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Any significant human capability utilizes an Augmentation System within which trained and conditioned "augmented humans" can exercise that capability.

C3

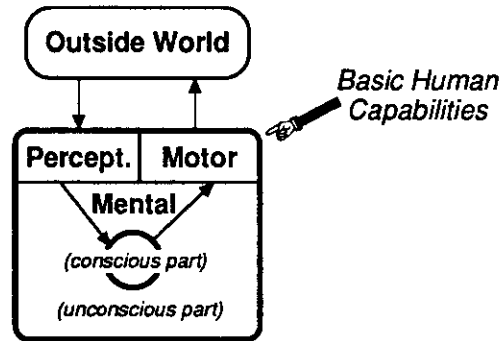
DEFINITIONS

augment (Websters) to make greater, as in size, quantity, strength, etc.; enlarge.

augment (DCE) to boost our capability infrastructure through the explicit co-evolution of human and tool systems.

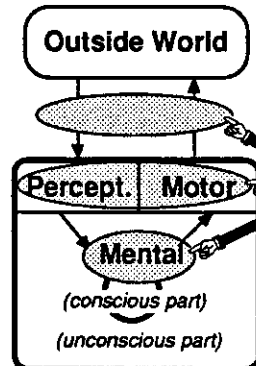
C4

STARTING TO THINK ABOUT HIGH PERFORMANCE: BEGIN WITH BASICS



C5

BUT OUR BARE MENTAL-MOTOR PERCEPTUAL MACHINERY CAN'T DO MUCH BY ITSELF

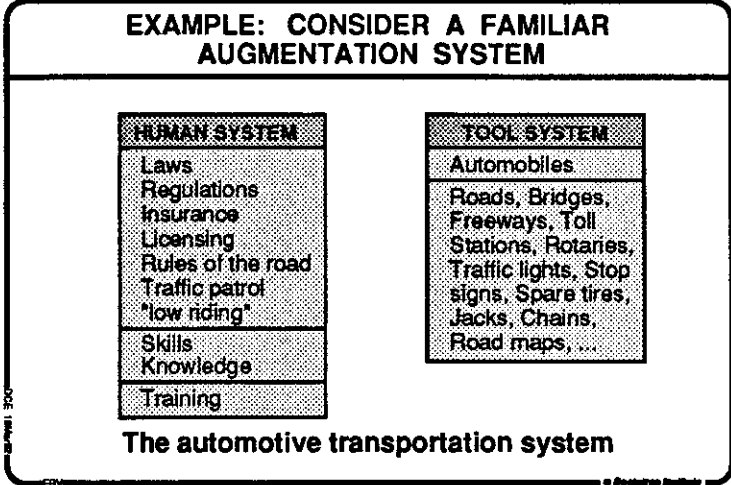


How could human's tiny grasp cope with large tasks and problems?

Human societies had to augment our basic human capabilities by developing a complex system of language, customs, tools, and methods.

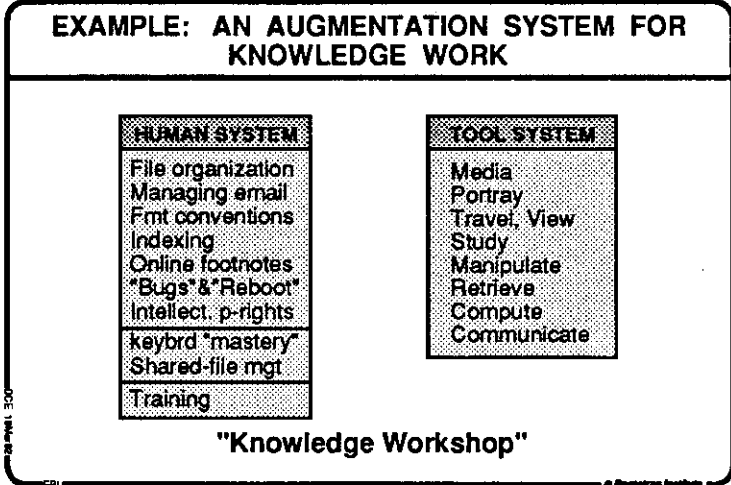
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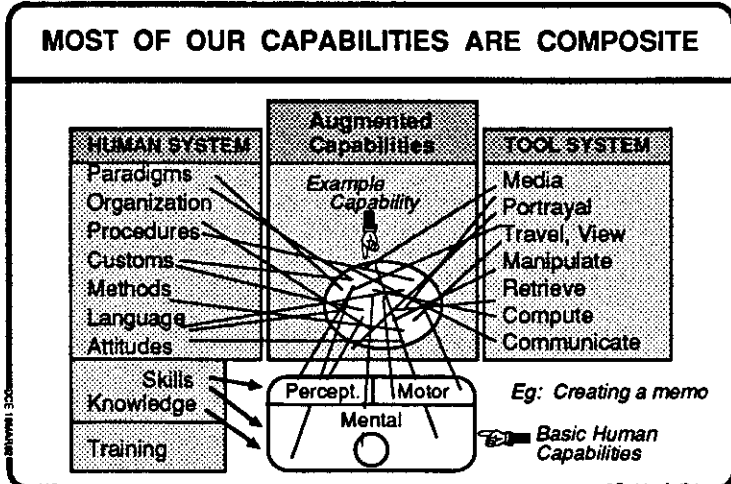
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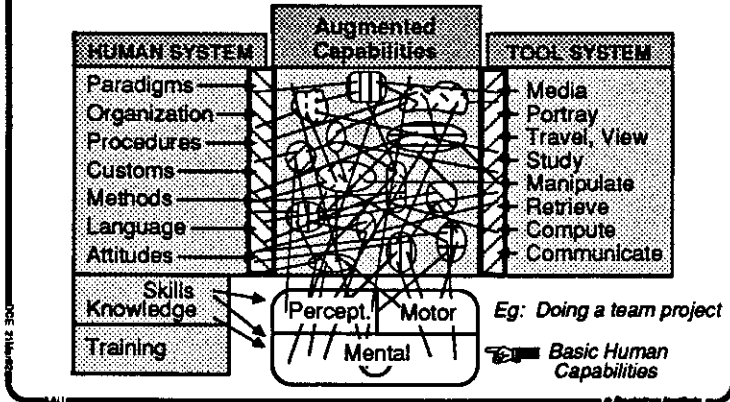
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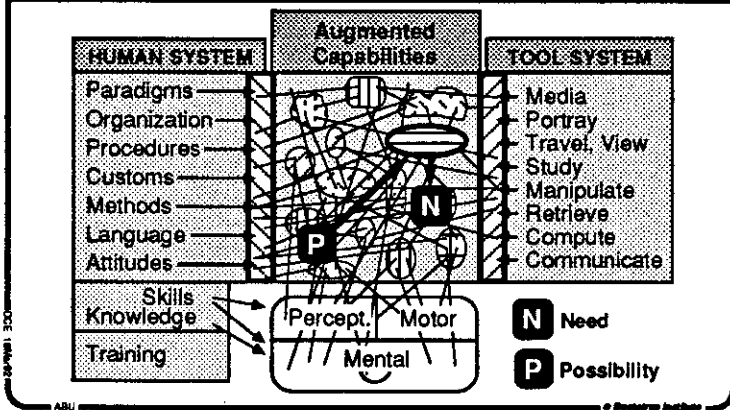
OUR CAPABILITIES GROW – WITH HIGHER LEVELS DEPENDING ON LOWER LEVELS



This model has been of seminal importance to the evolution of this "Bootstrap Strategy."

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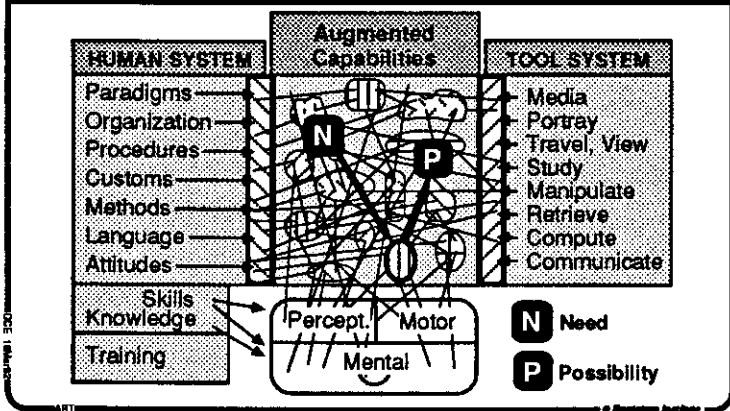
POSSIBILITIES ↑ AND REVERBERATE AS NEEDS ↓



A "Possibility" for improvement of a higher level capability emerges when new or heretofore under-utilized, lower-level capability is seen to be available to harness -- but often requires other improvements in the lower levels -- developing a "Need."

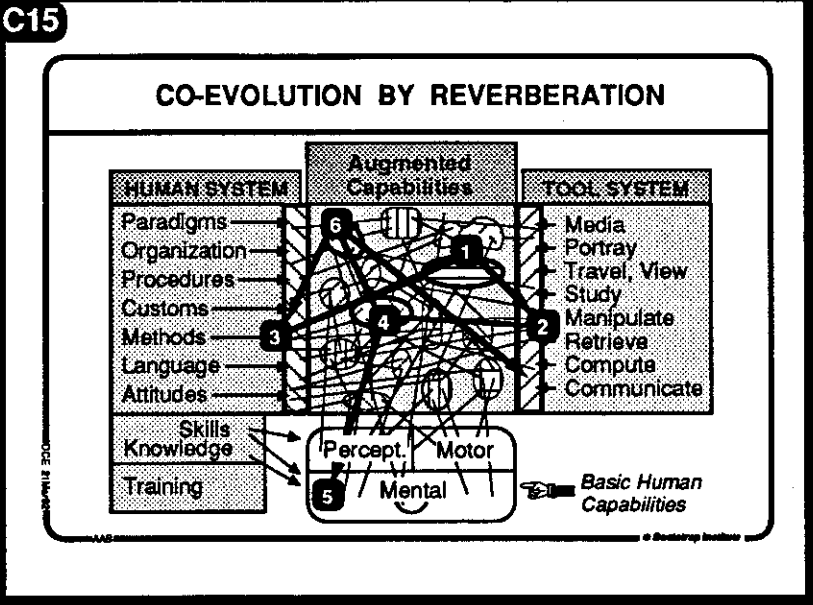
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NEEDS ↓ AND REVERBERATE AS POSSIBILITIES ↑



If a higher-level capability needs to be improved by harnessing some improvement which must be implemented in a lower-level -- then when that improvement is implemented, it provides a possibility for harnessing to improve other higher-level capabilities.

Realization about this reverberation of Needs ↓ and Possibilities ↑ as an Augmentation System evolves, when considered for the capability structure of a large organization, was instrumental in triggering the "Bootstrap" concepts in 1960-61.



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CO-EVOLUTION BY REVERBERATION IS A NATURAL ORGANIC PROCESS

Until recently, our Augmentation Systems co-evolved gradually.

Selected elements changed in isolation, and the other elements eventually adapted *on their own*.

Our Augmentation Systems remained largely intact, well-integrated, and coherent.

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THE TWO PARTS OF OUR AUGMENTATION SYSTEM GREW BY STEADY CO-EVOLUTION

For countless generations this has been a slow evolution, through processes such as:

- By the generational cycle of role succession
- By the five to ten-year cycle for students to be hired, integrated, and matured, and then to be listened to
- By the time it takes new findings to be published, digested, and then responded to

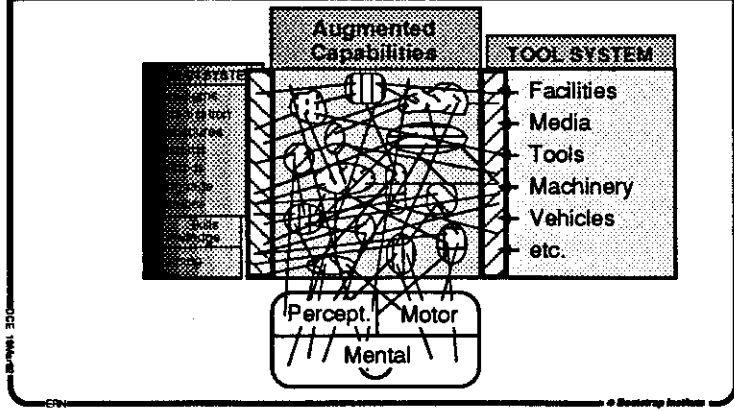
Further evolution will also necessarily be a *concurrent* process -- coordinated change in both the tool- and the human-system.

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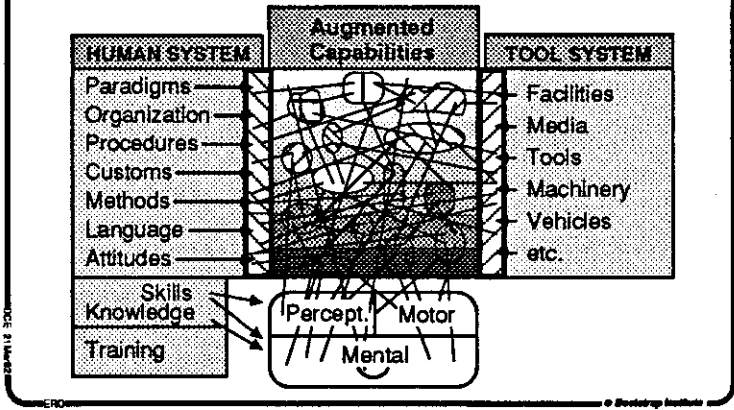
PREVAILING PARADIGM PLACES DISPROPORTIONATE FOCUS ON TOOL SYSTEM



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PREVAILING PARADIGM IGNORES MANY IMPROVEMENT OPPORTUNITIES



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PREVAILING PRACTICES COULD CRIPPLE OUR ORGANIZATION'S AUGMENTATION SYSTEM

- Not appreciating rate, scale, pervasiveness, and *complexity* of change
- Isolated changes, expecting the other elements to adapt "on their own"
- Paradigm "blind spots" skew selection of needs & possibilities
- Vendor-driven marketplace skews selection of needs & possibilities
- Computer revolution bombarding with point-solution technology
- Methods based on obsolete technologies
- Technologies based on obsolete methods
- Tools not harnessed for lack of well-developed methods
- Tactically-driven, with no strategy

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MOST OF THE FAMILIAR EVOLUTIONARY PROCESSES ARE GEARED FOR SLOW CHANGE

As the need for organizational change accelerates, we must find new processes by which changes are brought forth, assessed, accepted, and integrated into the whole -- processes which not only work within shorter time periods, but also within more complex and global organizational environments.

DOE NUMBER

EAD

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CO-EVOLUTION IS A CAPABILITY THAT WARRANTS SERIOUS HIGH-LEVEL ATTENTION!

HUMAN SYSTEM

- Paradigms
- Organization
- Procedures
- Customs
- Methods
- Language
- Attitudes
- Skills
- Knowledge
- Training

Augmented Capabilities

TOOL SYSTEM

- Media
- Portray
- Travel, View
- Study
- Manipulate
- Retrieve
- Compute
- Communicate

Percept. Motor
Mental

Capability to Improve
Needs a prominent and explicit role!

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EAD

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NEW PARADIGM

Accelerating whole-system augmentation will require:

- New strategic criteria for investing in improved capabilities and for deploying newly emergent capabilities
- New recognition and prominence of capability-improvement roles and career paths
- Organizational units responsible for integrated whole-system pursuit
- More explicit co-evolution stages between R&D and end-use = special exploratory pilots
- New modes of collaboration in info-sys marketplace and among communities of improvement professionals

DOE NUMBER

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C30



NEW PARADIGM



We also need to get faster and smarter at:

- Identifying needs and possibilities
- Designing and deploying solutions
- Incorporating lessons learned

Toward improving the whole organization's *capability infrastructure!*

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PARADIGM REVISITED

The toughest part in acquiring a really new *effective* Augmentation System will be coping with the associated cultural evolution.

The prime limitation in how hard we pursue high-performance Augmentation Systems will be the perception of potential improvement -- which is essentially a cultural matter.

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This suggests a critical hypotheses: The rate and direction of moving toward tomorrow's Augmentation System (and associated, changed culture) is limited by the perceptions inherent in today's culture!

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WE NEED A WHOLE-SYSTEM AUGMENTATION DISCIPLINE/APPROACH. WHERE IS CAMP 3?

Camp 1

- technology drivers
- automaters
- product developers and pushers
- etc.

Camp 2

- process drivers
- organizational development
- socio-technic
- etc.

Camp 3

Balanced co-evolution within integrated, whole- system environments?

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Our Western culture has been quite tardy in developing the very under-populated Camp 3.

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Hypothesis #1: Whole-system Augmentation

Moving toward high performance will require dramatic improvements in organizational capabilities.

Augmentation Theory provides a model for faster and smarter improvement of an org's capability infrastructure.

- Basic Augmentation-System Model
- Prevailing Augmentation Practices
- Strategic Augmentation
- Conclusion

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CONCLUSION

- ☞ Co-evolution happens naturally by gradual reverberation
- ☞ Prevailing point-solution practices will probably *not* lead directly to high-performance capabilities
- ☞ Need strategy for faster and smarter co-evolution:
 - strategic selection of capabilities to improve
 - strategic deployment of early capability gains

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