

**Once Upon a Time, There Arose the Idea of a New Device... - Engineering
Design as a Form of Fiction**

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In this contribution, I argue that engineering design can and probably should be considered as a form of fiction. My reasoning is based on a logical argument and some interlinked phenomenological observations. Finally, some implications of the sketched position are outlined.

First, the logical argument is considered. The engineering design process extends over some period of time, reaching from a vague initial idea to the production of the final artifact. The artifact is called final only when it is fully functional in its intended sense and also a suitable manufacturing process is established. Up to this final point, the idea is ahead of its realization; it is represented by and also refined in close interaction with different media such as language, drawings, computer models, and material scale models. If, consequently, fictions are defined as ideas about possible states of the world including their representations in some medium, technological artifacts in the design process clearly count as fictions.

In a second step, this somewhat tautological argument is fleshed out by a row of phenomenological observations. To further sharpen the notion of fictions, literary fictions are focused on as a prototypical example; other fictions in the arts are considered when they contribute to the topic. These fictions are characterized and at the same time juxtaposed with the ideas developed in the engineering design process. Literary fictions are based on the medium of language. Also, the design process in engineering is medium-based. However, language is not the dominant medium in this case, instead models, understood here in a broad sense that ranges from drawings, to computer models, and material models, are decisive. This is, however, no important difference to fictions in the arts as some also rely on other media than language, consider, e.g., (silent) movies or picture stories. Literary fictions are composed of previously existing elements, e.g., words, phrases, elementary settings, and basic plots. Also, the engineering design process hinges on previously given elements. In this case, however, the elements are technical sub-solutions such as screws, nuts, cogwheels, and ball bearings when the example of mechanical designs is looked at. Literary fictions must obey some notion of possibility. In this case, possibility takes the form of credibility; literary fictions have to be plausible or mentally convincing for the reader. Technological designs, on the contrary, have to be not only convincing but possible in a logical, nomological, economical, and ethical-political sense. A spaceship that exceeds the speed of light might be described in a convincing and inspiring way, it is, however, impossible to build according to the laws of nature, i.e., it is nomologically impossible. The last point refers to probably the most important difference between technological ideas in the design process and fictions in the arts, namely their different goals. Only technological ideas aim at realization; fictions in the arts, on the contrary, have their goal in themselves, respectively in the effect on the reader or observer. Despite the important differences between fictions in the arts and the technological ideas developed during the design process, it is asserted that also the latter can be considered as a form of fiction. Juxtaposing fictions in the arts and in technology has shown that they share important characteristics and that the above assertion of considering both as ideas about possible states of the world including their representations in some medium earns some basic credibility from these characteristics. As design is often considered as the central element of engineering, the above considerations have

large implications for the discipline as a whole. In contrast to, e.g., the natural sciences which aim to analyze the actual state of the world, engineering and technology explore possible states of the world as they may be realized by technological means. Consequently, engineering and technology are far from being applied sciences, but are seen as creative disciplines, in the literal meaning of the word, with their goal being the synthesis of new artifacts and devices. Engineers should, thus, be trained at least as much for developing technological fictions than for merely applying the natural sciences - which of course are an important tool for exploring possible artifacts. Besides these more practical consequences for the discipline of engineering, the outlined perspective has also some interesting philosophical implications. For example, analyzing the nature and mechanisms of technological fictions allows studying the old and still interesting question of the emergence of novelty as it is instantiated in this tangible case.