



According to Alasdair MacIntyre, applying virtue ethics to any practice is primarily a matter of recognizing the goods that are internal to it and the character traits that enable those who are involved in it to achieve them (“Rethinking Engineering Ethics,” November 2010; “Engineering Ethics as Virtue Ethics,” May 2011). David Miller argued that this is insufficient for practices that serve a wider social purpose (“The Proper Purpose of Engineering,” January 2013). When it comes to what constitutes a virtue in these cases, he wrote:

Very often a virtue is valuable both to its possessor and to those around him who benefit from its exercise. The possessor himself may value his attribute primarily because it enables him to achieve certain internal goods . . . But such an attribute only qualifies as a virtue because of other people’s valuations, and these will derive ultimately from the external purposes which the practice or practices in question serve.

Therefore, if the proper purpose of engineering is the material well-being of all people, and if its basic societal role is the assessment, management, and communication of risk, then its moral virtues must be grounded accordingly. In the terminology of Allison Ross and Nafsikas Athanassoulis, the perspective of the potential harm-bearer carries greater ethical weight than that of the decision-maker (“The Internal Goods of Engineering,” March 2013). It is not simply up to engineers to define the limits of their own responsibility; instead, the public understandably assigns particular duties to them.

Mechanical engineering professors J. S. Busby and Mark Coeckelburgh discuss the ramifications of this in a 2003 paper (“The Social Ascription of Obligations to Engineers,” *Science and Engineering Ethics*, Vol. 9, No. 3, pp. 363-376). They suggest that acknowledging their “ascribed obligations” would be beneficial to engineers, “not because they provide pre-formed rules that engineers can blindly follow, but because they can be used to help engineers develop a capacity for moral imagination.”

The first step is to admit that “the picture of engineering as morally neutral is misleading.” It is true that engineers are not completely autonomous and rarely have the authority to establish the degree of risk that is acceptable for a given assignment (“The Social Captivity of Engineering,” May 2010). However, this does not absolve them from taking risk into account – especially its moral dimensions. Instead of only asking, “How can I justify the design that I want to develop?” engineers should also wonder, “How can I find the design that reasonably minimizes risk?”

Busby and Coeckelburgh offer three motives for engineers to embrace what they call “ascribed ethics.” First, people generally behave in accordance with their expectations, so understanding common pre-suppositions about engineers and (especially) engineered systems may help better inform the design process. Second, non-engineers perceive risks that engineers are not in the habit of noticing, precisely because of their specialized expertise. Third, and most important, “The ability to imagine the implications of one’s actions, such as taking risks

with others’ welfare in one’s product design . . . [is] as important to morality as any general principle.”

How can following an approach along these lines facilitate deriving the moral virtues that are specific to engineering? Aristotle advocated locating most virtues at the mean between corresponding extremes of excess and deficiency that are deemed to be vices. With this in mind, adopting the standpoint of those put at risk by engineering endeavors in order to identify the types of behavior that engineers ought to avoid may lead to insights about those to which they should aspire.

It seems logical to begin with the three virtues that MacIntyre identified as indispensable for every practice. *Justice* precludes both favoritism and indifference; every single person who will potentially be affected by what an engineer does deserves due consideration. *Courage* calls for being neither overconservative nor overconfident; in the words of Ross and Athanassoulis, engineers must “balance degrees of caution and (social) ambition that are appropriate to the circumstances and nature of [their] decisions.” *Honesty* means eschewing both deception and indiscretion; respect for confidentiality must be balanced with the public interest.

Gene Moriarty, an electrical engineering professor at Illinois Institute of Technology, proposed a similar trio of virtues more closely tailored to engineers in his 2008 book, *The Engineering Project: Its Nature, Ethics, and Promise*, published by The Pennsylvania State University Press. Objectivity is a stance of impartiality or fairness that diligently examines all relevant factors and resolves each matter on the merits. *Care* entails assuming personal concern for another and then instinctively doing whatever the situation demands accordingly. *Honesty* encompasses cooperation and transparency as well as truthfulness.

In light of the usual connotations of “objectivity” and “care,” it may appear at first glance that these two dispositions are incompatible. Moriarty is aware of this and explicitly downplays the association of objectivity with “coldness, lack of emotional involvement, bureaucracy . . . To be objective is not to be aloof, uninvolved, or uncommitted. It is to be disinterested rather than uninterested.” This notion of objectivity is perfectly consistent with the kind of empathy that genuine care demands, and that Busby and Coeckelburgh urge engineers to cultivate.

Of course, these attributes are hardly exclusive to engineering; perhaps there is nothing more to being a virtuous engineer than being a virtuous person (in general) who happens to be an engineer. While this is accurate to an extent, Miller’s insight about purposive practices leads to the realization that Moriarty’s three moral virtues of engineering naturally align with the three components of its societal role. Engineers enhance the material well-being of all people by *objectively* assessing risk, *carefully* managing risk, and *honestly* communicating risk. ■



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