

Creating New Wealth by Improving the Fuzzy Front End of the Innovation Engine

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The objective of this grant is to discover, significantly improve and disseminate effective practices for the Fuzzy Front End (FFE) so as to increase the number of high profitable and commercially successful major products that may be fed into the New Product Development (NPD) portion of the innovation engine in the Chemical, Food and Beverage, Medical Device and Petroleum segments.

The innovation process can be divided into three parts: 1. the FFE where product concepts are created and conceptualized; 2. the NPD portion where the product is developed and made ready for manufacturing and distribution and 3. commercialization where the product is sold. Practices for the NPD portion have been extensively investigated over that last 15 years and have made substantial contributions to economic prosperity of the nation by significantly decreasing the innovation cycle time (i.e. the time to develop a product and make it ready for commercialization) and being able to introduce high quality products needed by the marketplace in budget and on time. As a result of this increased efficiency the new product pool has become “dry.” Most companies have found that the, now efficient, NPD portion is being mostly fed with low profit and low risk incremental projects. Companies need to feed the NPD portion faster with an increased number of new platforms and radical high profitable projects. A better understanding of the FFE will allow more high risk platform and radical projects to be introduced into the NPD.

This goal will be achieved in seven sequential steps: 1. perform additional case studies at innovative companies in the targeted segments which were not part of the PI’s previous 3 year research; 2. develop a validated survey with outcome measures with partner companies; 3. survey the targeted segments; 4. determine the most effective practices by visiting companies identified by the survey as being in the top 20% and compare them to a matched pair in the 50% octal; 5. develop an assessment tool which companies can use to compare their practices against the top 20%; 6. apply the methodologies in an actual intervention at the partner companies using the assessment tool to catalyze change; and 7. develop traditional and web enabled course material which may be used by Universities and Corporations to educate the workforce.

The intellectual merit of the grant is related to advancing knowledge in the FFE – which represents an under researched area. This research will be done as an active partnership between academia and industry. The PI, Koen, over the last 4 years has focused his effort on the FFE and has developed a model for the FFE that provides a common language and terminology and determined effective practices in the FFE working with 11 companies who are members of the Industrial Research Institute (IRI) – which is an association of 260 companies in the US which employ approximately 500,000 scientists and engineers. This grant will extend this effort beyond the knowledge base within these 11 companies. In addition to the IRI, Cabot Corporation, Ethicon, ExxonMobil, LORD Corporation and Rich Products have agreed to help fund the grant, participate in project decisions and will be used as sites for the interventions. The Co-PI, Kleinschmidt, has considerable experience in doing this type of research and has pioneered, with Cooper and Edgett, an understanding of the effective practices in the NPD portion of the innovation process. Leonard and von Hippel, both of whom have substantial knowledge in innovation, will serve as ongoing peer reviewers to this project.

The broader impact of this grant is the enablement of new scientific and technological discoveries to be more quickly turned into products. Discoveries such as the laser, liquid magnetic resonance imaging, optic fibers and cellular phones– to name a few breakthrough inventions over the last 50 years – may have been commercialized earlier if the inventors and companies had used more effective practices, tools and methodologies learned from this study.