BENTLEY UNIVERSITY

Responsible Design
value-infused innovation

Les Waguespack, Ph.D.
Computer Information Systems Department

Design is the expression of intentions that forms an artifact

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"Value" is the experience of an artifact resonating with intention(s)

Design is the expression of intentions that forms an artifact

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Design illuminates "value"

Design is the expression of intentions that forms an artifact

"Value" is the experience of an artifact resonating with intention(s)

Design illuminates "value"

Because "design" is both a verb and a noun -

Design is the expression of intentions that forms an artifact

"Value" is the experience of an artifact resonating with intention(s)

Design illuminates "value"

Because "design" is both a verb and a noun -

"Value" depends on the lens through which intentions are expressed in design and subsequently interpreted in experience

Design Phenomenon

"a dialog of intention"

ontological primitive

Design Phenomenon

"a dialog of intention"

what

ontological primitive

why

how

Design Phenomenon

"a dialog of intention"

generative activity

ontological primitive

what

why

how

Design Phenomenon

"a dialog of intention"

generative activity

ontological primitive

what

why

to design (v)

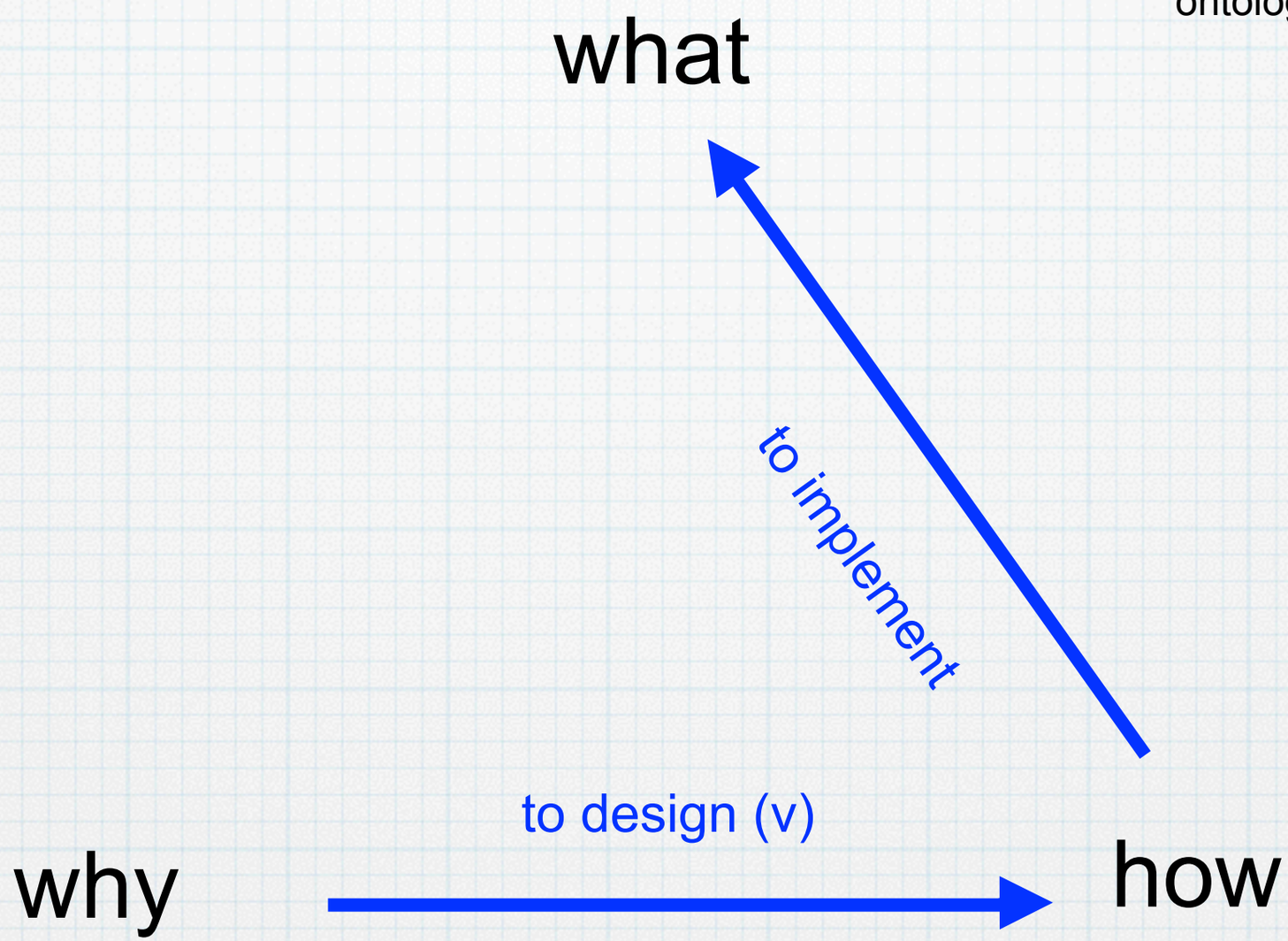
how

Design Phenomenon

"a dialog of intention"

generative activity

ontological primitive

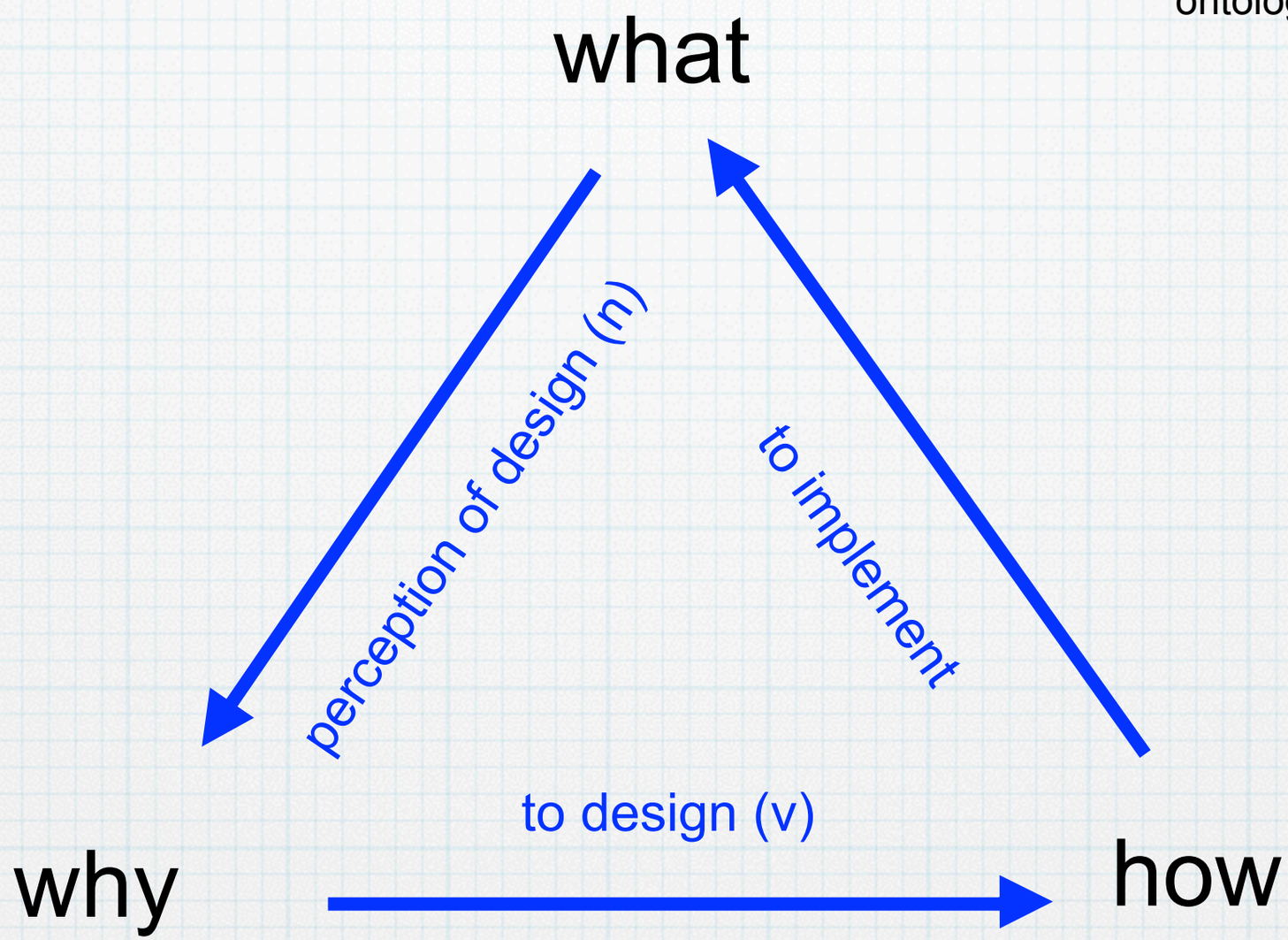


Design Phenomenon

"a dialog of intention"

generative activity

ontological primitive



Design Phenomenon

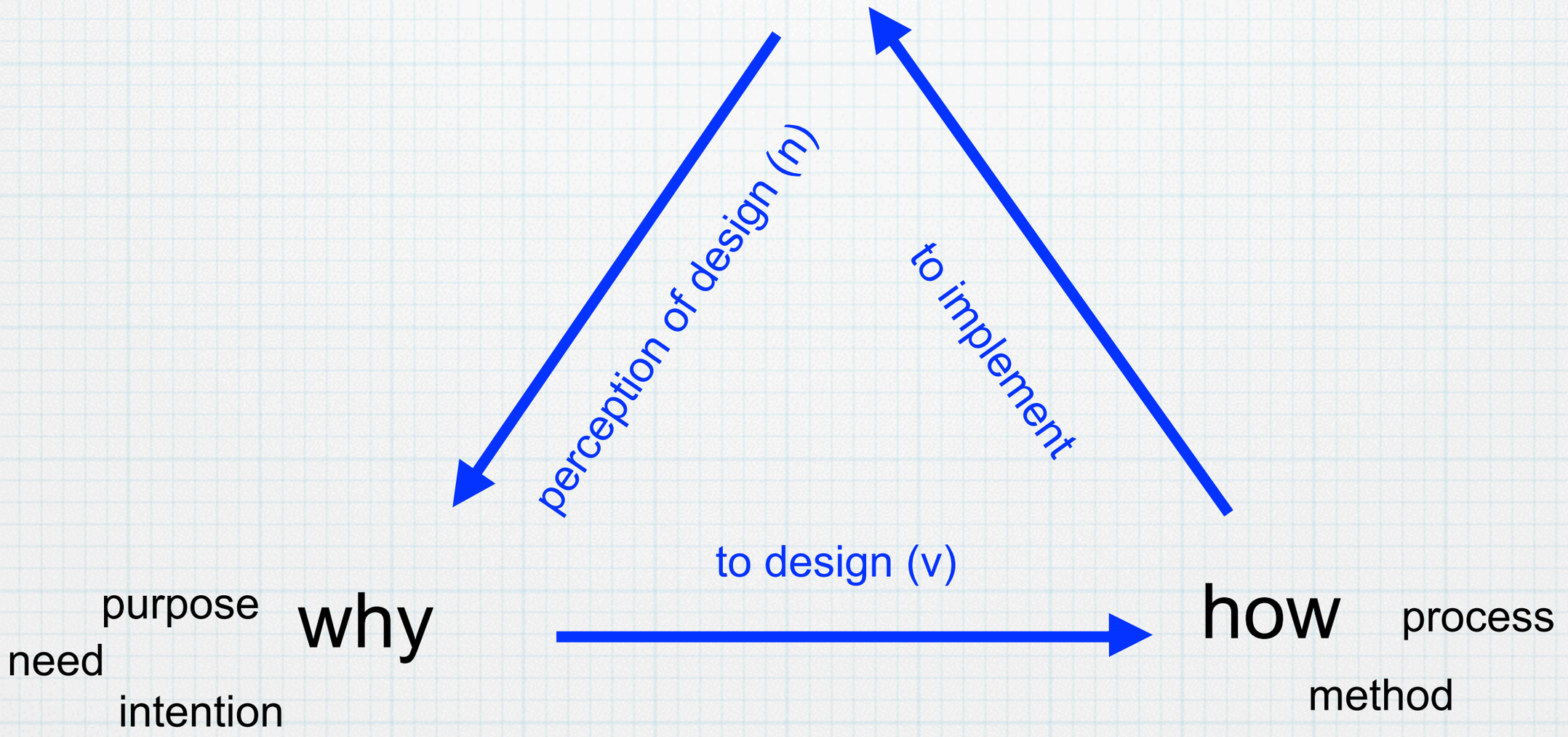
"a dialog of intention"

generative activity

system
edifice
model
artifact

ontological primitive

what



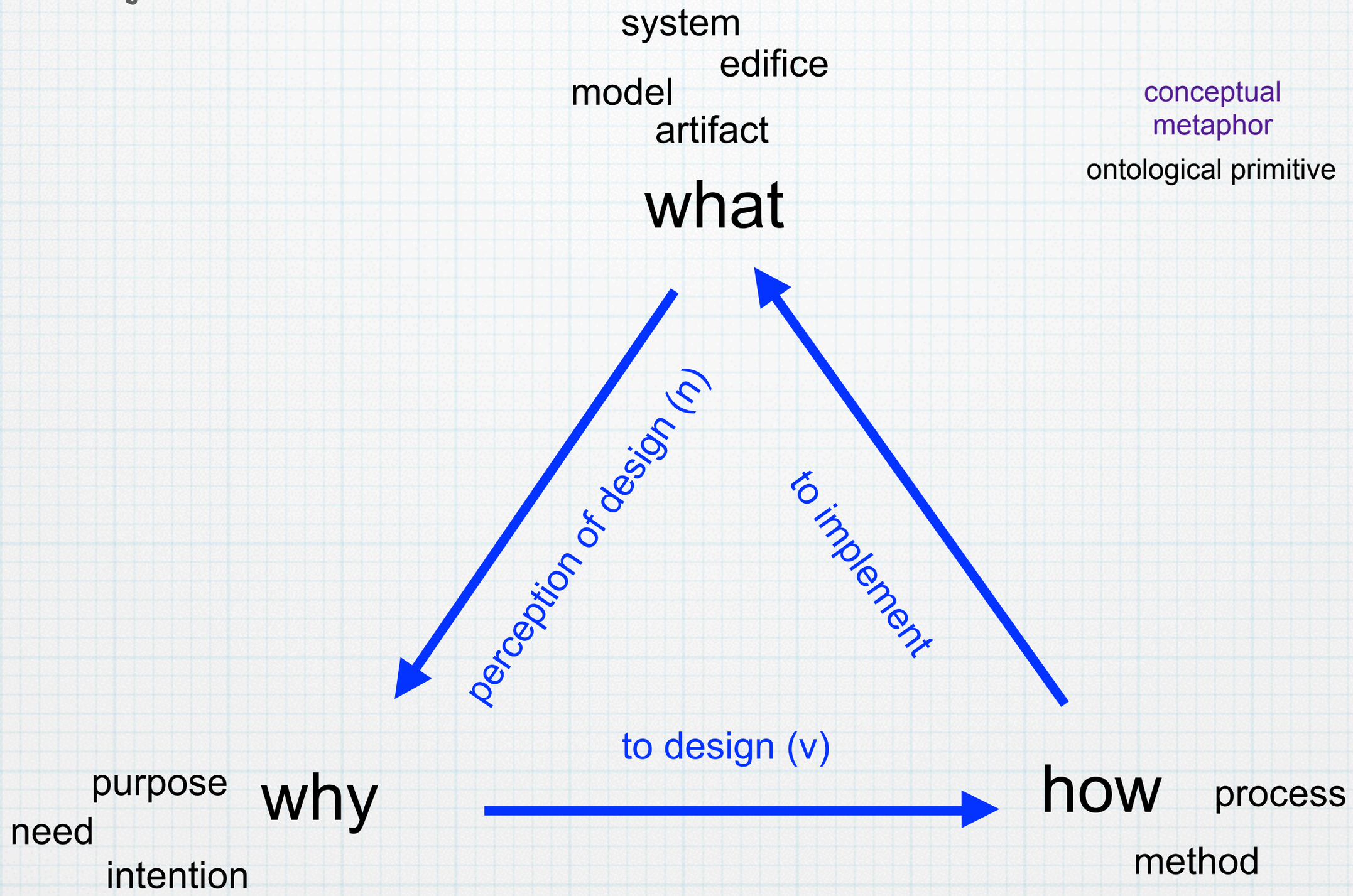
Design Phenomenon

"a dialog of intention"

generative activity

conceptual metaphor

ontological primitive



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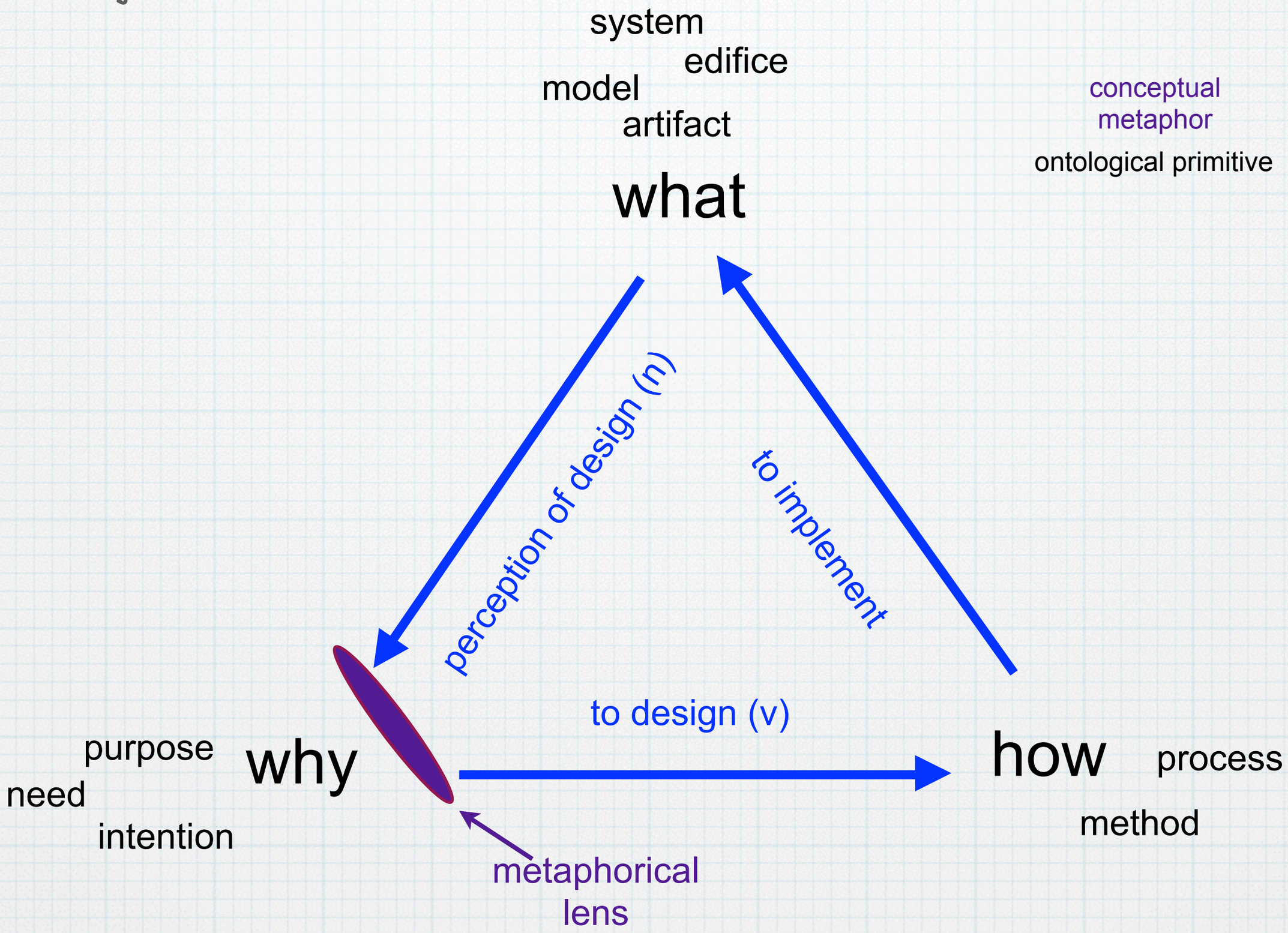

Design Phenomenon

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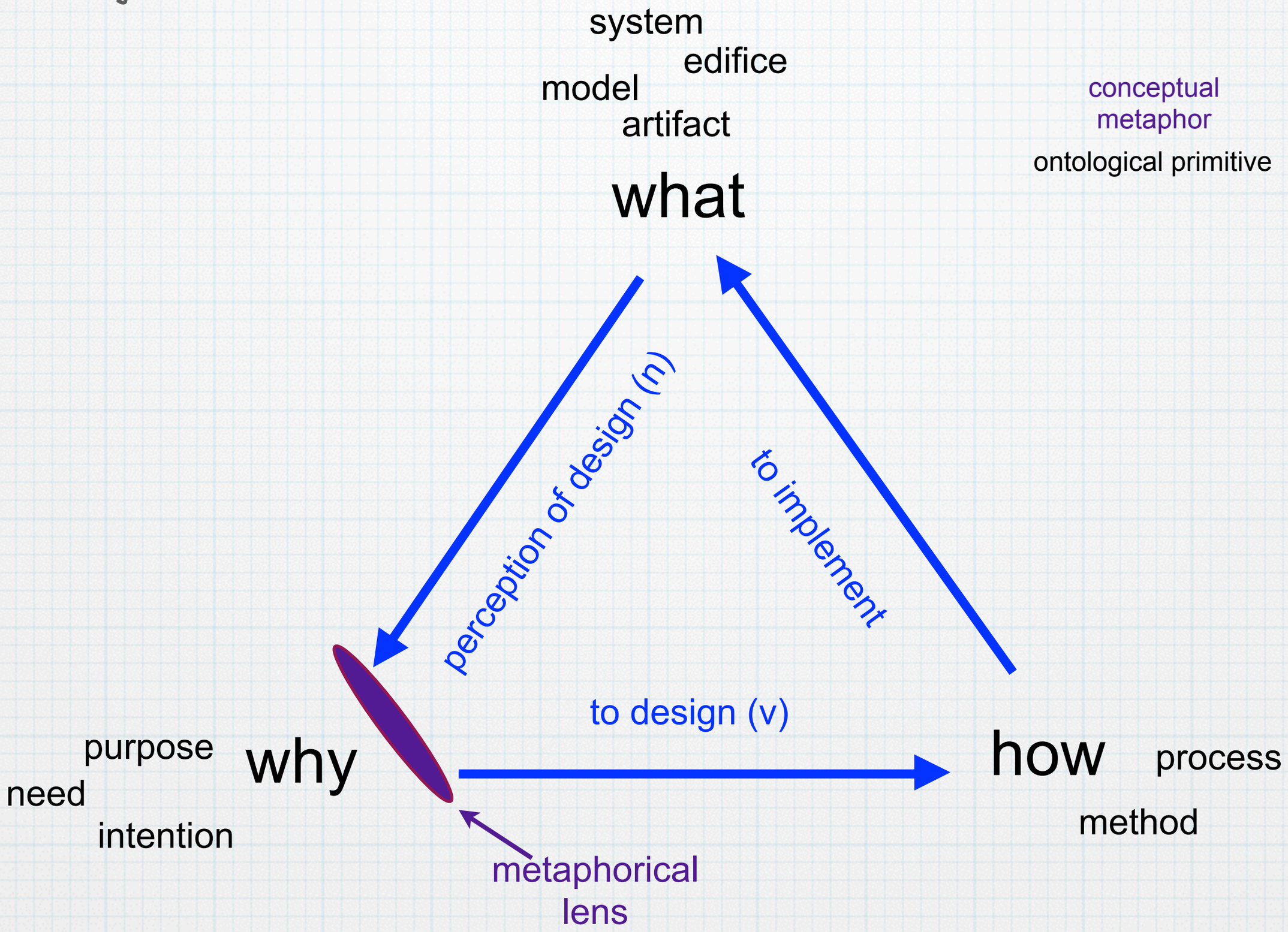
generative activity

conceptual metaphor

ontological primitive



Design Phenomenon

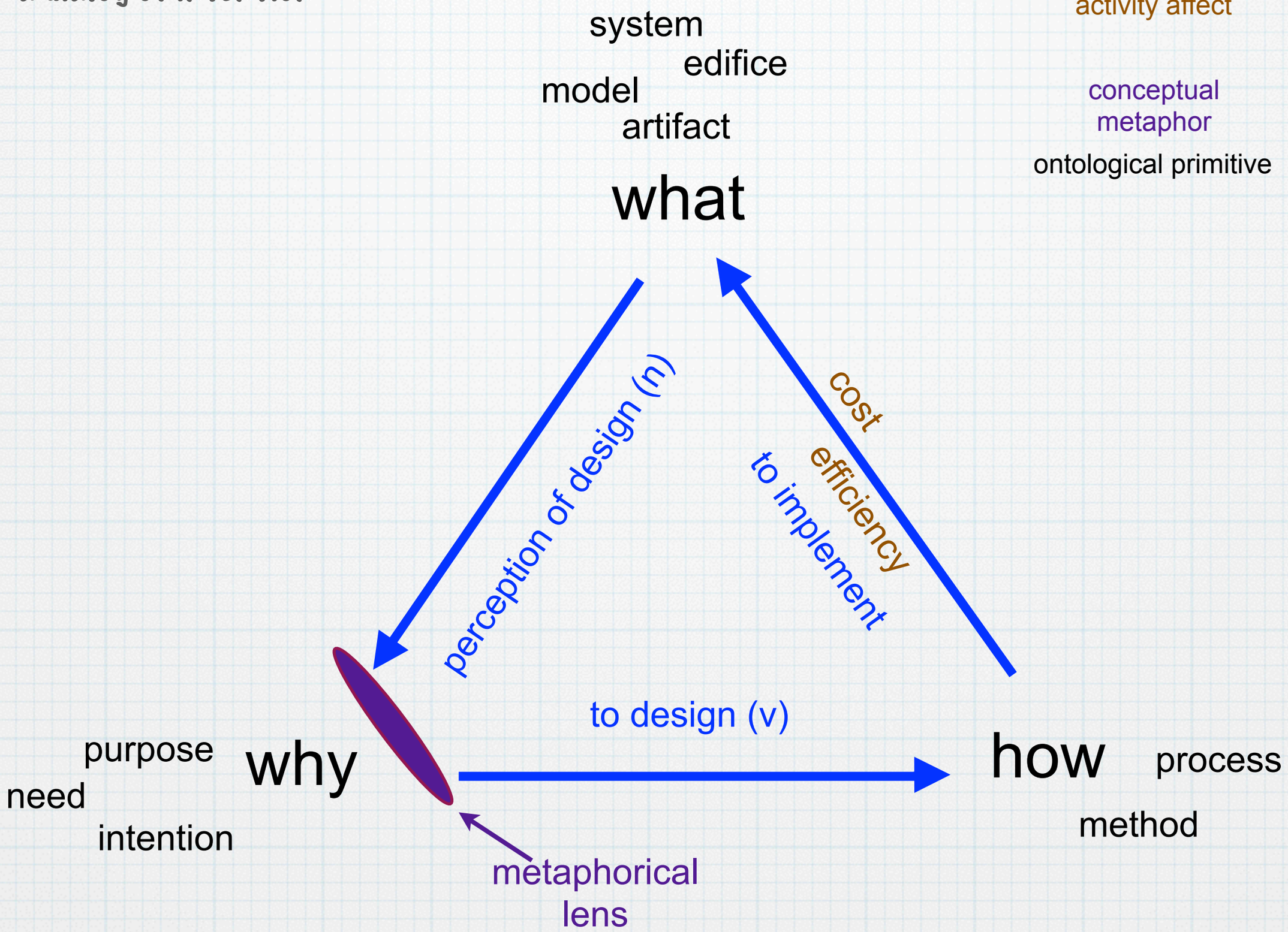
"a dialog of intention"

generative activity

activity affect

conceptual metaphor

ontological primitive



Design Phenomenon

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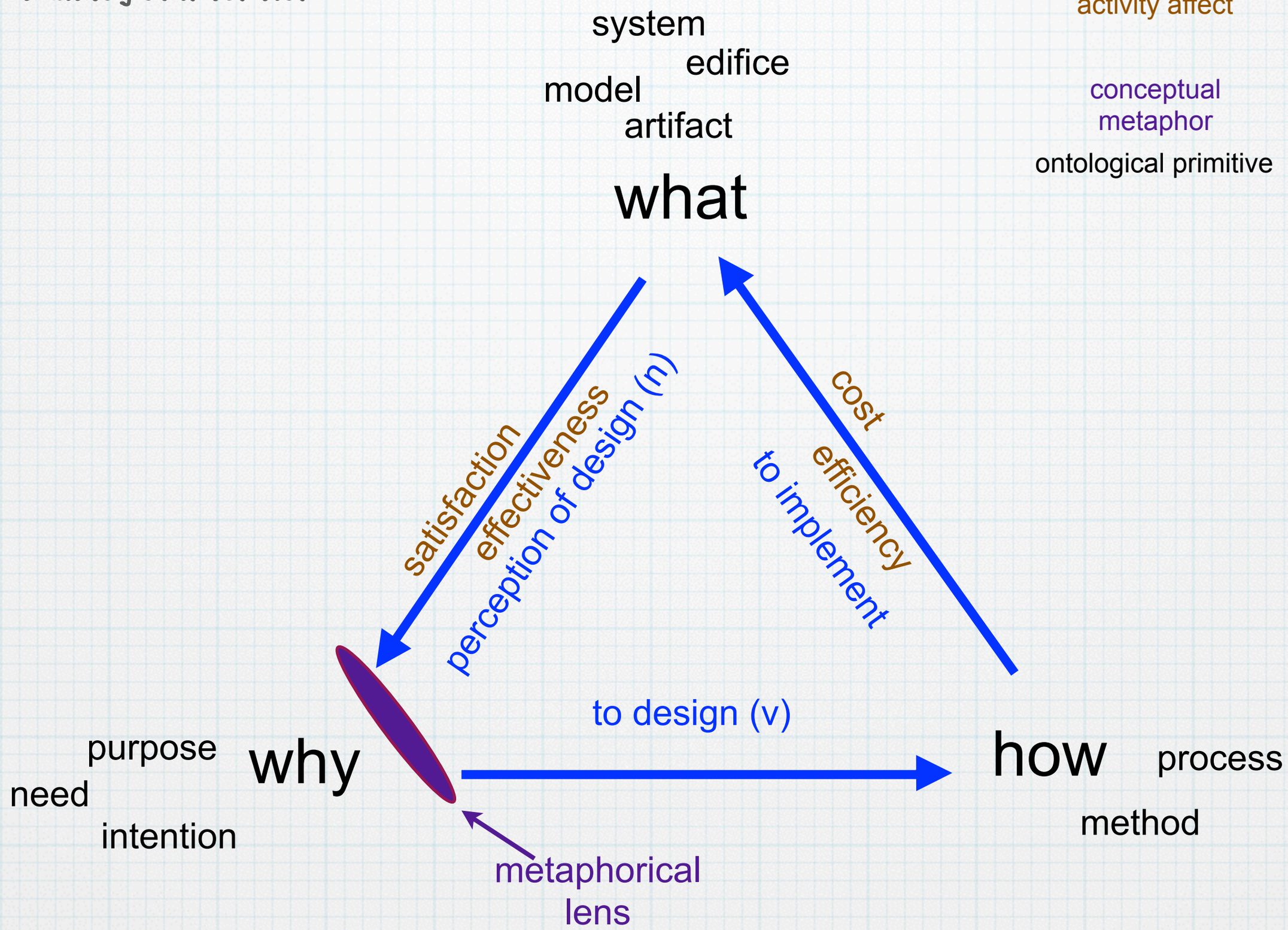


Design Phenomenon

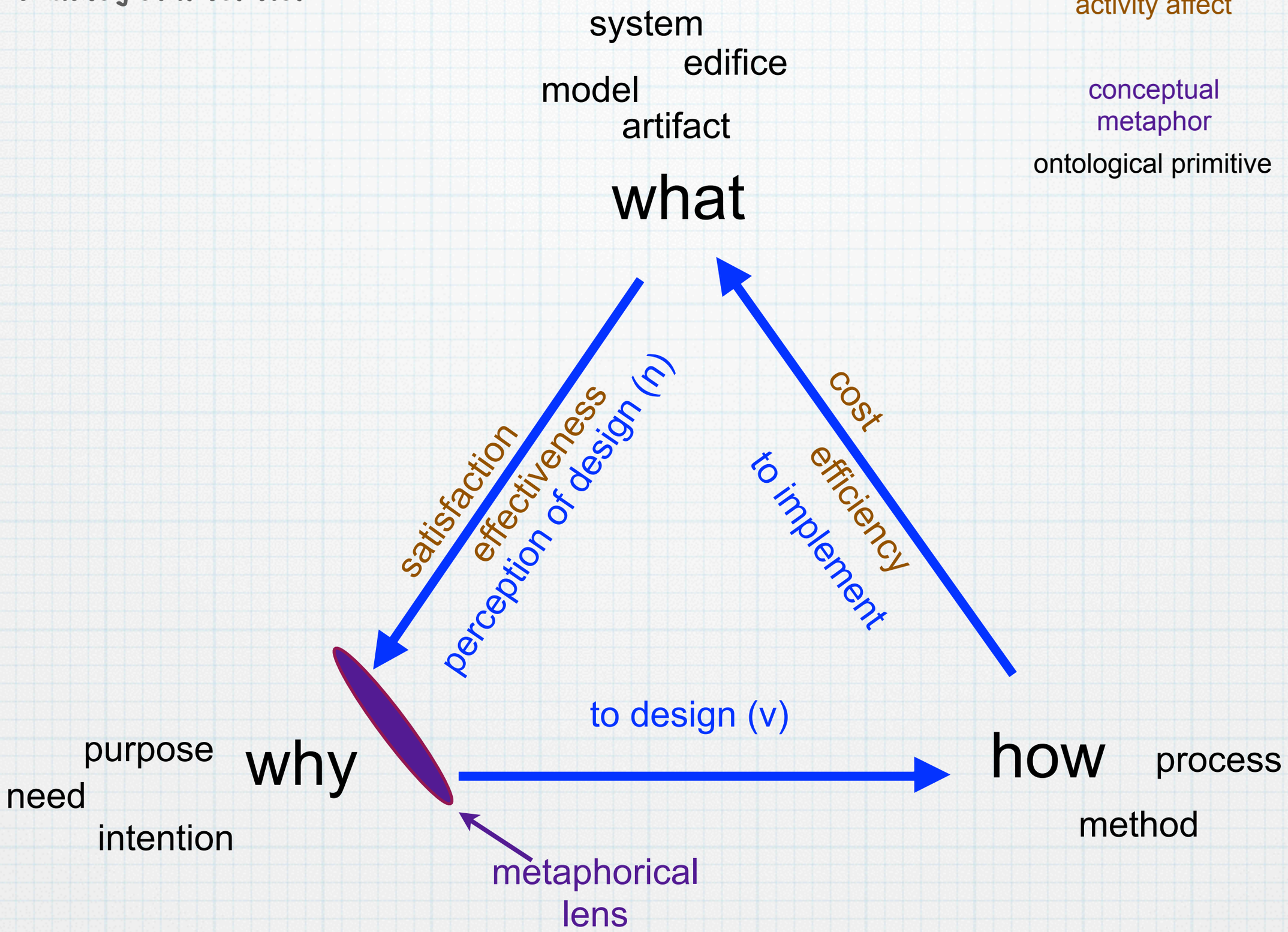
"a dialog of intention"

generative activity

activity affect

conceptual metaphor

ontological primitive



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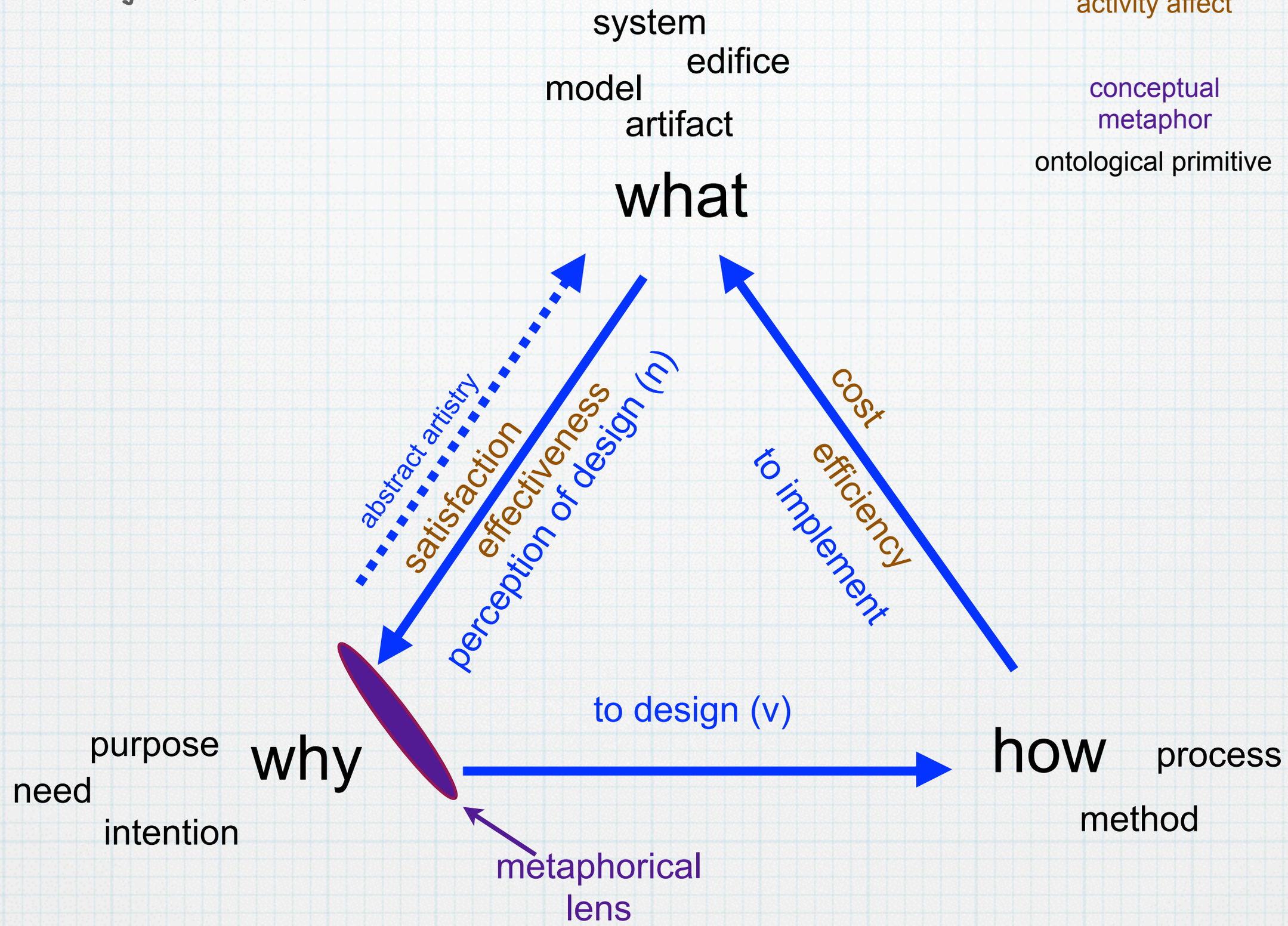

generative activity

activity affect

conceptual metaphor

ontological primitive

Design Phenomenon

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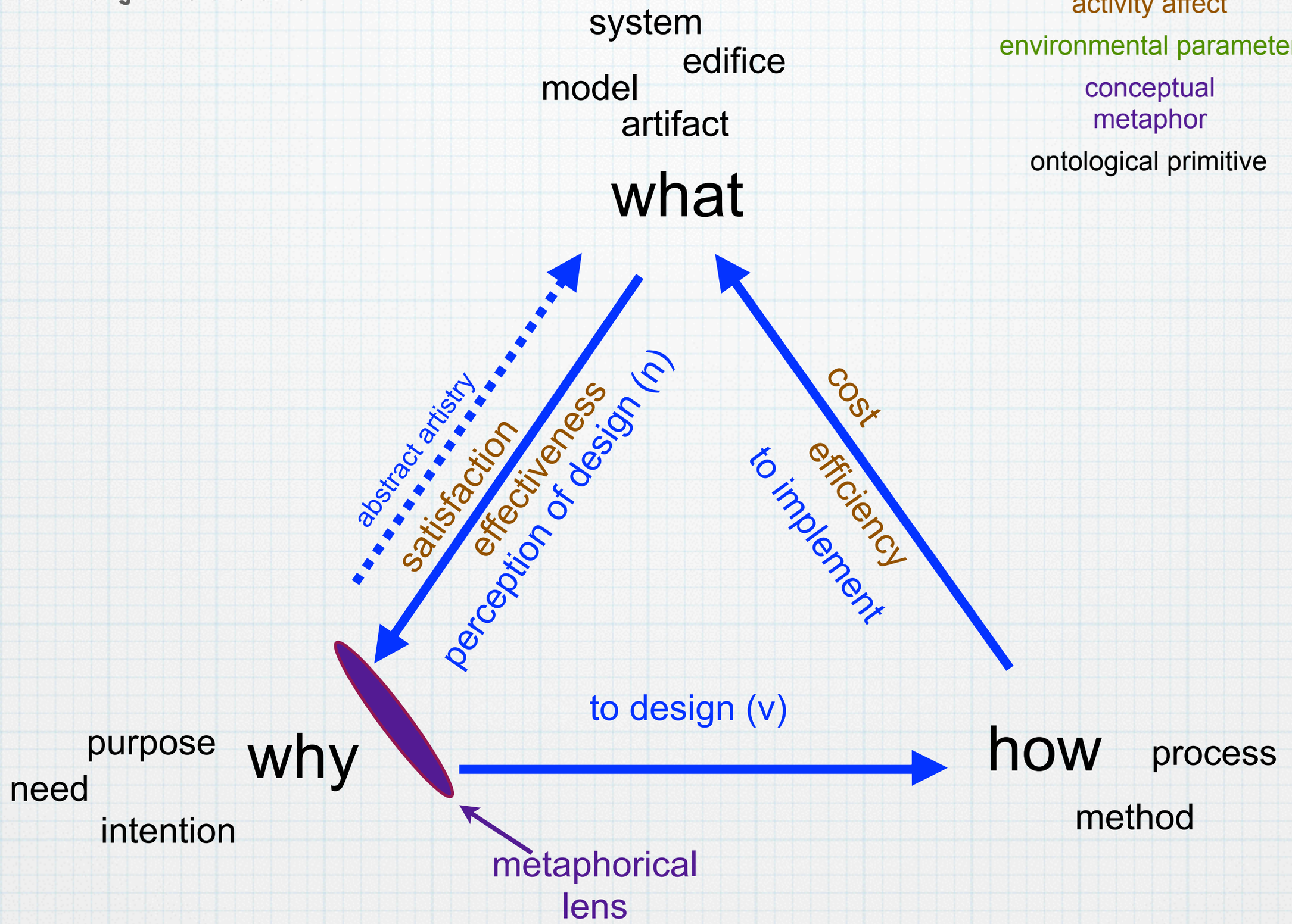


generative activity

activity affect

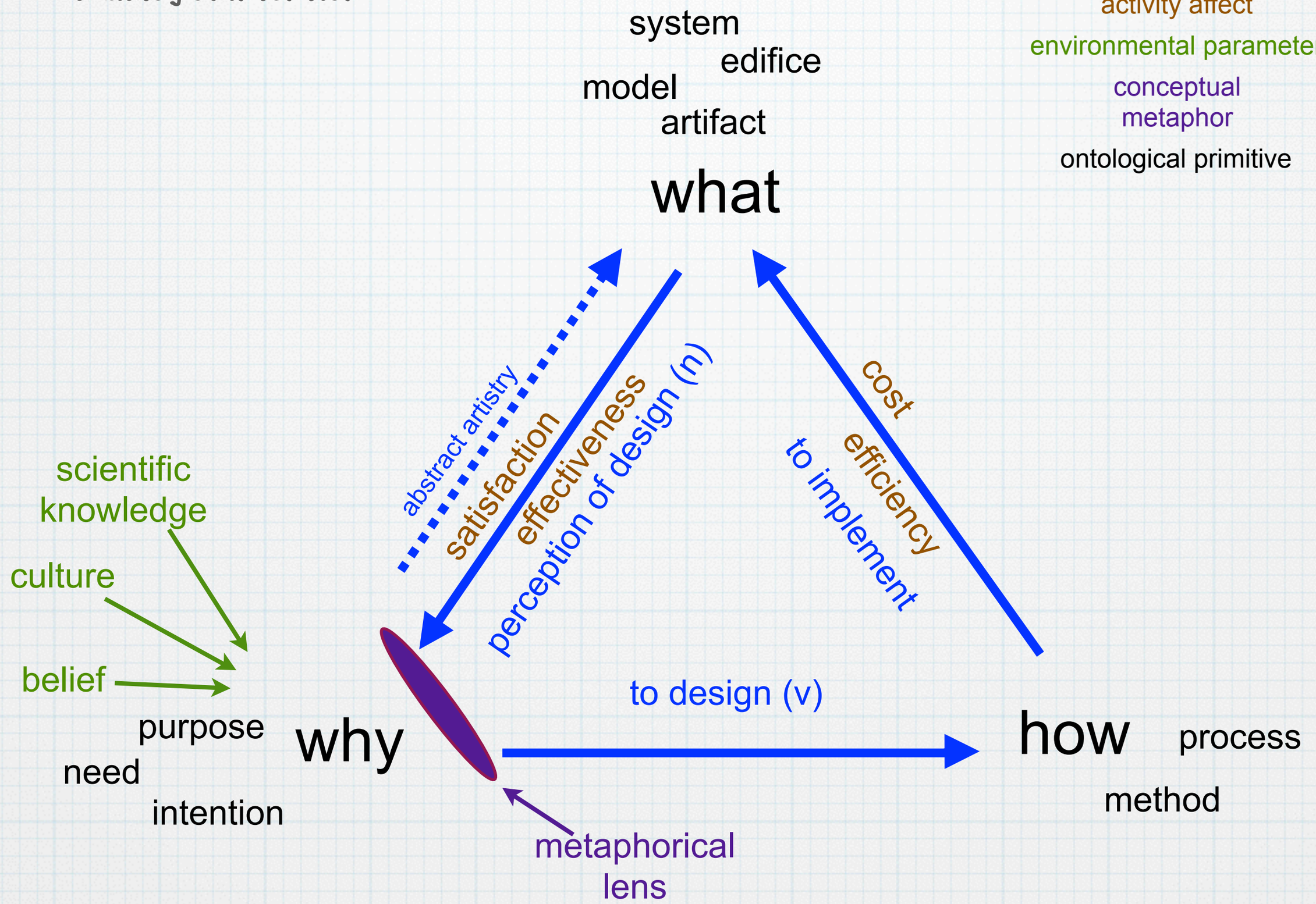
environmental parameter

conceptual metaphor

ontological primitive

Design Phenomenon

"a dialog of intention"



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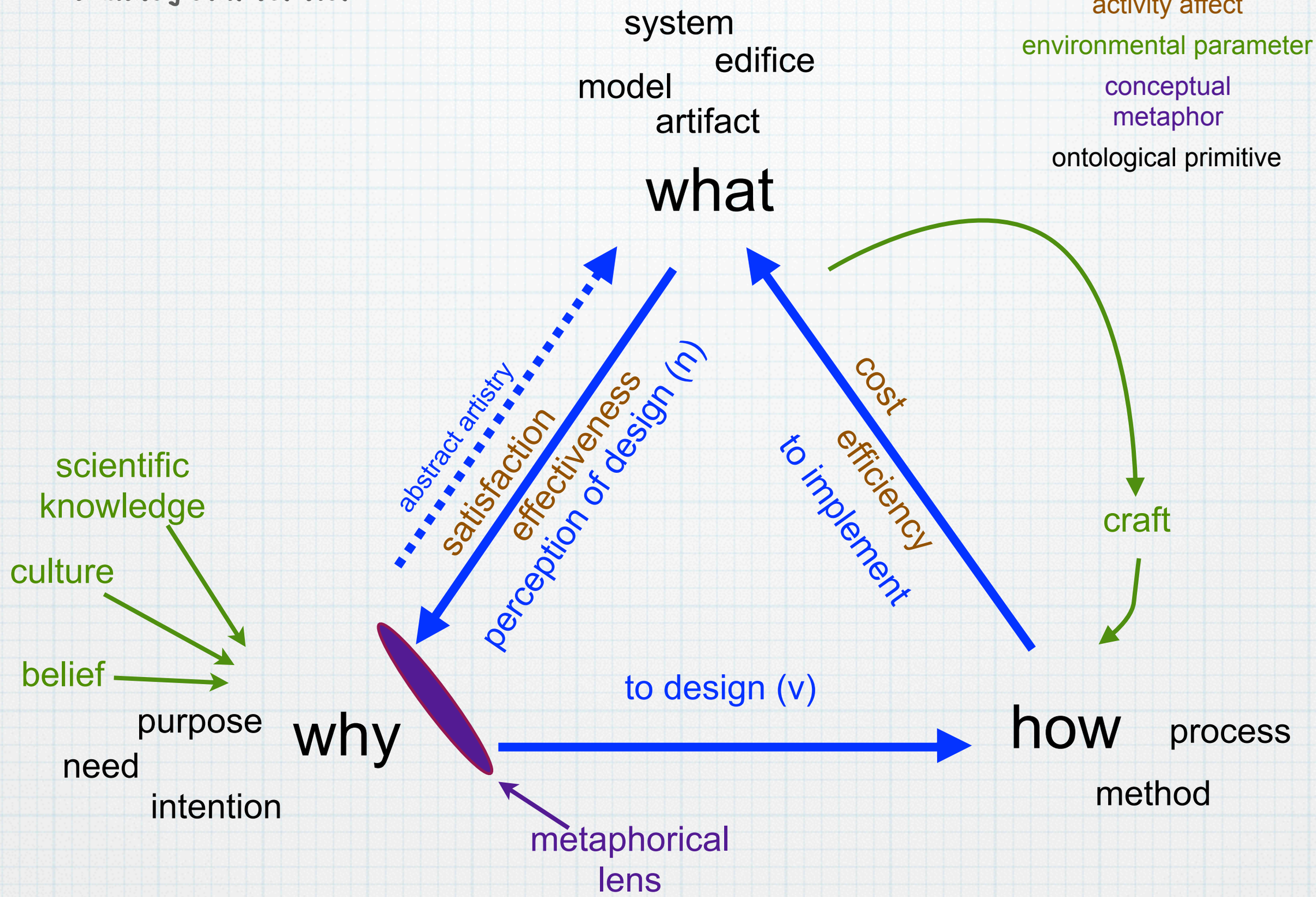

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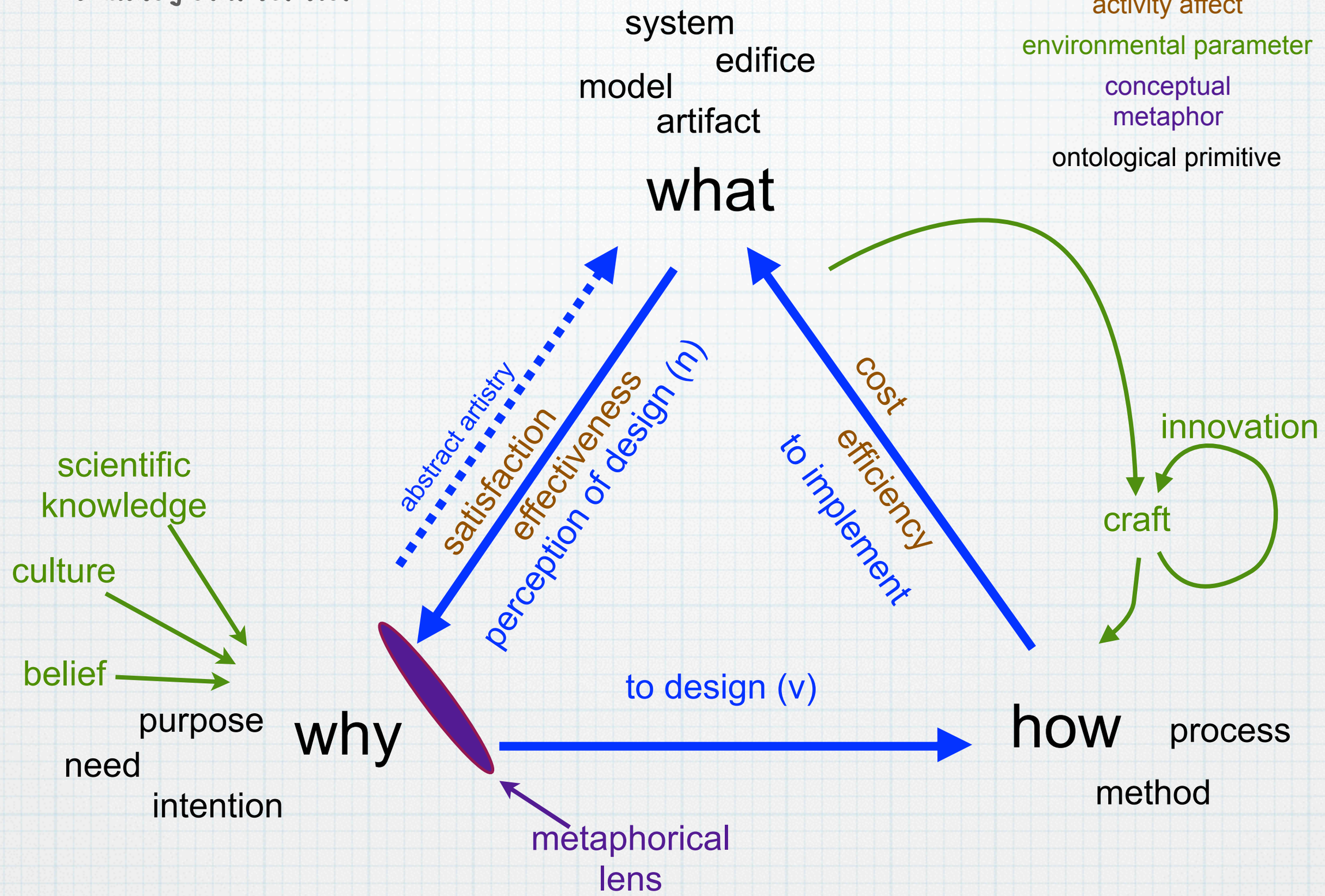
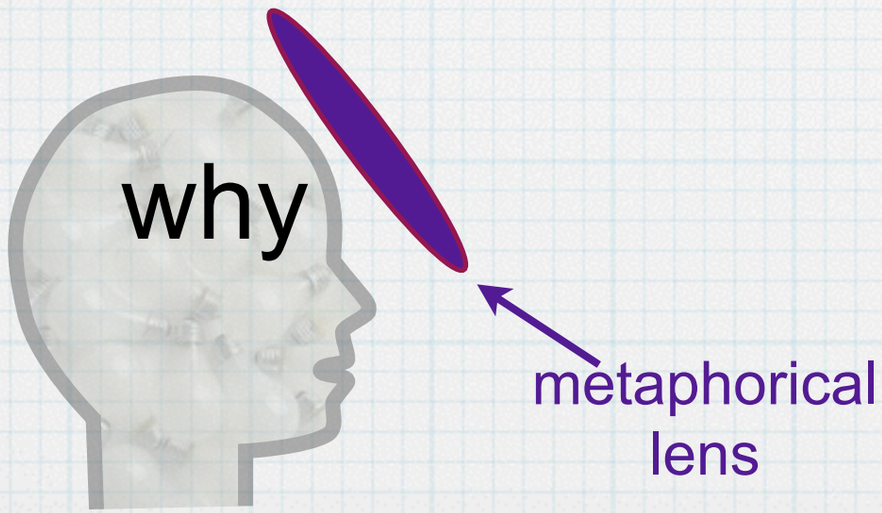
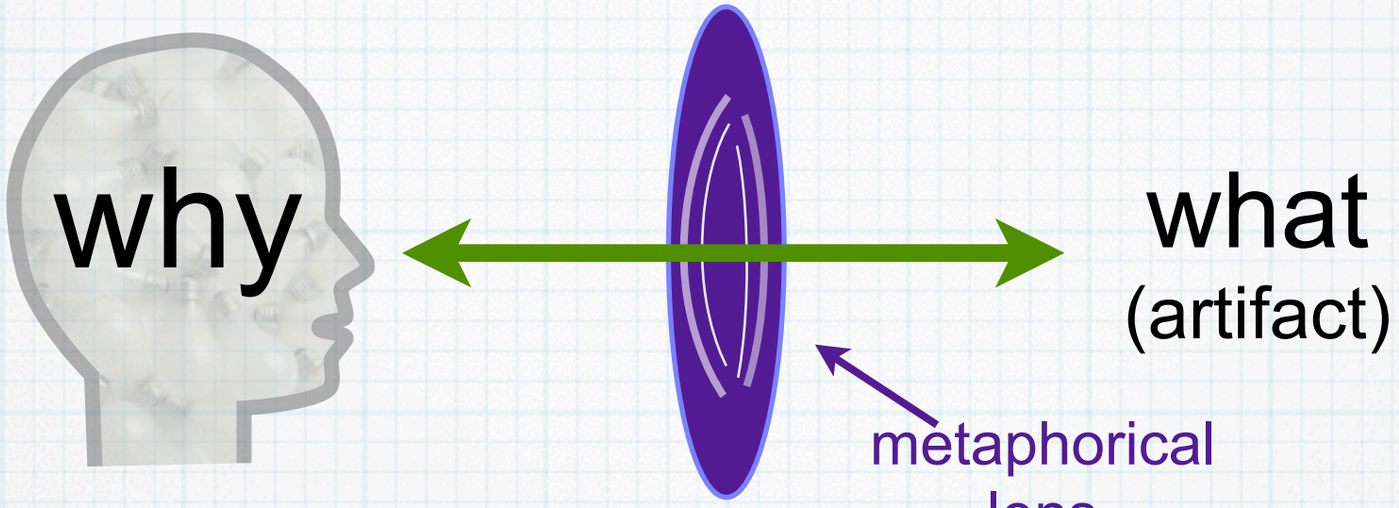


- A special ontology of design
  - constructs: why, how, what
    - The Why establishes the purpose of the artifact based on the intention and mindset of the designer
    - The How determines the mode of implementation of the artifact as process or methodology
    - The What is the product of the implementation that is the design efforts attempt at addressing the intention
  - relationships
    - the Why informs the How through design (v)
    - the How produces the What as artifact, edifice, model or system
    - the Why perceives the What's characteristics
    - the implementation of What bypassing design(v) might be called artistry where the intention is rendered directly in the artifact (given that any material art product involves some implementation if not "design(v)")
  - modifiers
    - the Why is conditioned by scientific knowledge, culture and/or belief in forming intention
    - the conceptual metaphor is the designer's mental model characterizing both the objective and subjective constructs to be produced in What by How
    - the conceptual metaphor translates the Why through design (v) to instruct the How
    - the How implements the What incurring cost and exhibiting efficiency
    - the What's design(n) characteristics are perceived by the Why through the conceptual metaphor to interpret the What's characteristics to exhibit satisfaction and/or effectiveness
    - the How is conditioned by existing craft that may be altered with implementation experience through innovation
- The metaphorical lens is both the source of instruction between the Why and How as well as the standard for interpretation from which the assessment of satisfaction will be realized
- It's interesting to note that although the characteristics of What seem to be the focus of design(v), only How is engaged directly with Why. It is as though How is the object of design rather than What. What simply provides the test case (the design(n)) that is evaluated as consistent or not against the Why, the result of the conveyance of Why's intention to How!?

The Metaphorical Lens



The Metaphorical Lens



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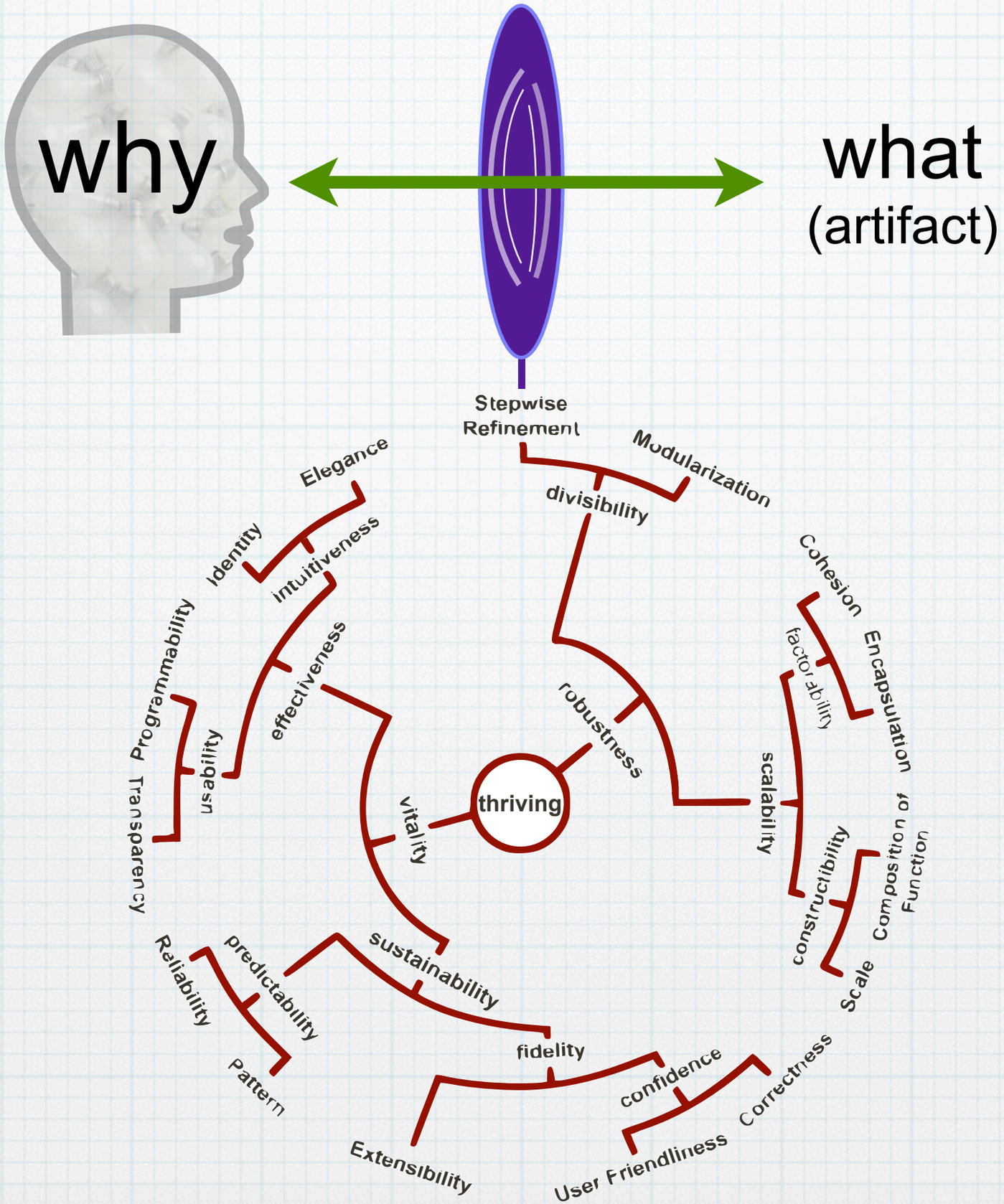
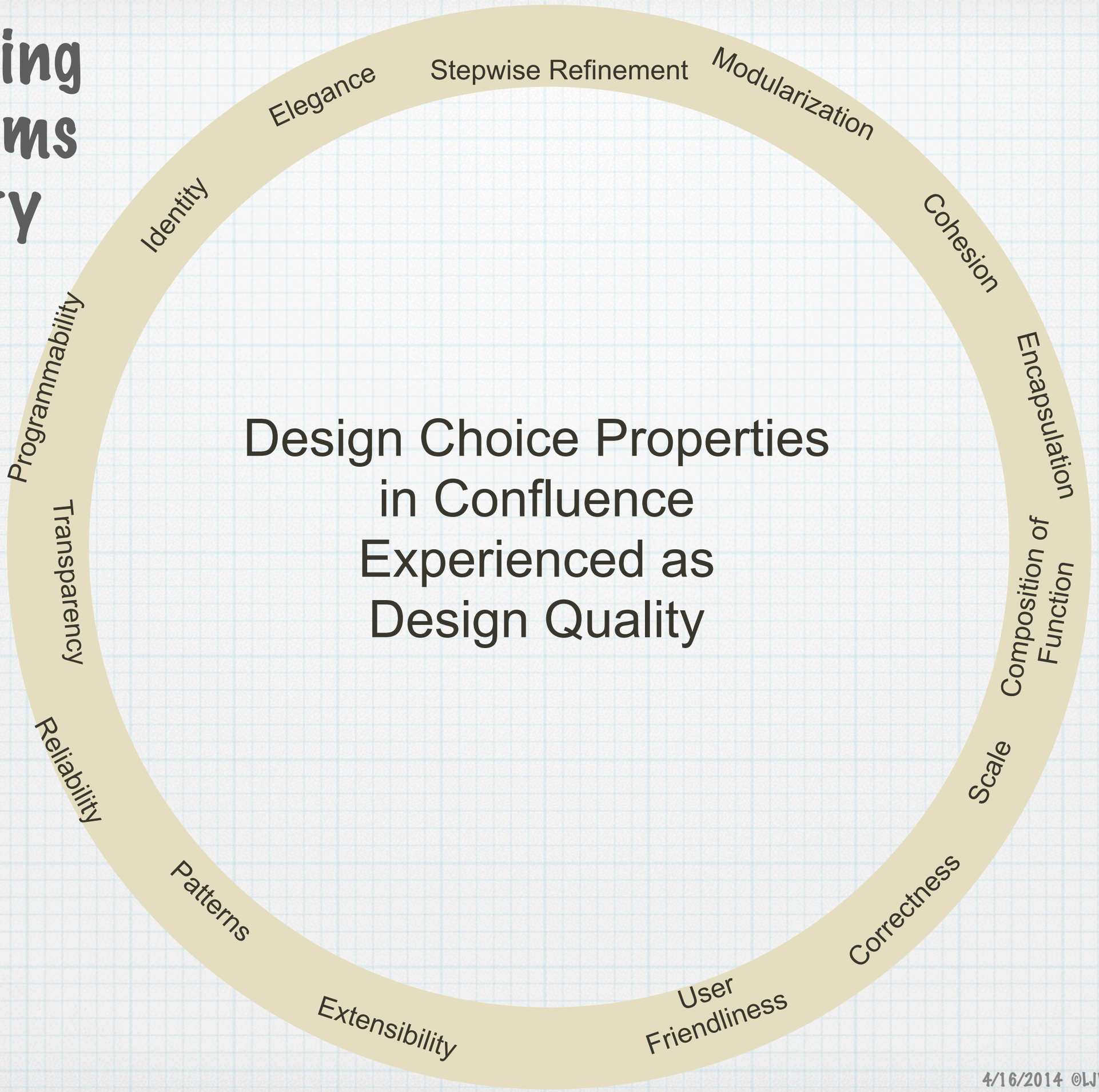


Thriving Systems Theory

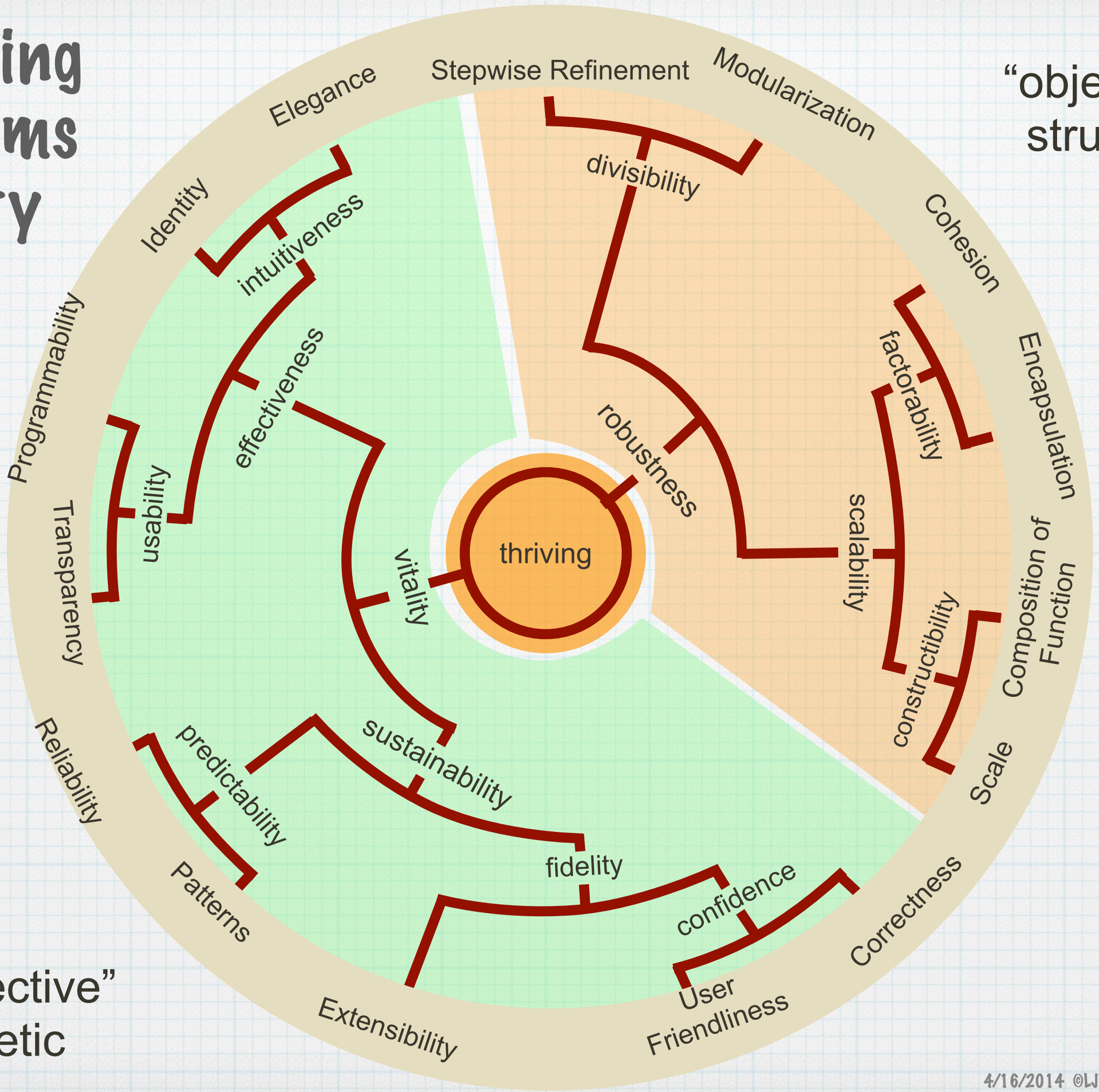
Design Choice Properties in Confluence Experienced as Design Quality

Thriving Systems Theory



Thriving Systems Theory

"objective"
structural



"subjective"
aesthetic

design that infuses value

- ☑ focus on intention resonance
  - ☑ form an explicit value proposition with:
    - ☑ aesthetic and structural objectives
- ☑ craft value sensitive requirements
- ☑ employ value preserving tools
  - ☑ methodologies and technologies

Pursuing Value-Infused Design thru Thriving Systems Theory

Projecting the choice properties of Thriving Systems Theory onto the entire design cycle of models and systems

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The value we experience in systems is the reflection of our intentions that we perceive in the artifact. That value is achieved in the alignment of our intentions with the properties of the artifact. We perceive value in an object's design (noun). We achieve value by faithfully infusing our intentions in the object's design (verb.)

A system thrives when it promotes the unfolding of the choices that support and align with the stakeholders' current intentions; and it promotes the unfolding of those intentions through the conceptual clarity and efficiency with which it represents them.

The fifteen choice properties of system quality can be perceived in information system artifacts, but can also be instilled and strengthened through the enlightened application of the ontology and/or vocabulary that defines the nature of the system domain. The confluence of the properties inform the experience of value, quality, in the artifact.

intention

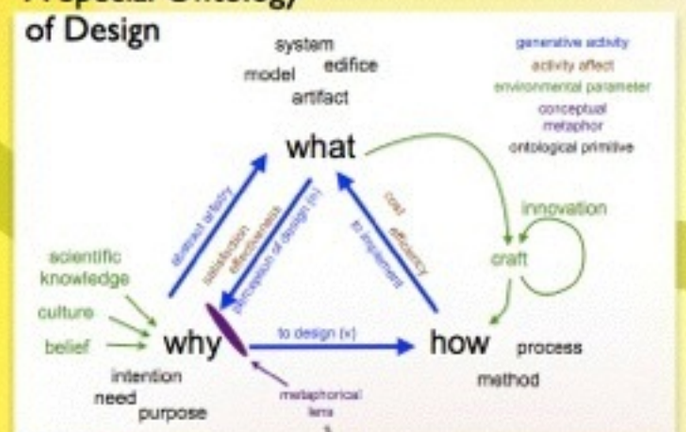
from the beauty in nature

Christopher Alexander's properties of order in nature

to the quality in systems

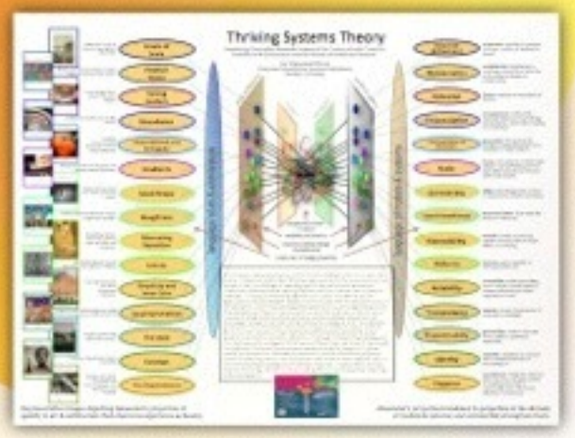
artifact

A Special Ontology of Design



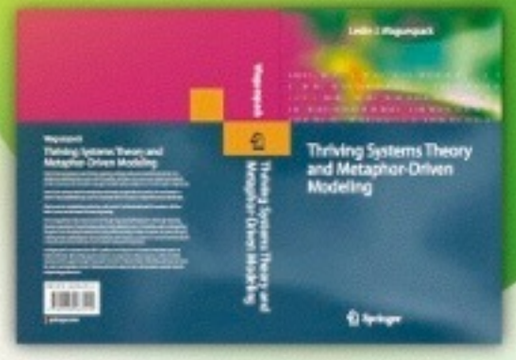
The metaphorical lens through which the designers both express the desired values as their intentions and then perceive the results of the artifact realization mediates the quality experienced, their satisfaction. The Thriving Systems Theory Properties provide both a vocabulary and taxonomy of design that informs the value-proposition and the evaluation of the artifact affording a means of faithfully fulfilling the designers' intentions.

Thriving Systems Choice Properties Conflate as Design Qualities



Since 2010, Les Waguespack in partnership with Bill Schiano and David Yates continues exploring the question of a fundamental, universal, underlying theory of systems quality. The work thus far has mapped the choice properties of Thriving Systems Theory to object-oriented modeling, relational data modeling, and explained the extraordinary success and resilience of the Apache web server. Since then we've explored the architectural qualities of agile project management methodologies (i.e. SCRUM), system security and the design implications of the choice properties on the perceived quality of management information systems.

The successful extension of Thriving Systems Theory's aesthetic characteristics of quality to these broader domains of information systems leads us to try more systems paradigms as a way to investigate quality in those domains and to further substantiate and refine the underlying Thriving Systems Theory.



Thriving Systems Theory Scholarship

Waguespack, Leslie J., Yates, David J., Schiano, William T. (2014) "Towards a Design Theory for Trustworthy Information Systems," Hawaii International Conference on Systems Sciences, Hawaii, HI, January (2014) (to appear!)

Schiano, William T., Yates, David J., Waguespack, Leslie J. (2013) "Apache Web Server: Applying Lessons from Physical Architecture to Enable Systems to Thrive," The International Journal of Design management and Professional Practice, (to appear) accepted 27 August 2013.

Babb, J.S. and Waguespack, L.J., (2013) "In Search of Design-Focus in IS Curricula," Information Systems Education Conference, San Antonio, TX, (to appear Nov 2013).

Schiano, William T., Yates, David J., Waguespack, Leslie J. (2013) "Apache Web Server: Applying Lessons from Physical Architecture to Enable Systems to Thrive," 7th International Conference on Design Principles and Practices, Chiba, Japan, 6 March 2013.

Waguespack, Leslie J. Jr, Schiano, William T. (2013) "Thriving Systems Theory: An Emergent Information Systems Design Theory" in 46th Hawaii International Conference on Systems Sciences, January 2013.

Waguespack, Leslie J. Jr, Schiano, William T. (2012) "SCRUM project architecture and thriving systems theory" in 45th Hawaii International Conference on Systems Sciences, January 2012.

Waguespack, L. J. (2010). Thriving Systems Theory and Metaphor-Driven Modeling. London: Springer-Verlag.