

# Improving Software Development Organizations with Autochthony

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## Abstract

In this poster, we address the fact that development involves both the desire to achieve a shared vision and a willingness to deal with the parameters that constrain improvement. **autochthony** is an evolving empirical framework for assessing organizations and building patterns-based roadmaps toward their vision of the future.

**Categories and Subject Descriptors** D.2.9 [Software Engineering]: Management - *Life cycle, Programming teams, Software process models*

**General Terms** Management, Measurement, Documentation, Standardization

**Keywords** Systems thinking, readiness assessment, incremental improvement

## 1. Introduction

The contribution of this poster is to introduce **autochthony**, an evolving, experience-based methodology and framework for collaboratively assessing and designing an organization's future. It has been applied to software development and project management improvement efforts, as well as the creation of an enterprise business architecture practice. The significance of **autochthony** is that it centers the systems analysis, opportunity identification and organizational change activities involved in designing the future on nine aspects that profile the group's current state and suggest progressive improvement goals. It also postulates that the same nine-aspect internal structure is applicable to the other three dimensions that provide context for the organizational improvement effort – knowledge/process/know-how, product/service, and customer relationships. The fact that many agile principles and practices fit naturally into these dimensions and that a variety of pattern languages focused on organization, collaboration, experiential learning, customer interaction, and other relevant topics cluster around the same nine aspects lends credence to this assertion. The term "improvement" in this paper equates to development,

defined as "a collective learning process by which a social system increases its ability and desire to serve both its members and its environment." [1, p. 92]

Because the organization's context, input, output, and processes must together form a holistic purposeful human endeavor that aligns with the purposes of its members and the organization, **autochthony** relies on action research to guide the improvement effort. Action research is "a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview," [2] consistent with Reflective Systems Development [3, 4]. The use of pilot projects and centers of excellence as laboratories where apprenticeship and mentorship patterns can be applied was critical to the roadmap created for the software development organization whose experience informed this paper.

The name **autochthony** was chosen because its meaning, "formed or originated in the place where found, aboriginal, indigenous, native," [5] captures the optimistic view that the limitations and possibilities of every environment contain the seeds of improvement and require only discernment and nurturing to flourish. Thus, the environment is the ground for improvement, and the outcome is autochthonous because it was generated by the community out of their own particular circumstances.

## 2. Model

**autochthony** (<http://autochthony.pbwiki.com>) was originally intended to serve as a baseline scorecard profiling a client's software development organization's current developmental level against its potential if the system development lifecycle (SDLC) introduced the previous year had been fully embraced, implemented, measured, and adapted. As the engagement progressed, however, it transformed into a dynamic organizational improvement model that comprises a series of three triads (related to latency, synergy and throughput [1]), organizing nine aspects (related to authentic leadership zones [6]) into five levels each (analogous to the structure of other capability maturity models; e.g., CMM, Bootstrap, etc.).

The first triad (Culture in Table 1) deals with the organization's function – the way the organization's behavior is motivated by its history (reflected in language, rites and rituals), its purpose (reflected in vision, mission and values) and its intent (reflected in the specific way it provides value to its customers). The Culture triad is the repository of default assumptions and decision systems. The middle triad (Organization in Table 1) deals with the organization's structure which entails:

- definition of disciplines, capabilities, resources, and roles that practitioners can compose into value chains
- definition of collaboration patterns that integrate complementary practitioners with each other, with management, and with external resources
- definition of a decision-making system that brings together the right people at the right time for the right purpose with the information they need to advance the organization's production of quality software.

The third triad (Expression in Table 1) deals with how the group expresses its goals through the organizational structure by developing processes, associating resources with roles, and applying tools and methods to deliver value to the customer. Table 1 shows all the aspects by triad.

**Table 1. Aspects of autochthony**

|              |                                                                                                                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Culture      | History (Shared Heritage) emphasizes probing the historical background of the present situation                                                                                                              |
|              | Meaning (Shared Beliefs) emphasizes making sense out of chaos through co-creation and centeredness                                                                                                           |
|              | Intent (Shared Goals) emphasizes participatory direction-setting, framing the future, convergence                                                                                                            |
| Organization | Definition (Shared Composition) emphasizes developing the means to realize the organization's goals: ubiquitous language [7], relevant disciplines, competencies, and opportunities for practical experience |
|              | Integration (Shared Power) emphasizes creating ownership, participation, negotiation, empowerment                                                                                                            |
|              | Management (Shared Focus) emphasizes affirmation of core values, strategic planning, coherence between what is said and done, team structures that distribute decision-making power at all levels            |
| Expression   | Process (Shared Plan) emphasizes interconnected sustainable systems, allowing self-organizing teams to assign prescribed roles and responsibilities and build infrastructure                                 |
|              | Roles (Shared Responsibility) emphasizes applying core competencies and acquiring practical experience                                                                                                       |
|              | Tools & Methods (Shared Approach) emphasizes applying tools and methods in the context of acquiring practical experience                                                                                     |

### 3. Methodology

The methodology followed for evaluating the client's organization comprised the following steps:

- Interview 40 stakeholders from multiple areas and echelons of the organization over a 2-week period
- Analyze the aggregated notes to calculate the interviewees' rating of the organization, and create the **autochthony** profile
- Abstract common strengths and weaknesses, along with forces that inhibit improvement, from the notes
- Derive a list of opportunities, and define the cost of not pursuing the opportunities
- Using system-based guidelines that emphasize patterns, convert opportunities to a prioritized roadmap organized around the nine aspects, and categorized by role

- Assemble the highest priority recommendations into a balanced product backlog, and present to stakeholders

The recommendations centered on two major types of relationships: communities of practice and pilot projects/centers of excellence organized around major project types.

The client's initial efforts have so far produced:

- charters for the steering committee and initial pilot
- discipline leaders assigned to Requirements, Analysis and Design, Testing, Coding, and Quality Management
- the highest priority center of excellence
- baselined methodology for that technology portfolio
- increased participation by practitioners in creating the development case
- practitioner ownership of analysis and design discipline

### 4. Contribution

This research is expected to contribute a framework for assessing organizations against their own goals, presenting established improvement patterns in a consistent framework that allows them to construct value chains of patterns to be applied, reflected upon, improved, and re-assessed throughout the organization's lifetime. The fact that it has been applied successfully in several domains and that it is consistent with systems thinking, agile methods and action research methods makes it a viable candidate for application in human-centric organizations willing to involve all stakeholders in exchange for their contributions to continuous improvement.

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