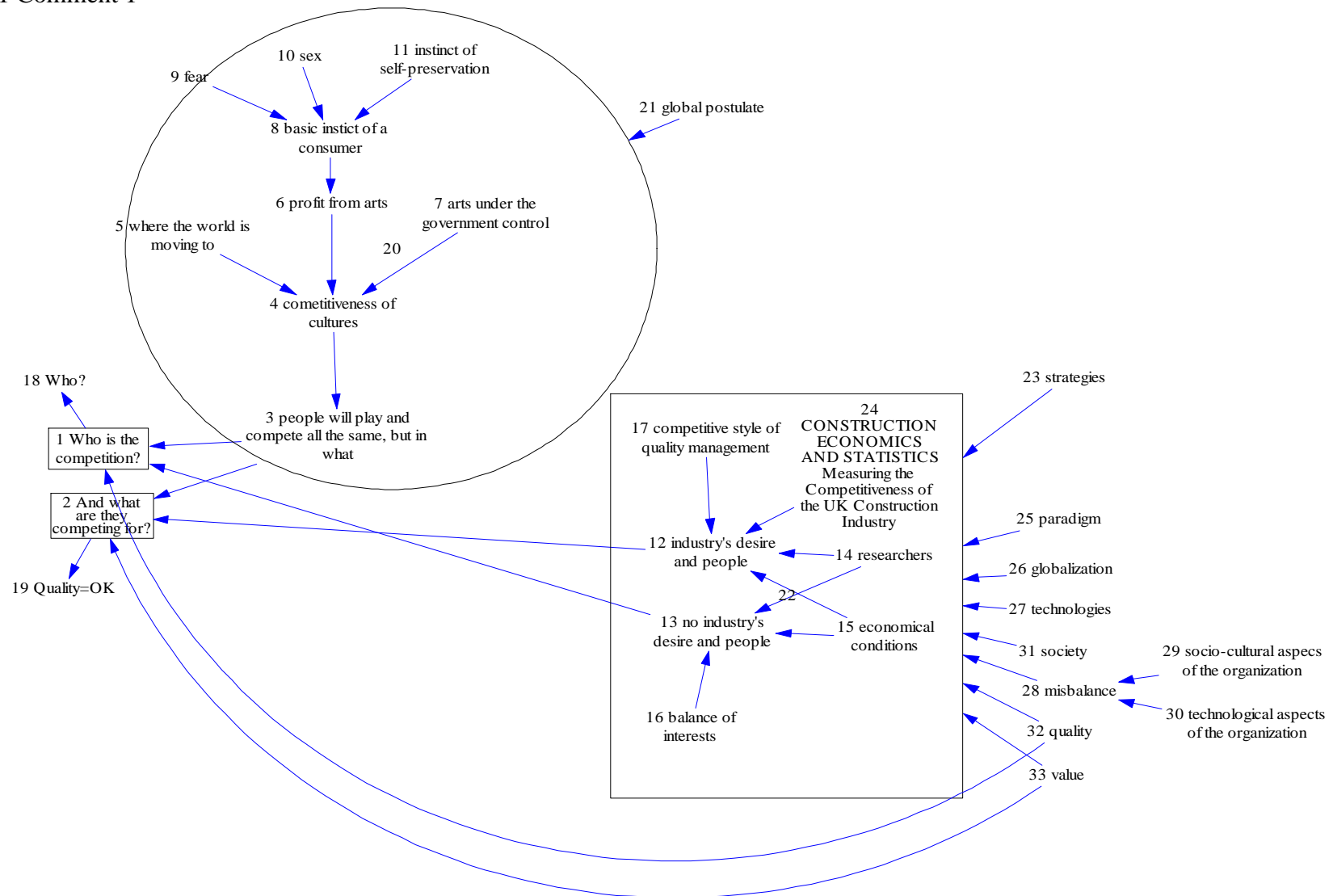
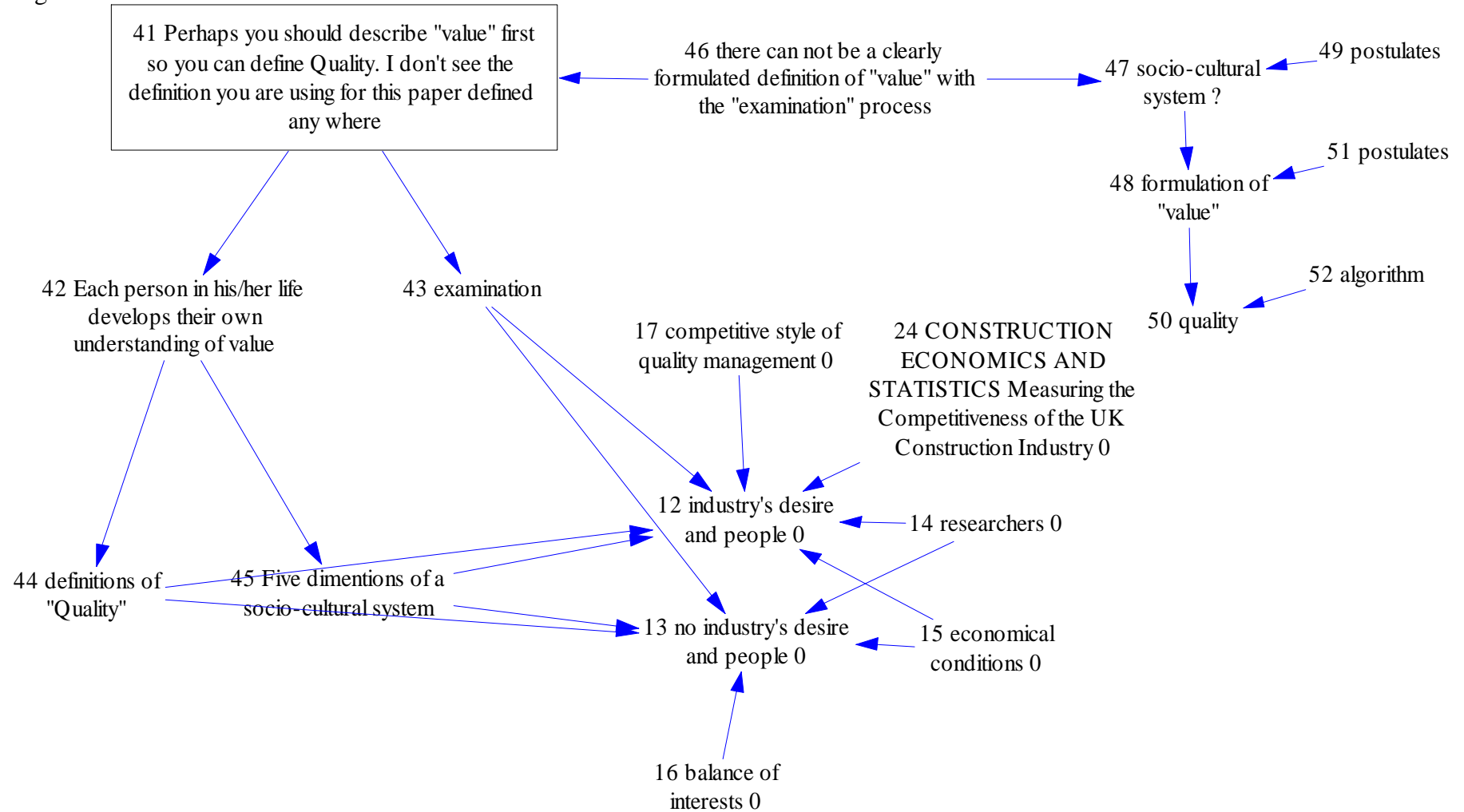


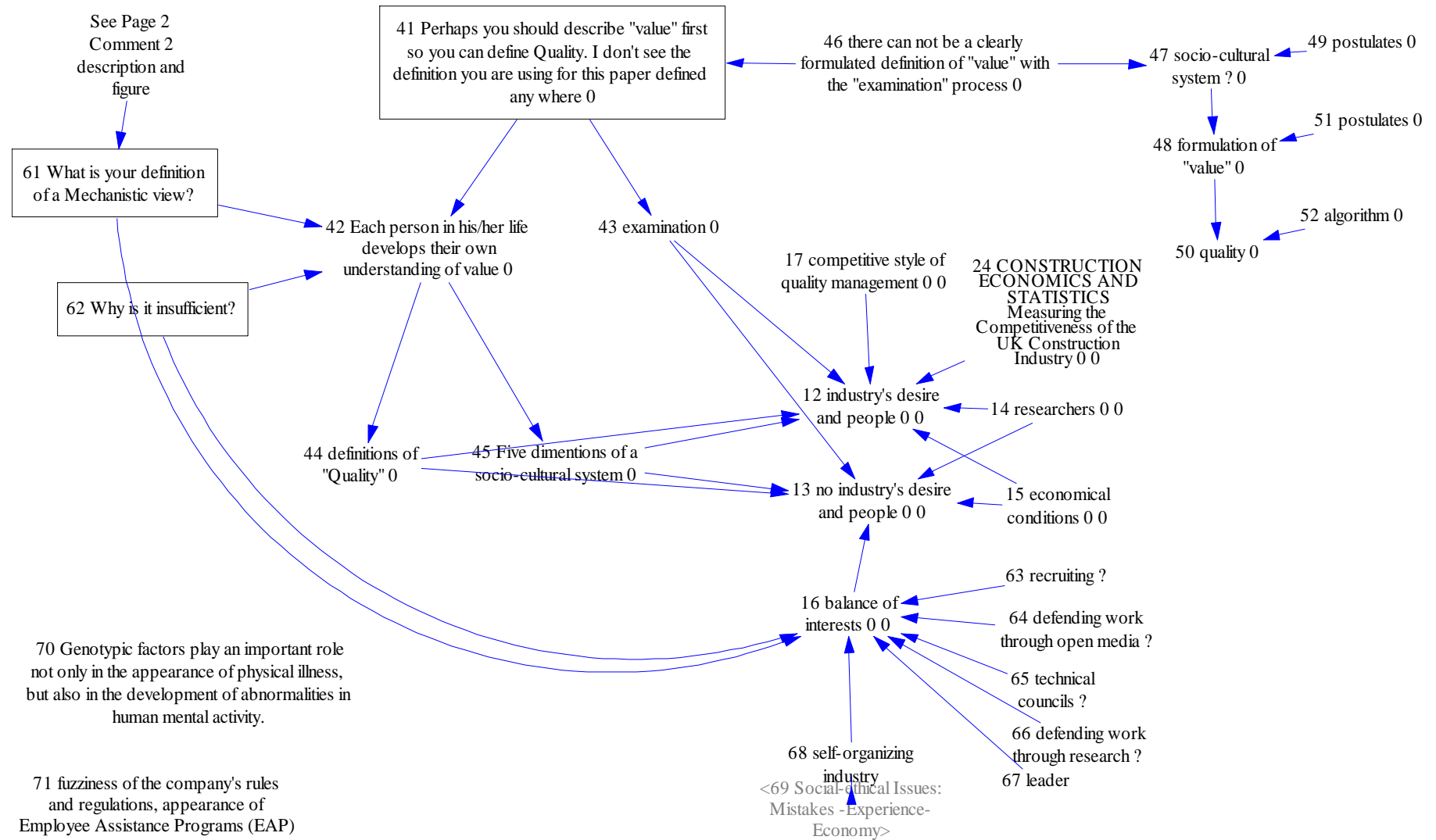
Page 1 Comment 1



Page 2 Comment 1



Page 2 Comment 2



Mechanistic View.

The essence of mechanical understanding of the nature, which is also called the kinetic theory of matter, consists in the following, that the various physical phenomena are explained through mechanical movements of environments or particles. Such idea was stated in his time by R. Descartes. This idea confronted to the scholastic physics of the latent qualities in according to which any body has those or other properties due to the latent qualities inherent in it.

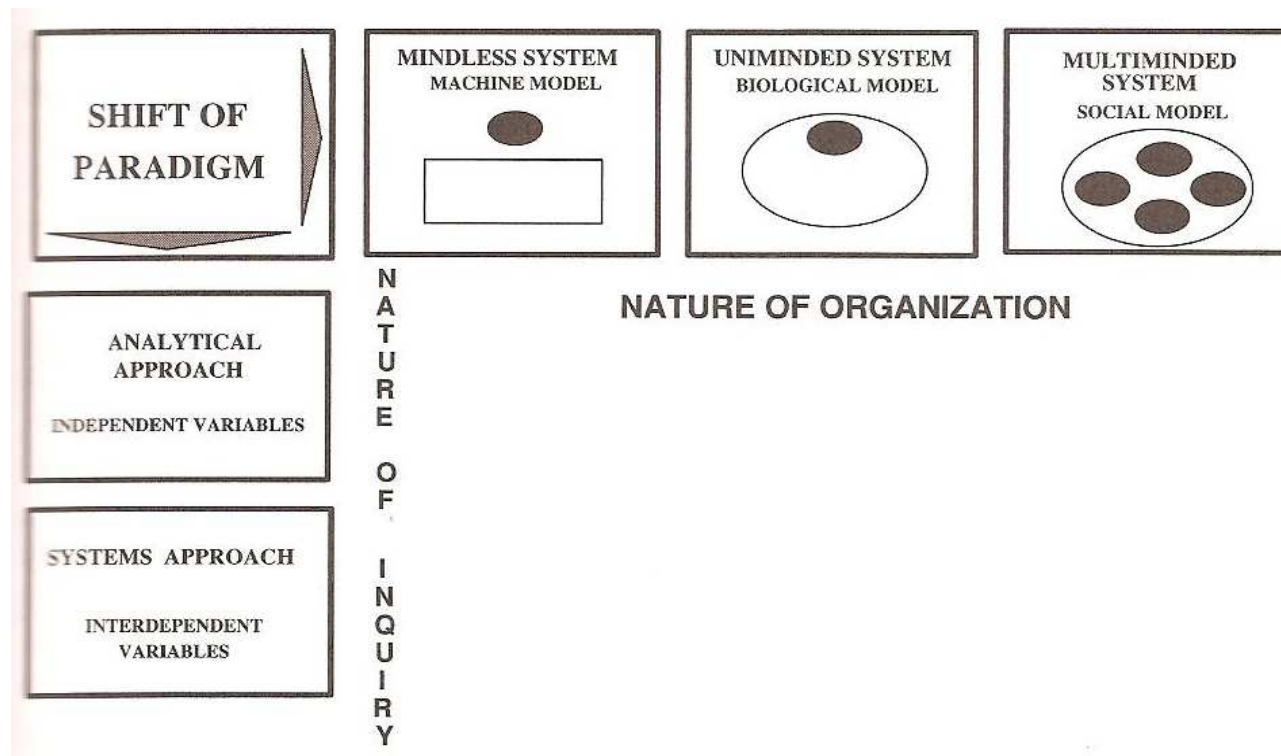
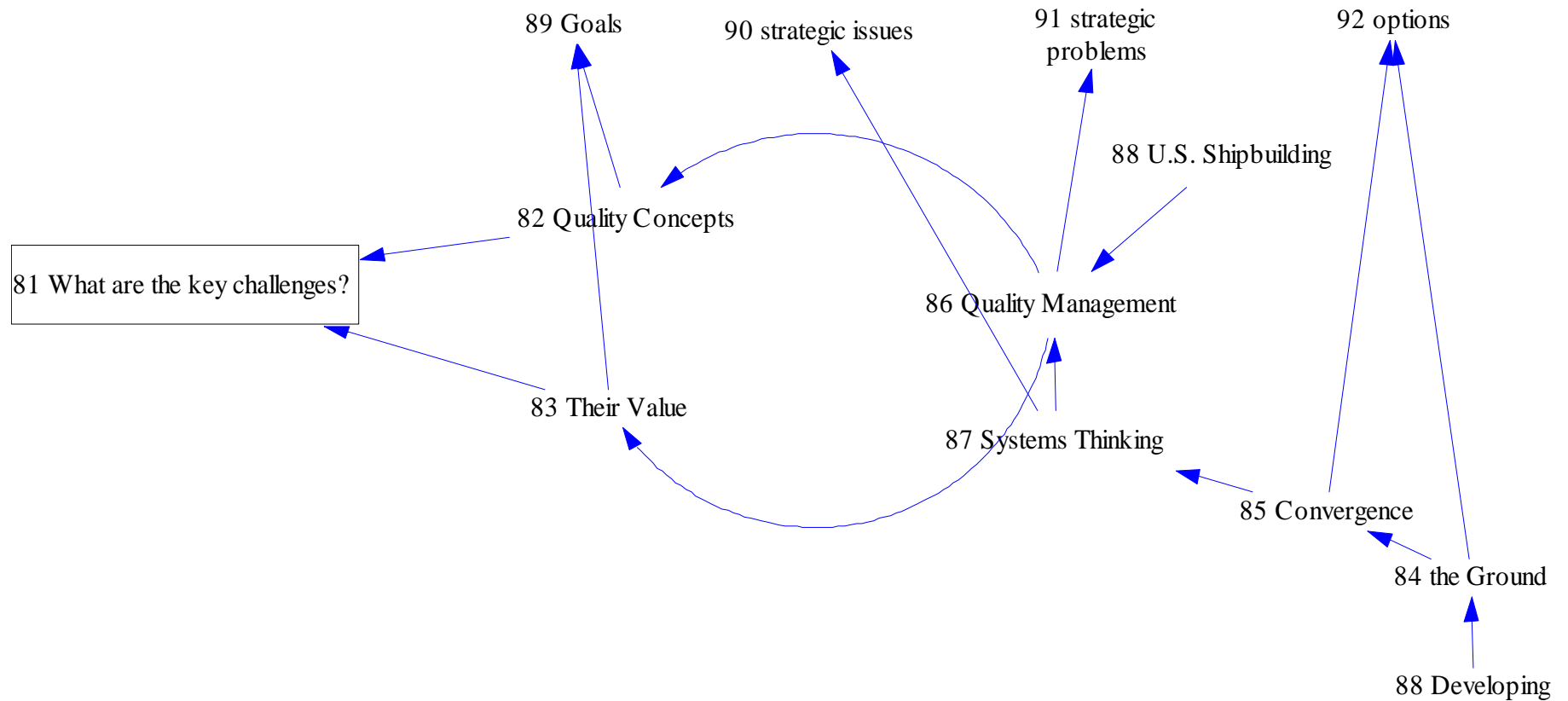
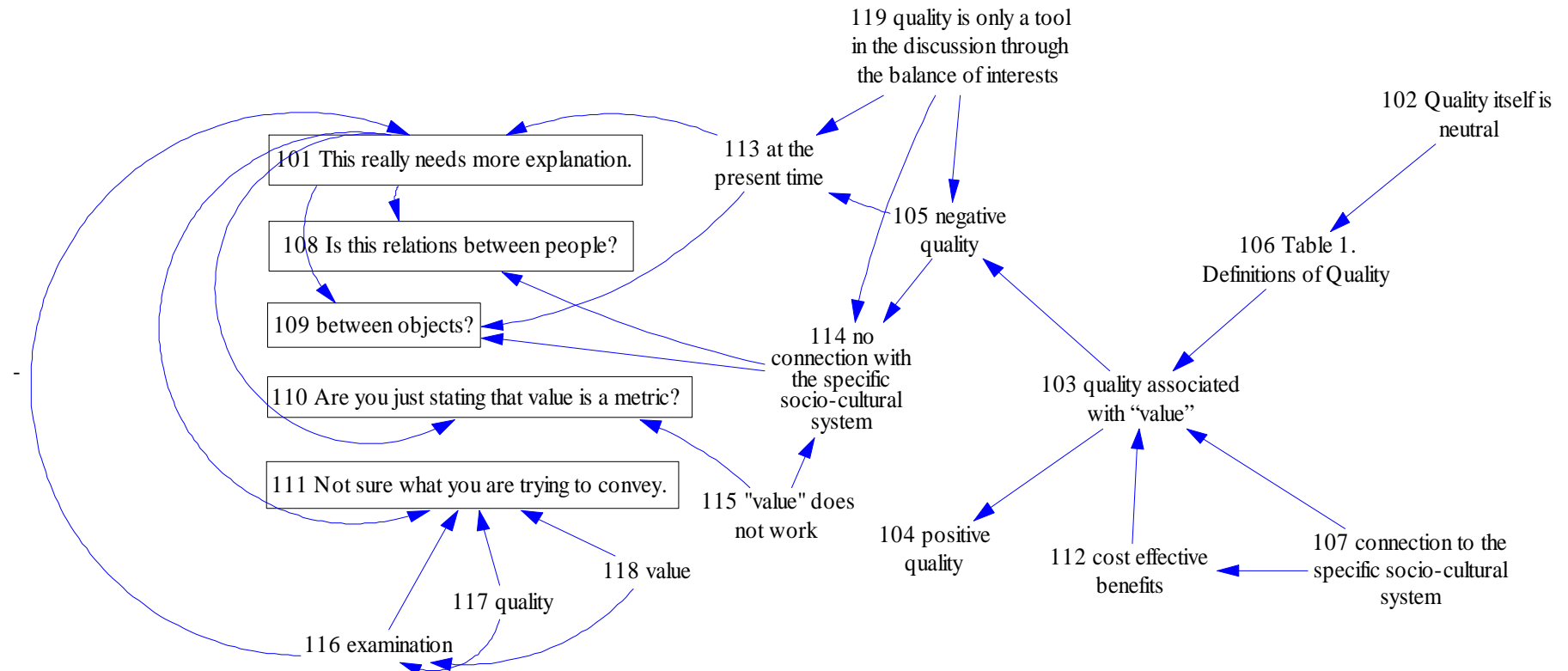


Figure 1. Shift of Paradigm

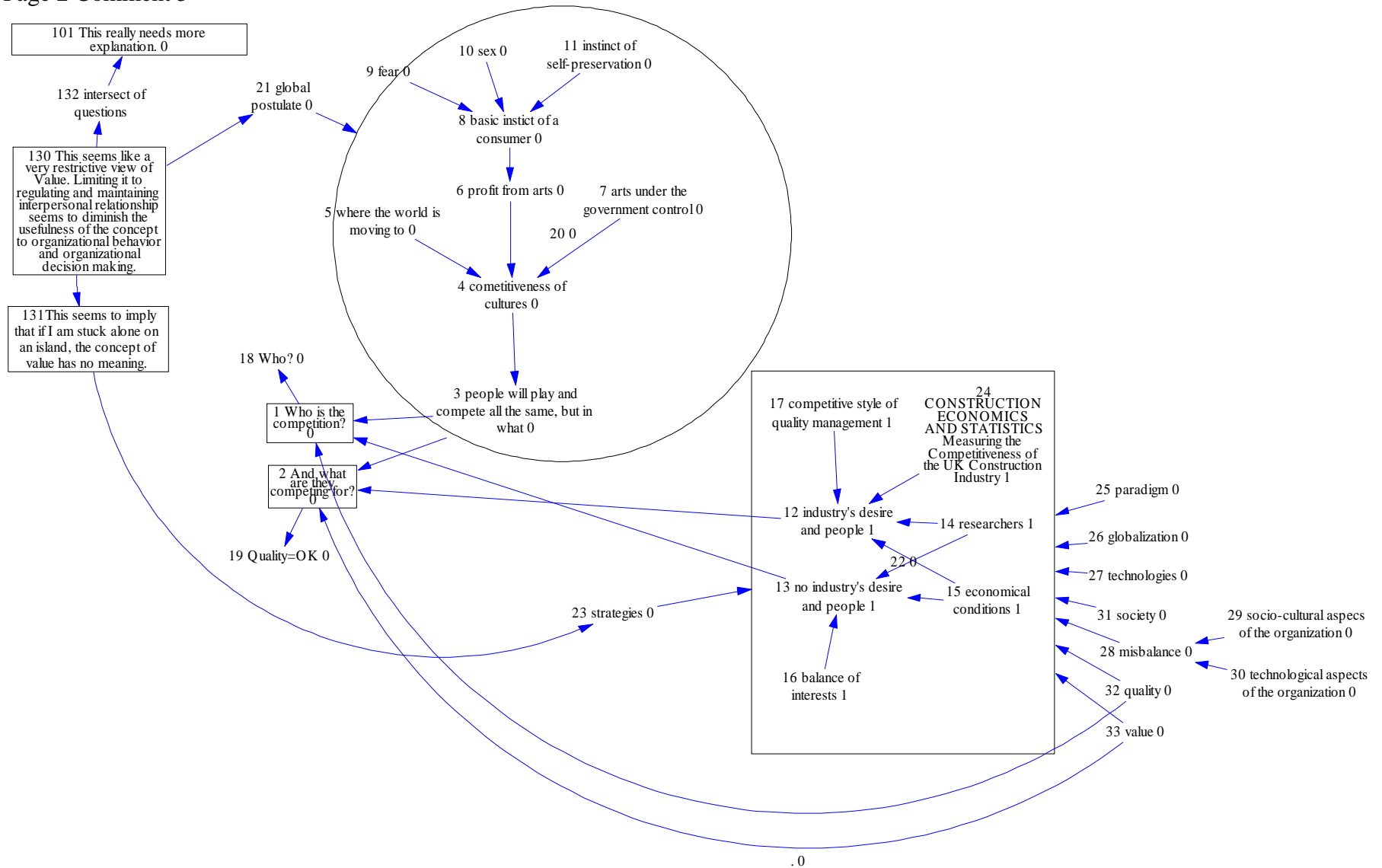
[Source: Gharajedaghi, J. (1999). Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture, Boston: Butterworth Heinemann]

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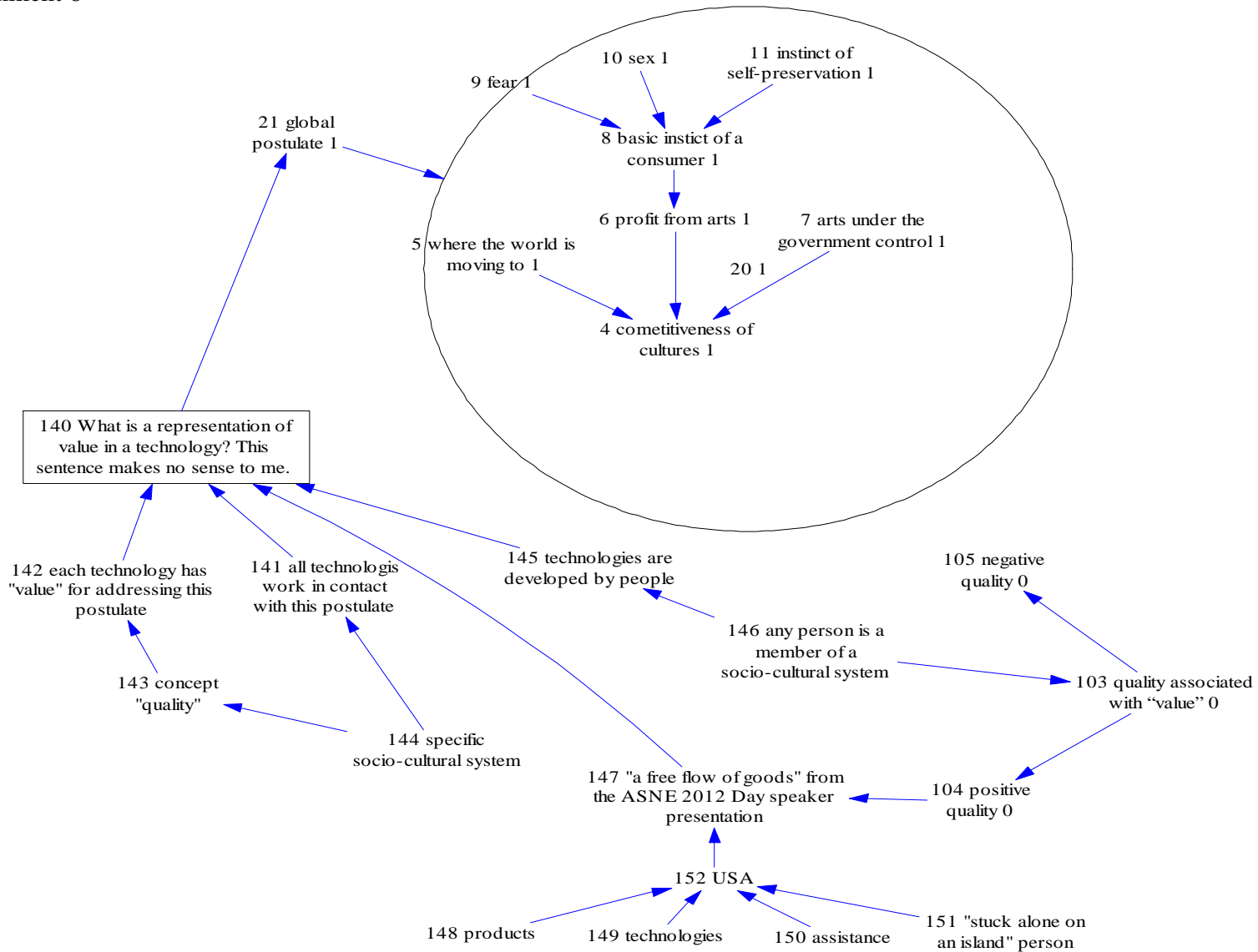




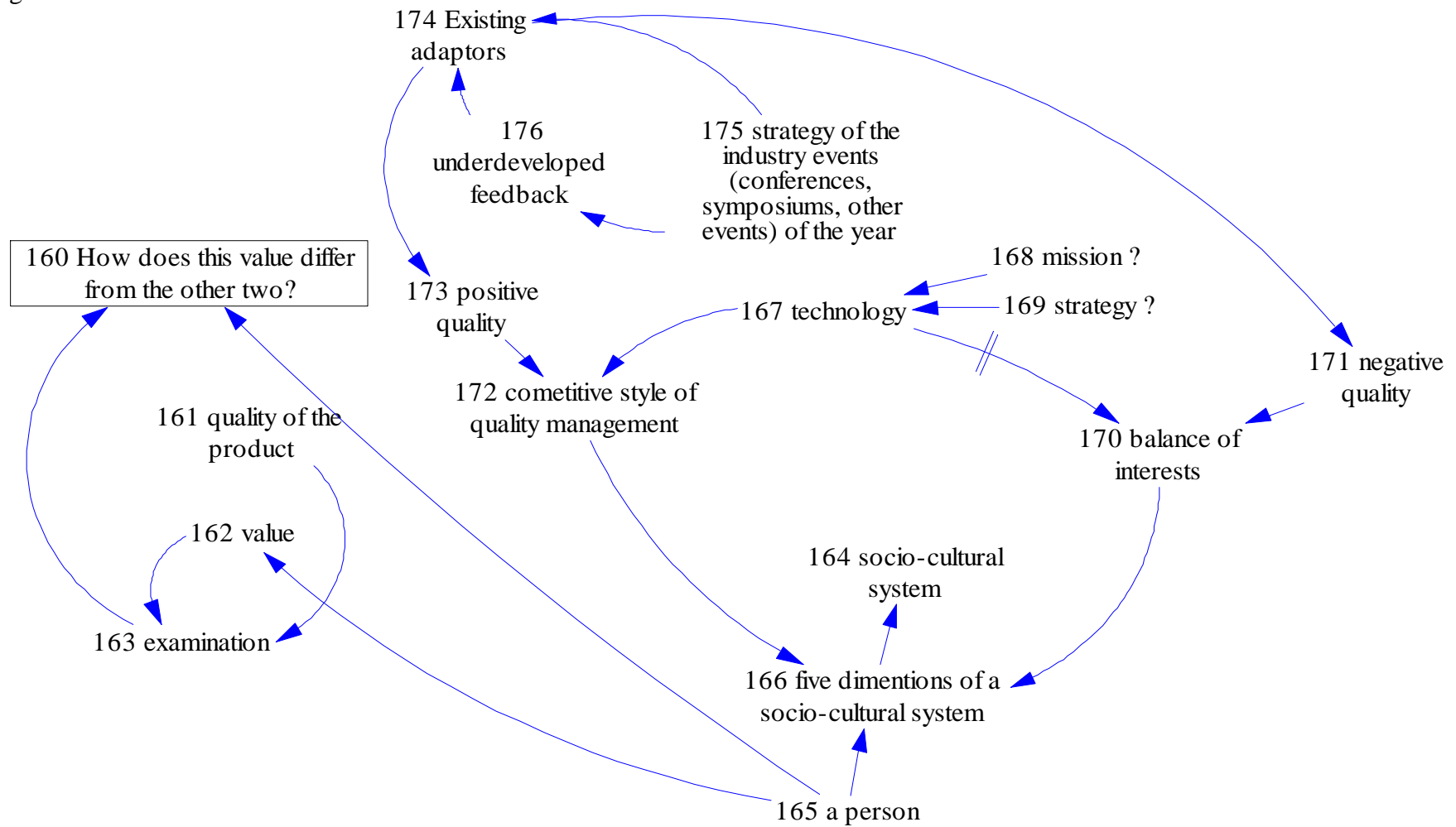
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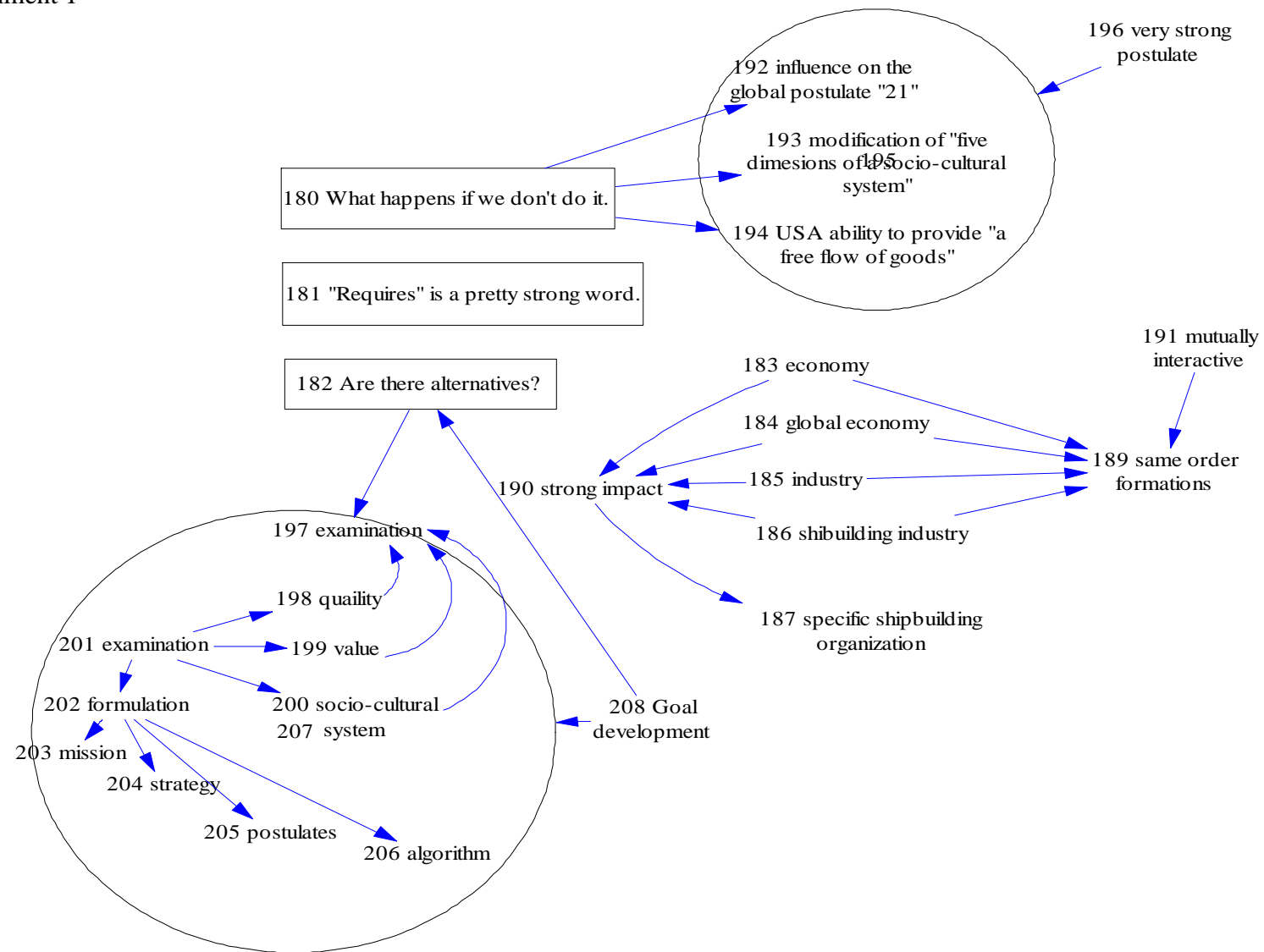
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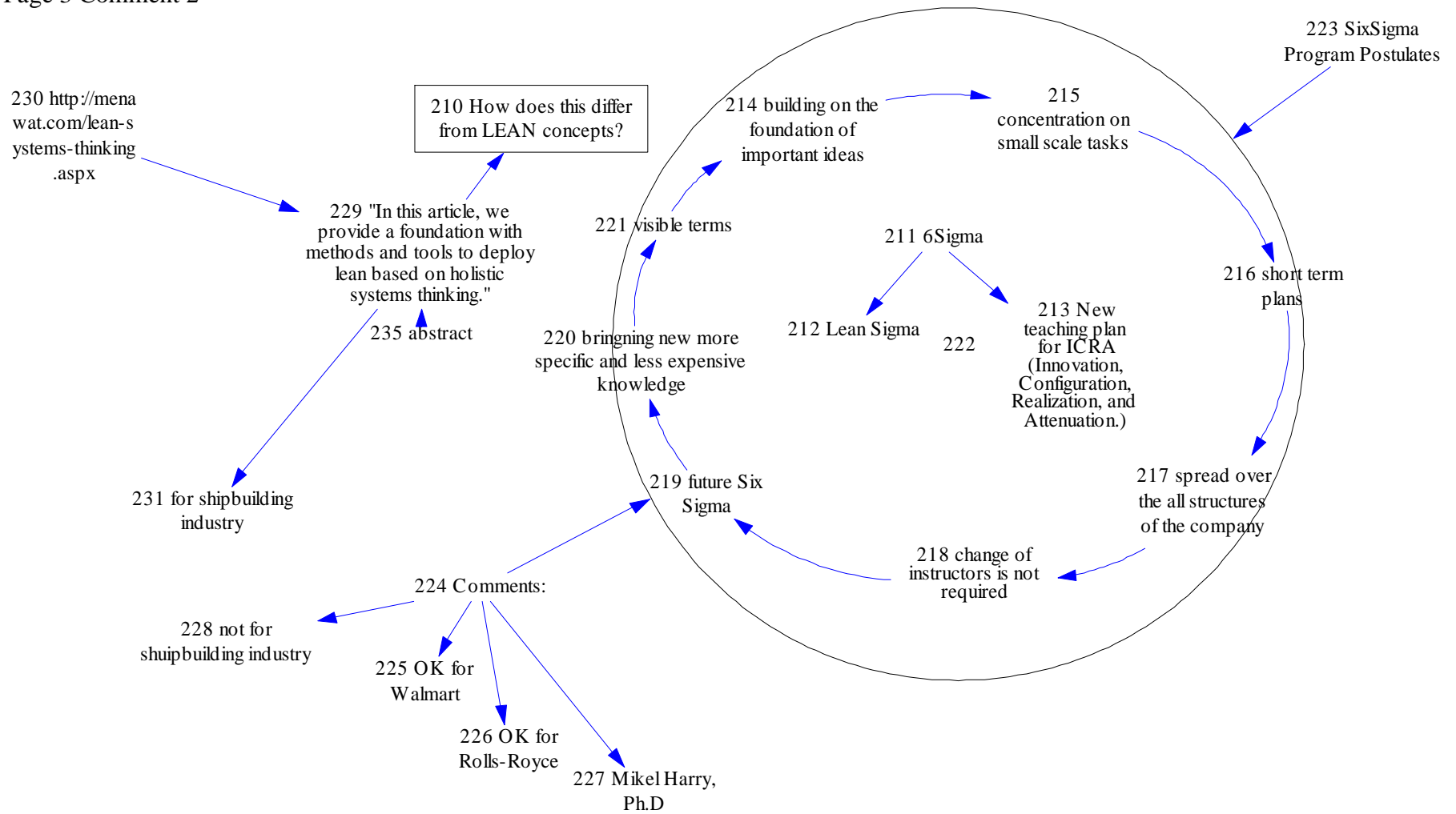
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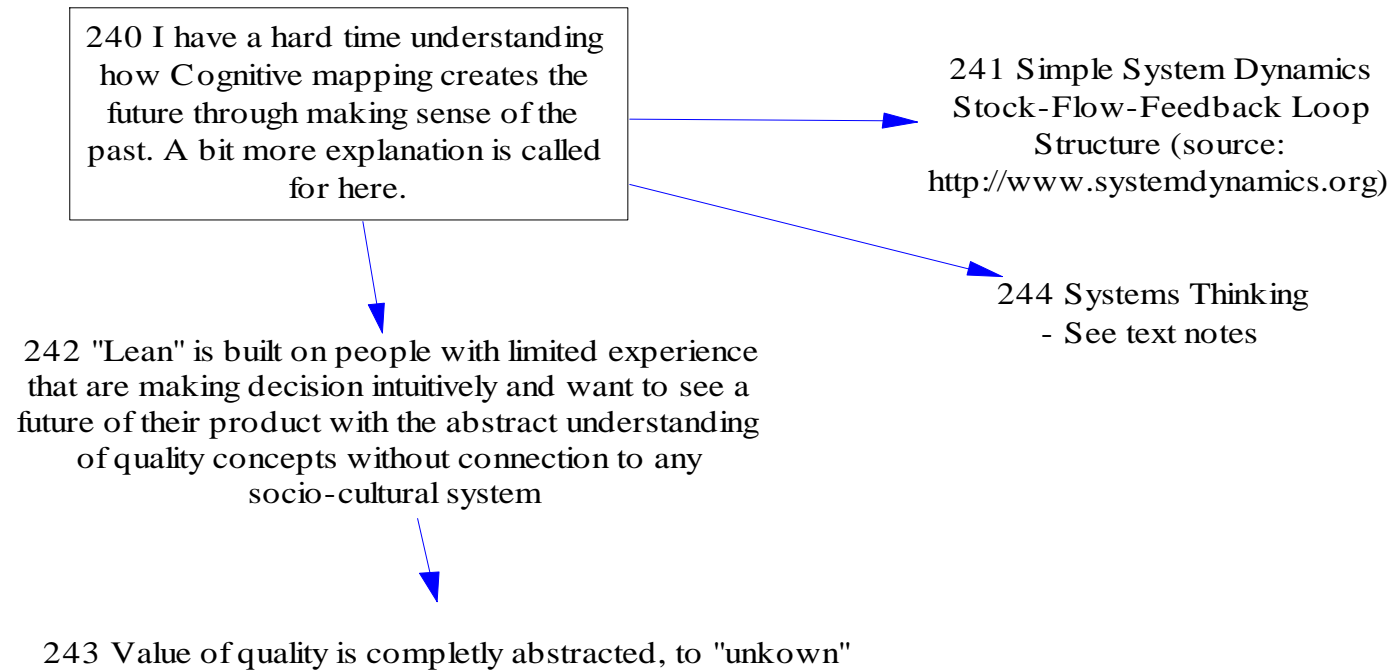
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Page 3 Comment 2



Page 3 Comment 3



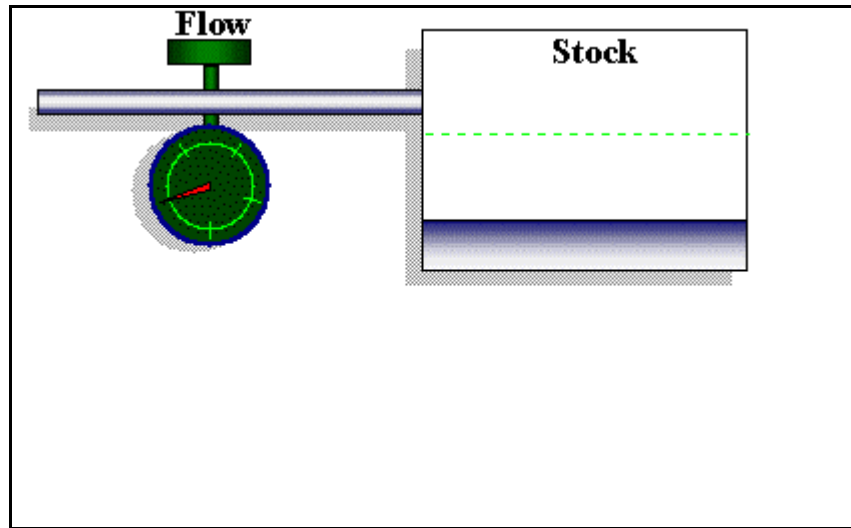


Figure A: Simple System Dynamics Stock-Flow-Feedback Loop Structure (source: <http://www.systemdynamics.org>)

"When a person dismounted a world apart, he ceased to understand the laws not only divine but human"

Lao Tzu

"The serious problems we face can not be solved at the same level of thinking at which they occurred."

Albert Einstein

The systems approach to understand an object can be viewed as a synthesis of intuitive and analytical methods. It denies an attempt to deduce properties of the whole to the properties of its parts, but borrows from the analytical approach the interest to the internal structure of the object. At first it put forward a set of system properties, which are generally not inherent by the components of the system, when taken separately. This approach focuses on those interactions, which become the cause of system properties. In a sense, we return to a holistic view of the object, which is typical for the intuitive approach.

"The Art of Systems Thinking : Essential Skills for Creativity and Problem Solving" by Joseph O'Connor, Ian McDermott

Ludwig von Bertalanffy, one of the founders of general systems theory, defines the basic principle of system approach (in his own words, "trivial in principle, but is associated with numerous problems in the practical application"):

"Properties and ways of functioning of the higher levels can not be explained by summing the properties and methods of operation of their components, taken in isolation from each other. However, if we know the components of the ensemble and the existing links between them, we can derive higher levels of the components. "

The principles of systems thinking (ST) by Peter Senge

"Systems thinking is an application of general principles of a systematic approach, especially in business and organizations, but not limited to it. Systems thinking comprises a set of principles and tools of various levels, usually of a qualitative nature used to identify systems, their research and work with them."

Some features of the systems

1. In the systems are often detected contours of positive and negative feedback, as well as more complex (but repetitive) patterns collected from these relationships (system archetypes). Negative feedback stabilizes the system while maintaining its existence, but also may impede change.
2. By virtue of the presence of feedback systems are often characterized by circular causality or conditioning ($A \rightarrow B \rightarrow C \rightarrow A \rightarrow B \rightarrow \dots$ etc.), as opposed to linear causality, where one can clearly distinguish between cause and effect ($A \rightarrow B \rightarrow C$). In the case of circular causality that distinction (Bateson called it a "punctuation") is conditional. People who are not aware of its conventionality, often have hot and fruitless debates about punctuation ("who first began, and who only adequately answered").
3. When using ST methods it often appears that an object or process we are interested in is integrated into the wider system and its behavior is largely determined by just that, not only by its internal structure. It is therefore advisable not only to go "inside" but "outside" as well - to look not only at the internal structure of what we are interested in, but also to those external objects or processes that may form together with it the wider system. Hence - the importance of "broad-minded," or the proper definition of the boundaries when working with systems.
4. Systems often have several levels of organization (strictly speaking, they, at least two - the level of the whole and the level of the parts, but often there are more). With this, as well with the possible delays in the feedbacks, there is a presence of multiple time scales in the system (Senge, "The behavior initially improves, but only later gets worse") and the importance of «long view», a view at the system in the long term.

5. The behavior of the system is often counter-intuitive - our everyday intuition does not work with circular causality, and some other features of the systems (for example, the exponential growth characteristic for systems with positive feedback). It is associated with the need for systems thinking as a distinct discipline.

Why do we need a systemic way of thinking:

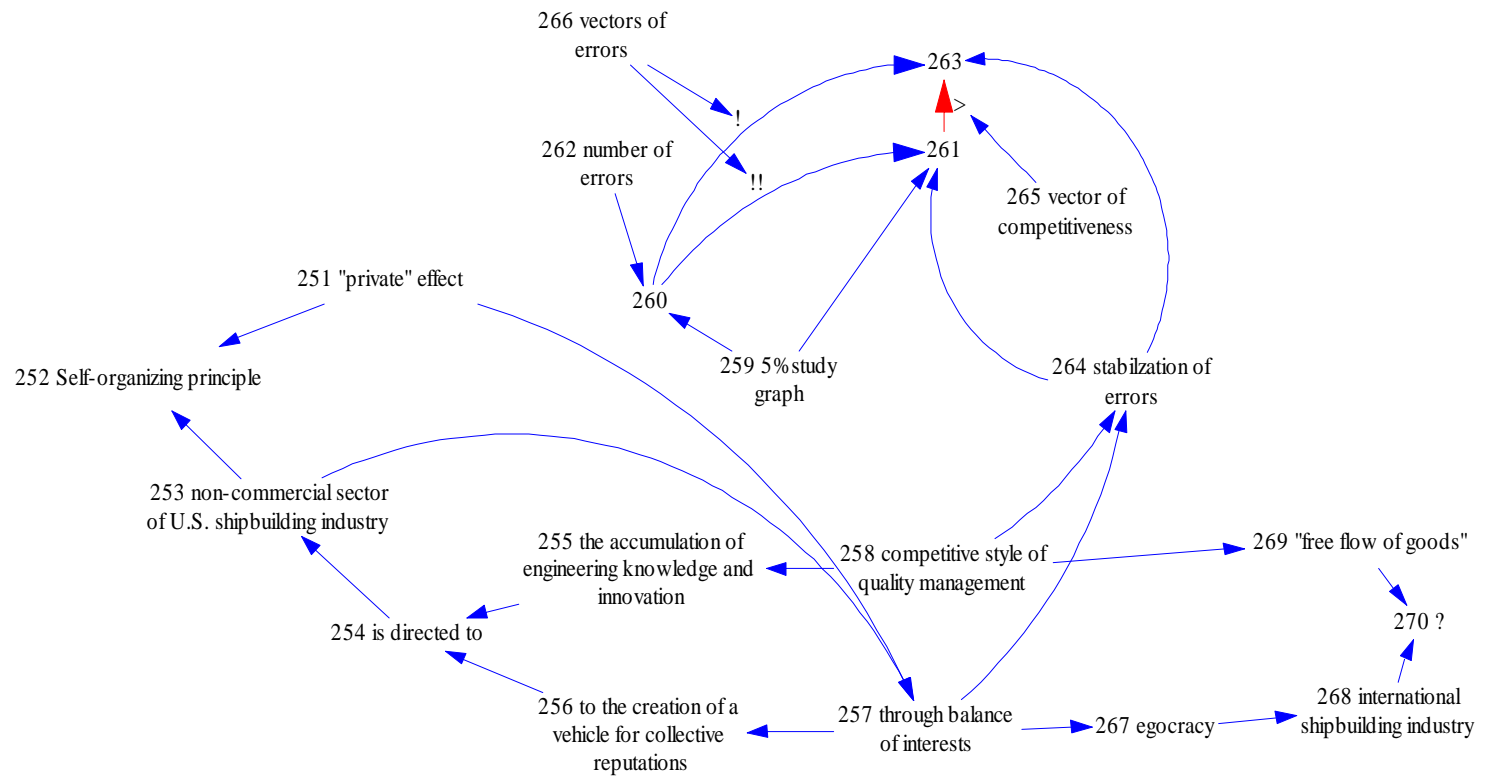
- Systems thinking - one of the key ways to create innovation.

The methods of systems thinking:

- Eliyahu M Goldratt's Theory of Constraints
- Simulation

Page 3 Comment 4

250 This needs a little more explanation. Private shipbuilders are largely publicly traded companies that are charged with increasing shareholder value.



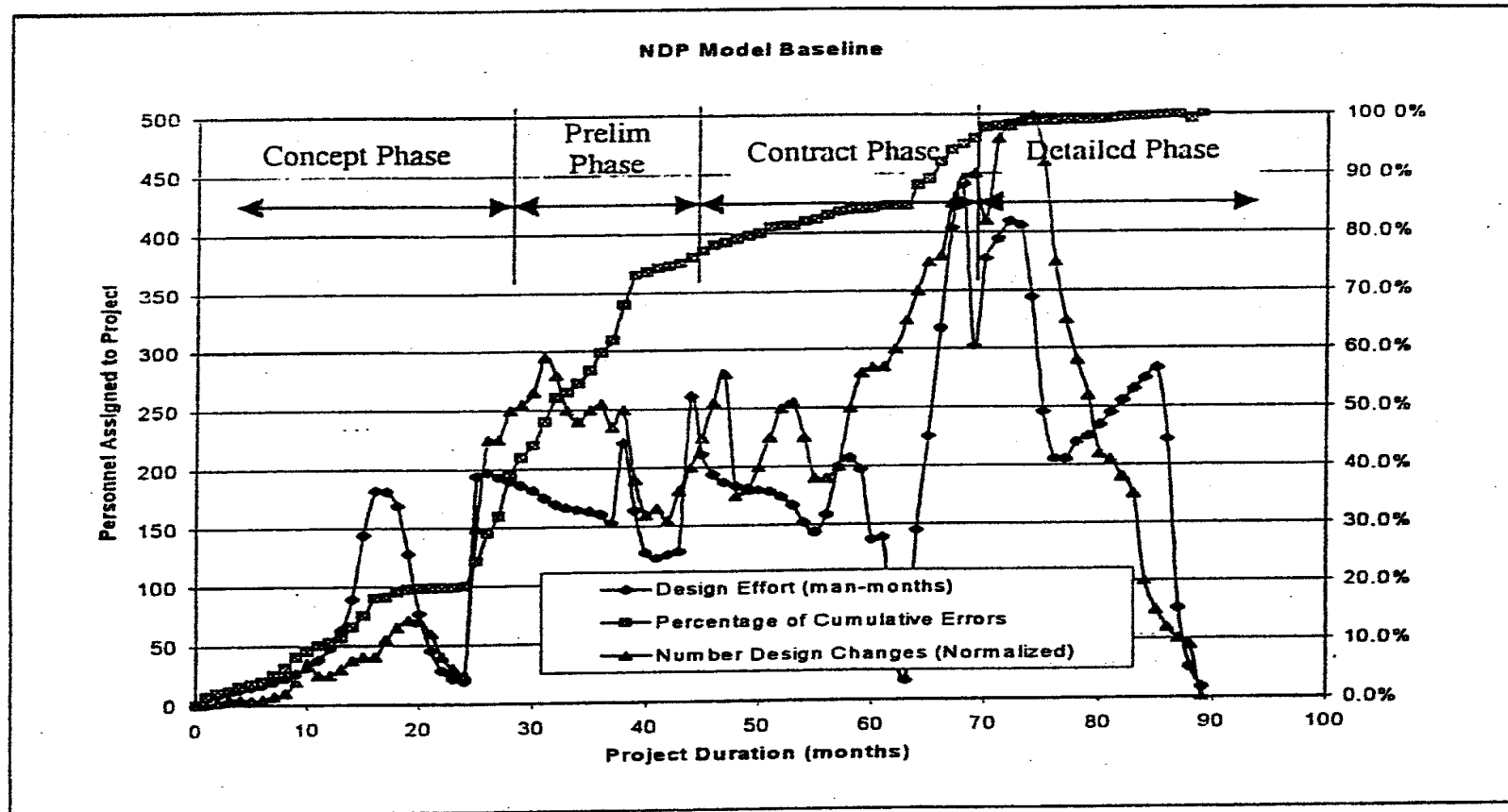
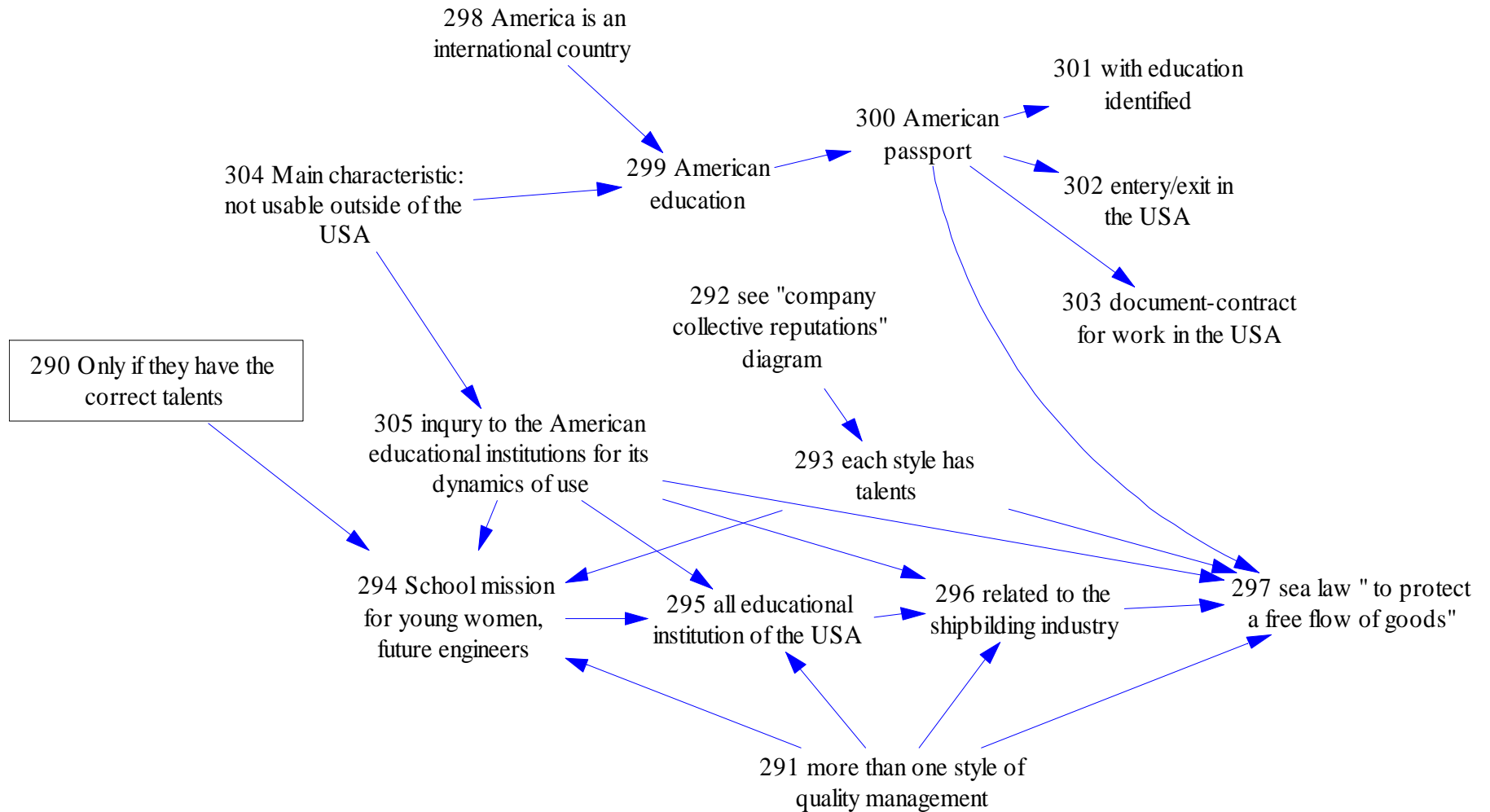
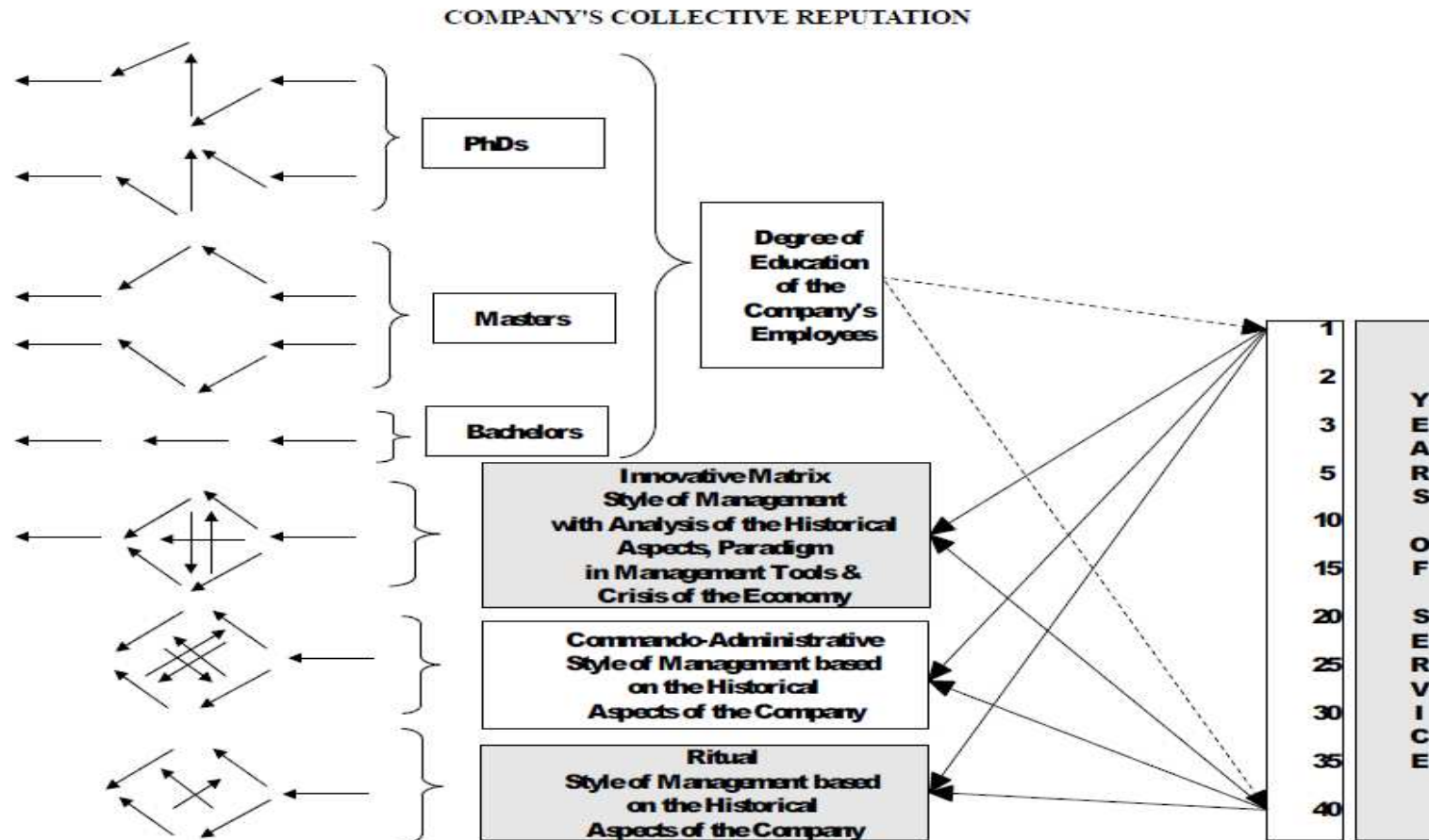


Figure 1. "5%" study (courtesy of Prof. Steven Walk, Director of Laboratory for Technology Forecasting at Old Dominion University)

Page 3 Comment 5





School mission for young women, future engineers

One of the schools in Connecticut has the following mission:

Our Mission

Miss Porter's School educates young women to become informed, bold, resourceful and ethical global citizens. We expect our graduates to shape a changing world.

Our Vision

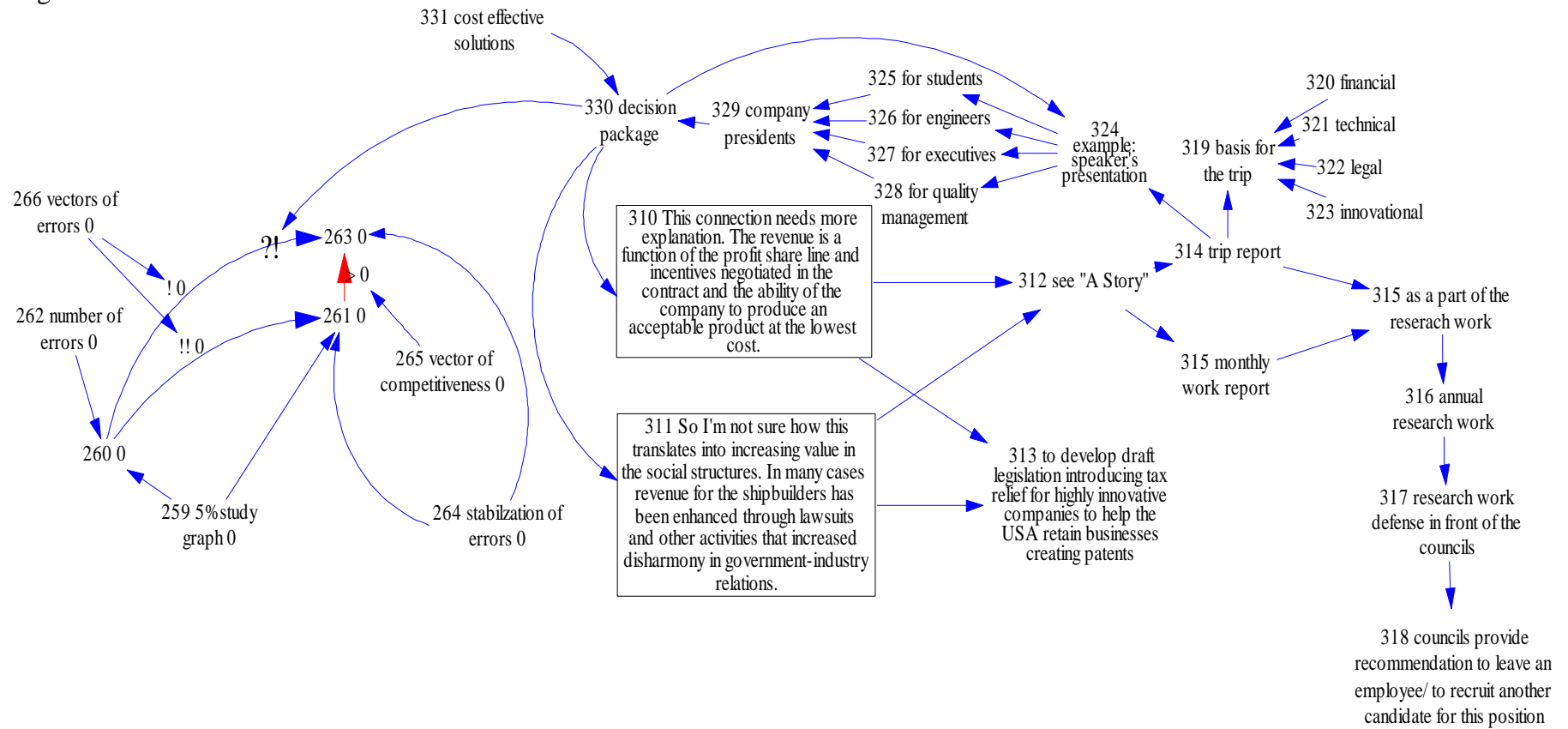
In keeping with our founder's vision, Miss Porter's School joins tradition with innovation to provide an exemplary education to young women. Generation after generation, our leadership is defined by our ability to articulate how young women think, how young women learn, and why gender matters. Within our legacy lies our future.

Our Core Characteristics

The Miss Porter's School community cultivates and commends the following core characteristics:

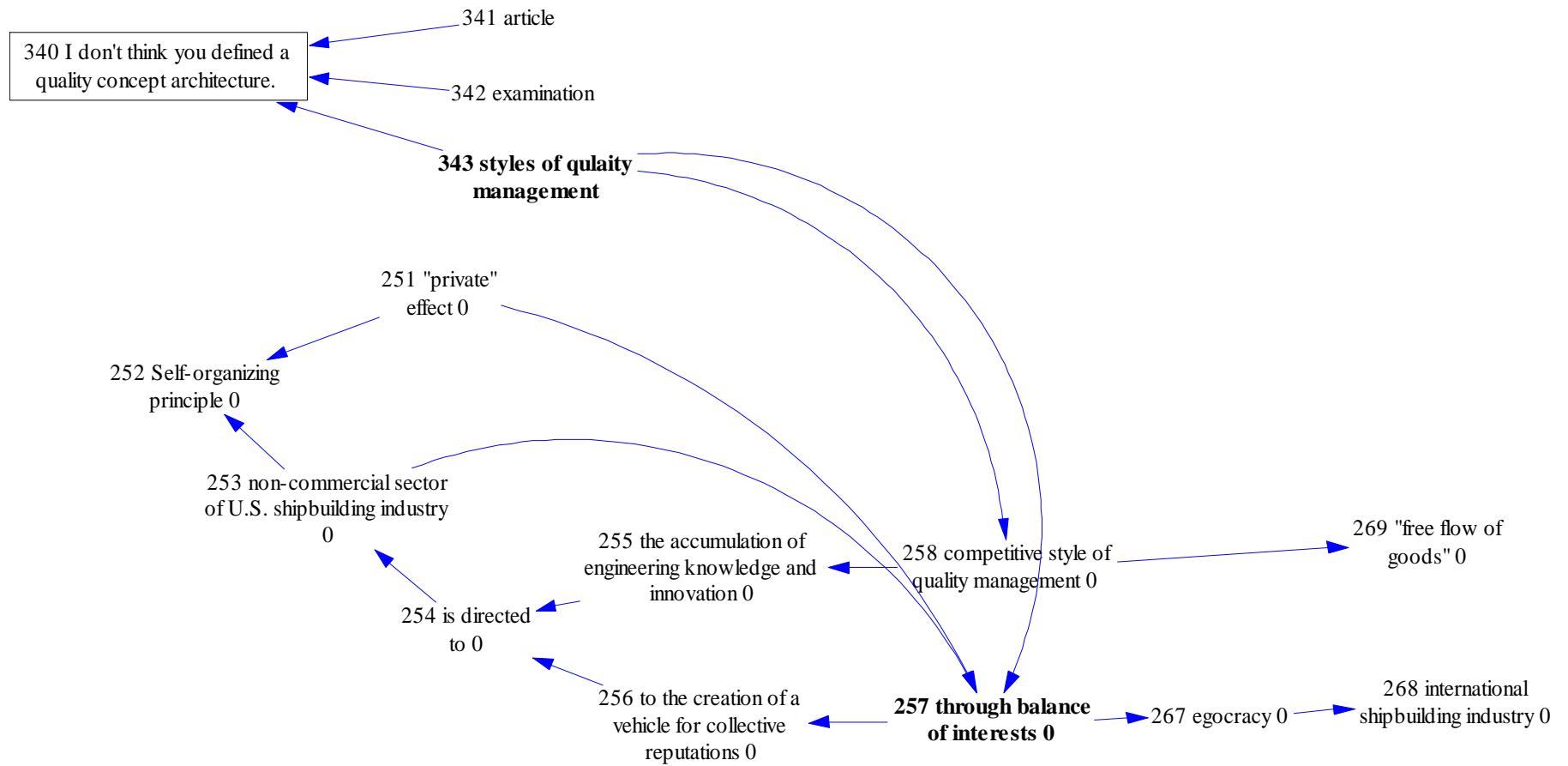
- Intellectual Curiosity
- Leadership
- Global Citizenship
- Integrity
- Courage

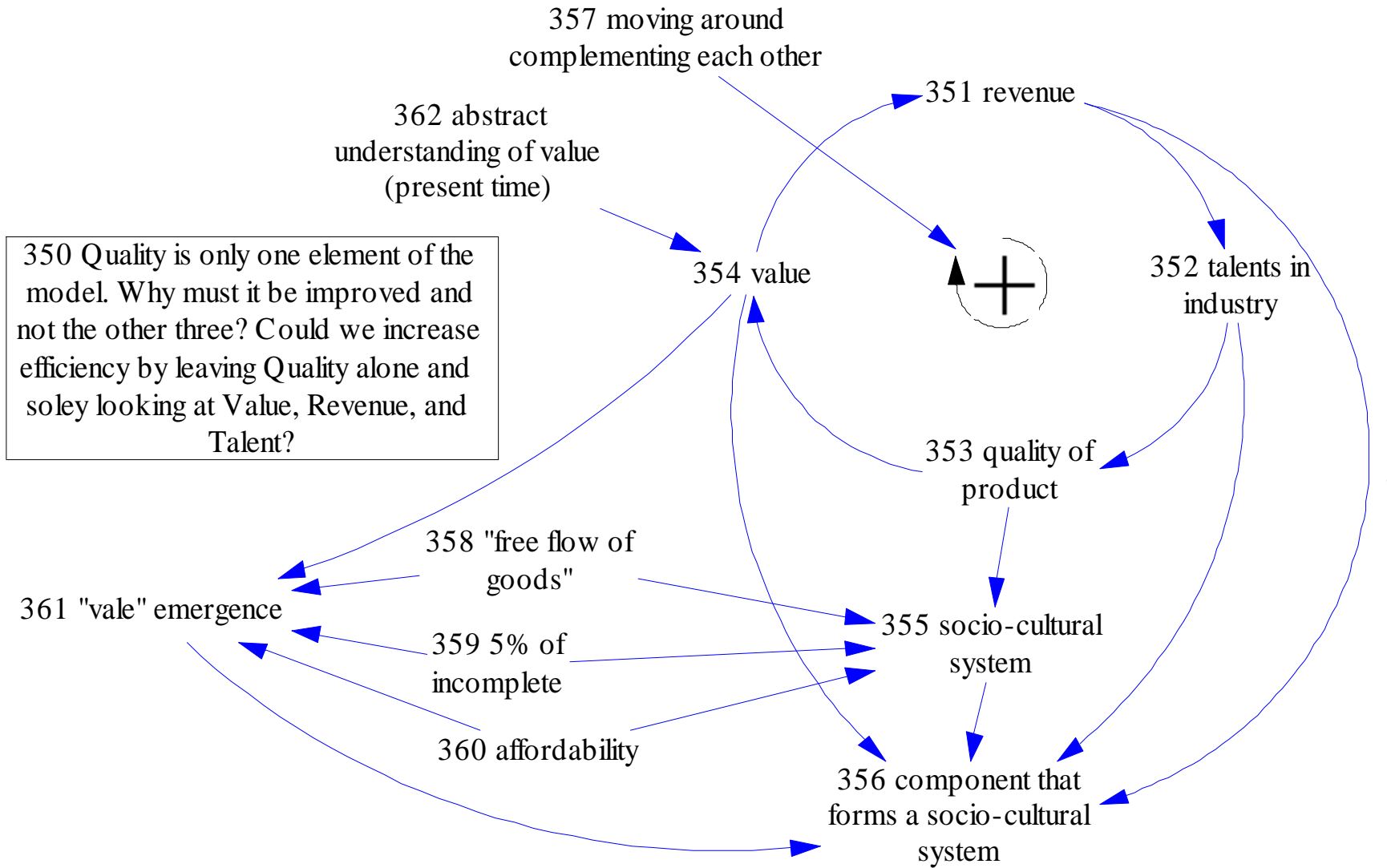
Page 3 Comment 6



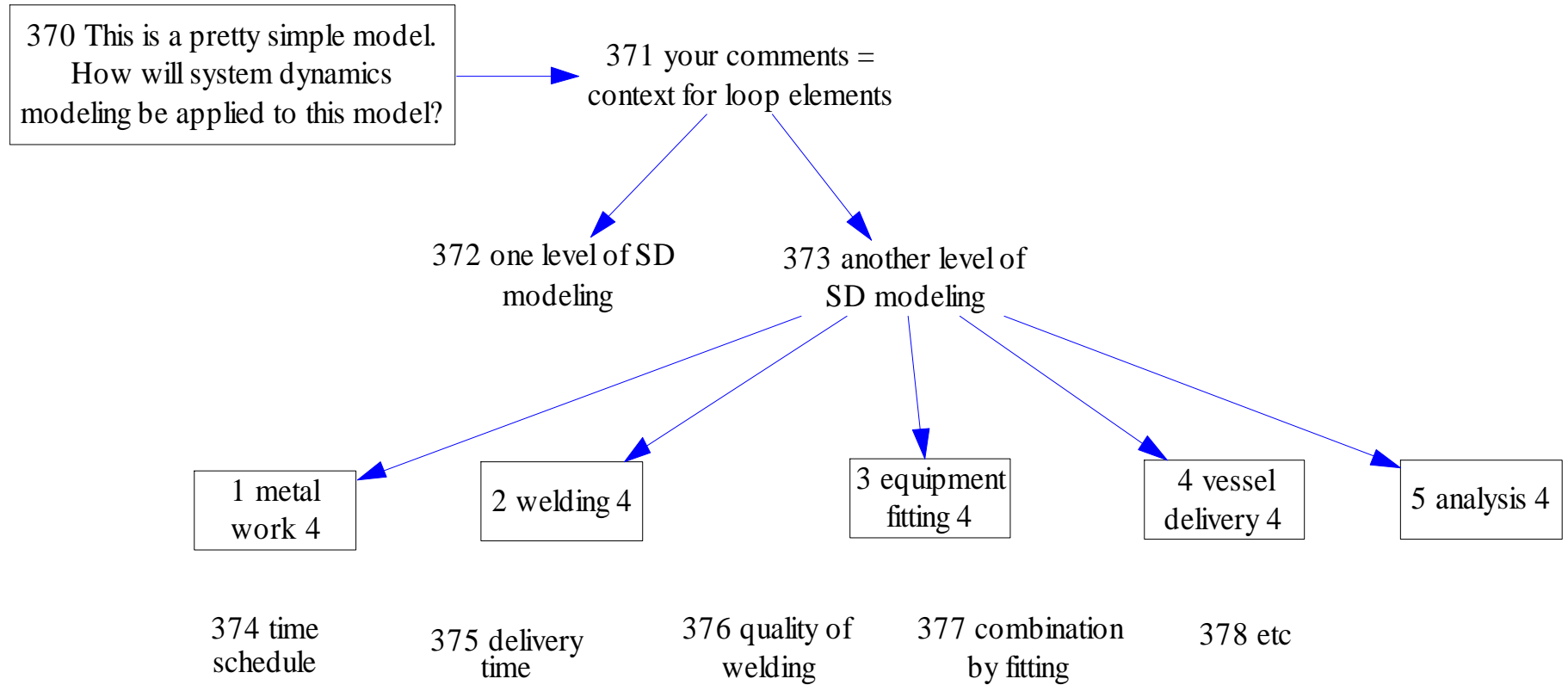
“A Story” slides are attached as a separate file

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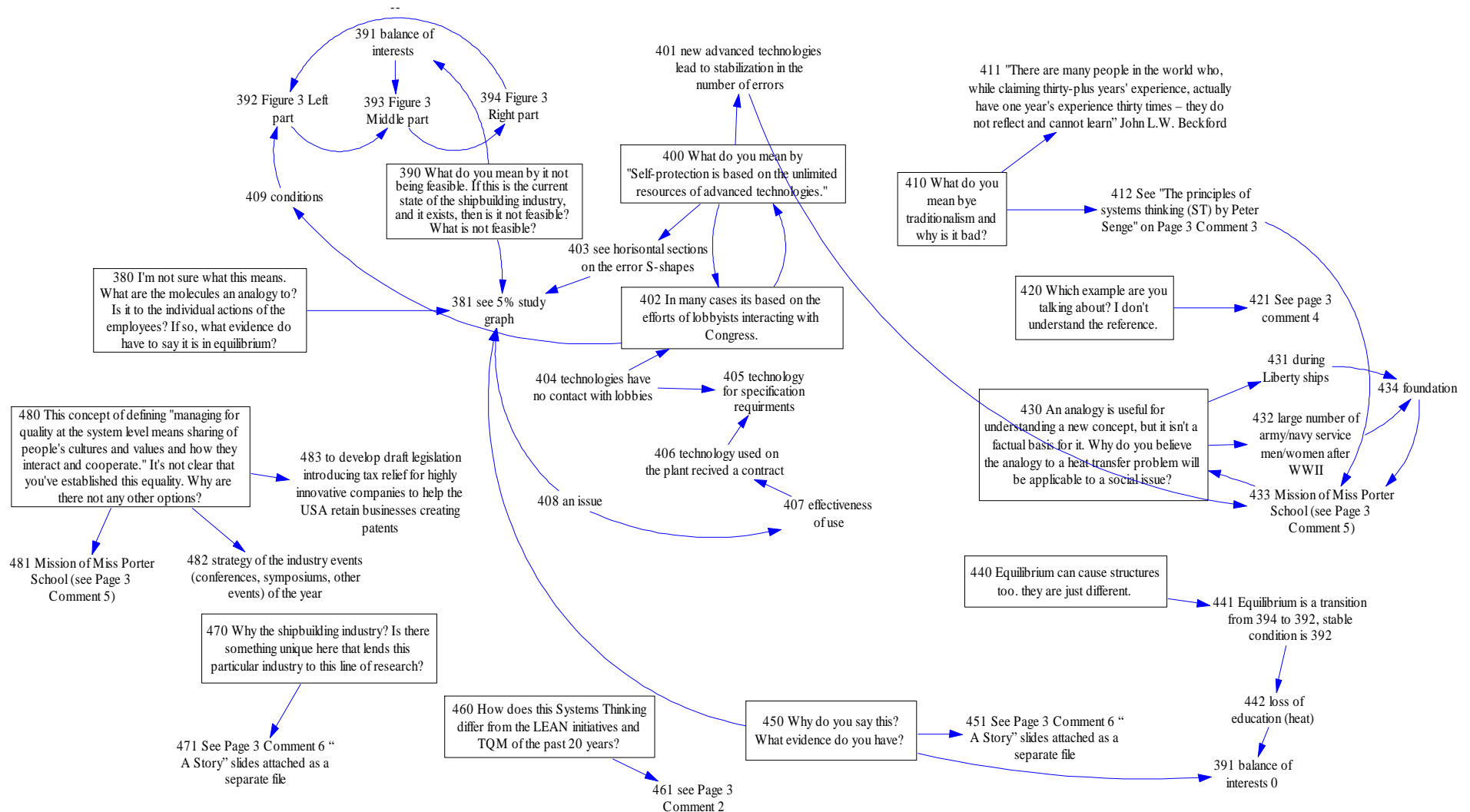




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Page 4 Comment 1-11



Comment 1 (corresponds to concept 380):

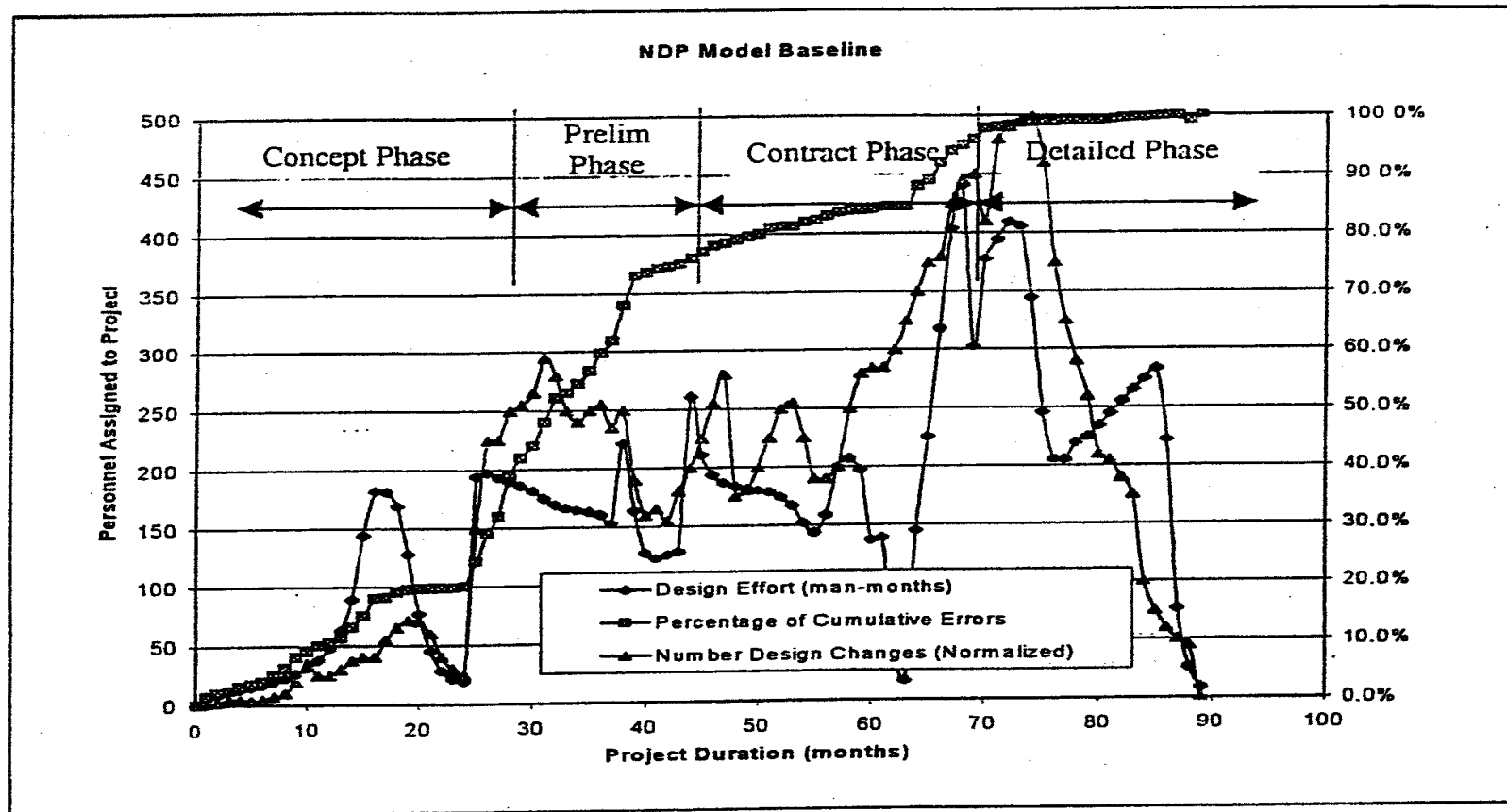


Figure 1. "5%" study (courtesy of Prof. Steven Walk, Director of Laboratory for Technology Forecasting at Old Dominion University)

Page 5 Comment 1-4

500 I still don't understand what you mean by either quality or value, hence I'm not sure of your objective.

501 See "Page 2
Comment 1 "

531 See "Page 2
Comment 1 "

530 I can't figure out what you are trying to say with this paragraph.

510 You may have difficulty working with the shipyards here because I'm not confident that your definition of Quality is aligned with the definition of Quality used in the shipyards.

511 "See Page 2
Comment 1 "

520 It's not clear how the questionnaires will be used to implement the process in Figure 4. Some explanation of the individual steps is warranted. I'm not sure what you mean each of the blocks.

521 See "Page 2
Comment 1 "

Page 6-7 Comments

