Engineers Are Persons, Too

By Jon A. Schmidt, P.E., SECB

In my last two columns, I discussed Bernard Lonergan's cognitional theory ("How We Know and What It Means", September 2009) and Hubert Dreyfus's critique of artificial intelligence ("What Computers Can't Do", November 2009). This time, I would like to draw from both of those perspectives to contemplate what it means to be a *person*, guided by complementary notions derived from the writings of J. P. Moreland, and note how this is integral to what it means to be an engineer.

In my view, each individual is a unique, irreducible, and enduring "self" who possesses *active power*, an essential ability that has three important qualities:

- It is *original* – I can exert it to bring about that which would not happen otherwise.
- It is *categorical* – I can exert it or refrain from exerting it at my sole discretion.
- It is *teleological* – I can exert it for the sake of specific ends or purposes.

We routinely and consciously use this faculty in five different modes of *personal agency*, each of which addresses a particular kind of mental state:

1) As a *perceptual* agent, I notice *sensations*.
2) As an *intellectual* agent, I entertain *thoughts*.
3) As a *rational* agent, I adopt *beliefs*.
4) As a *moral* agent, I weigh *desires*.
5) As a *volitional* agent, I make *choices*.

As it turns out, these correspond rather nicely to Lonergan's "transcendental precepts" (TPs) if we split the fourth one into two separate levels:

1) Experience – Being *attentive* in examining the data presented.
2) Understanding – Being *intelligent* in envisaging possible explanations.
3) Judgment – Being *reasonable* in evaluating which is most likely.
4) Deliberation – Being *considerate* in exploring potential courses of action.
5) Decision – Being *responsible* in electing to proceed accordingly.

This requires a similar adjustment to the question types:

1) Descriptive – What do I observe? How do I feel?
2) Interpretive – What is it? How and why is it so?
3) Reflective – Is it really so? Do I have it right?
4) Prescriptive – What should I do? How and why should I do so?
5) Normative – Should I really do so? Would it be worthwhile?

We can also delineate two more categories of insights:

- Conjectural – Postulating a plausible account of a given state of affairs.
- Conditional – Ascertaining the circumstances under which it would obtain.
- Confirming – Determining whether those exigencies are indeed satisfied.
- Contextual – Identifying next steps that are compatible with the situation.
- Consequential – Anticipating the probable positive and negative ramifications.
- Conforming – Discerning whether motives are sound and plans are virtuous.

Descriptive questions help us to clarify and organize the raw input that we receive from the environment and via introspection. Interpretive questions stimulate conjectural and conditional insights, while prescriptive questions occasion contextual and consequential insights. Reflective and normative questions always elicit a simple yes or no, a verdict that is reached on the basis of a confirming or conforming insight; it is only at this point that *knowing* has occurred.

Beyond this, as non-compulsory inner demands, the TPs also call for *willing*; especially the last two, which require not only apprehending an obligation, but also striving to fulfill it – setting priorities and selecting the best way forward from among multiple options. Assistance is provided by a tender and well-informed *conscience*, disciplined through habitual exercise of the TPs, which will consistently evoke attraction to the good or the better, and repulsion from the bad or the worse.

As Dreyfus notes, this aspect of people is critical – our interests and concerns naturally organize the field of our existence and shape our intentions, but a computer merely has access to raw data and a list of objectives that are dictated by its programmers. We are *situated* within the world, constantly confronting "open-structured" problems that can only be solved once we figure out which facts are *possibly* relevant, which of these are *actually* relevant, and which of those are truly indispensable – all using criteria that cannot be established in advance (i.e., heuristics).

In light of all of this, I find myself even more convinced that machines will never be able to emulate, much less duplicate, human behavior - let alone our engineering prowess. Design procedures, for the most part, do not involve the mechanical execution of deterministic algorithms; rather, they call for responsible decisions, triggered by considerate deliberation, based on reasonable judgment, applied to intelligent understanding, grounded in attentive experience.▪

Your Turn

Do you agree or disagree with the characterization of humans as personal agents with active power? Why? What role do the will and conscience play in your daily practice of engineering? Please submit your responses and see what others have had to say by clicking on the "Your Turn" button at **www.STRUCTUREmag.org**.

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