

ESSENTIAL EXPERTISE FOR USER-CENTERED TEAM

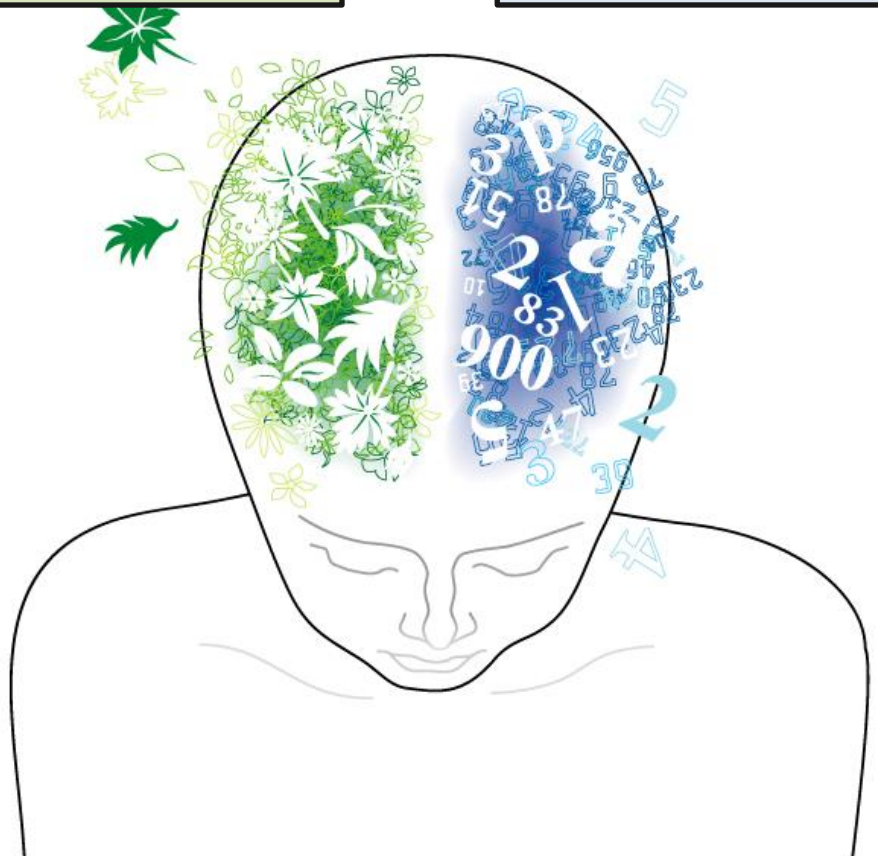


- Market Research
- Customer Clinics
- Graphic Design
- Interactive Design

Industrial Design

Human Factors

- Physical Aspects
- Cognitive Aspects
- Goal/Task Analysis




Systems Engineering
• Peripherals
• Network Constraint
• System Simulation

Software Engineering

- Product Simulation
- Embedded Arch.
- Code Generation

KEY 3:
ACTIVELY MANAGE CROSS-DISCIPLINE DESIGN TRADE-OFFS

MODELING CREATES BALANCE

My spec says we should have animations, multi-touch, swiping, etc.

My spec says we should have low-cost processors and display technology.

KEY 4:
GREAT TOUCH-BASED GUI IS MORE THAN AN LCD AND SOFTWARE

THE HARDWARE/SOFTWARE CONSIDERATIONS

Touch Screen Technology & Drivers

LCD Resolution Dimension Color Depth

Application Interfaces

Color Formats, Raster-Vector Image Compression, Animation

Font Management Sizes, Types, Runtime/Pre-Render

Graphics Accelerator
Memory Bandwidth for FLASH and VRAM
Amount of FLASH and VRAM
Bill of Material Management

INTERACTIVE DESIGN CONSIDERATIONS

Usability
Layout, Information Processing
Goal Achievement

Text and Font Consistency
Legibility, Animation

Information
Chunking

Screen Area
Management for
Performance

Z-Order
Precedence and
Management

Demand on
Embedded
Resources

PRODUCT LINES PROVIDE ADDITIONAL CHALLENGES

Start Small

SMALL FOOTPRINT

- Limited or No External RAM
- Limited or No External FLASH
- No Graphical Acceleration
- qVGA, limited WVGA
- Small screen size

FULL FEATURED

- External System RAM, VRAM
- External FLASH
- Graphics Acceleration
- Small or Large HD Displays
- Large screen size

KEY 5:
MODEL THROUGHOUT THE LIFECYCLE FROM DESKTOP TO PRODUCT HARDWARE

RECOMMENDED PROCESS

Market Research

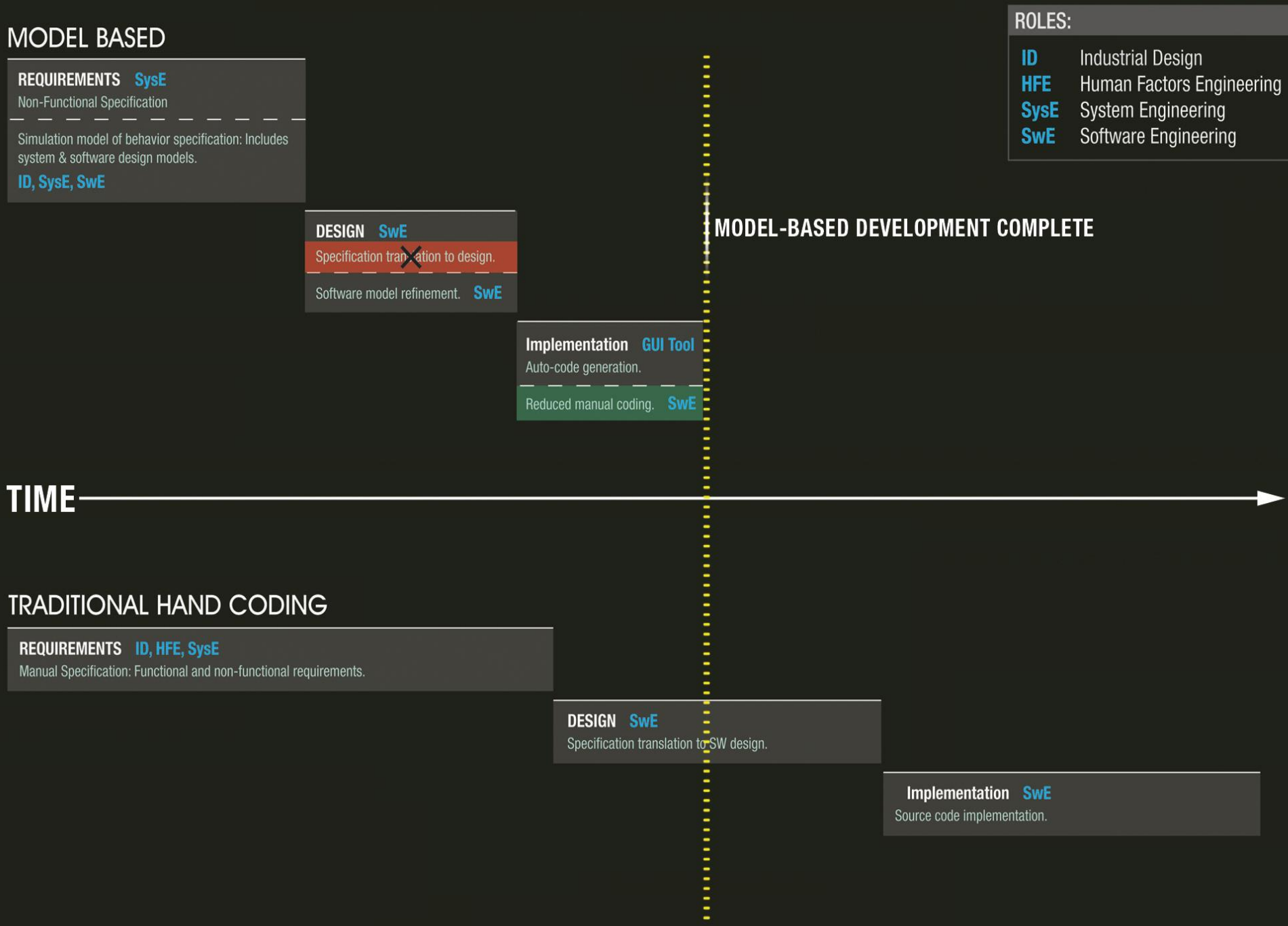
User Studies

Build GUI for reference hardware(s)

Verification User Studies

THE GREAT EXAMPLE:

TANDEM DIABETES CARE®


ROLES:
ID Industrial Design
HFE Human Factors Engineering
SysE System Engineering
SwE Software Engineering
MODEL BASED
REQUIREMENTS SysE
Non-Functional Specification
Simulation model of behavior specification: Includes system & software design models.
ID, SysE, SwE
DESIGN SwE
Specification translation to design.
Software model refinement. SwE
Implementation GUI Tool
Auto-code generation.
Reduced manual coding. SwE
MODEL-BASED DEVELOPMENT COMPLETE
TIME
TRADITIONAL HAND CODING
REQUIREMENTS ID, HFE, SysE
Manual Specification: Functional and non-functional requirements.
DESIGN SwE
Specification translation to SW design.
Implementation SwE
Source code implementation.

SUMMARY

- Be uncompromising at the PRODUCT level
- Build a multi-disciplined team for user-centered design
- Actively manage cross-discipline design trade-offs
- Great touch-based GUI is more than an LCD & software
- UI simulation throughout the development lifecycle from desktop to product hardware

Questions?

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BACK-UP SLIDES