Background
When individual innovators are unable to readily overcome complex problems, projects stall and potentially great ideas languish. Inability to proceed on research and development projects can be a consequence of a lack of ideas or know-how/expertise, limited internal capacity or resource capability, insufficient funds, or inadequate connectedness to those with the missing resources. Consequently, most innovative companies regularly convene internal, multidisciplinary teams in order to enrich and accelerate effective innovation. Companies also frequently connect to other companies, universities, and individuals through open innovation processes in order to access knowledge, ideas, people, and research capacity.

Universities and their research communities can radically multiply innovation outcomes by readily convening internal multidisciplinary teams and purpose-driven innovation networks that accelerate open innovation for ideas and acquisition of critical missing expertise, experience, and insights. Adaption of such structures and processes allows universities to be premier partners to their industry counterparts.

Kansas State University (KSU) seeks to expand its collaboration with academic and industry research partners for product and technology development projects by building on the following unique technology development assets at KSU:

- The Advanced Manufacturing Institute (AMI) has completed more than 2,700 technology development projects with 600 businesses throughout the United States. AMI employs integrated business and technology development processes that facilitate collaborative industrial projects and partnerships.
- AMI has supported faculty research efforts on diverse projects such as aircraft cabin air filtration, noncontact railroad tie inspection, wind turbine testing, and Big Data recommender systems.
- An Economic Development Administration (EDA)-funded innovation accelerator focused on animal health and food processing industries is housed on the KSU Olathe campus.

Description
The ALPHA LAB is proposed as a collaborative core facility that will be staffed and equipped to expand the innovation capacity of faculty/student research teams. Industrially experienced technical professionals will work with research teams to develop and cost-effectively produce proof-of-concept (Alpha) artifacts, prototype devices, and processes for targeted research and industrial uses. In addition, ALPHA LAB will build university/industry innovation networks to accelerate research projects and directly engage technology brokers and suppliers to scout relevant markets and available, competitive sources of technology.

ALPHA LAB will be staffed with shared instructors and dedicated practitioners from a variety of disciplines who join research teams to enable faculty and senior graduate students to focus on discoveries and to mentor new graduate students to build and strengthen critical bridging skills, such as market and competitive research, recombinant innovation, open innovation and technology sourcing, digital design and fabrication, and project management fundamentals (via an internal KSU Project Management Academy). ALPHA LAB will employ a facilitated deep-dive, multi-disciplinary problem-solving process with industrially experienced staff and industry collaborators and suppliers.

Knowledge management and sharing will be central to ALPHA LAB, with development and delivery of internal workshops and boot camps in project management, digital design and fabrication, and technology entrepreneurship. ALPHA LAB will also serve as host and convener to university-wide communities of practice, such as computational modeling and simulation and National Instruments users.

ALPHA LAB requires investment to expand faculty and graduate student involvement, hire instructors and practitioner staff, enhance digital design and fabrication capabilities, and expand ALPHA LAB’s industrial reach.

Relevance
The ALPHA LAB in support of K-State 2025 will
- Increase funding for investigator-based research, research centers, and graduate training grants,
- Increase graduate-student involvement in high-level learning and experiential training,
- Support more clusters and centers of collaborative Research, Scholarly, and Creative Activities and Discovery (RSCAD) focus, and
- Enhance integration between academics and student service learning.

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The ALPHA LAB: An Innovation Accelerator Core Facility

Lead Investigator: Brad Kramer

Advanced Manufacturing Institute, College of Engineering

Summary: The K-State ALPHA LAB will integrate professional innovators with faculty/student research teams to multiply and accelerate research and commercialization outcomes and build open innovation networks to scout potential markets and technology partners.

Opportunity: Universities and their research communities can radically multiply innovation outcomes by readily convening internal multidisciplinary teams and purpose-driven innovation networks that accelerate open innovation for ideas and acquisition of critical missing expertise, experience, and insights. Adaption of such structures and processes allows universities to be premier partners to their industry counterparts.

Solution: The K-State ALPHA LAB is a collaborative core facility that expands the innovation capacity of faculty/student research teams. Technical professionals work with research teams to develop cost-effective proof-of-concept (Alpha) artifacts, prototype devices, and processes. ALPHA LAB builds university/industry innovation networks to engage technology brokers and suppliers to scout markets and sources of technology.

Impact: The ALPHA LAB in support of K-State 2025 will:
- Increase funding for investigator-based research, research centers, and graduate training grants
- Increase graduate-student involvement in high-level learning and experiential training
- Support additional clusters and centers of collaborative Research, Scholarly, and Creative Activities and Discovery (RSCAD) focus
- Enhance integration between academics and student service learning.

Equipment & Expertise:
- The Advanced Manufacturing Institute (AMI) has completed more than 2,700 technology development projects with 600 businesses throughout the United States. AMI employs integrated business and technology development processes that facilitate collaborative industrial projects and partnerships.
- AMI has supported faculty research efforts on diverse projects such as aircraft cabin air filtration, noncontact railroad tie inspection, wind turbine testing, and Big Data recommender systems.
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