

Following Old Paths or Charting New Territory?

An Antidote for: “We Have Always Done it This Way!”

Jim Bensen, President Emeritus
Bemidji State University

Following The Foot Steps of Others.

There is an ancient story of the “calf path”, where one day a young calf wanders across the hillside in search of fresh water and “greener pastures”. Soon others follow in his tracks and the grass gets trampled down. The tracks eventually become a cow path, gradually other animals and humans trek along, broadening the surface and widening way. The early path becomes “habitual” and emerges into a trail, the trail becomes a road and “low and behold” the early random wanderings the calf influences where people and commerce travel for generations to come!

Creatures of Habit.

As human beings we become creatures of habit very quickly. People get into routines, sit in the same places, drive the same routes, and approach their tasks in the way they did them yesterday. We get caught up in these routines because it is easier that way. We do things without thinking about alternatives or better ways. Thinking, thinking, always thinking, but always in the same way!

The Antidote: A New Meaning to Positive Thinking!

To break out of our “lockstep past” and chart new territory for ourselves we need to embrace a fresh and purposeful way of thinking. We often hear of people who think outside the box, are a “fountain of ideas”, are imaginative, or “are so creative”. Thinking differently and with purpose is no accident.

If we understand the “process” of thinking and realize that we can teach others this process, our challenges can become opportunities and our losses can become gains. The “twin forces” found in the “methods” or processes of science and technology are tremendous tools to serve us in our work. Science and technology are very different yet each in their own way is critically important to driving the change and providing us with a competitive edge.

Scientific Thinking and Work. (To Know That)

Scientific work is motivated by cognitive or theoretical interest and it answers the question “to know that”. We utilize the “scientific method” of discovery and are guided by systematic rules of inquiry. Scientific work must be able to be replicated by others. The outcomes of science are theoretical knowledge in the forms of theories and laws. The “scientific method” would focus on a process as follows:

SCIENTIFIC METHOD

State the question

Develop hypothesis

Conduct experiment
to test the hypothesis

Observe phenomena/
gather data/draw inferences

Build theory/state laws/
replicate previous work

Technological Thinking and Work. (To “Know-How”)

Technological work is motivated by pragmatic or instrumental interest and the aim is “know-how”. The means to achieve technological work uses the methods, tools, and skills that are characteristic of invention. This work is guided by theoretical knowledge and effectual practice. The outcomes of this work is in the form of systematized rules, so that if we follow the engineering (as a verb) process we use “know-how” and things can be done. The technological method would focus on a process as follows:

TECHNOLOGICAL METHOD

Identify a want or need
(Imagination/ideation)

Design/develop/invent/
model/innovate/problem solve/
test/retrofit/create/
engineer (as a verb)

Develop solution(s)

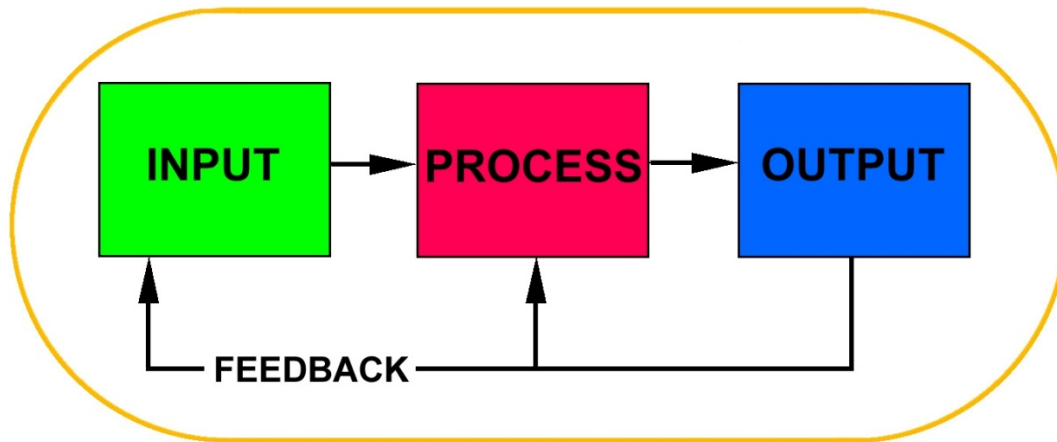
Intellectual property in the form of
patents/licenses/copyright (if appropriate)

Systematic Technical Work: (To Do)

Science and technology, (technology as in the form of engineering), are traditionally formatted in disciplines. However, both science and technology must come together systematically when we perform technical work where the aim is

“to do”. We can not rely on behavior and actions that are “random”, but rather we work systematically where there is continuous improvement. The universal systems model is the “method” of creating and doing things.

UNIVERSAL SYSTEMS MODEL



This work is motivated by practical or productive interest and we use the methods, tools, and skills characterized by production. We are guided by systems of prescribed rules, or even rule of thumb. The outcome is in the form of things done or produced. A synthesis model is provided to illustrate how scientific, technological and technical work inter-relate. This matrix was developed in the doctoral research of Dr. Stanley Kasprzyk at Michigan State University.

Characteristics of Scientific, Technological and Technical Work

FORMS OF WORK	AIMS		MEANS		CONSEQUENCES
Scientific work	Motivated by a cognitive or theoretical interest	To know that...	Methods, tools, and skills characteristic of discovery	Guided by systematic rules of inquiry	Theoretical knowledge in the form of theories and laws
Technological work	Motivated by a pragmatic or instrumental interest	To know how...	Methods, tools, and skills characteristic of invention	Guided by theoretic knowledge and effectual practice	Instrumental knowledge in the form of systematized rules
Technical work	Motivated by a practical or productive interest	To do or produce...	Methods, tools, and skills characteristic of production	Guided by systems of prescribed rules, or rule-of-thumb	Things done or produced

S. Kasprzyk

The power of the possible!

It is acknowledged that we can't follow the "calf-path" of the past and stay relevant and prosperous in our future. With many fields of knowledge (both to "know that" and to "know-how") exploding at an exponential rate, it is imperative that we "chart new territory for tomorrow! Educators, (from preschool on to graduate school), business, government, and community leaders need to embrace the study of technology from a "systems" approach and in doing so we will all participate in a better tomorrow! We can and must step out boldly, claim our destiny and chart new territory!

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