

---

## Moving up the Usability Food Chain

A Cross-Disciplinary Holistic Viewpoint

By Alex Paul Conn, Ph.D.  
Principal, APConsulting, LLC  
APConsulting.com

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

---

## Agenda

- What is a Solution?
- Vicente's broader "Human Factor" ladder
- Recasting Vicente's perspective
- Some examples
- Terminology: JTBD, WoDT, and conformability
- Modeling the way of doing things: Where does the solution fit?
- When the paradigm shifts...
- Examples
- Usability in the Large
- Convergence and Seamlessness
- Additional Examples & Discussion

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

2

## What is a Solution?

“When customers become aware of a job they need to get done in their lives, they look around for a product or service that they can ‘hire’ to get the job done.”

*Source: The Innovator's Solution, Page 75  
by C.M. Christensen and M.E. Raynor*

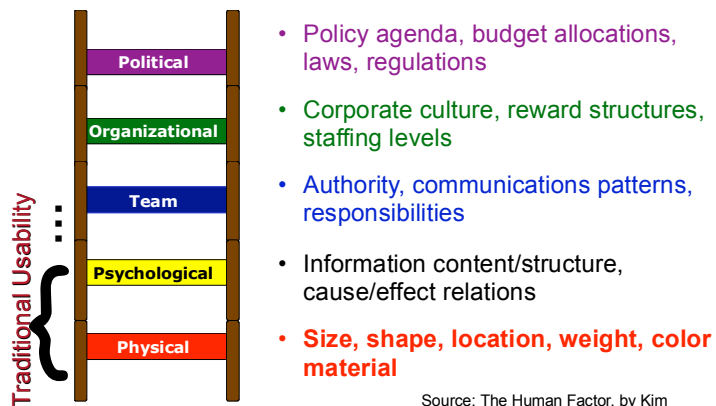
“When customers (and organizations) have a job to be done they select the solution that conforms best with the way they do things or the way they would like to do things”

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

3

## Kim Vicente's Ladder: His Language



Source: The Human Factor, by Kim Vicente, New York, Routledge, 2003

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

4

## Vicente's Ladder: Our Interpretation



- Determining policies, setting priorities, framing the options, gathering support
- Processes, procedures, attitudes, metrics for motivating actions and responsibilities
- Communication with others: showing intention and interpreting actions
- Perceived affordances, task design, man-machine interaction at the cognitive level
- **Ergonomics, physical affordances, match to muscles, size, fit, etc.**

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

5

## Some Examples (technology)

- **Team:**
  - Signaling intentions
    - Used for vehicles (rules of the road)
    - Turn signals, flashing headlights
  - Body language
    - Showing what you intend to do: direction of wheels, aim, actual movement
  - Cross-geographical video meeting
    - Easy with large panel displays
    - How to indicate agitation, excitement, need to interrupt, dynamics of brainstorming?
  - Cross-temporal (time-shifted) “meeting”
    - How to “interrupt” or “brainstorm” at different times?
    - Protocols for escalating to real time



May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

6

## Some Examples (Cont'd)

### • Organizational

Organizational

- Corporate culture and culture of locale
  - Maintaining quality: authority and accountability
    - Monitoring and surveillance, feedback and critical issues
  - Locus of authority: hierarchies versus peer organizations
    - Impacts customer interactions at multiple levels
  - Individual versus group create, revise, criticize
    - Saving products versus saving face, lead versus control
  - Well defined versus free flowing and changeable
  - Relative versus fixed morality (bribes, favors, etc.)

May, 2008

© 2008 Alex Conn, APCConsulting, LLC, All Rights Reserved

7

## Some Examples (Cont'd)

### • Political: 4 components of Policy

Political

1. Determine policy
  - Desirable, compatible with culture, pragmatic, effective
2. Create laws, rules, regulations to implement the policy
  - Often requires a lawyer or lawyer-like personality
3. Fund the policy
  - Staffing and personnel to ensure/help targeted populations comply with policy
4. Monitor and enforce the policy
  - Monitoring/Surveillance with metrics reveal non-compliance
  - Incentives and punishment to motivate compliance

### • Example:

- Airlines: (Vicente example) required separate agency to determine cause rather than blame

May, 2008

© 2008 Alex Conn, APCConsulting, LLC, All Rights Reserved

8

## Terminology

- **JTBD (Job To Be Done)** *[Derived from Clayton Christensen]*
  - Types of customer groups
    - Undershot: need more features
    - Overshot: getting too fancy for my blood
    - Non-participants: too complicated for me
  - Good Enough versus not good enough
    - When good enough, cost and other factors rule
    - When not good enough, it's always a compromise
  - Explicit hot buttons versus assumed requirements
    - A true solution: tradeoffs based on real JTBD

## Terminology (Cont'd)

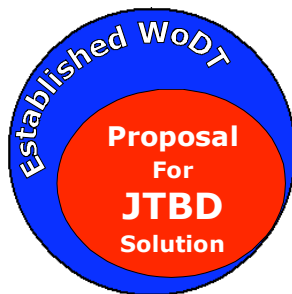
- **WoDT (Way of Doing Things)**
  - Physical: motor memory, physical comfort and ability
  - Psychological: Learning styles, known patterns, expected behavior, viewpoint and biases, perceived affordance clues
  - Team: Sending, receiving protocols signaling intention, agreement, recognition, etc.
  - Organizational: Boundaries, limitations, escalation paths, culture, values, behavior. Processes and procedures.
  - Political: All activity directed at influencing those who enact, enforce, and change policies
    - Artificial constraints on actions based on laws, activity aimed at gaming the system / exploiting loopholes
    - Mechanisms to control power, ensure transparency
- **Without a manual, you interpret or react to any interface based on your personal set of ways of doing things**

## Terminology (Cont'd)

- **Conformability**

- All aspects of a solution design that allow the accommodation of the existing or planned ways of doing things (WoDT)
- Includes (but not limited to):
  - Usability
  - Adaptability and customizability
  - Quality attributes
  - Interoperability
  - Dimensions and aesthetics
- Applies especially to technology-based products and services
- Important cross-disciplinary component:
  - Solutions fail when they ignore social, cultural, psychological, political, philosophical, etc. aspects of conformability

## “Ideal” Solutions (traditional Usability)



- **No surprises**

*Conforms to established WoDT for usability*

- Affordances are clear and follow conventions
- Widgets are familiar
- Tasks are similar to those done in past
- Physical controls are ergonomically satisfactory
- Web pages follow Steve Krug's "Don't Make Me Think" guidelines

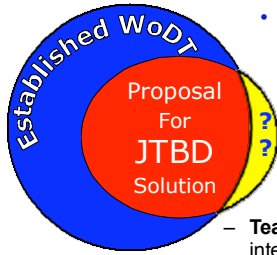
- **No User Manual needed**

- All functions and features extend established paradigms and/or
- Interface leads by example, wizard, etc.

**Caution: These questions only address the first two rungs of Vicente's Ladder**

## Evaluating Proposed Solutions: Impact of Unplanned/Unknown WoDT

*How can we be sure that a proposal for JTBD will succeed?*



- **Extending beyond the WoDT**  
Examples:

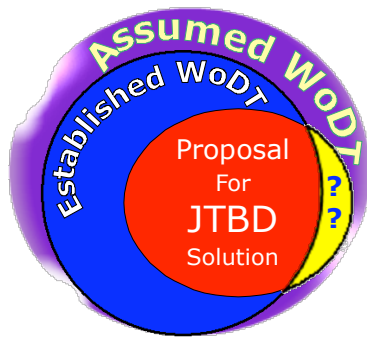
- **Physical:** new location for knob in car. Unknown new function
- **Psychological:** new nomenclature, changed search methods, changed location of common information, inability to find or understand common data
- **Team:** New unclear signals of intention; unclear interaction protocol, expectation, objective
- **Organizational:** B2B, B2C: undefined how to carry out a function (purchase, get service or repair, sell to, contract with, get payment or rebate): nobody knows how to do it for sure; customer/client must guess
- **Political:** Inability to see full objectives, get feedback and understand it, influence, see impact, hold accountable, limit power. Powerless feeling.

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

13

## Do we know how we do things? Impact of Assumed WoDT



- **Processes, procedures, habits, culture, locale assumptions...**
- **Explicit:** training, learning by example, manuals, regulations
- **Tacit:** learning the ropes, inferring from others' actions, trial and error,
- **Assumed but wrong:** incorrect models that seem to explain actions but are wrong

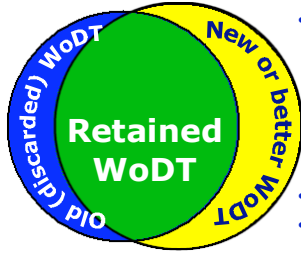
*Note that it is difficult to assess conformability without understanding the existing WoDT*

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

14

## When the paradigm shifts...



- Realization of the value of a new WoDT (often a “tipping point”)
- New paradigm makes sense *because it is not completely new*
  - Extends existing WoDT
    - Does not replace it
    - Keeps the good parts
    - Throws out the old and no longer useful ways.
- Often leverages familiar metaphors
- New way of looking at the familiar
  - New perspective to old WoDT
- Retained WoDT forms basis for conformability of solution

*A change in the WoDT may not be a paradigm shift.  
It may be a deliberate change to improve operations*

May, 2008

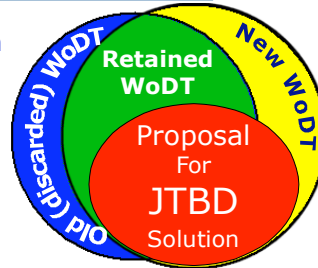
© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

15

## The Job-to-be-done for the New Paradigm

- Creating a solution for a JTBD in a new paradigm requires:

- Understanding what was retained in the WoDT and why
  - What is considered old and discarded and why?
- How to leverage or extend the existing WoDT
- Rationale and expectations regarding the new WoDT
  - Converting assumptions into explicit understanding
  - Defining what conformability means (what is essential or core to the new WoDT)
    - Changes in the deployment environment
    - Usability and adaptability challenges and unknowns
    - How to test



May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

16

## Examples of changing the WoDT

- **At the team level**
  - High performance teams: complementary skills, common purpose, performance goals, mutually accountable
  - Each person allowed most of their WoDT, jointly adjust for JTBD
- **At the organization level**
  - Cemex (cement company): restructures delivery logistics for just-in-time delivery based on sites needs
  - Locate closest delivery truck to get job done minimizing site's need to change WoDT
- **At the political level**
  - Airline safety: separate organizations for blame versus cause
    - Allows continued WoDT for accountability/discipline
    - Provides mechanism to gather important information and remove technical and systemic problems

## Interaction: “trying on” examples

- **Physical**
- **Psychological**
- **Team**
- **Organizational**
- **Political**

## Usability in the Large

### Improving a company's ease of use

- **Explicit versus Implicit WoDT**

- WoDT ≠ Processes or Procedures
  - Process/procedure is declared but may or may not be followed (they could be wrong)
  - Processes are for repeatability and constrain when steps are new and/or in new arrangement
- Implicit WoDT is tacit knowledge
  - May not be shared or universally understood
  - Depends on experience, awareness, trained heuristics
  - Unclear interaction interface is confusing to customers

- **Goal: Flexible, transparent WoDT**

---

---

---

---

---

## Convergence and Seamlessness

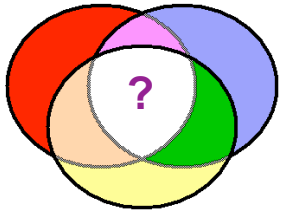
- **What are the issues around convergence**

- Overlaying of different technology interfaces  
*and*
- Overlaying of different ways of doing things

- **What is seamlessness**

- Simply defined: how to deal with the overlap in merged paradigms (think WoDT)
  - The JTBD is confined to the overlapping areas  
*or*
  - The new JTBD forces a paradigm shift (or extensions to the WoDT in at least one of the paradigms)
- Seamlessness means no surprises
  - The user is not aware that there is a change in the WoDT and/or
  - The user figures out how to explore changes because they make sense (seem to fit existing paradigms)

## Convergence: Common questions



- Device WoDT
- Application WoDT
- Domain WoDT

- **Device: how do other things work?**
  - Search, go back, make entries, confirm
- **Application: organization, look & feel, priorities of operations, etc.**
  - How do you transfer common functions
- **Domain: How people approach problems, the mindset**
  - Musicians are different from lawyers
  - Other apps have a vote on WoDT

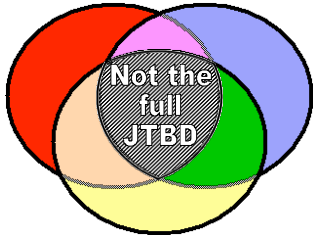
(These are examples of paradigms to be merged; there may be others)

**Issue: how to introduce new capabilities into multiple existing ways of doing things?**

## Convergence



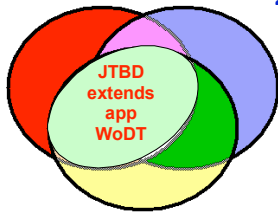
The answer is **not** to confine the proposed JTBD solution to the intersection of the ways of doing things!



- Device WoDT
- Application WoDT
- Domain WoDT

- **Extend a known WoDT**
  - Device: How are other problems approached on the same device?
  - Application: How does this application perform on other platforms?
  - Domain: What other jobs to be done are already familiar to the target audience?

## Convergence



- Device WoDT
- Application WoDT
- Domain WoDT

- **Extend a known WoDT**
  - **Device:** Is an analogous capability already provided in the “vocabulary”?
    - Copy/clone the WoDT
  - **Application:** Is a similar capability provided on a different platform
    - For this app somewhere else?
    - For a similar app somewhere else?
  - **Domain:** Insight into usage paradigm from other tasks or capabilities?
- **Use a familiar metaphor**
  - Unrelated application but familiar to everyone
  - Clone the essence, not the details

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

23

## More examples

- **Nintendo Wii**
  - Problem: Physical therapy is boring, requires PT to motivate, patient often lapses once sent home
  - Goal: “work on weight bearing and increasing coordination, increasing strength and stability, increasing fine and gross motor skills”
  - Why is the Wii special?
    - The body motions (WoDT) are essentially the same: you actually use the same physical movements
    - The controls are a fusion between existing controls and sports motions: Minimal learning.
      - Practice improves actual physical recovery or training, not just the game

May, 2008

© 2008 Alex Conn, APConsulting, LLC, All Rights Reserved

24

## **Additional Examples & Discussion**

---

**APConsulting, LLC**

---

**Questions?**