

Science and technology in the age of “nano”: On the merging of disciplines, the emergence of “biological physics” and the potential contribution of biomimetics to conquer major global challenges

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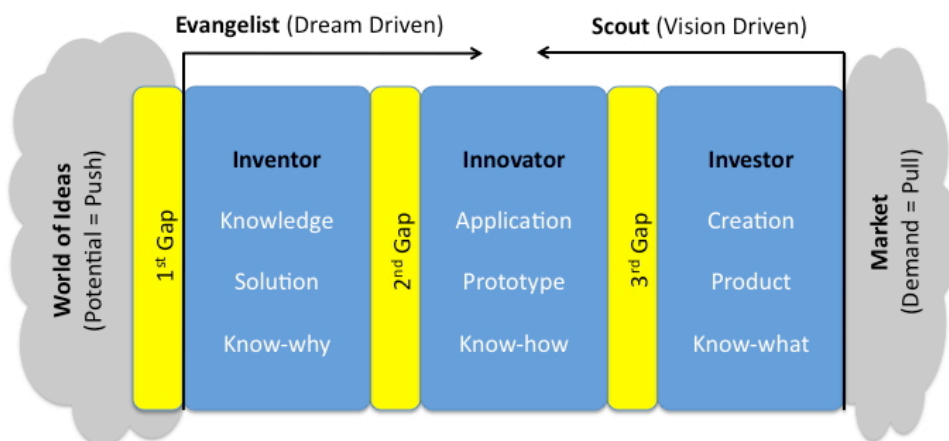
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In the old predominant science of physics as well as in biology more and more causation and natural laws are being uncovered. The amount of causal laws is indicated by the ratio of causal versus correlational knowledge, or the ratio of explanatory versus descriptive knowledge. A new field that can be called “biological physics” is emerging.

Increasing interdisciplinarity in the age of nano, with disciplines merging and new fields emerging, calls for novel ways to educate the young. The “Conditions of Learning” theory is introduced in this respect (Cambourne 1995). Biomimetics has the potential to drive major technical advances and might dramatically change the research landscape and the engineering culture by the blending of disciplines (interdisciplinarity). Possible scenarios such as bioinspired wave and tidal power systems and biomimetic primary energy conversion systems to overcome major global challenges will be presented.

Bridging the three gaps between inventors, innovators and investors would expand the potential for scientific and technological breakthroughs (Gebeshuber, Gruber and Drack 2009, see Figure).



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