Boosting Collective IQ
A Design for Dramatic Improvements in Productivity, Effectiveness, and Competitiveness

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The Bootstrap "Paradigm Map"

OBJECTIVE
High-Performance Organizations
The Bootstrap "Paradigm Map"

**APPRAOC**
Focus on the Capability Infrastructure

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The Bootstrap "Paradigm Map"

**APPRAOCH**
Whole-System Augmentation

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The Bootstrap "Paradigm Map"

**APPRAOC**
Pragmatic Co-Evolution

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COMPOUNDING ROI

Targeting Collective IQ
- Boosts Product Cycle
- Boosts Improvement Cycle

Collective IQ boosted by:
- Concurrently Developing
- Integrating &
- Applying Knowledge

CHALLENGE

Global Interoperability for collective use
The Bootstrap "Paradigm Map"

Objective
Continuous Improvement
Improvement Cycles
Improvement Community
Deployment Targets?

Capability Infrastructure
Augmentation System
Co-Evolution

Most Payoff
Investment Criteria
Improvement Infrastructure
Bootstrap Strategy

Open Hyperdocument System
Critical missing piece of the tool system

QUESTION
Best targets for deploying new capabilities?

ANSWER
Advanced Pilots especially within Networked Improvement Communities

Bootstrap Pardigm Map (PMAP1221.ppt)
Objective

Capability Infrastructure
Augmentation System
Co-Evolution
Most Payoff

Continuous Improvement

Improvement Cycles

Deployment Targets?
O H S
Global Interoperability
Collective IQ

RESULTS!
Smarter and Faster:
• Product Cycles
• Improvement Cycles
= Compounded ROI

Ever accelerating continuous improvement!

OBJECTIVE
High-Performance Organizations
Objective

- Coping with complexity and urgency collectively
- High performance
  - Individuals
  - Teams
  - Organizations
  - Regions
- Improvement Strategy
  - Boosting Collective IQ
  - Boosting Improvement Infrastructure
  - Networked Improvement Communities

The Bootstrap "Paradigm Map"

Objective

- Coping with complexity and urgency collectively
- High performance
- Improvement Strategy

Continuous Improvement

Improvement Cycles

Deployment Targets?

O H S

Global Interoperability

Approach

Focus on the Capability Infrastructure
Solving large-scale problems requires collective capability.

The Bootstrap "Paradigm Map"

**APPRAOCH**

- Whole-System Augmentation

<table>
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<th>Tool System</th>
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**Objective**

- Capability Infrastructure
- Augmentation System
- Most Payoff

**Improvement Cycle**

- Continuous Improvement
- Deployment Targets?
- O H S
- Global Interoperability

**Infrastructure**

- Investment Criteria
- Improvement Infrastructure
- Bootstrap Strategy
- Collective IQ

**Augmentation**

- Improvement Community

**Evolution**

- Continuous Improvement
- Improvement Cycle
- Deployment Targets?
- O H S
- Global Interoperability
- Collective IQ
The Bootstrap "Paradigm Map"

Objective
Capability
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APPRAOH
Pragmatic
Co-Evolution

The Co-Evolution Frontier
Where is your organization today?

20 Years
Anticipatable Today
Here?

The Co-Evolution Frontier
Or, is this more like it?

20 Years
Anticipatable Today

Tools System Improvement
Human System Improvement

Tools System Improvement
Human System Improvement
STRATEGIC QUESTION
What would yield the compounded ROI?

STRATEGIC TARGET
Faster, smarter "improvement cycles"
Simple Organizational Model

Objective

Capability

Infrastructure

Augmentation

System

Co-Evolution

Most Payoff

Investment Criteria

Improvement Infrastructure

Bootstrap Strategy

Collective IQ

Global Interoperability

O H S Deployment

Targets?

Improvement Community Improvement Cycles

Continuous Improvement

Showing explicit provision for improving product cycle

Improves A’s Capabilities

There should be a permanent "continuous improvement" B activity (as for TQM)
The Bootstrap "Paradigm Map"
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Improvement Community
Deployment
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Compounding ROI
Targeting Collective IQ
- Boosts Product Cycle
- Boosts Improvement Cycle

Investment Criteria
Improvement Infrastructure
Bootstrap Strategy
Collective IQ

The Goals of B and C Activities

A
Core Business Activity

B
Improves A's Capabilities

C
Improves B's Capabilities

Improving Product Cycle
Improving Improvement Cycles

Leveraging gains in collective IQ at multiple levels of the organization yields compounding ROI

Extra Bootstrapping Leverage

A

B

C

A's
Core Business Activity

B's
Improves A's Capabilities

C's
Improves B's Capabilities

Improving Product Cycle
Improving Improvement Cycles

Leveraging gains in collective IQ at multiple levels of the organization yields compounding ROI
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Collective IQ Boosted By:
Concurrently
Developing &
Applying Knowledge

Collective IQ:
How well people work collectively

Leveraging their collective...
• memory
• perception
• curiosity
• reasoning
• ingenuity
• experience
into applicable knowledge
Engaged in Basic Knowledge Processes

A Dynamic Knowledge Repository (DKR) emerges

Engaged in Basic Knowledge Processes

CONCURRENTLY:
- Assessing
- Digesting
- Integrating
- Collaborating
- Developing
- Applying
- Learning
- (Re)using

Useful Categorization of the Evolving Knowledge Base

CONCURRENTLY:
- Assessing
- Digesting
- Integrating
- Collaborating
- Developing
- Applying
- Learning
- (Re)using
Collective IQ Depends on CoDIAK

Concurrently Amplified by Interacting Knowledge Domains

The Bootstrap "Paradigm Map"
CHALLENGE
Global Interoperability for collective use

Example: Manufacturing Organization

Islands in a supplier hierarchy of a major aircraft program would be very costly
The Bootstrap "Paradigm Map"

- Objective
- Capability Infrastructure
- Augmentation System
- Co-Evolution
- Most Payoff

- Continuous Improvement
- Improvement Cycles
- Improvement Community
- Deployment Targets
- OHS
- Global Interoperability
- Collective IQ

Open Hyperdocument System
Critical missing piece of the tool system

OHS Technology
Boosting Collective IQ

Dynamic Knowledge Development

HUMAN SYSTEM

TOOL SYSTEM
OHS Enabling Technology

A collaborative hyperdocument environment
- Hypermedia for "real work"
- Unified knowledge capture and management
- Enhanced utilization of knowledge assets
- Enables concurrency, coordination, and collaboration
- Evolvable, interoperable, scalable, and integrative

OHS for Basic Collaborative Knowledge Work

- Structured
- Object linking
- Viewing
- Browsing
- Shared Screens
- Scripting

CoDIAK Example

OHS for Basic Collaborative Knowledge Work

- Structured Multi-Media Document
- Shared knowledge work environment
- Structured multi-media document

CoDIAK Example
**E-Mail Fully Augmented:**
- structured browsing, editing, filtering
- object level manipulation ...

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**OHS for Basic Collaborative Knowledge Work**

- Structured
- Object linking
- Viewing
- Browsing
- Shared Screen
- Scripting

CodIAK Example

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**Mail Draft**

To: terry.org
Cc: lane.org
Subject: Project Status

Message: Attach <Doc X>

Example: Posting a document in the Journal
Objective
Capability
Infrastructure
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CoEvolution
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Investment Criteria
Improvement Infrastructure Bootstrap Strategy
Collective IQ Global Interoperability
OHS Deployment
Targets?
Improvement Community Improvement Cycles
Continuous Improvement

Augmented Knowledge Workshop
Document Support
For Groups & Individuals
• Structure
  • View Control
  • Browsing
  • Object-level
  • Linking
  • Integrated Editor

AUGMENT is a text processing system designed for analyzing human authorship. We recognize explicitly that highly skilled authors have a great deal of expert knowledge in their field. In this regard, our design goal was to provide a set of tools that would assist individuals in studying another's work.

This paper concentrates upon the development of AUGMENT's authorship analysis tools. Many of AUGMENT's unique authorship support features are due to two basic requirements: (1) Many of the authorship analysis tools are based on a consistent set of addressing features. (2) Each of AUGMENT's addressing features provide a consistent set of addressing features.

AUGMENT employs explicitly structured files, known as markers.

CONTROLLING THE TOOLS
ADDRESSING THE WORKING MATERIALS
ADJUSTING THE VIEWS
EMBEDDING THE GRAPHICS
TRAVELING THROUGH THE WORKING MATERIALS
SUPPORTING MULTI-PARTY COLLABORATION
REFERENCES

For Groups & Individuals
• Structure
  • View Control
  • Browsing
  • Object-level
  • Linking
  • Integrated Editor

AUGMENT commands are expressed with a set of addressing features. The addressing features are implemented using a set of interacting commands. AUGMENT commands are expressed with explicit addressing features.
AUGMENT is a text processing system marketed by Tymshare for a multi-user network environment. In AUGMENT’s front-end is a User Interface System that facilitates flexible evolution of command languages and provides optional command recognition features. Exceptionally fast and flexible control of interactive operations is enabled by concurrent action of mouse and optional one-handed chord keyset. Files are hierarchically structured, and textual address expressions can flexibly specify any text entity in any file.

INTRODUCTION

FROM
- Tool-centric system
- Function-oriented tool/system
- Authoring and Publishing
- Isolated passive libraries and archives
- One user class: “easy to use”

TO
- Document-centric system
- Integrated end-to-end knowledge management environment
- Developing, integrating, & applying knowledge
- Active “living” libraries seamlessly integrated within the organization’s work processes
- Many classes of user: Pedestrian to high performance

OHS Represents a Paradigm Shift

OHS: to Support CoDIAK Work Processes and DKRs

AUTHORSHIP PROVISIONS IN AUGMENT
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Tymshare, Inc.
Cupertino, California 95014

ABSTRACT
AUGMENT is a text processing system marketed by Tymshare for a multi-user network environment. In AUGMENT’s front-end is a User Interface System that facilitates flexible evolution of command languages and provides optional command recognition features. Exceptionally fast and flexible control of interactive operations is enabled by concurrent action of mouse and optional one-handed chord keyset. Files are hierarchically structured, and textual address expressions can flexibly specify any text entity in any file.
OHS Represents a Paradigm Shift (cont.)

FROM
- File-level addressability
- "Load & scroll browsing" in WYSIWYG or outline view modes
- Windows tied to a file and to the application used
- Each application has unique file design

TO
- Object-level addressability
- "Precision browsing" jumping directly to any object in any file with on-the-fly custom views
- Windows are a portal onto a file repository; a variety of applications may be used on any file
- Applications use common file design

Potential OHS Applications
To Support and Integrate CoDIAK-intensive Work

- Program Management
- Collaborative Planning & Tracking
- Command and Control
- Concurrent Engineering
- Software Engineering (CASE)
- Acquisitions Support (DALS)
- CAI-Integrated Architectures
- Contracts Management
- World Wide Web (WWW)
- Records Management
- Digital Libraries
- Telecommuting
- Intranet Document Delivery
- Groupware/ICS
- Enterprise Integration
- Total Quality Management (TQM)
- Continuous Improvement
- Re-engineering
- Organizational Learning
- Distance Learning
- Digital Libraries
- Networked Improvement Communities
- etc...

The Bootstrap "Paradigm Map"
QUESTION
Best targets for deploying new capabilities?

Pushing the Frontier Requires Aggressive Co-Evolution

Increasing Organizational Capability
Mode 1
Increasing Organizational Capability
Mode 2

Objective
Capability
Infrastructure
Augmentation
System
Co-Evolution
Most Payoff
Investment
Criteria
Improvement
Infrastructure
Bootstrap Strategy
Collective IQ
Global Interoperability
O H S
Deployment Targets

Distribution of Capability throughout an Organization
Knowledge Capability Level

Increasing Organizational Capability
Mode 3

Mode 3
Increasing Organizational Capability

Mode 4
Increasing Organizational Capability

The Bootstrap "Paradigm Map"

ANSWER

Advanced Pilots especially within Networked Improvement Communities
Bootstrap Pardigm Map (PMAP1221.ppt)
The Bootstrap "Paradigm Map"

Objective  Capability  Augmentation  Co-Evolution  Most Payoff
Continuous Improvement

Improvement Cycles

Improvement Community

Networked Improvement Community

RESULTS!
Smarter and Faster:
- Product Cycles
- Improvement Cycles

= Compounded ROI

Ever accelerating continuous improvement!
The Bootstrap "Paradigm Map"

Objective
Continuous Improvement
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Continuous Improvement
- Coping with complexity and urgency collectively
- High performance
- Improvement Strategy

Objective
Capability Infrastructure
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Improvement Infrastructure
Bootstrap Strategy

HUMAN System
Paradigms
Organizations
Procedures
Customs
Methods
Language
Skills
Knowledge
Learning
Affiliates

TOOL System
Facilities
Media
Tools
Machinery
Vehicles
etc.

Continuous Improvement
Improvement Cycles
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Step-Wise vs. Compounded ROI

Investment Criteria
Improvement Infrastructure
Bootstrap Strategy

Improvement Cycles
Deployment Targets?
O H S
Global Interoperability
Collective IQ

STRATEGIC QUESTION
What would yield the compounded ROI?
The Bootstrap "Paradigm Map"

- Objective
- Capability
- Augmentation System
- Co-Evolution
- Most Payoff
- Improvement Cycle
- Improvement Community
- Deployment Targets
- O H S
- Global Interoperability
- Collective IQ

- Continuous Improvement
- Improvement Cycles

- Improvement Community
- Co-Evolution

Interacting
Scanning
Ingesting
External Environment

- Integrating
- Developing
- Improving
- Applying
- Assessing

CONCURRENTLY:
- • Developing
- • Integrating
- • Assessing

Bootstrap Strategy

- Improvement Infrastructure
- Investment Criteria
- Improvement Infrastructure
- Bootstrap Strategy
The Bootstrap "Paradigm Map"

Objective → Capability Infrastructure → Augmentation System → Co-Evolution → Most Payoff

Continuous Improvement

Improvement Cycles

Deployment Targets? → O H S → Global Interoperability → Collective IQ

Networked Improvement Community

Improvement Alliance → Collaborative "C" Activities

Investment Criteria → Improvement Infrastructure → Improvement Alliance → Bootstrap Strategy

RESULTS!

Smarter and Faster:
• Product Cycles
• Improvement Cycles

= Compounded ROI

Continuous Improvement

Ever accelerating continuous improvement!