Organizational Patterns The Foundations of Agile

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A Bit of History

- Sutherland: Dr. Dobb’s article was the final key
- Beck: Organizational patterns are one of the three influences on XP
Organizational Patterns: born out of a need for agility

- The ISO 9000 world of 1990 telecom
  - Process heaven: linear shelf decimeters of process documentation: the “Online Methodology” (OLM)
  - “Highly compliant” organization...
  - ... yet 80% of the work was being done under “documented waivers”
  - Employees outside earshot of ISO auditors would decry the OLM as a myth
- Our conclusion: Process guidance didn’t work
  - Premise: roles are more stable than process, and needn’t change
  - Focusing on roles and responsibilities allows the right things to happen

Patterns: Our Tool of Empiricism and Learning Processes

- A solution to a problem in a context
- Architectural patterns ideas first published by Alexander in 1977
- Look at issues of system structure, not just parts
- Build on proven practice, not just promising theories
- Have a central notion of the fundamental process:
  - 1. Find the weakest link
  - 2. Fix it locally by adding local structure
  - 3. If it is better, iterate. If not, undo it and try restructuring elsewhere
- It’s how organizations learn
What are Organizational Patterns?

- Solutions to organizational problems in a context
- First appeared in the Alexander + software context at PLoP in 1994 (Coplien, Whitenack); received with some skepticism
- Now, a growing body of knowledge

Or, a construct from anthropology, Kroeber:
  - Universal patterns: transcend cultures
  - Systemic patterns: have a common root in an ancient culture
  - Total culture patterns: give a culture its identity

*Patterns define culture*

Mining the Patterns: Work-life Role-Play

- Identify project roles
- Study subjects play roles
- Development scenarios drive role-play
- Capture interaction & coupling on CRC cards
- Social Network Analysis Tools
  - Organization Structure Visualization
  - Organizational Metrics
- Capture Trends as Generative Patterns
CRC Cards: Classes, Responsibilities, and Collaborators

Subsystem coord.

Validate MR lists
Build products
Administer ENVY
Resolve deps.

Subsystem coord.
Change committee
Designers
System test

Subsystem coord.
Change committee
Designers
System test
Organization Metrics

Agility is about communication
DISTRIBUTE WORK EVENLY

... an organization is working to organize in a way that makes the environment as enjoyable as possible and which makes the most effective use of human resources.

***

It is easy to depend on just a few people to carry most of the organization’s burdens. Managers like this because it minimizes the number of interfaces they need to manage. And some employees strive to do all they can out of a misplaced feeling of monumental responsibility. In fact, we find that PRODUCER ROLES tend to have stronger communication networks than other support roles.

But if this unevenness continues, it is difficult for a heavily loaded role to sustain the communication networks necessary to healthy functioning of the enterprise as a whole. Resentment might build between employees who don’t feel like they are central to the action, and the central people may easily burn out.

Define the communication intensity ratio as the ratio of the number of communication paths of the busiest role to the average number of communication paths per role. The organization has a problem if this ratio becomes too large.

Therefore: Try to keep the communication intensity ratio to two or less. (We have found that it isn’t easy to get much below two.) The easiest way to do it is to have FEW ROLES. It also helps to identify the PRODUCER ROLES and eliminate any deadbeat roles. You can also identify all the communication to the most central role and see which are really necessary. There may be ways to “brute-force” eliminate some of the communication, after you have identified it.
**DISTRIBUTE WORK EVENLY**

![Graph showing the distribution of work](image)

- **Number of Roles**
- **Communication Intensity Ratio**
- **QPW**
Patterns work together

- Like words in a language combine into sentences, you can combine patterns into an organization
- There are rules for putting patterns together
  - For example, TEAM PER TASK provides context for PROGRAMMING IN PAIRS
- However, there are many legal ways to put them together
  - ... because there are many kinds of organizations
- Building the process itself should be agile

Systems Thinking and Patterns

- Where to attack the problem?
  - Processes: the ISO 9000 story: too superficial; comes from structure
  - Organizational structure: deeper, manageable; comes from values
  - Values: Relate to organizational identity; very difficult to elicit
- How to attack the problem?
  - Local adaptation and piecemeal growth: impossible to master-plan
**Organizational patterns**

- Code Inspection
- Recommitment Meeting
- Unit Test
- Developer Controls Process
- Work Flows Inward
- Function Owner and Component Owner
- Architect Also Implements
- Individuals and Interactions
- Customer Contact
- Product Focus
- Embrace Change

**The Top Ten Org Patterns**

- **UNITY OF PURPOSE**
- **ENGAGE CUSTOMERS**
- **DOMAIN EXPERTISE IN ROLES**
- **ARCHITECT CONTROLS PRODUCT**
- **DISTRIBUTE WORK EVENLY**
- **FUNCTION OWNER AND COMPONENT OWNER**
- **MERCENARY ANALYST**
- **ARCHITECT ALSO IMPLEMENTS**
- **FIREWALLS**
- **DEVELOPER CONTROLS PROCESS**
Scrum by the Org Patterns

<table>
<thead>
<tr>
<th>Scrum in general</th>
<th>Few Roles, Producer Roles,</th>
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</thead>
<tbody>
<tr>
<td>Daily Scrum, Release Planning</td>
<td>Group Validation</td>
</tr>
<tr>
<td>Customer Demo</td>
<td>Engage Customers</td>
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<tr>
<td>Sprint Backlog</td>
<td>Someone Always Makes Progress</td>
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<tr>
<td>Burn-down Chart</td>
<td>Work Queue, Completion Headroom</td>
</tr>
<tr>
<td>Stop-the-Line</td>
<td>Recommitment Meeting, Take No Small Slips</td>
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<tr>
<td>Roles</td>
<td>Few Roles</td>
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<tr>
<td>Product Owner</td>
<td>Patron, Surrogate Customer</td>
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<td>ScrumMaster</td>
<td>Firewalls</td>
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<tr>
<td>The Team</td>
<td>Self-Selecting Team, Producers in the Middle</td>
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<tr>
<td>DONE</td>
<td>Take no small slips, Named Stable Bases</td>
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<tr>
<td>Multi-disciplinary Team</td>
<td>Holistic Diversity</td>
</tr>
<tr>
<td>Chickens and Pigs</td>
<td>Firewalls, Producer Roles</td>
</tr>
</tbody>
</table>

Scrum: Project Management Pattern Language

[Diagram showing relationships between concepts such as Community of Trust, Someone Always Makes Progress, Programming Episode, Completion Headroom, Take No Small Slips, Recommitment Meeting, Interrupts Unawaiting Blocking, Work Queue, Informal Labor Plan, Developer Controls Process, Firewalls.]
Scrum: Piecemeal Growth Pattern Language

Scrum: Organizational Construction Patterns
Conclusion

- Organizational Patterns capture Agile foundations
- Grounding in a decade of empirical research
- Be wary of trying Scrum before having “competencies” from the Org Patterns
- Patterns are an incremental, low-risk path to Agile adoption
Interesting On-Line Reading

- Sutherland, Jeff. SCRUM: Another way to think about scaling a project. 11 March 2003, on the web at Jeff Sutherland’s SCRUM Log. On how the Organizational Patterns work is the foundation of SCRUM. http://jeffsutherland.org/scrum/2003_03_01_archive.html

References and Online Resources

References, continued.


