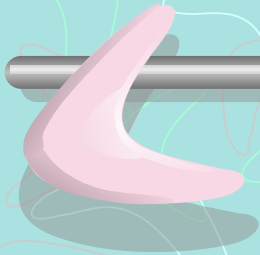


The System Metaphor *Explored!*



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Agenda

- Introduction
- What are metaphors?
- How do you find them?
- Why do you want them?
- What do you do with them?
- What are some issues?
- Wrap-up

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Icebreaker

- Each card has a 3-letter piece of a quotation
- Work together to arrange the cards to spell out the quotation
- (Two separate tables with two different quotes)

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Put each three-letter block on its own card (write large). Shuffle/scramble them. Make sure to keep the two quotations separate.

This game structure is one of Thiagi's frame-games, called "Chunks."

Might then explore who's in the room - programmers, customers, managers, etc.

First Quote

MET APH OR: _A_ FIG URE
OF _SP EEC H_W HIC H_M
AKE S_A N_I MPL IED _CO
MPA RIS ON_ BET WEE N_T HIN
GS_ WHI CH_ ARE _NO T_L ITE
RAL LY_ ALI KE.

Second Quote

THE _SY STE M_M ETA PHO
R_I S_A STO RY_ THA T_E
VER YON E—C UST OME RS,
_PR OGR AMM ERS ,_A ND_
MAN AGE RS— CAN _TE LL_
ABO UT_ HOW _TH E_S YST
EM_ WOR KS.



What Is a Metaphor?

- Dictionary definition: “Metaphor: a figure of speech which makes an *implied* comparison between things which are not *literally* alike.”
- XP definition: “The system metaphor is a story that everyone--customers, programmers, and managers--can tell about how the system works.” -- Kent Beck, *Extreme Programming Explained*



What Is a System Metaphor?

- Example: Call center as an assembly line
- “System of Names”
- Metaphors help with abstraction and modeling
- Who? Customer and programmers
- Every time? Yes, but...
- Solution or problem? Solution, but...



What *Isn't* a System Metaphor?

- System metaphor != user interface metaphor
- System metaphor != pattern
- System metaphor != full architecture

We don't mean e.g., the desktop metaphor ala Mac.
The metaphor only covers some aspects of architecture.



Why Do You Want a Metaphor?

- Shared vision
- Generativity
- Vocabulary and Naming
- Architecture

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Metaphor provides a framework and context for the project.



How Do You Find a Metaphor?

- Naïve metaphor [Literal metaphor]
 - “I’ve been speaking prose all my life”
Molière’s *Le Bourgeois Gentilhomme*
- Magic metaphor
- Brainstorming; immersion and stewing
- Combine metaphors
- Evaluate metaphors

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Naïve & magic metaphors: where you need help isn’t governed by the metaphor
“Naive metaphor” is term used in early XP literature; we prefer “literal” (or perhaps “direct”) as it’s naive in a restricted sense.

Magic metaphor isn’t constraining enough; a magic typewriter could do anything.
A mixed metaphor can work - e.g., combine a typewriter with cut and paste (literally).



Exercise: Brainstorm Metaphors

- Read your problem statement aloud
- Brainstorm some metaphors
 - Don't critique, just capture
 - Quantity now, quality later
 - Pursue wild ideas - have fun!
 - Let everybody participate
 - Build on each other's ideas

Brainstorming Exercise

- Have various topic areas for which to explore metaphors
- Put on cards, one or two per table

Brainstorm: Advisory Service

Create an advisory service that helps people make decisions about a variety of topics (like which is the best movie to rent or which appliance to buy). It should be based on expert guidance, opinions, and facts.

Brainstorm: Calendar

Create an online calendar that allows a person to keep track of their appointments. It should also allow people to view others' calendars and help in scheduling meetings with others.

Brainstorm: Marketplace

Create a system that allows people to buy and sell items and services to/from each other. The system should be usable by both buyers and sellers.

Brainstorm: Buying a House

Create a system to help in the purchase of a house. It can be focused on the real estate agent, a buyer, or a mortgage agent.

Brainstorm: Library System

Allow the user to obtain research materials. This can be done by searching the catalog of available materials, by obtaining inter-library loans of materials which are available elsewhere, or by requesting acquisitions.

Brainstorm: Checkbook

Create a program to help people keep track of their finances. It should help them eliminate errors and should allow tracking of income and expenses.

Brainstorm: Compiler/Translator

Create a program that translates from one language to another (could be between computer or human languages). Consider issues of real-time vs. batch translation.



Example: eBay®

- Store
- Auction
- Stock Market
- Bazaar
- More?



Debrief

- What happened?
- How did you react to it?
- How does this relate to real use?
- How will that affect what you do?

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Phone book example: look up by last name is easy, by first name is hard.



What Do You Do With a Metaphor?

- Shape the system
- Develop architecture
 - “4 key objects”
 - Naming
 - Patterns and interactions
- Guide cost decisions
 - Tradeoff matrix

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Phone book example: look up by last name is easy, by first name is hard.



Exercise: Score Card

- Create a matrix
 - Columns are the candidate metaphors
 - Rows are attributes of your problem or solution
- Score row by row (1 to n = worst to best)
- Add up columns
- Reach team consensus on best metaphor
 - Use scores for guidance



Example: eBay® - more like a bazaar?

	Auction	Store	Stock Mkt	Bazaar
1 buyer, many sellers				
Many buyers, 1 seller				
Many buyers, many sellers				
Requires inventory				
Fixed price				
Name your price				
Real-time				
Aggregation				
etc.				

Attributes: System Monitor

Create a system to monitor another system running in production. Describe which attributes are important to your system and score the following metaphors:

- EKG
- Graphic equalizer display (like on a stereo)
- Alarm

Attributes: Others?





Four Key Objects

- What are the “four key objects” implied by the metaphor?
- Does the way these objects interact guide you in the way your system interacts?
- “Iron-man” CRC



Exercise: Your Four Key Objects

- For each metaphor...
- Propose four key objects
- What do they say about what's important?
- Do they have an interesting interaction?



Examples

- **Store:** Item, Inventory, Cart
- **Auction:** Item, Bid, History, Buyer
- **Stock Market:** Agent, Pit, Board, Stock
- **Bazaar:** Stalls, Entrance





Issue: Bad Metaphors

- Bad metaphors
 - Misleading
 - Flat-out wrong
- But perfect is the enemy of good



Exercise: Garden Path

- Given system description and metaphor, and some potential system changes...
- Think of some ways this metaphor misleads you
 - about what's easy
 - about what's hard
- How could you fix it?

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Garden Path: EBay[®] as an Auction

Where does this metaphor lead you astray?

Garden Path: Word Processor as a Magic Typewriter

Where does this metaphor lead you astray?

Garden Path: Drawing Program as a Bitmap

Where does this metaphor lead you astray?

Garden Path: Online Marketplace as a Shopping Cart

Where does this metaphor lead you astray?



Some Answers from Others:

- **Store:** Shopping cart left unattended? Used books?
- **Microsoft Word®:** picture != character
- **EBay®:** Auction, bazaar, or other?





More Issues

- Limits of metaphors
 - **Unfamiliar:** e.g., if you don't know anything about double-entry bookkeeping, that metaphor won't help
 - **Too weak:** e.g., “paint” when you need “draw”
 - **Too strong** (lock-in) (“When you have a hammer...”): e.g., word processor trying to treat images like big characters
 - **Magic**
- Is XP without metaphors still XP?
- Evolving metaphors: based on new insights



Exercise: Popcorn

- When you catch the ball, propose a type of system and a metaphor for it. (Alternate colors)
- Toss the ball to someone who hasn't gone yet.
- If you draw a blank, pull one from the bag of tricks.
- We'll categorize at end





Summary

- The metaphor can guide system design, and intuitions about what's easy or hard to do.
- Identifying a metaphor is a creative process; it's not always easy, and the struggle is part of the value.
- Don't let a bad metaphor get in the way.
- A good metaphor is a treasure.



For More Information

- <http://c2.com/cgi/wiki?SystemMetaphor>
- *Designing Information Technology in the Postmodern Age*, R. Coyne
- *Extreme Programming Explained*, K. Beck
- *Extreme Programming Explored*, W. Wake
- <http://www.xp123.com>