THE FUTURE OF QUALITY
A NEW VISION

Thomas Pyzdek

ANTICIPATION

ANTICIPATION

- Control by a central mind

- Predict and prevent potential dangers before damage is done

- Preserve stability

- The less fluctuation, the better

- Goal: prevent failures

- Bug-chasing at BayBank

RESILIENCE

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RESILIENCE

Experimentation

- Try a lot of things and keep what works
- Premise: there is always a better way
- Goal: many failures

The edge of chaos

Interleaf versus Microsoft

EFFICIENCY

Hallmarks: order and simplicity

MODEL OF EFFICIENCY:

bacteria

BUSINESS EXAMPLE:

sucker rod manufacturing

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CREATIVITY

CREATIVITY

Hallmarks: messiness and simplicity

SLOPPINESS, POOR FIT, QUIRKY DESIGN, REDUNDANCY

- Evolution of hearing

SLACK

- Many great thinkers did their best work when they had time off
- Ford's efficiency expert
- Why Deming loved monopolies

COMPLEX ADAPTIVE SYSTEMS

CAS

1 **Order without control**

2 **Interacting agents described by rules**
- Firms, species, neurons

3 **Complexity "emerges"**
- Free economies
- Ecosystems
- The brain

THE CONTROL PARADOX

The fatal conceit

Who plans America?

- No one
- Everyone

Nucor Vs. Big Steel's HQ

Control discourages adaptation

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                    │   BIGGEST BOSS   │
                    └────────┬─────────┘
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│  BIG BOSS    │    │  BIG BOSS    │    │  BIG BOSS    │
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ADAPTIVE AGENTS

Defined by performance rules

- Detectors: filter information from their environment
- Effectors: actions taken in response to information processing

Adapt by discovering new rules

MECHANISMS OF CAS

Tagging

Internal models

- Tacit
- Overt

Building blocks

PROPERTIES OF CAS

Aggregation   **Nonlinearity**   **Flows**

Multiplier effect

PROPERTIES OF CAS

Diversity

- **Convergence**
- **Mimicry**

GENETIC LEARNING

GENETIC LEARNING

1

Knowledge encoded in a schema of rules

Rules modified by experience (learning)
- Six sigma black belt helpful, but not required!

Knowledge shared through intercourse
- Sexual or social sharing
- Crossover
- Mutation

The Prisoner's Dilemma Game

		AGENT 1	
		Cooperate	Defect
AGENT 2	Cooperate	$3, $3	$0, $5
	Defect	$5, $0	$1, $1

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GENETIC LEARNING

Evolving strategy **VS** planning strategy

c d c   c d   d c   c

. . .

d d d c c   d d c

Play 64 times, with 20 players, "mate" winners. Repeat 151 times.

c d c c d d c c   c d d c d d c c

Crossover and Mutation

d d d c c d d c   c d c c d d d **d**   "Mutant"

W W W . P Y Z D E K I N S T I T U T E . C O M

CULTIVATION TECHNIQUES

Landscape Theory

- Aggregation building within organizations
- Groups highly compatible agents
- Determines which configurations are stable

Norm building techniques

- Creating internal models among agents
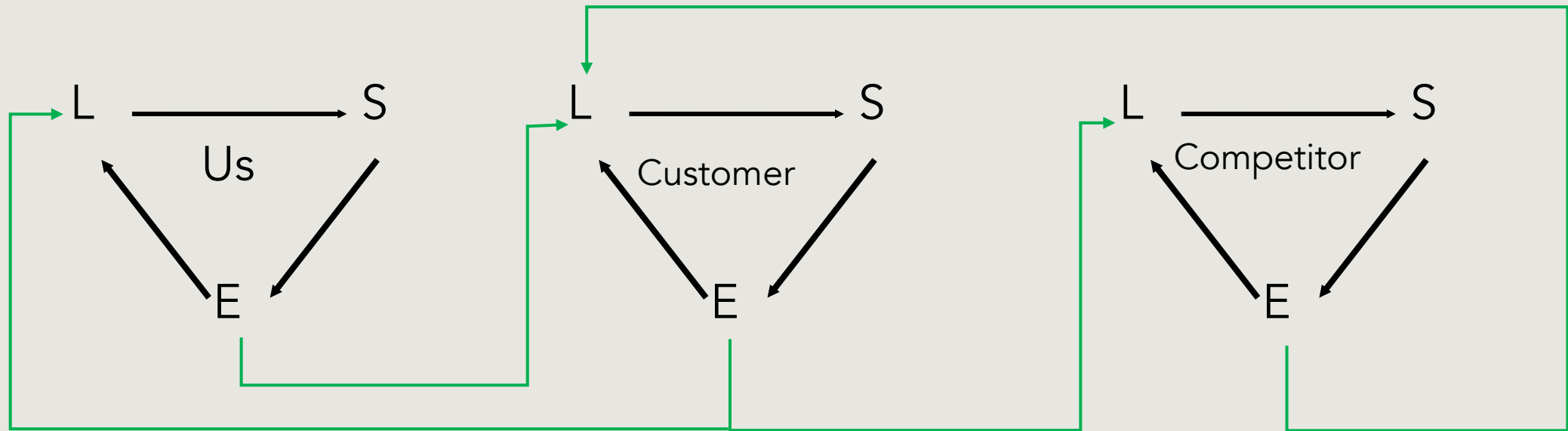- Aids in tagging and aggregation
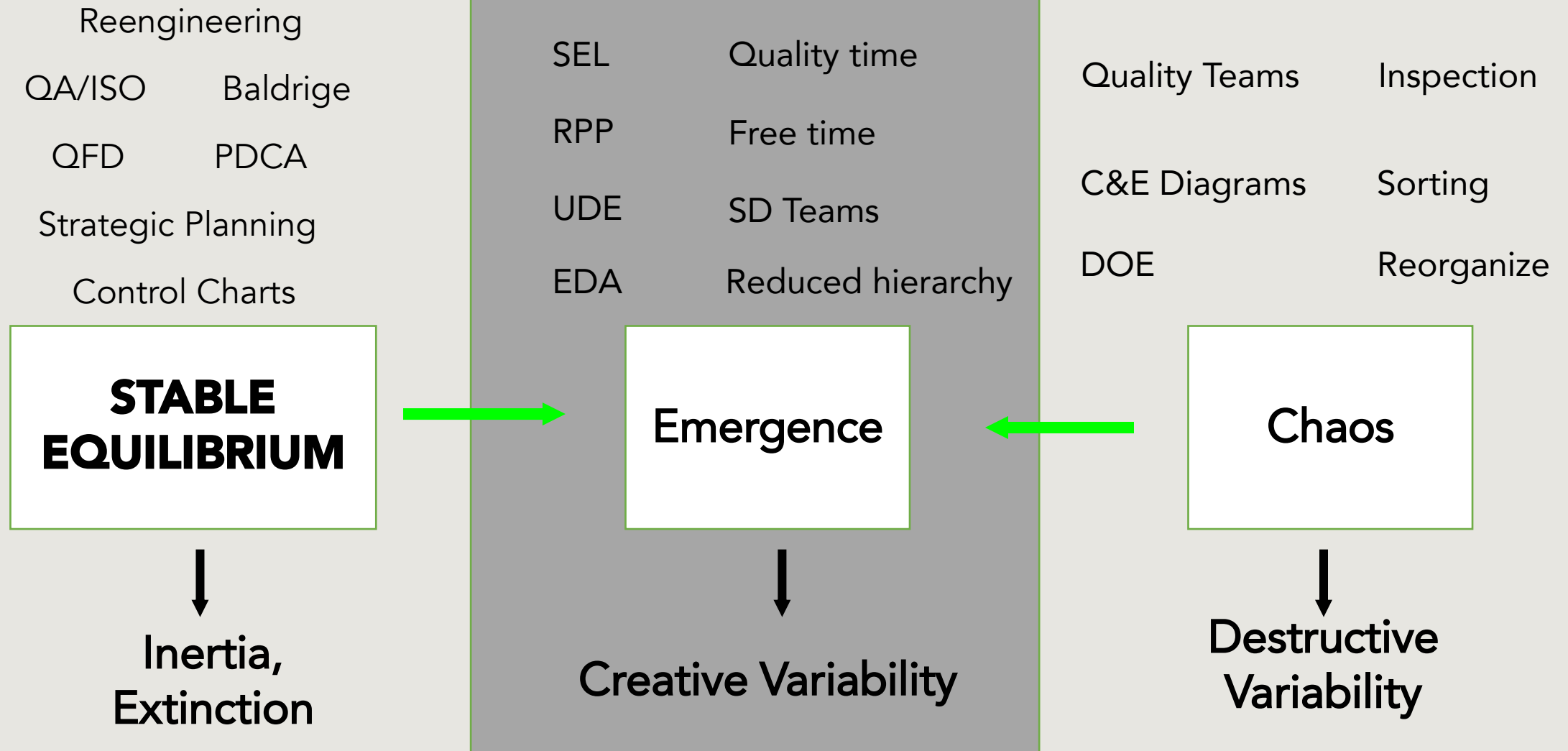
WHAT CAN QUALITY PROFESSIONALS DO?

- Challenge assumptions, admit mistakes

- Develop resilient approaches to quality

- Tolerate variation, failure, redundancy, slop

- Value individuals as well as groups

- Use special knowledge to accelerate learning

DYNAMIC SEL MODEL

Reengineering

QA/ISO   Baldrige

QFD   PDCA

Strategic Planning

Control Charts

SEL	Quality time
RPP	Free time
UDE	SD Teams
EDA	Reduced hierarchy

Quality Teams   Inspection

C&E Diagrams   Sorting

DOE   Reorganize

STABLE EQUILIBRIUM → **Emergence** ← **Chaos**

↓   ↓   ↓

Inertia, Extinction   Creative Variability   Destructive Variability

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