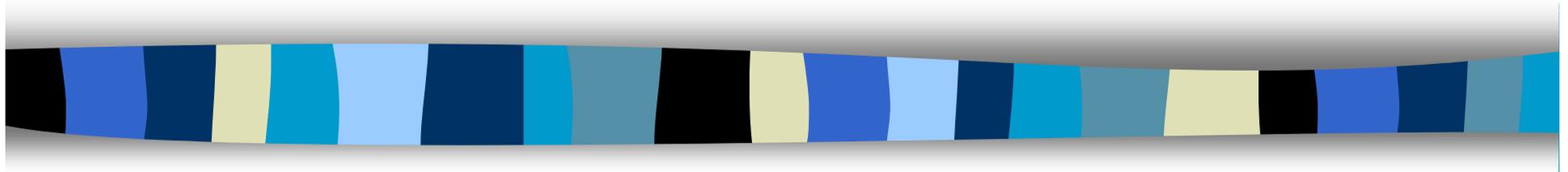


Metaphor Design Spaces



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XP 2003

Overview

- Why Metaphor Design Spaces (MDS)?
- What is a MDS?
- Why and how does a MDS help?
- How to apply a MDS?

Why Metaphor Design Spaces?

- Metaphors are a key element of Extreme Programming.
- Metaphors are useful to ...
 - ... facilitate communication.
 - ... identify key elements and their interactions.
- But they are the most discarded practice of XP. Why?
- It is often unclear how to ...
 - ... find the right metaphor.
 - ... use the metaphor to evolve the system architecture.

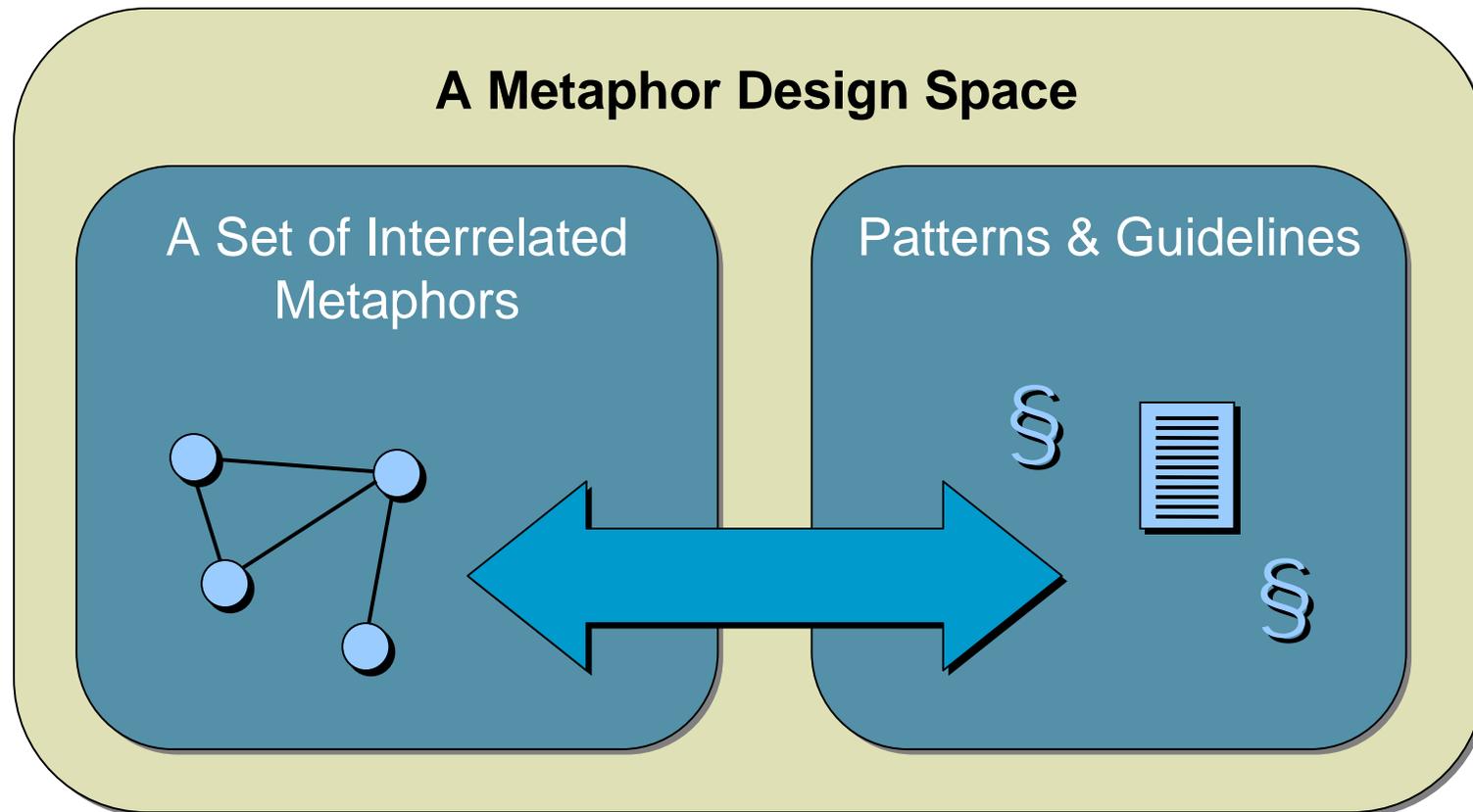
Finding Good Metaphors

- What makes a good metaphor?
- A metaphor should not be
 - too specific (then it is not a metaphor anymore)
 - too generic (then it is not of any use)
- It would be nice if we could get some guidance in finding the right metaphors.
- Why not reuse experience with metaphors that were previously successful?

What is a Metaphor Design Space?

- Metaphor Design Spaces are like toolkits or frameworks for metaphors:
 - They provide help for similar situations/problems.
 - They have to be concretized for an individual situation.
 - They abstract previous experience with successful metaphors (compare with design patterns).

What is in a Metaphor Design Space?

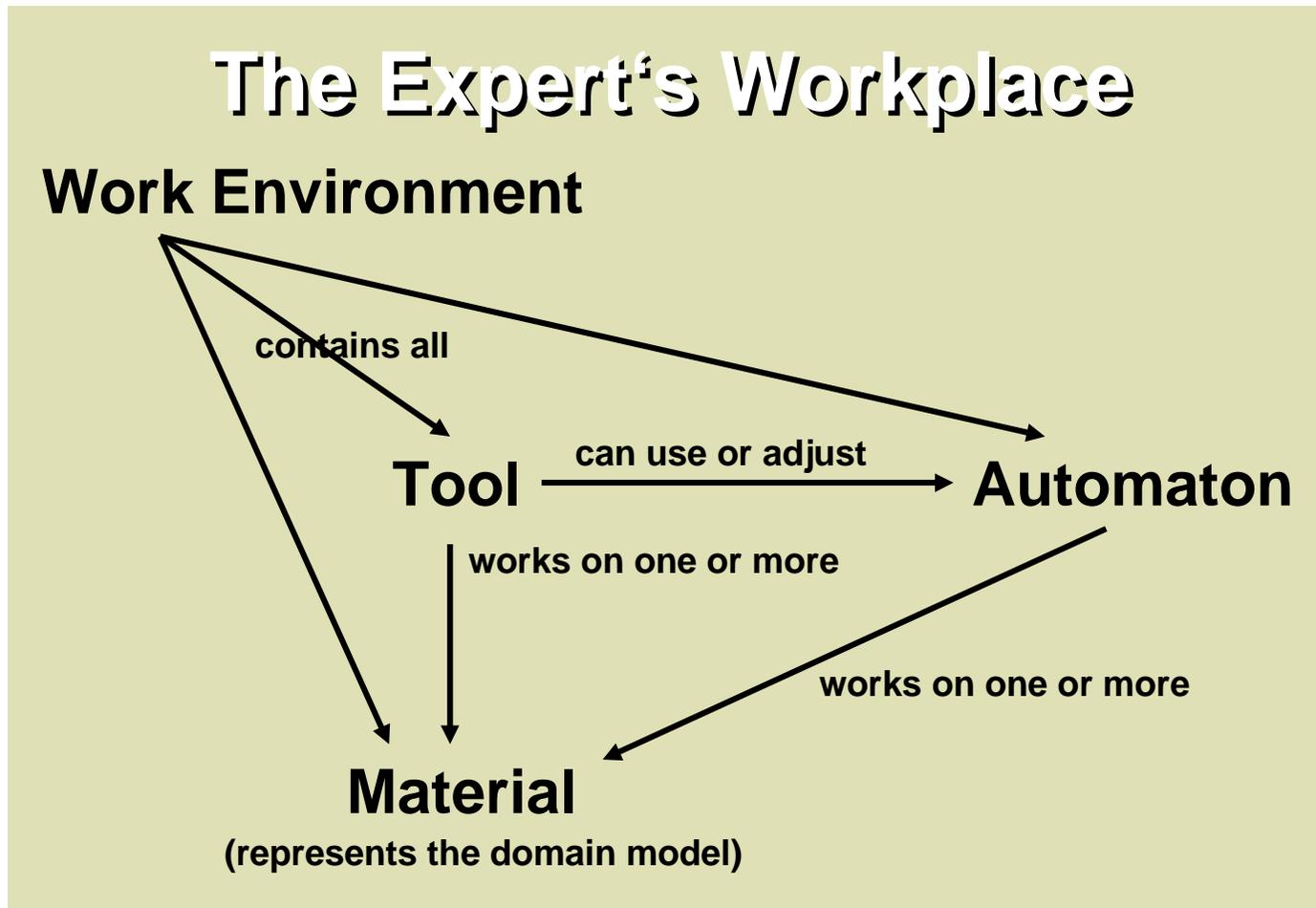


A Set of Interrelated Metaphors

- One part of a Metaphor Design Space is a set of interrelated metaphors.
 - The metaphors are focussed on a specific kind of work (or system)
 - e.g. interactive expert workplace systems
 - e.g. embedded production line system
 - The metaphors themselves are transferable.
 - they are not limited to a specific domain;
 - but to a specific kind of work.
 - The relationships between the metaphors are clearly described within the MDS.

Example Metaphor Set

- from the Tools & Materials Approach -



Example Metaphor Set

- Matching the Criteria -

- The metaphors are understandable:
 - we all have an intuitive idea what a tool is and what a material is.

- The metaphors are transferable:
 - most of the typical office work can be understood in terms of tools and materials.
 - we can map our work and the metaphors.

- The metaphors are specialized:
 - they mainly deal with highly situated work.
 - they seem not to be applicable to embedded real-time systems.

Example Metaphor Set

- Benefits -

- The metaphors help to create the structure of the system.
 - The system consists of a set of tools and materials working together.
 - The metaphors provide the basic vocabulary for the system, the elements the system consists of.
- The metaphors help to understand the system.
 - It is easy for users to understand the system's behavior in terms of tools and materials.
 - Materials are part of the work result.
 - Tools are used to view and manipulate materials.

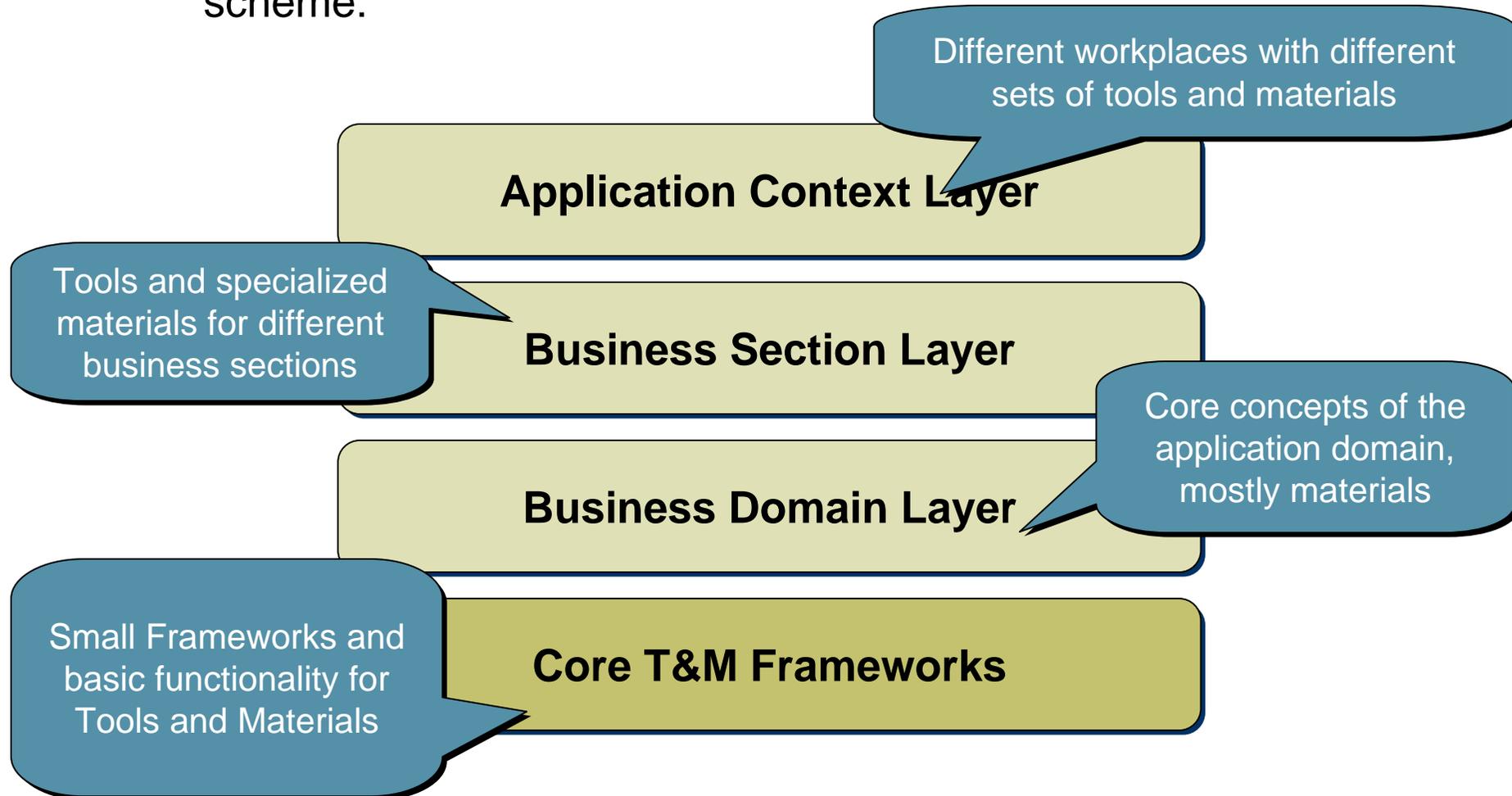
From the Metaphors to the Architecture

- The second part of a Metaphor Design Space is a set of guidelines and patterns to transfer the metaphors to concrete technical constructs.
- A Big Architectural Picture guides the developers how the architecture could look like.
 - e.g. layering techniques
 - e.g. basic client/server separation
- Patterns demonstrate how to realize the elements of the system that are motivated by the metaphors
 - e.g. design patterns
 - e.g. construction patterns

Example Guidelines and Patterns

- from the Tools & Materials Approach -

- The architectural big picture is reified using a special layering scheme:



Example Guidelines and Patterns

- from the Tools & Materials Approach -

- The patterns of a Metaphor Design Space provide common solutions how to construct systems using these metaphors.

- In the Tools & Materials approach:
 - e.g. patterns for tool construction, tool composition, tool handling
 - e.g. patterns for material construction, value objects

- They fit nicely into the pattern catalogue of Fowler's Enterprise Application Patterns:
 - e.g. Domain Model, Value Objects (materials)
 - e.g. MVC, Web Presentation (tools)
 - e.g. Service Layer, Mapping (services, used by tools)
 - ...

How to apply Metaphor Design Spaces?

- First question to answer is:
 - Does the Metaphor Design Space fit for my situation?
- If so, concretize the metaphors of the design space you chose
 - this is important to give them a more concrete meaning.
 - it customizes them for the current project and the concrete artifacts of the project's domain.
- Evolve your metaphors, if necessary.
 - Feedback -> evolve -> feedback -> evolve -> feedback -> evolve -> feedback -> ...

Example from a banking project

- Using the Tools & Materials Approach -

- Talk to the users and learn their language.
 - Leads to a common understanding of the user-relevant terms.

- Discuss the things they are using and how they are used by them.
 - Helps to understand typical tasks and basic concepts of the application domain, gives first impressions for materials.

- Transfer materials into the system and provide tools that supports the users tasks in an optimal way.

Example from a banking project

- Using the Tools & Materials Approach -

- Main goal:
 - universal banking workplace with integrated third-party products

- Concretized materials:
 - Product File, Product Description, Product Application Form, Customer, Selling Process Folder, ...

- Concretized tools:
 - Product Browser, Product Analyzer, Searcher, Application Checker, ...

Experiences using Metaphor Design Spaces

- We have used the Tools and Materials approach, which heavily builds on these metaphors, for about 10 years:
 - banking, insurance, car rental, health-care, ...
 - Product development, individual systems, enterprise application integration, ...

- Experiences:
 - provides a solid base for most of our projects
 - because we mainly build interactive workplace systems.
 - helps to exchange people among projects.
 - common thinking
 - eases communication between developers, users and among them.
 - architecture maps nicely on enterprise patterns.

Thank you for your attention !!!

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