# KM, Sustainability and Risk Management: Converging Concepts, Unified Strategy

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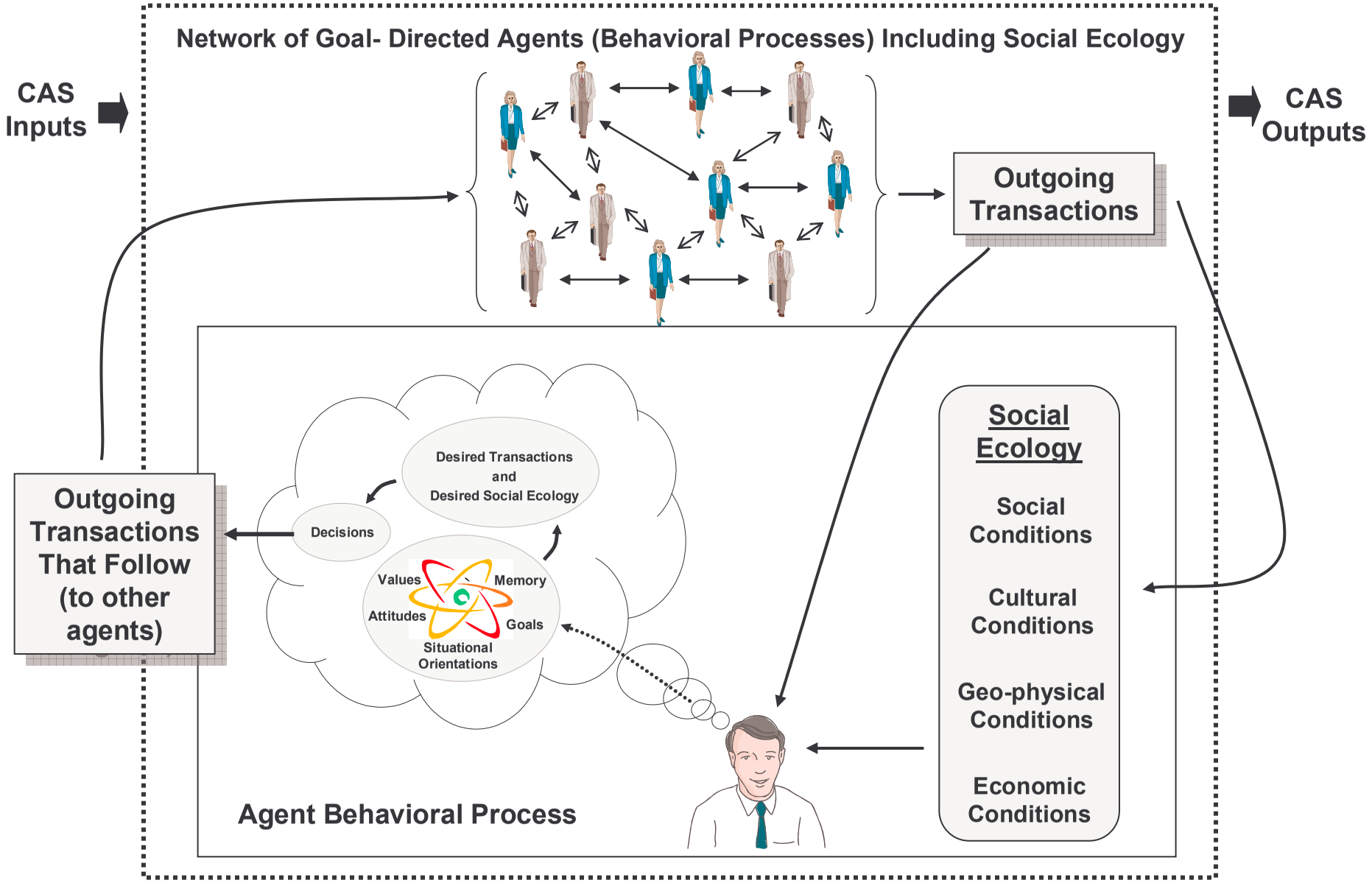
# Outline

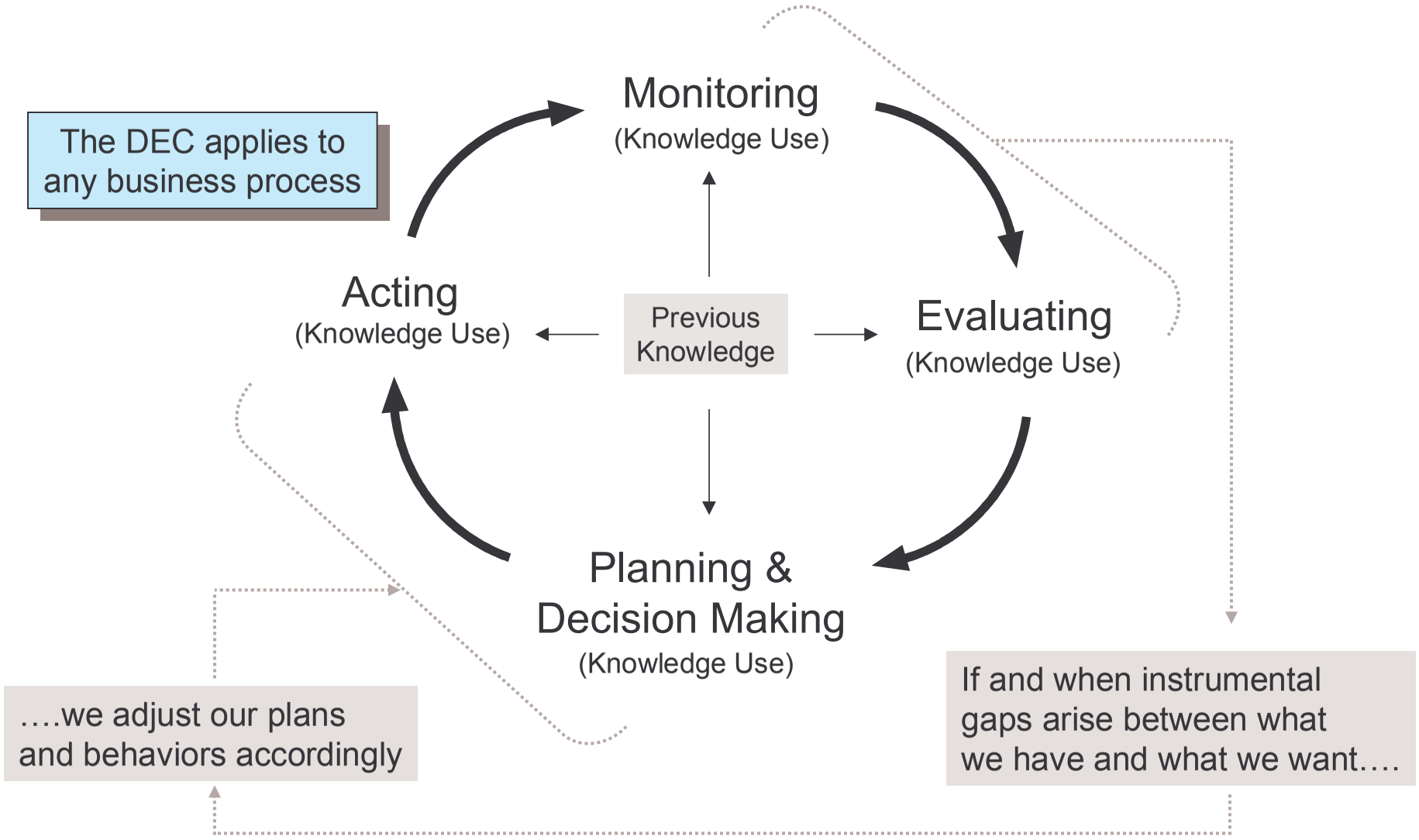
- Background: Decision Processing, Knowledge Processing and KM
- Adaptation
- Sustainability, Innovation and Sustainable Innovation
- The Sustainability Code
- Reducing Risk
- Risk Management
- Converging Concepts
- A Unified Strategy

# Decision Processing, Knowledge Processing, and Knowledge Management

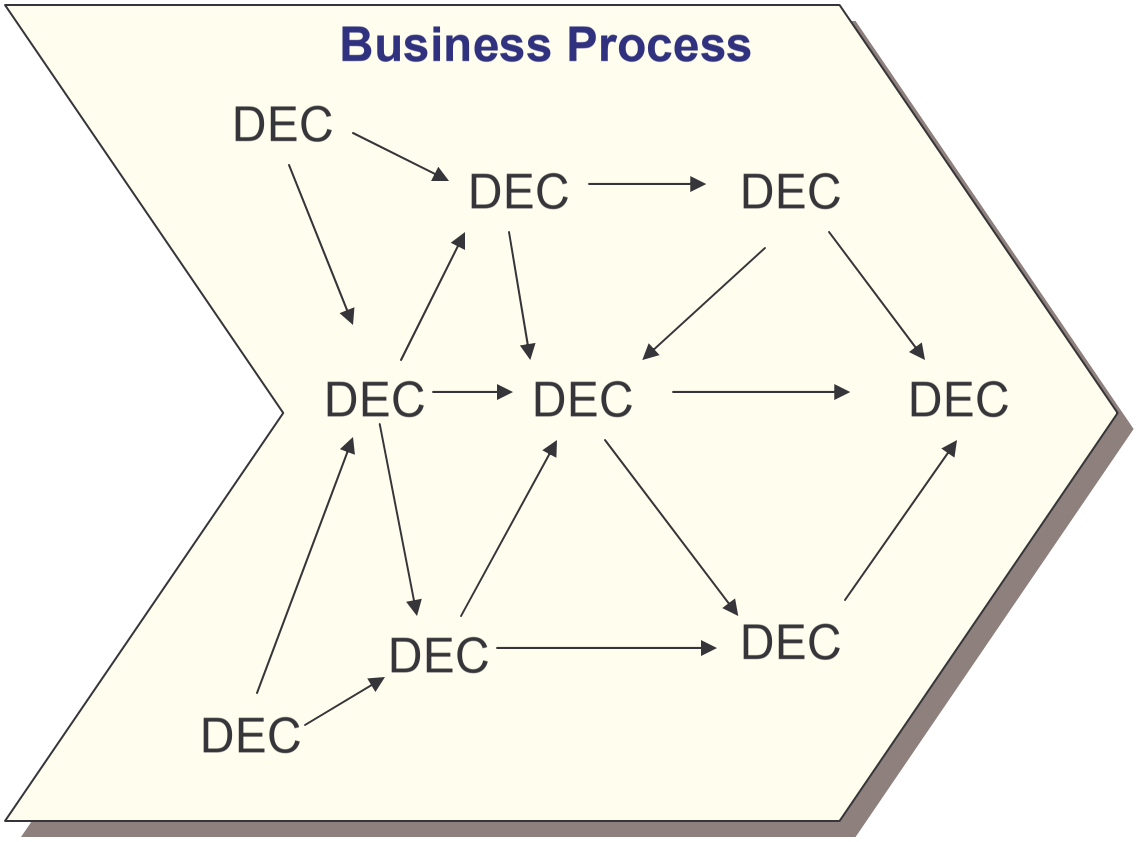
# An Organizational CAS Network with Agents



# The Decision Execution Cycle



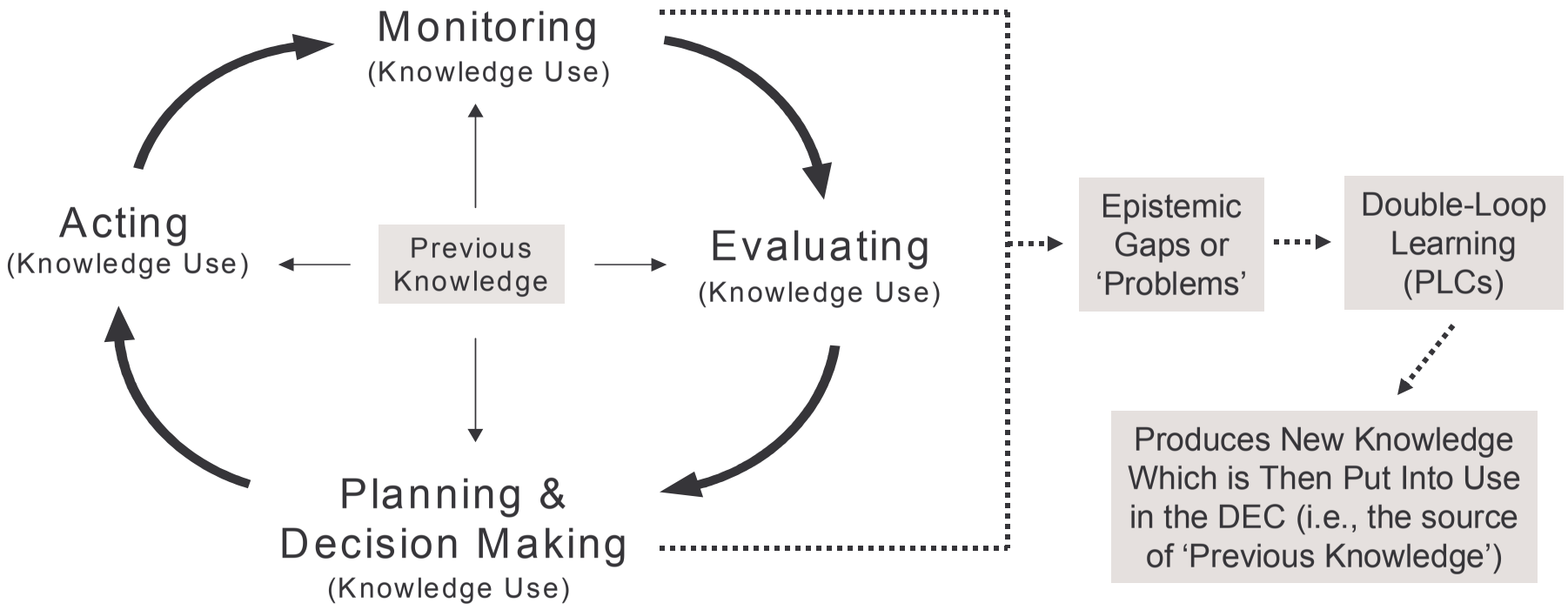
# DECs and Business Processes




## Business Processes

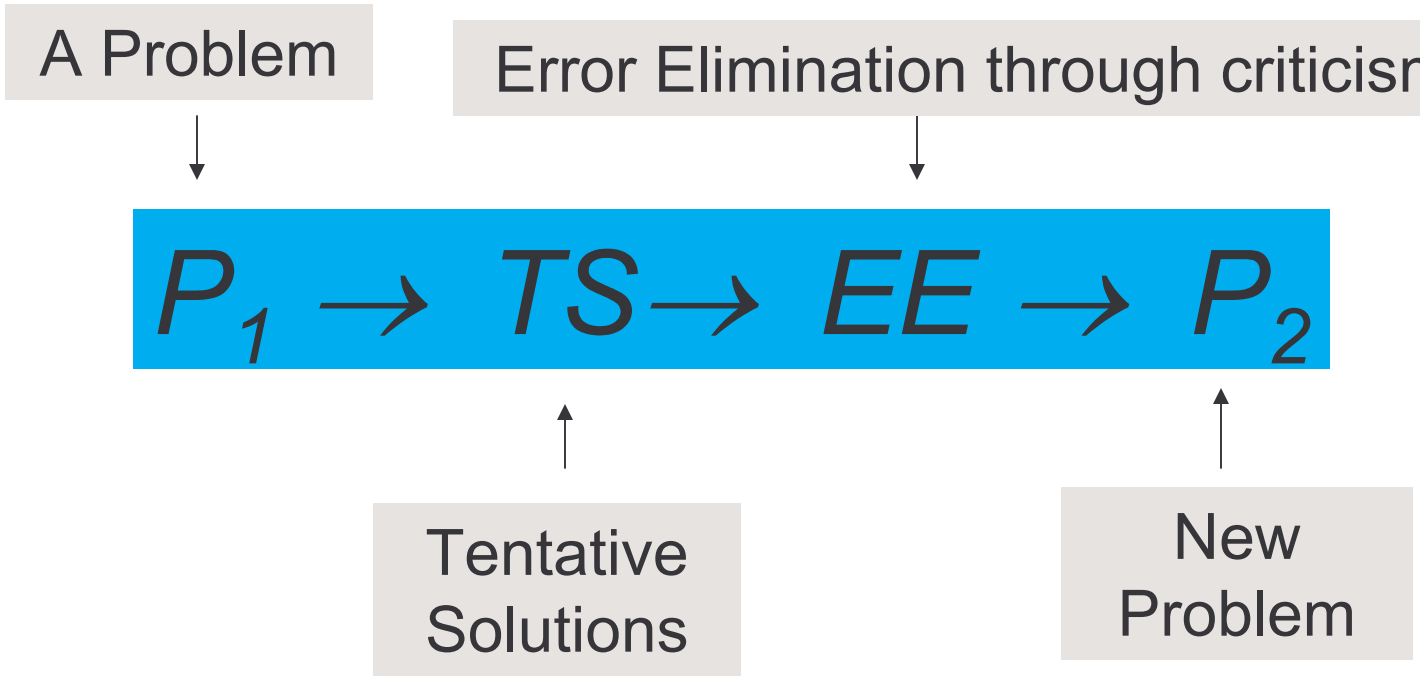
- Ultimately break down to activity patterns
- Activities are produced by DECs
- Some DECs are more opportunity- or risk-filled than others
- Business processes are goal-directed networks of DECs
- BPs exhibit conflicts between human attempts at control, emergence, and CAS self-organizing tendencies

# Linking K Processing with the DEC



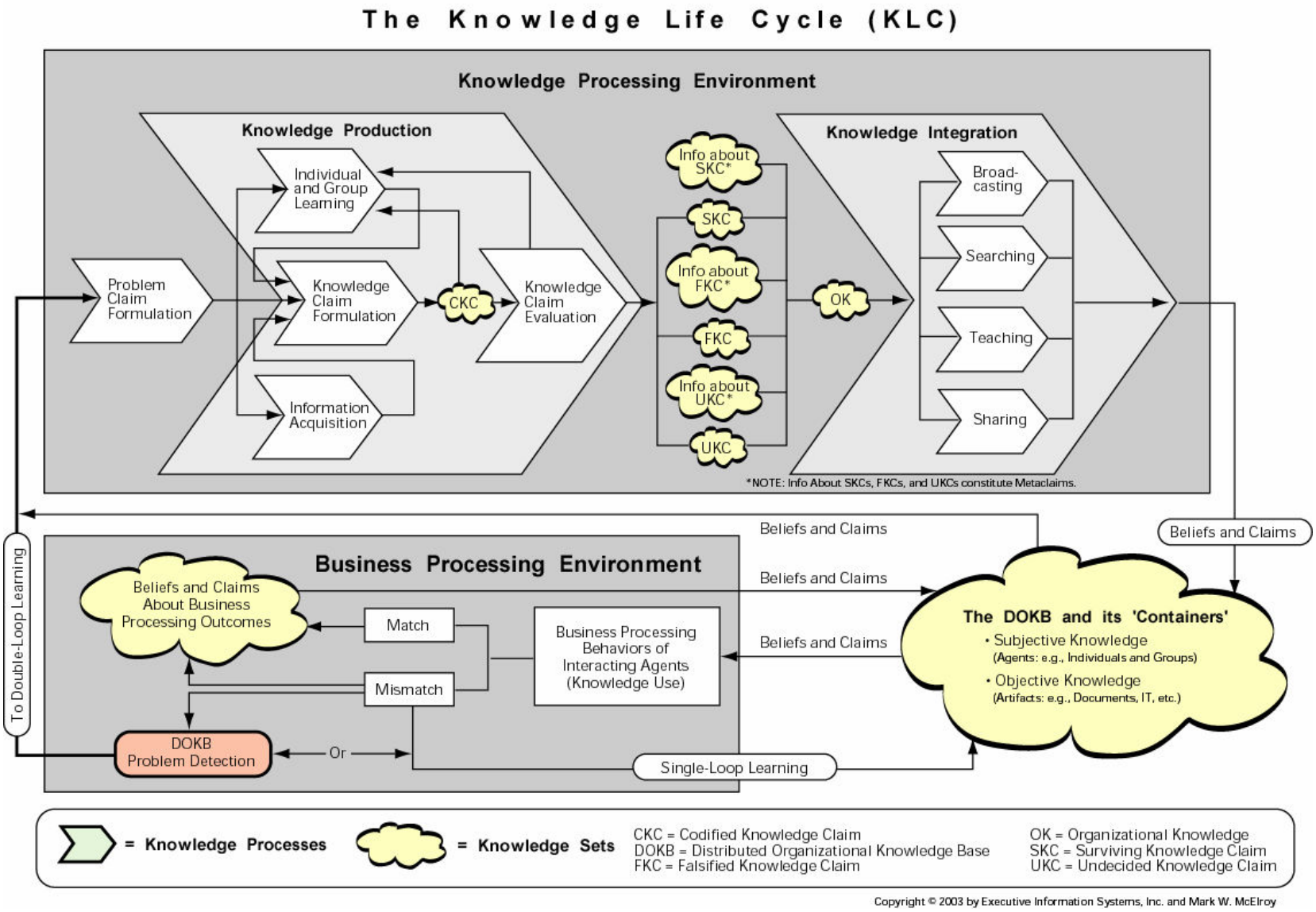

Sometimes problems arise, prompting episodes of Double-Loop Learning via the Problem Life Cycle

# Karl Popper's Tetradic Schema: A Framework for Adaptation

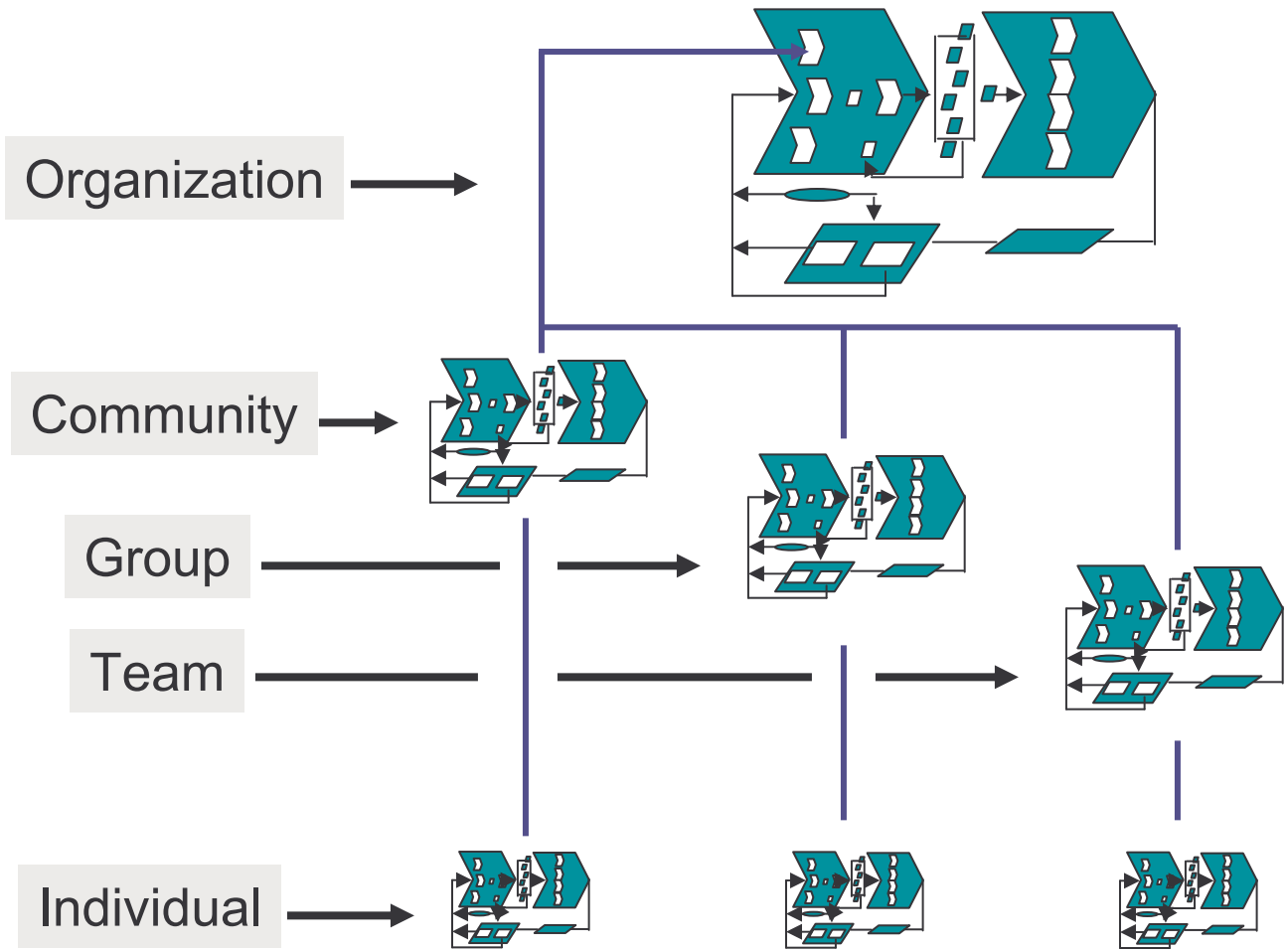



- Tentative Solutions are produced by 'Knowledge Claim Formulation'
- Error Elimination occurs by means of 'Knowledge Claim Evaluation'
- The result of EE is Falsified TSs, Undecided TSs and Surviving TSs.

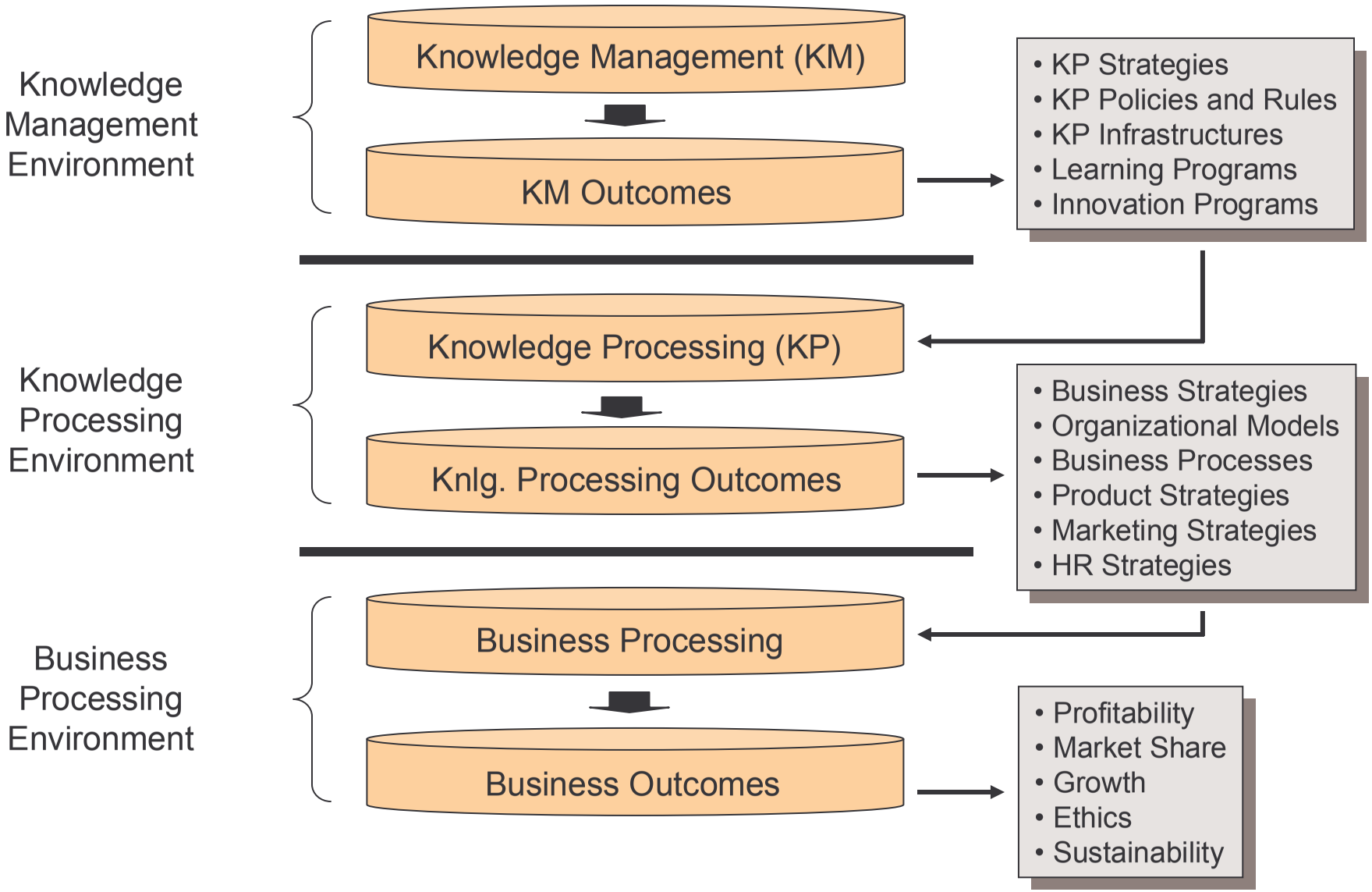
# The KLC – A More Granular View



# Nested KLCs



# *The New KM* Reference Model



# Let's Move On With:

- Adaptation, Sustainability, Innovation
- Risk Management
- Converging Concepts
- A Unified Strategy

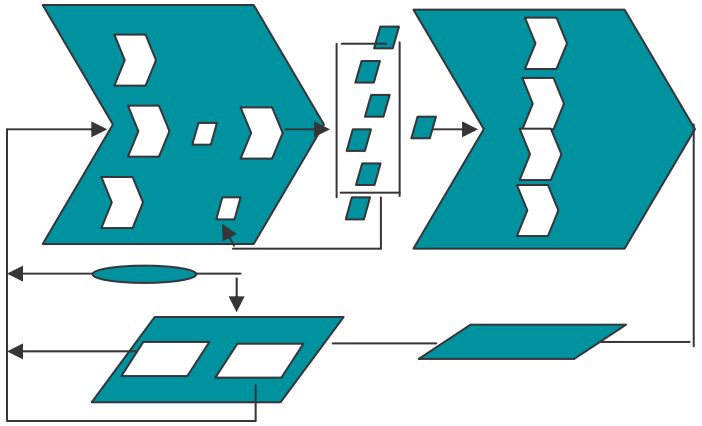
# Adaptation and Sustainability

- ***a sustainable organization is one that adapts while continuing to maintain or increase its future adaptive capacity***
- Organizational adaptive behavior involves
  - learning, and
  - acting
- Adaptive behaviors are sustainable if they don't degrade, diminish, or conflict with a system's capacity to regenerate itself
- Adaptive behaviors are sustainable if they don't degrade, diminish, or conflict with the environment's capacity to regenerate itself

Sustainability refers to a system's capacity for longevity

# Innovation – A Definition

- Innovation embodies the entire knowledge (problem solving, learning) life cycle of
  - Knowledge production and
  - knowledge integration



- Need to distinguish between innovation and invention
  - Invention = knowledge production
  - Innovation = the whole life cycle

**Innovation is a whole life cycle affair!**

# Sustainable Innovation (SI): Definition

- SI:
  - (1) produces solutions that solve current epistemic problems without side effects and
  - (2) maintains or enhances the capacity of the system to adapt as it solves problems
- SI clearly a self-organizing pattern that is equivalent to the continuous and effective functioning of organizational KLCs
- -- which brings us to the Sustainability Code

# The Sustainability Code: A Target Model for SI

- All knowledge used as a basis for individual and/or shared action by members in a collective ----– in the context of the collective – shall always be open to criticism, and no such knowledge shall ever be regarded by any member as true with certainty. ***This is the FALLIBILITY rule.***
- All organizational knowledge in the collective shall be accessible and transparent to all members, regardless of management roles or structures in place. No such knowledge shall be withheld from a member of the collective by any other member, except in cases where fulfilling fiduciary duties or the need to respect privacy entitlements are involved. ***This is the TRANSPARENCY rule.***

# The Sustainability Code: A Target Model for SI (2)

- All learning and innovation processes in the collective shall be accessible to, and inclusive of, all members, regardless of whatever separate and/or restricted management roles or structures may be in place. ***This is the INCLUSIVENESS rule.***
- All learning and innovation in the collective shall be rooted in the principle of fair critical comparison, such that prevailing or competing knowledge claims may always be criticized, tested and evaluated against one another in a fair and complete way. This rule shall apply to claims of what such tests themselves should consist of, and not just to the primary claims to which such tests may be applied. ***This is the FAIR COMPARISON rule.***

# The Sustainability Code: A Target Model for SI (3)

- All members of the collective shall employ their best efforts to seek, recognize, and formulate problems in existing knowledge through critical evaluation of the performance of that knowledge in action. ***This is the LOOKING FOR TROUBLE rule.***
- Members of the collective may produce any new rule not otherwise specified by these rules, so long as it and the learning system used to produce it do not contravene these rules. ***This is the GROWTH OF KNOWLEDGE rule.***
- Rule numbers 1 through 6 shall apply to not only knowledge claims of fact, but also to knowledge claims of value as well. ***This is the FACT/VALUE rule.***

# The Sustainability Code: A Target Model for SI (4)

- The collective shall establish a Knowledge Management function that will be independent of the Executive Function and invested with enforceable authority to
  - (1) allocate resources for enhancing all learning and innovation in the collective,
  - (2) change and enhance all knowledge processing rules,
  - (3) handle crises in knowledge processing, and
  - (4) negotiate for resources with other organizational functions.
  - ***This is the KNOWLEDGE MANAGEMENT rule.***

# The Sustainability Code: A Target Model for SI (5)

- The Knowledge Management function shall adopt and implement only knowledge processing policies that are aligned or synchronized with the self-organizing tendencies of people in organizations to produce and integrate knowledge as they will. ***This is the POLICY SYNCHRONIZATION rule.***
- Any member who fails to abide by these rules shall be subject to exclusion from the collective by its other members, at their discretion. ***This is the ENFORCEMENT rule.***

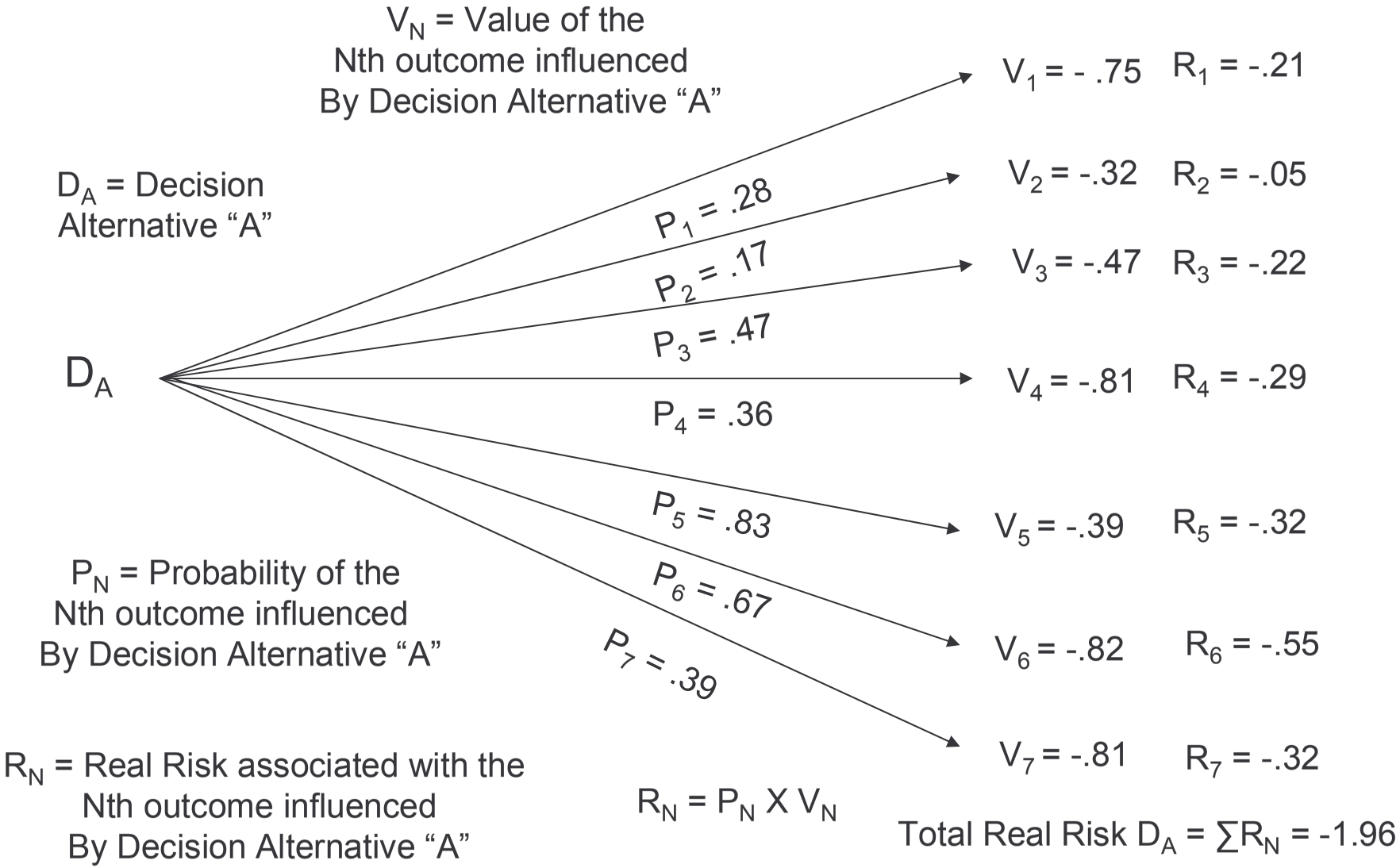
# Moving On To Risk

- Risk = chance/negative outcomes of decisions
- Envisioned risks involve those negative consequences that:
  - we anticipate from decision alternatives we reject,
  - Are logically possible consequences of decisions we select, but that we do not think will result from them
- Unknown risks involve negative consequences we haven't thought of
- Anticipated negative consequences of decisions we take ***are not risks, but expected costs***

# The Real Risk Arising Out of a Decision

- Real risk arises because most major business decisions do not immediately cause or bring about their intended effects
- ***Only create a propensity, a probabilistic disposition,*** for many of their most important outcomes
- Decision outcomes have positive or negative value.
- A decision has a probability relation to each possible outcome
- Probability is the strength or ***propensity*** of decision to bring about outcome.
- ***Objective probability,*** not degree of belief.
- ***The combination of the probability and the value of a negative outcome is the risk associated with that outcome***
- ***The total risk of making a decision, provided the outcomes are independent of one another, is the combination of all the individual risks arising from the decision***.

# A Flattened Decision Risk Hierarchy (Reality)



# The Risk of Error

- We don’t know for sure what the real risks are
- We have fallible mental or explicit models of real risks
- The risk of error in accepting a model, is "***the probability"*** that you've made the error, ***combined*** with ***the negative consequences*** of it.
- Consequences may be specified only partly, or not at all, in your model
- because reality may correspond to an alternative model that you may or may not have formulated, giving rise to its probabilities and its negative consequences, in other words, its risks, rather than those envisioned in your chosen model.

# The Risk of Error (2)

- The risks existing in the world, specified in a true model, may be either much greater or much less than specified in an accepted model
- No way of knowing whether this may be true, unless we have thought of and mistakenly rejected an alternative model that is close to the truth
- We do know that the greater the likelihood that we have erred in our decision model, the greater the likelihood that we will be ignorant about the risks we are taking when we accept it, in preference to its alternatives.

# The Ambiguity of ‘Probability’

- Earlier, I used it to refer to the propensity of a decision to produce a particular outcome given the decision's context.
- But, when I refer to the "probability" of a decision model, I have in mind,
  - not the probability of formulating the decision model, or of the decision model occurring, but, instead, something like:
  - ***its likelihood of being true in light of the results of attempts to test, criticize, and evaluate it.***
- This idea of "probability" is common in ordinary language where we say that one model is "probably" true while another is "probably" false, because the first has survived the results of our tests, while the second has not.

# Probability and Truthlikeness

- This idea is not a "probability" in a sense that is logically consistent with the probability "calculus".
- Not a "probability" in the same sense as the "relative frequency", or "propensity", or "set-theoretical", or "logical" ideas of "probability" are, since all of these provide consistent interpretations of the calculus, while the idea “likelihood of being true in light of the results of attempts to test, criticize, and evaluate it” does not.
- For this reason, I won't call the "probability" of truth of a decision model with respect to the results of tests, criticisms, and evaluations, a "probability", but instead will refer to it as ***"the truthlikeness"*** of a decision model and will view it as a performance index for comparing decision models.

# Estimating the Risk of Error

- Which "probabilities" and which negative outcomes should we take account of in estimating the risk of error?
- Here are some rules for computing the estimated risk of error assuming all significant decision models are evaluated. The rules also specify the idea of the risk of error in one's decision models more clearly.

1. Don't use the negative outcomes and probabilities envisioned in the decision model you accept to assess the risk of error.
   - These are your best guesses related to the first category of risk
   - Because error in your model means that the negative consequences in it won't occur unless they're also specified in a true alternative model.

# Estimating The Risk of Error (2)

2. Use the negative outcomes in alternative models.
3. Use the probabilities (propensities) in alternative models along with negative outcomes, to compute the total risk in each alternative model.
4. Compute the truthlikeness of each alternative model. These are the "probabilities" of the various models. The higher the truthlikeness of an alternative, the higher the risk in rejecting it, other things being equal.
5. Weight the total risk specified in each alternative by ***the truthlikeness*** of that model, to compute the adjusted total risk of error in each model.
6. Compute the average adjusted risk of error over all other alternative models.

# The Risk of Error, KCE, and Fair Critical Comparison

- The risk of error in models is closely related to quality in knowledge making because of its role in knowledge claim evaluation and fair critical comparison
- ”Biased" KCE vs. *KCE through fair comparison*
- Two parts:
  - Implement necessary conditions for fair comparison
  - Implement KC performance comparisons based on criteria
- Necessary conditions and direct comparative criteria constitute a criticizable *theory of fair comparison*

# Fair Comparison Requirements

- Four *requirements* for fair comparison of Knowledge Claims (KCs)
  - (1) equal specification
  - (2) continuity
  - (3) commensurability, and
  - (4) completeness

# Direct Comparative Criteria for KCE

- Logical consistency
- Empirical fit (deductions consistent with fact)
- Projectibility (extending generalizations to new cases and to new domains of applicability)
- Systematic fruitfulness (extent of a decision model's ability to facilitate deduction of new knowledge claims)
- Heuristic quality (disposition to encourage formulating new conjectural knowledge claims)
- Systematic coherence (extent to which a decision model is integrated by linguistic relationships)
- Simplicity (in model form, in economy in attributes) and
- Pragmatic priority (assessment of average adjusted risk of error ranging over alternative decision models)

# Why Pragmatic Priority?

- Pragmatic priority, compares average adjusted risk of error ranging over each alternative model in the comparison set
- We do this because if we are in error, we will suffer the consequences predicted by the true decision model, and we want to weight or adjust our KCE epistemic criteria for this possibility
- But why should we adjust epistemic criteria for the risk of error in knowledge claim evaluation?
- Because to do so introduces a control in the fair critical comparison process that in the long run reduces the risk of error and protects the legitimacy of KCE
- It makes KCE implemented through fair critical comparison, and, by extension, knowledge production and KM more sustainable than if we proceed through epistemic comparisons alone

# Reducing Risk

- We cannot reduce real risk directly, and on a sustained basis, without first reducing the risk of error in our decision models
- since they determine what our decisions will be and measure how risk-filled they are.
- And like it or not, we cannot reduce the risk of error in our decision models without improving the quality of the decision models we accept, and the quality of those that we consider, compare, and select among.
- Reducing risk is about making better knowledge, since our decision models are as much knowledge, as any other mental or explicit models we formulate

# Risk Management

- Many definitions of Risk Management offered.
- I approach a definition through the three-tier idea
- Here the first tier, again, is business processing, driven by DECs which, always give rise to real risk
- In the second tier we try to reduce risk by reducing the risk of error in our models, thereby improving their quality
- You can recognize, I think, that reducing the risk of error in our decision models, i.e. high quality risk processing, and high quality knowledge processing are, perhaps, identical, or at least, very closely related
- The third tier is, of course, the tier whose activities are devoted to enhancing risk/knowledge processing
- It is Risk/Knowledge Management. They are the same.

# Converging Concepts

- We've briefly reviewed KM, knowledge processing, adaptation, innovation, sustainable innovation, sustainability, risk, and Risk Management
- Time to summarize relations among these ideas
- Sustainability in organizations and corporations is grounded in change and reinvention to meet environmental challenges
- That is, it depends on and uses adaptation
- Adaptation, in turn, depends on problem solving, learning, and knowledge processing, including both knowledge production and knowledge integration in knowledge life cycles
- But the quality of knowledge processing, in its turn, is influenced by Knowledge Management, the set of activities whose purpose is to enhance knowledge processing
- So we see that organizational sustainability depends on successful adaptation, high quality knowledge processing and KM

# Converging Concepts (2)

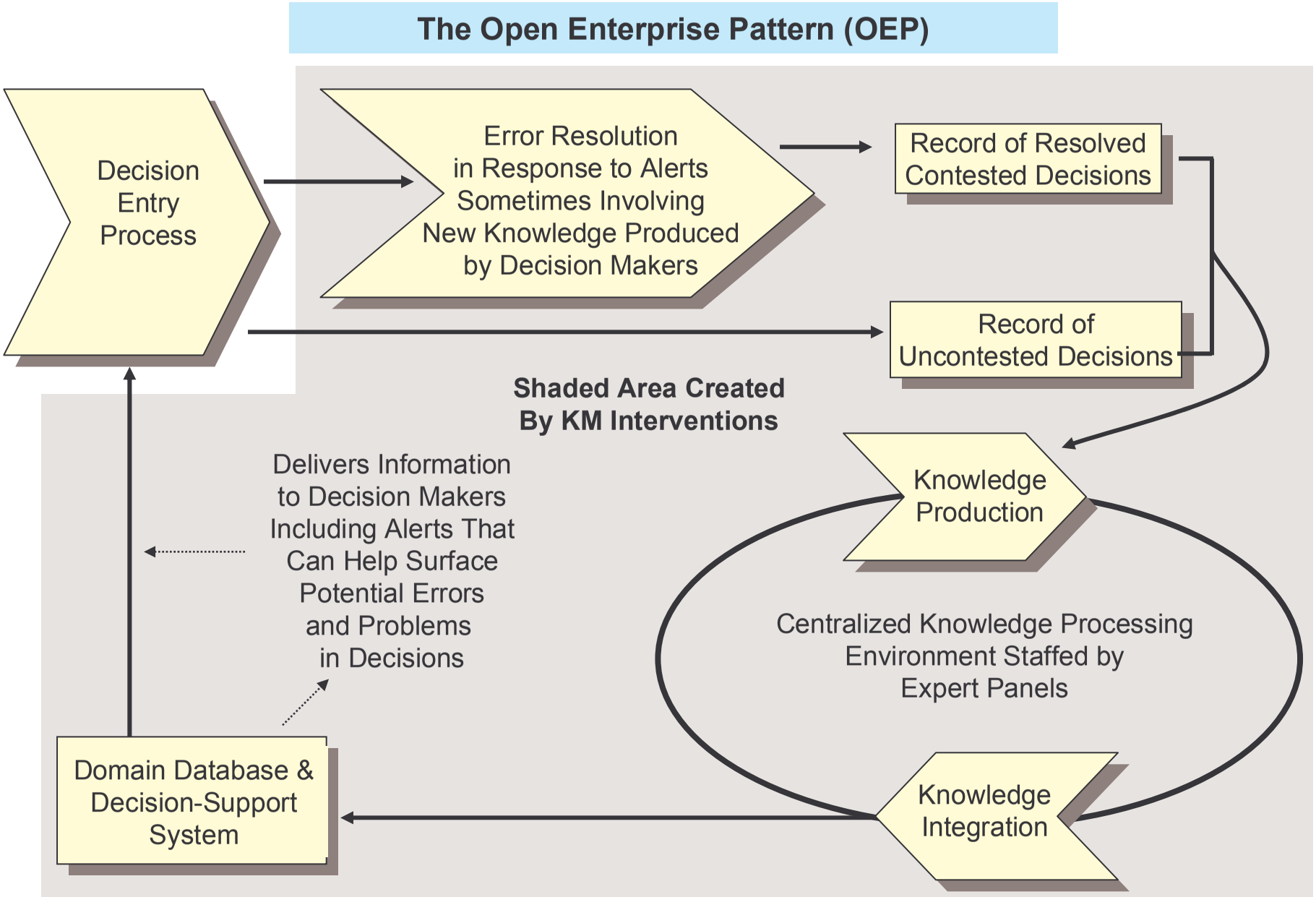
- But that's not all. Earlier slides also indicate that sustainability and high quality knowledge processing involve sustainable innovation and that innovation itself is a successful traversal of the knowledge (problem solving, learning) life cycle
- Furthermore the sustainability code, a target model of requirements for SI, is about knowledge processing and KM requirements for SI
- When we begin to look at risk also, we see that there are two distinct types of risk: the real risks arising out of a decision and the risk of error in our decision models
- It turns out that to reduce real risk we need first to reduce the risk of error in our decision models
- And this, in turn, is enabled through fair critical comparison, which, in turn, is dependent on KM, and also on people incorporating the risk of error as a factor in fair critical comparison

# Converging Concepts (3)

- Finally, I've approached Risk Management through a three-tier model analogous to the one used for KM
- Since the middle-tier of the model is focused on reducing the risk of decision model error so that use of a better model results in reduced real decision risk, and
- since the risk of error can only be reduced by enhanced knowledge processing and by better knowledge evaluation through fair critical comparison
- I concluded, in conflict with literature that provides varying definitions of Risk Management, that Knowledge and Risk Management are really the same.
- Given the close relationship of all the ideas we've studied (and I could easily have added organizational learning to the list) I pose the question:
- ***Is there a unified organizational strategy that will provide enhanced knowledge processing, sustainability, sustainable innovation, successful adaptation, and reduced real risks and risks of error?***

# A Unified Open Enterprise Strategy

- The following is a unified strategy for:
  - Enhancing Knowledge Processing
  - Enhancing organizational sustainability
  - Creating SI
  - Approaching the sustainability code model
  - Reducing real risk in decision models
  - Reducing the risk of error in decision models
  - Getting to the Open Enterprise (OE), an attractor basin in phase space characterized by self-organization, distributed problem solving, transparency, inclusiveness, trust, and other important attributes
  - The OE provides background conditions enabling implementing the sustainability code and the various other goals or objectives listed just above




## How KM can Help Flag and Resolve Errors in Decision Making in a Specific Decision Type

# Global OE Strategy Implications

- Identify and Prioritize DECS according to risk and opportunity
- Select DECs as targets for KM interventions according to priority and write up the business case
- Make interventions that embed new KI functionality within existing IT-based business applications (the active DOKB) supporting DECs
- KI functionality should present competing knowledge claims to those expressed or implied in a DEC outcome attempting to implement an action using the IT-based application
- KI functionality should require meta-claims to be added to the DOKB when competing knowledge claims are over-ridden by decision maker
- Such OEP-based KM interventions will help DMs to “look for trouble” and recognize problems kicking off KLCs

# Scale it up and Create the OE

- Move around the corporation according to priority of risk and opportunity, taking into account expense, implementing the OEP in diverse domains
- Strengthening the ability to recognize problems in area after area, thus kicking off KLCs
- Producing distributed problem solving
- Increasing adaptiveness
- As you go you can measure the progress toward the OE
- One day you'll wake up and you'll have the OE
- This OE strategy uses a ***vertical, bottom-up strategy*** rather than a horizontal top-down approach, that attempts to implement the OE all at once.

# Summary: Elements of the Unified Strategy

- Seek the normative end-state of the Open Enterprise because it provides sustainable innovation, risk and opportunity management, and openness
- Use the Sustainability Code as a target expressing some of the key characteristics of the OE
- Use a vertical approach to strategy, identifying key risk- and opportunity-filled DECs to develop a portfolio of OEP-based KM interventions and to incrementally create the OE
- Use a formal methodology such as KMCI's K-STREAM™ to implement the strategy