Prof. J-A Mansson
CMSC - Purdue

EFC – Future Manufacturing

J-A Mansson
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Essentials

The College of Engineering has recently launched its Engineering Faculty Conversations (EFC) initiative, focusing on a number of topic areas of global importance. The initiative should serve as a seed for the engineering faculty to explore and nucleate emerging opportunities in the engineering field, in which Purdue can sustain global excellence.

This initiative includes a one-year funding opportunity from the College of Engineering which serves as "seed-funding" and should be in the order of $50k per project proposal. Winning proposals require a vision for further development within the larger funding landscape. The initiative aims at funding high risk, "game-changing", proposals with high leverage potential. Notably, proposals seeking collaborative efforts at new domain interfaces will be encouraged.

"Future Manufacturing" is one of these College of Engineering focus topics and is soliciting input until April 6 to efficiently merge to a call for proposals, scheduled for release in late April.

Perspectives

There are no doubts that the manufacturing industry today is confronted with huge challenges in order to stay competitive. This is not just in its global competitive positioning but also in its ability for rapid integration of new technologies. This puts tremendous pressure on resource access, e.g. technology access, investment readiness, workforce development, etc. The teaching and research institutions play a major role in supporting when facing these challenges. Furthermore, our role is to have a split-vision for current needs and also to lay the fundamentals for next generation needs.

A quick review of the key priorities could be summarized into three categories:

a) Implementation speed b) Manufacturing agility c) Resource efficiency

a) Implementation speed:
The efficiency in moving from idea to market implementation has always been a topic of concern. With today's enabling technologies, new avenues are quickly developing by highly efficient and accurate simulation capabilities in addition to all of the emerging additive manufacturing processes.

Thoughts:

- *Are there new engineering interfaces to explore for reducing the implementation time?*
- *How can a design development process be more efficiently merged with the manufacturing development?*
- *……*

b) Manufacturing agility: The request for more tailored/personalized products often contradicts the classic economic optimized manufacturing processes. The "tsunami" of information generation and the related information processing gives potential for new control and logistics in the complete value and supply chain. Designed connectivity has emerged as a key word in the field.

Thoughts:

- *What are trend breaking opportunities in manufacturing agility when embracing ultimate connectivity?*
- *Are there new sensors and information harvesting methods which support more flexible manufacturing?*
- *……*

c) Resource efficiency: The trend for global market position has streamlined and fine-tuned manufacturing arrangements. Trend-breaking manufacturing concepts will need to seek new concepts and partners in the supply chain to capture and integrate these new manufacturing

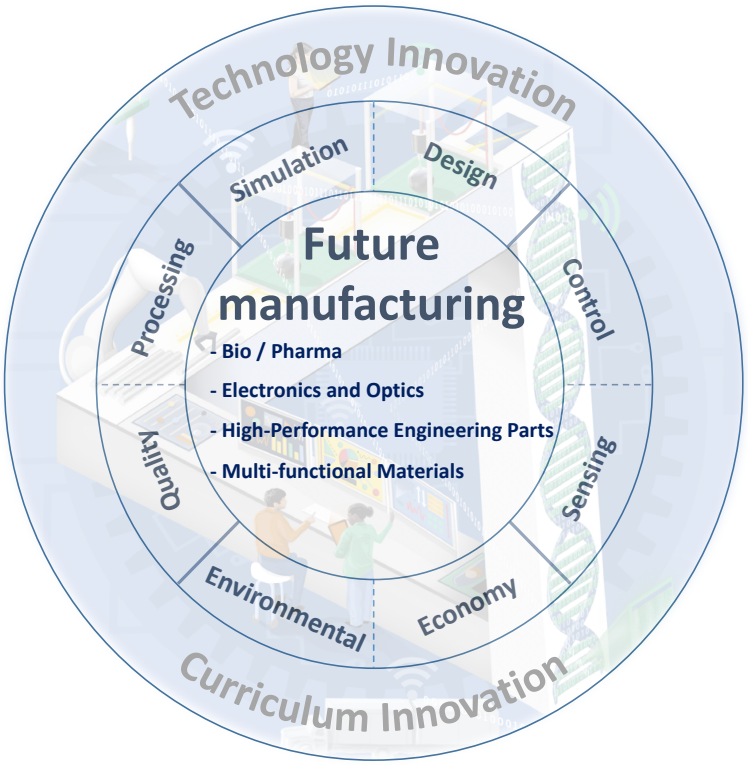
approaches. This has integration implications on both human and facility resources. Issues of "curriculum innovation" will stand side-by-side with technical innovation.

Thoughts:

- *Are there a more efficient workforce education/adaptation concept to explore (e.g. cross disciplinarily, certificates, …)?*
- *Are there new prediction methodologies to be explored for strategic decision making?*
- *……..*

As an Example

Different manufacturing fields relates in similar way to a number of engineering topics. The high dynamics in today's manufacturing development provide unique opportunities for innovation by novel cross-disciplinary competence mergers in both technology and curriculum development.



The integration of workforce development with the technology implementation is on high demand from industry today, in order to keep a competitive edge, and is independent of material type and manufacturing technique.