Institute for Healthcare Improvement
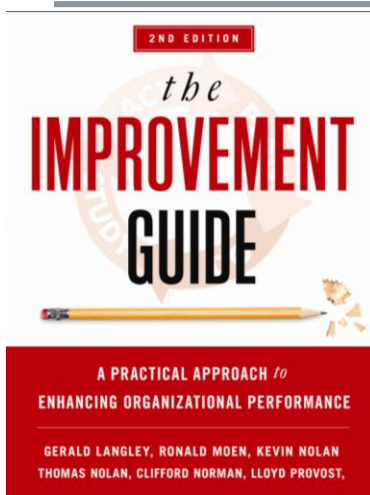
Oregon Health Authority

Improvement Science *in Action*

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The Science of Improvement

2ND EDITION

the **IMPROVEMENT GUIDE**

A PRACTICAL APPROACH *to* ENHANCING ORGANIZATIONAL PERFORMANCE

GERALD LANGLEY, RONALD MOEN, KEVIN NOLAN
THOMAS NOLAN, CLIFFORD NORMAN, LLOYD PROVOST,

Science (from the Latin *scientia*, meaning knowledge) is defined in *Webster's New Collegiate Dictionary* as "knowledge attained through study or practice."

Science refers to a system of acquiring knowledge of the physical world. This system must be based on observable phenomena and capable of being tested through the scientific method for its validity.

Acquiring knowledge is essential for improvement activities, whether it is a simple problem to solve, a work process to improve, a design or redesign of a product or service, or improvement to a complex system**.**

Session Objectives:

- **Recall and identify some key components of Deming's System of Profound Knowledge (SOPK):**
  - Systems
  - The Human Side of Change
  - Variation and
  - Knowledge
- **Identify relationship between Subject Matter Knowledge and Profound Knowledge in achieving improvement**
- **Begin to apply the SOPK to your projects**

Deming's System of Profound Knowledge

"The aim of this chapter is to provide an outside view – a lens – that I call a system of profound Knowledge. It provides a map of theory by which to understand the organizations that we work in."
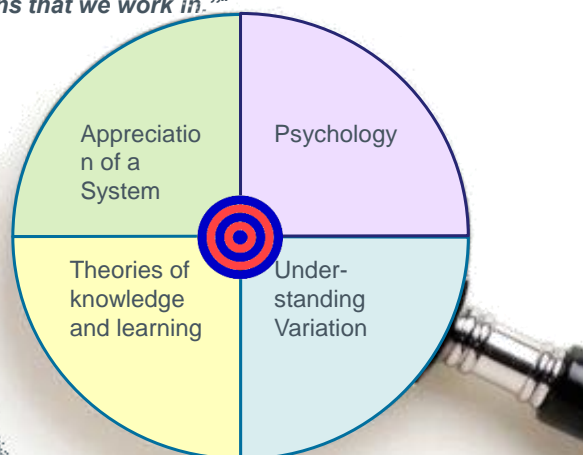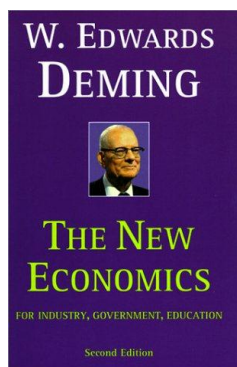
Components of the
System of Profound Knowledge

- Appreciation of a System

  What is a system? What is our system? How can we start to understand system interactions and use this knowledge for improvement?

- Psychology

  People are part of the system. How do we understand and value differences? How can we best approach involving people in change?

- Understanding Variation

  How should we interpret and act on the variation that continually occurs in every system?
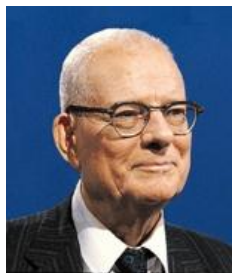
- Theory of Knowledge

  How do we learn? What are the theories to improve the system and how do we test those theories?

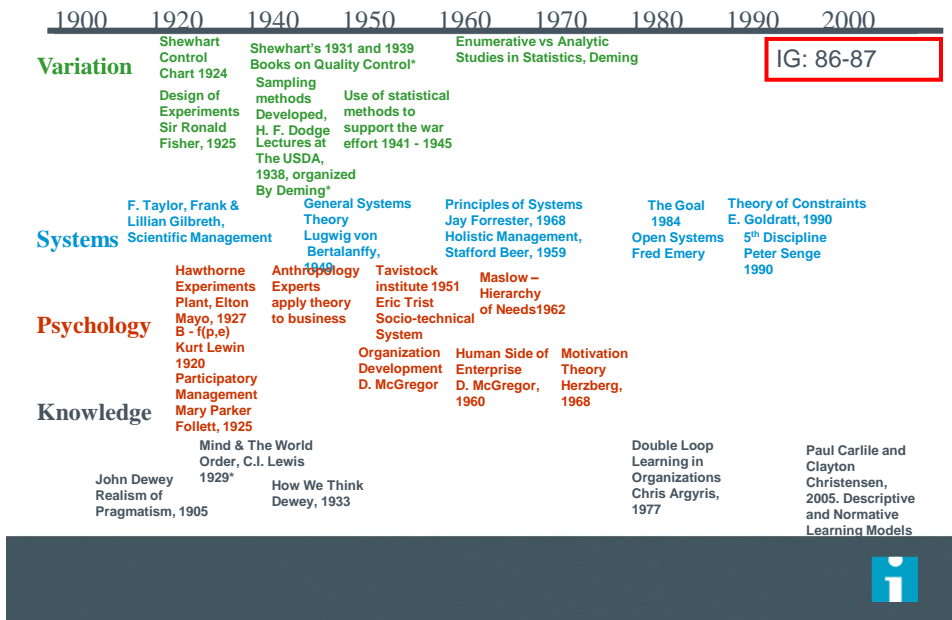## Deming's System of Profound Knowledge

"One need not be eminent in any part of profound knowledge in order to understand it and to apply it. The various segments of the system of profound knowledge cannot be separated. They interact with each other. For example knowledge about psychology is incomplete without knowledge of variation."
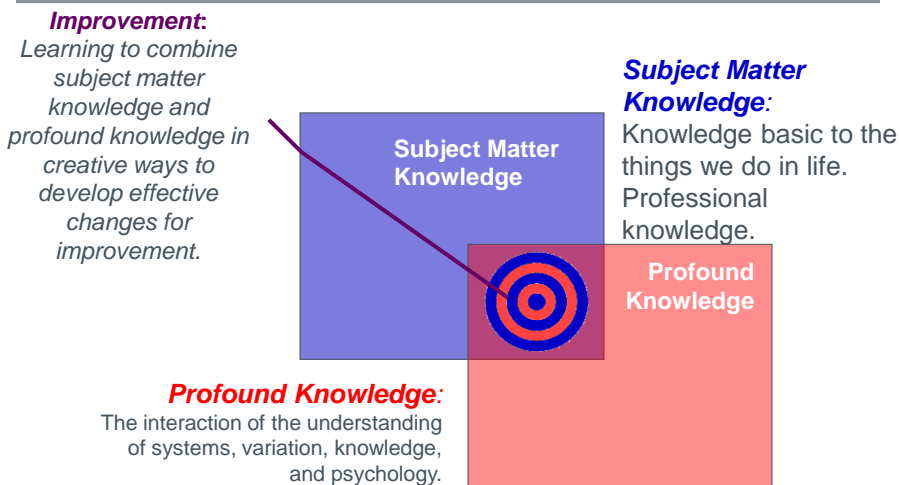
Profound - having intellectual depth and insight (Webster)

Development of Profound Knowledge

	1900	1920	1940	1950	1960	1970	1980	1990	2000

Variation

Shewhart Control Chart 1924

Shewhart's 1931 and 1939 Books on Quality Control*

Enumerative vs Analytic Studies in Statistics, Deming

IG: 86-87

Design of Experiments Sir Ronald Fisher, 1925

Sampling methods Developed, H. F. Dodge Lectures at The USDA, 1938, organized By Deming*

Use of statistical methods to support the war effort 1941 - 1945

Systems **Scientific Management**

F. Taylor, Frank & Lillian Gilbreth,

General Systems Theory Lugwig von Bertalanffy, 1940

Principles of Systems Jay Forrester, 1968 Holistic Management, Stafford Beer, 1959

The Goal 1984 Open Systems Fred Emery

Theory of Constraints E. Goldratt, 1990 5th Discipline Peter Senge 1990

Psychology

Hawthorne Experiments Plant, Elton Mayo, 1927 B - f(p,e) Kurt Lewin 1920 Participatory Management

Anthropology Experts apply theory to business

Tavistock institute 1951 Eric Trist Socio-technical System

Maslow – Hierarchy of Needs1962

Organization Development D. McGregor

Human Side of Enterprise D. McGregor, 1960

Motivation Theory Herzberg, 1968

Knowledge

Mary Parker Follett, 1925

Mind & The World Order, C.I. Lewis 1929*

Double Loop Learning in Organizations Chris Argyris, 1977

Paul Carlile and Clayton Christensen, 2005. Descriptive and Normative Learning Models

John Dewey Realism of Pragmatism, 1905

How We Think Dewey, 1933

Knowledge for Improvement

Improvement:
Learning to combine subject matter knowledge and profound knowledge in creative ways to develop effective changes for improvement.

Subject Matter Knowledge

Profound Knowledge

Subject Matter Knowledge:
Knowledge basic to the things we do in life. Professional knowledge.

Profound Knowledge:
The interaction of the understanding of systems, variation, knowledge, and psychology.

Systems

Systems Team - 6 Min teaching time

- **Improvement Guide Pages. 77-79**
- Please teach us (orient us to IG pages please):
  - What is a system?
  - What are some key system principles?
  - What does an understanding of systems have to do with improvement?
- Please share specific example(s) of how understanding of systems will be useful with IA work. What ideas, scoping, approaches, interactions, issues will it help with?
- IAs take notes on SOPK worksheet

Knowledge

Knowledge Team - 6 Min teaching time

- **Improvement Guide Pages. 81-83**
- Please teach us (orient us to IG pages please):
  - What are some key principles related to gaining knowledge?
  - How do we learn and gain knowledge in improvement efforts?
- Please share specific example(s) of how understanding of knowledge portion of the SOPK will be useful with IA work. What ideas, approaches, work will it help with?
- IAs take notes on SOPK worksheet

Variation

Variation Team - 6 Min teaching time

- **Improvement Guide Pages. 79-81**
- Please teach us (orient us to IG pages please):
  - What are some key principles of variation?
  - How does understanding variation relate to improvement?
- Please share specific example(s) of how understanding of variation portion of the SOPK will be useful with IA work. What ideas, approaches, work will it help with?
- IAs take notes on SOPK worksheet

Psychology

Psychology Team - 6 Min teaching time

- **Improvement Guide Pages. 83-85**
- Please tell colleagues which page in IG to turn to
- Please teach us (orient us to IG pages please):
  - What is psychology?
  - What are important contributions in psychology?
  - What role do assumptions play in our interactions?
  - What issues of psychology do we find in our improvement work?
- Please share specific example(s) of how understanding of psychology will be useful with IA work What ideas, approaches, issues will it help with?
- IAs take notes on SOPK worksheet

Exercise: Application of Profound Knowledge to Project

What insights might be obtained by looking at your project through the Lens of Profound Knowledge?

14 Min Total

1. **Each personally <u>individually</u> look at the project through the 4 parts of the lens (6 min). How does it apply to project? What do you need to be alert to? What opportunities? What do differently?**

2. **Share your insights with the team and capture composite of learning (8 Min):**
   1. **Each briefly share insights with your table team**
   2. **Table nominates 1 person to share with others in room**

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Variation:

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