AC 2009-239: A MODEL FOR TECHNOLOGY COMMERCIALIZATION: MISSISSIPPI STATE UNIVERSITY

Gerald Nelson, Mississippi State University

Gerald Nelson, an industrial engineering graduate (1974) with an MBA (1985) from Mississippi State University, began his career with a co-op experience at Rockwell International. Nelson worked five semesters with Rockwell before joining them full time after graduation as a Project Engineer and Program Manager.

Nelson's career includes former positions as Plant Manager, Trinity Industries; President and Chief Operating Officer of the Wear Resistance Group of Thermadyne Industries, Inc.; Executive Vice President of Operations, Viasystems Group, Inc.; and Chief Operating Officer of Deka Medical, Inc.

Nelson was selected as Director of the Engineering Entrepreneurship program through professional association with Dr. Wayne Bennett, Dean of the College of Engineering. The program is funded through an endowment given by MSU Alumnus and Entrepreneur Jack Hatcher of Pinehurst, NC.

The Entrepreneurship Program is designed for engineering students who plan to pursue a career combining technical and business skills. It features a Certificate Program that includes completion of 15 hours of selected business and engineering classes, the Engineering Seminar Series, and completion of a Team Project with commercial aspects considered in the form of a business plan. The Projects are usually sponsored by participating engineering entrepreneurs or their companies. They provide mentoring and sometimes, financial support for the team's prototype expense.

In 2006, Nelson assumed responsibility as Director for the Thad Cochran Endowment for Entrepreneurship which fosters, funds and nurtures new business entities involving MSU technology, with student and faculty involvement. This program fits hand and glove with other efforts at MSU for the creation of a culture of entrepreneurship. Nelson continues to direct the Hatcher program as well.

Byron Williams, Mississippi State University

Byron J. Williams is a PhD Candidate in the Department of Computer Science and Engineering at Mississippi State University. He currently serves as Vice President of Upsilon Pi Epsilon, a computer science honor society. Byron is also a Jack Hatcher Engineering Entrepreneurship Program certificate holder and a recipient of the James Worth Bagley College of Engineering Fellowship.

Gary Butler, Mississippi State University

Dr. Gary D. Butler is Assistant Vice President for Research and Technology Development at Mississippi State University where he is responsible for leading advanced research initiatives and building the university's strategic relationships with major industry and government partners. He received his Ph.D. from the University of Cambridge (Churchill College) and is a Senior Member of IEEE.

Previously, Dr. Butler was a senior member of the technical staff of Cambridge, Massachusetts based BBN Technologies (the company credited with launching the ARPANET) where he generated more than $19M of DARPA research awards and was the principle investigator on advanced technology development programs in the areas of low power, long-endurance unattended ground sensor networks; ultra-wideband communications and radar; and advanced signal processing technologies.

Additionally, Dr. Butler was elected for membership in BBN's Science Development Program, a rank representing the top 10% of the company's technical staff, and received BBN's annual best

DARPA revenue award. He has co-authored publications on the application of wavelets to signal analysis and has been awarded patents related to the application of genetic algorithms to signal classification and multi-static ultra-wideband radar signal processing. Dr. Butler is a member of the IEEE Antennas and Propagation Society, IEEE Circuits and Systems Society and IEEE Communications Society.

Dr. Butler received his B.S. degree from Tulane University in Mechanical Engineering where he was a four-time varsity football letterman and named an NCAA and Entergy Corporation Winning for Life Scholar Athlete. He completed his M.S. in Mechanical Engineering at Vanderbilt University.

A Model for Technology Commercialization: Mississippi State University

Abstract

Commercializing university technologies has been a focus of many research directors throughout the country. In most cases however, the desire to commercialize technologies and shift the focus to entrepreneurship and business development has been a slow process. At Mississippi State University, there are efforts underway to change the culture of the university to focus more on technology commercialization and entrepreneurship. The university understands that technology commercialization is an economic driver for the university and for the state of Mississippi. In observing the efforts underway and recording the initial successes, a model for technology commercialization has been developed to conceptualize the effort and provide a roadmap for future success. The technology commercialization model depicts a phased process where technology drivers provide the inputs, and the output is a commercialized technology and/or a new business entity. These technology drivers include industry, government, consumers, and philanthropists that interact directly with university ambassadors that are familiar with the research and development capabilities of the university. These drivers currently fund research efforts in the research focal centers through the university Research Park and colleges. As the university moves forward, market needs will define technology drivers and more applied research will be conducted to specifically target those needs. As these technologies mature and commercialization potential is identified, additional efforts are needed to ensure that university faculty and researchers get the help that they need to push the technology forward toward commercialization. This paper reports on the observations and issues with technology commercialization at Mississippi State and describes a model of university technology commercialization.

Introduction

Entrepreneurship and technology commercialization is increasingly becoming a major focus among research institutions throughout the United States. Universities have found that when faculty and students start successful businesses, they play a very important role in the continued development of the university and have a substantial effect on the economy of the surrounding cities. Universities such as MIT, Stanford, and Harvard are all premier institutions that have well-established centers and resources dedicated to entrepreneurship and technology commercialization. Until recently however, for many other institutions the focus on entrepreneurship has been more of an afterthought than a primary interest.

In order to create an environment where university faculty members, staff, and students pursue entrepreneurial activities, the culture of many universities must change. This change in culture must first be instituted in the faculty. Faculty members drive university research efforts. They are the lifeblood of the research centers and research parks throughout the United States. They conduct both basic and applied research with the applied research often making its way into government labs and research and development groups at many of the larger corporations. This research is then positioned for commercialization and put into practical use. Any efforts pushing

technology commercialization at the university level must include a strict focus on developing a select subset of faculty as entrepreneurs and applied researchers.

Many critics of faculty and student led startup initiatives from research activities assume that there is a conflict of interest between university researchers and institutions that promote entrepreneurial activities. They argue that faculty who pursue applied research for technology transfer and commercialization purposes may neglect the university's primary foci of teaching, service and academics. The enactment of the Bayh-Dole Act in 1980, which gave US universities, small businesses and non-profits intellectual property control of their inventions that resulted from federal government-funded research, provided universities with legislative motivation for taking applied research and commercializing it. This act requires universities to assess the commercialization potential of any intellectual property created with federal funding. The Bayh-Dole Act does not lessen the focus of university researchers on academics but ensures that the outstanding research conducted by university faculty members can be used for the greater good and not solely for publication in a conference or journal.

Today, the Nation's universities play a critical role in driving technology and business development. From conducting basic research to facilitating the transition of technology into the commercial market place, universities are required to manage a complex, end-to-end technology development and commercialization cycle. Effective execution of such a process requires integrating faculty, administration and industry into a seamless organizational infrastructure. This paper describes this integration as a model for university technology commercialization.

Model for Technology Commercialization

The Mississippi State University Technology Commercialization Model depicts a phased process where technology drivers provide the inputs, and the output is a commercialized technology and/or a new business entity. An abstract view of the model is shown in Figure 1.

The starting point of the model is the Research branch. University technology commercialization begins with teaching and research that is conducted in the university research expertise areas identified as focal centers. A focus on teaching students the technical and engineering skills needed to thrive in the marketplace at both the undergraduate and graduate levels is equally important and key to the economic advancement of any locale. The Research branch combines with the Development branch. The Development branch includes university ambassadors that act as liaisons between the university community and the technology/research drivers. These technology drivers fund large-scale research initiatives such as research centers and labs and provide the motivation to conduct applied research that is directly beneficial to the entity that is providing the funding. These entities include government and commercial organizations, but also include alumni and philanthropic organizations that donate large sums of money to endow distinguished chairs and other efforts.

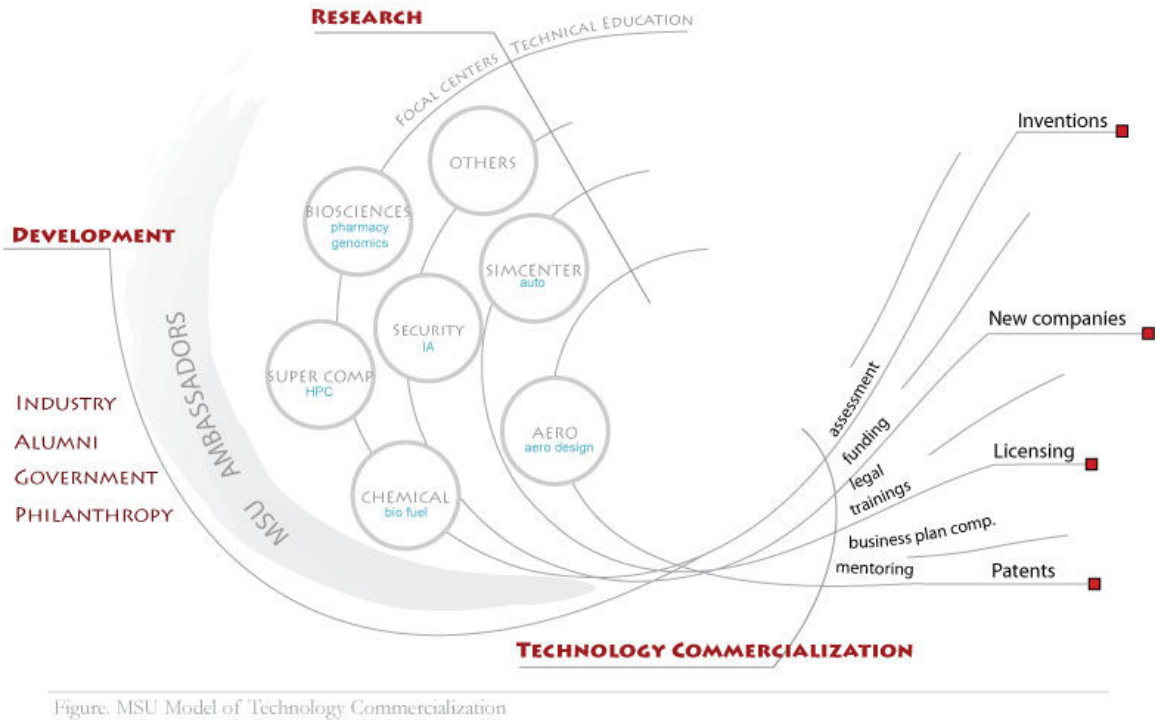

Figure 1: MSU Technology Commercialization Model

The outputs of the spiral are inventions, new entities, licenses, and patents. In order to get to the outputs, the faculty and students that are doing the applied research with commercial potential, receive help in the form of grants, legal assistance, training, business assessment, mentoring, and opportunities through engaging experiences such as business plan competitions.

The following sections describe the components of the model that are required to promote technology transfer and commercialization. These components include university faculty and students, organizations at the federal and state level, campus organizations created to support economic development, and national philanthropic organizations. Each component plays a key role in this model and are all necessary to support the commercialization efforts at Mississippi State University.

Motivate Faculty through Tenure Process

The essential component of any efforts to commercialize technology within a university setting rests with its faculty members. Faculty members conduct research and guide students through research. While conducting basic research is important to developing hypotheses and acquiring knowledge about a phenomena, applied research is required when the goal is technology commercialization. Applied research is designed to solve practical problems in the real world. Conducting applied research provides value not only to the researcher, but also to the population whom the research benefits.

In order to motivate faculty to have a focus on applied research that has the potential for commercialization, the promotion and tenure process must be augmented. A tenure process that promotes commercialization should provide incentives for working with industry, starting a

business, generating research dollars, and for patent disclosures. The incentives will include recognition during the tenure review process that rewards commercialization efforts as well as teaching, research, and service. These incentives will not remove the focus on academics, service, and publishing in scholarly journals, but will allow faculty members with a desire to innovate in the marketplace to pursue research that allows them to do so.

Office of Technology Commercialization

Many universities have offices dedicated to technology commercialization. The Mississippi State University Office of Technology Commercialization (OTC) was created to support technology transfer and is the initial resource for faculty or students that have marketable research. The mission of the MSU OTC is to "foster an entrepreneurial environment and assess, protect, market, and license intellectual properties developed by Mississippi State University faculty, staff, and students. Commercialization of these technologies benefits society, fosters economic development, and provides income which is shared with the inventors and their college, department or unit."

This broad mission encompasses many responsibilities and places the OTC office as the primary organization responsible for advancing research activities from the lab to commercial application. The office houses five full-time staffers that assess the potential for patent disclosures when approached with promising technology developed by university researchers.

MURA Process

The Mississippi University Research Authority Act was passed in 1972 by the state legislature to promote the economic development of the state by forging links between universities and establishing a process that allows the university employee to engage in a private, for profit enterprise while allowing the inherent conflict of interest to be monitored by the university. The law allows for several forms to exist:

1) MURA company can sponsor university research.
2) University may purchase company goods or services.
3) Company may lease university facilities.
4) Company may employ graduate students.
5) Employee/owner may spend a portion of his time on company business, if not a conflict with university duties.

Faculty ownership in a start up company can thus be an excellent means of transferring university developed technology to the public sector and promoting economic development. This is particularly true of embryonic technology where existing companies are unwilling to undertake the required research and development effort.

The MURA law requires university employees to submit a MURA letter applying for permission to establish and maintain a material financial interest in a company formed to license and commercialize technology they developed as a university employee. The MURA letter is submitted to the OTC for review and further processing. After submittal, review and required approvals the letter is forwarded to the state MURA committee for final approval and annual

review thereafter.

Financing and Other Support

In order for any company to be successful, they must have financial support. There are several entities on the university campus and throughout the state that have a vested interest in economic development through technology commercialization. These entities provide capital and other resources to assist pre-seed and early stage companies to grow.

Thad Cochran Endowment for Entrepreneurship (TCEE)

The Thad Cochran Endowment for Entrepreneurship is a multi-million dollar endowment created to establish a culture of entrepreneurship on the campus of Mississippi State University. This program provides resources to support business startups with awards, grants, scholarships, access to incubation space, mentoring, and networking opportunities. The endowment also helps to enable business planning and mentoring with university partners such as the College of Business and Industry, the Industrial Outreach Center, and the Technology Resource Institute all of which are located on the university campus.

The endowment awards grants ranging from $1,000 to $25,000. University faculty and students can use these grants to cover business operating expenses and capital equipment purchases. For student led companies, 40% of the award can be used for living expenses while working in the startup company. Funds have also been made available through the endowment for patent pursuits and rental assistance. One of the new initiatives of the program is to subsidize undergraduate and graduate students to work as part-time consultants for the funded startup companies. The students provide additional help and support for the startup companies at a minimal cost while the students gain invaluable experience working closely with the entrepreneurs. The endowment also supports student business plan competitions and an entrepreneurship speaker series each semester. All activities promoted by the endowment are designed to engage the faculty and students in entrepreneurial activities.

For individuals seeking funding, the awards process begins with a proposal submitted to the TCEE office by the applicant. Each proposal accepted is then assigned a mentoring committee that can be comprised of faculty members, alumni, and others with an interest in the startup. The mentors assist applicants to develop a viable business plan. After the plan is finished, the applicant must submit the written plan to the TCEE steering committee and present the plan before the committee for review. The applicant will receive funding if three of the five-committee members approve the award.

In recent months, an entrepreneurship steering committee was formed and a study was conducted to determine future needs of the program university wide. The findings indicated that we should:

- Improve culture
  - Create entrepreneurial ecosystem
  - Actively build student and faculty led start-ups
  - Marketing of entrepreneurial activities
- Consolidate and synergize disparate entrepreneurship activities

  - TCEE, COB, Bagley, Hatcher Entrepreneurship Program
  - Outside business
- Create capital resources for start-ups
  - MSU government contracts/appropriations
  - Pre-seed capital
  - MSU specific angel fund

The TCEE office is working to adapt as many initiatives as possible toward this overall direction identified by the above committee. In keeping with the findings of the Entrepreneurship Committee, TCEE will continue to work towards establishing a "virtual" Center for Entrepreneurship on the MSU campus.

The TCEE funding supports areas of critical need for long-term success at MSU and of the startup businesses. The funding from TCEE provided to startups is used in some of the following ways:

- **Pre-Seed Product Development** – Several MSU technologies show commercial promise but lack funding to provide data necessary for proof of concept to commercial partners.
- **Award to Startup Companies** - Most faculty and students with inventions lack the business acumen to conduct market studies and develop business plans. TCEE needs to provide funds for market and business plan development as well as proof of concept when needed.
- **Incubation of Business** - Aid in finding sources of further funding is vital to startups, as are mentoring partners.
- **Formation of Capital Sources -** Under SBA funding in 2008/2009 the plan is being written to form a capital structure adjacent to the University made up of qualified investor alumni and others. Fundraising to enhance the current TCEE endowment, Hatcher Endowment and fund the Entrepreneurship Center are also in the planning stages.

The FastTrac Program

The FastTrac Program is a business development and training program designed to help entrepreneurs to develop the skill set needed to create and grow a successful business. This program is sponsored by the Ewing Marion Kauffman Foundation, an organization with a commitment to advance entrepreneurship and to be a catalyst for an entrepreneurial society. The FastTrac TechVenture program is designed for technology-based businesses that want to equip themselves for rapid growth. FastTrac TechVenture is a 10-session program designed to assist entrepreneurs to develop their business concepts, formulate a business plan, and perfect their "elevator" presentations.

Mississippi Sate University conducts the FastTrac TechVenture program on an annual basis. The team of TechVenture facilitators that put on the program come from the on-campus entrepreneurial organizations such as the aforementioned TCEE, the OTC, the Industrial Outreach Service, and the Technology Resource Institute. Each TechVenture facilitator has gone through the FastTrac facilitation training and holds a certification from the Kauffman Foundation. During the TechVenture training sessions, experienced entrepreneurs from around the state give talks on a set of topics that include entrepreneurial readiness, marketing, finance,

and dealing with potential investors. Local entrepreneurs and experienced business people also serve as business coaches that assist the startup companies throughout each session.

Mississippi Technology Alliance

The Mississippi Technology Alliance (MTA) was created to drive innovation and technology based economic development in the state of Mississippi. MTA is a non-profit organization organized into three centers:

- The Center for Innovation & Entrepreneurship
- The Center for Innovation-Led Economic Development
- The Center for Capital Formation

These three centers facilitate their mission to help entrepreneurs, manufacturers, communities and investors create Mississippi companies.

MTA is the umbrella organization for the entrepreneurial activity in Mississippi. The organization sponsors statewide business plan competitions, trade-shows, and an annual technology conference. They offer business plan assessment, access to incubator space, and a host of other activities. MTA also organizes the Mississippi Angel Network and the Mississippi Seed Fund (described in the next section).

The Mississippi Angel Network and Mississippi Seed Fund

The Mississippi Angel Network is a group of accredited investors interested in reviewing fundraising presentations from Mississippi-based technology companies seeking seed and growth capital. The MS Angel Network is administered by MTA and is comprised of accredited individual and institutional investors from inside and outside of the state. Companies typically seek funding ranging from $500,000 to $5 million and represent many technologies such as software, life sciences, and communications. Companies seeking funding via the MS Angel Network must either be headquartered in Mississippi or have substantial operations within the state.

The Mississippi Seed Fund provides high-tech start-up companies with access to pre-seed financing, early stage risk capital and product development capital to stimulate and accelerate the development of high-performance, technology-based business ventures in Mississippi. The MS Seed Fund was created by House Bill 1724 “for the purpose of making assistance available for seed and early stage capital to small and medium sized Mississippi businesses with high growth potential that are engaged in research and development activities with a Mississippi university, college and/or community/junior college.” The MS Seed Fund enables the university’s faculty and student entrepreneurs to receive early stage, interest free capital for a two-year period ($100k per year). The funding is provided interest free for three years, after which the funding must be repaid or converted into common stock or a royalty on sales.

Both initiatives allow university startups an opportunity to receive the funding required to grow their technology-based businesses.

Industry Partnerships

The History of MSU is replete with successful entrepreneurs, many in technical fields. Our Swalm Chemical Engineering School is named after David Swalm, founder of Texas Olefins. Hartley Peavey, after graduation founded Peavey Electronics, a global name in the music amplifier business. The Bagley Engineering School is named after James Worth Bagley of LAM Research, a pioneer in chip manufacturing equipment in California. The portfolio of industry partners includes these and many others. The defense industry has long been a mainstay of the Mississippi Economy going back to Senator Stennis, Jamie Whitten and more recently Senators Lott and Cochran. These defense operations were located in Mississippi years ago and relationships with today's leaders in industry such as Boeing, Northrup Grumman and General Dynamics add to and strengthen the portfolio of industry partners with the MSU Office of Research and Economic Development. In recent years, the Center for Advanced Vehicular Systems was established to provide valuable solutions to the automotive giants such as Nissan, Toyota and Mercedes, all located in the a close proximity to the MSU campus.

The concept of industry partners in research has been a mainstay of MSU’s mission as a learning, service and research institution. The ties between agriculture and the university research community have been a major boon to our economy in years past and as bio-fuel and alternative energy comes to the forefront, MSU has a natural collaboration between chemical and mechanical engineering and the agricultural production components of new sources of energy to power the 21st century.

The model for technology commercialization should enhance our relationships with our industry partners, taking a more focused approach to the commercial markets, thus compressing the timeframe from concept to application in any of the industry partner market areas. The synergy of disciplines working in unison such as bio life sciences with supercomputing capability in DNA and genomic sciences provide an example of potential partnerships to achieve excellence and market leadership.

The development of a university portfolio of industry partners is key to economic success in the 21st century.

APEX

The Advanced Prototyping Experimentation Laboratory (APEX) at Mississippi State University (MSU) aims to provide both government and commercial organizations with world-class research and technology development. APEX uniquely integrates the University's faculty, facilities and industry partners into key working groups that address critical problems related to national security. These working groups include: (1) applied and computational mathematics; (2) autonomous systems; (3) cognitive computing; and (4) sensors and signal processing.

The goal of the APEX program is to match the needs of industry and government partners with the expertise of the many university research labs. This group works within the concept of the Development branch in the technology commercialization model.

Recent Successes

In this section, we describe some recent successes of the enactment of the technology commercialization model.

Accomplishments and Milestones

- Eleven startups funded and operating as of EOY 2008
- TCEE and Entrepreneurship Center websites are operational
- Annual Business Plan Competition in College of Engineering was established
- TCEE Office was established in the College of Business for campus wide outreach
- Kauffman Foundation FastTrac Program implemented for business planning support
- Students participating in "Students in Startups" program
- Partnership with the Mississippi Technology Alliance for funding opportunities through the Mississippi Seed Fund and Angel Network (SIS in process currently)
- SBA Grant SBAHQ-08-I-0092 Mississippi State University Spin-Out Incubation Program approved in August 2008. The program is currently five months into the twelve month program.
- Entrepreneurship Steering Committee study completed and finding discussed above

Camgian Microsystems

Camgian Microsystems designs and develops ultra-low power wireless microsystems that support long-battery life mobile sensing and communications applications. Camgian's microsystem design and engineering capabilities, along with its 24 patents in low-power, clockless integrated circuit technologies, provide a unique capability for delivering wireless solutions that meet demanding form factor and power consumption requirements. From systems-on-a-chip to modules and boards, Camgian implements its innovative, power efficient solutions in a range of applications that include advanced unattended ground sensors, global asset tracking and industrial monitoring and control.

Camgian Microsystems uniquely combines advanced technologies in the areas of low-power microelectronics, micropower sources, sensing, networking, wireless communications, and data analysis to provide customers with solutions for persistently monitoring remote assets and environments. Specifically, Camgian's advanced wireless microsystem technologies provide novel solutions that address critical problems related to:

- Battlefield Situational Awareness
- Border Security
- Cargo Tracking
- Industrial Monitoring and Control
- Physical Security

Camgian Microsystems was a recent Thad Cochran Endowment for Entrepreneurship grant recipient. They were also recently named one of two Mentor-Protégé companies of DRS, a $4 billion defense contractor.

SemiSouth Laboratories

SemiSouth is a silicon carbide (SiC) based semiconductor company specializing in SiC materials and electrical components for high-power, high-efficiency, harsh-environment power management and conversion applications. Typical applications range from power conversion, such as in computing and network power supplies, to variable-speed drives for industrial motors and hybrid electric vehicles, to high-power, harsh-environment military and aerospace applications.

The company was spun off from the silicon carbide (SiC) research and development activities at Mississippi State University. The company was founded in July 2000 by Drs. Jeff Casady and Mike Mazzola, both professors from MSU involved in SiC development. SemiSouth began full-time operations in May 2001 and incorporated in January 2002. To ensure that SemiSouth remained a high-growth emerging company, they acquired key semiconductor industry executives to help pave the road for the future.

As a spin-off, SemiSouth retained exclusive rights to SiC intellectual property developed at MSU. The company is focused on developing, manufacturing, and marketing quality high-performance electronic materials and components based on the semiconductor SiC, an emerging semiconductor technology known to have very significant advantages for high-power and/or harsh-environment applications. Along with the ongoing government programs, the company is leveraging the experience and know-how to provide SiC epiwafers and custom components to commercial customers utilizing its pilot production facility. The company is expanding its facilities and capacity for expected high-volume production from these customers. □□

SemiSouth recently received $5 million in Series A1 funding and was named one of the “Top 50 Emerging Technology Companies” by Dow Jones and Venturewire.

Eleven TCEE Funded Startups

TermiSys

TermiSys utilizes applied biology to develop and evaluate different products as they relate to preventing and/or controlling wood-destroying organisms. TermiSys is working to develop new and innovative systems that will protect residential and commercial structures from being inhabited by wood destroying fungi and insects.

JuiceHeadz

JuiceHeadz is a company that will provide healthy and delicious beverages as an alternative to high calorie artificial beverages in an easy to dispense vendible format. Their goal is to produce mixed fruit smoothies that not only taste good, but also good to the consumer by supplementing the natural mixed fruits with healthy vitamins and minerals.

Remote Animal Monitoring Solutions (RAMS)

RAMS is a leader in the development of devices and services aimed at the non-invasive monitoring of physiological parameters in livestock with direct economic impact to the livestock producer. They provide research monitoring devices and product support to animal scientists.

BarSic Semiconductors

BarSic was founded to commercialize semiconductor processing technologies aiming at development of micro- and nano-scale silicon carbide devices and integrated circuits. The key BarSiC's technology and IP is a low-temperature epitaxial growth of SiC pioneered at MSU. This technology enables formation of submicron and nano-scale SiC device topologies using so-called selective epitaxial growth approach.

Mississippi Pacific Resins (MP Resins)

MP Resins, Inc. has been established based on the patent-applied new thermosetting carbamate-formaldehyde resin technology licensed from Mississippi State University. CF resins can replace the current urea-formaldehyde resin binders used in interior grade particleboard, medium density fiberboard, and hardwood plywood.

nSite Innovations

Nsite Innovations is a developer and distributor of patented technology that provides any size organization with cutting edge computer assisted training, education, and quality assurance solutions. Nsite is designed from the ground up to comply with industry Advanced Distributed Learning (ADL) standards in terms of technology and education and was created to integrate with any existing training or educational software tools.

Spatial Information Solutions (SIS)

SIS is a developed a portfolio of software products that will be marketed to government agencies, private companies and individual clients. The software developed by SIS will be compatible with traditional Geographic Information System tools, but provide more accurate mapping data for such critical applications as 911 emergency response and disaster planning. End users will be able to mine information from large quantities of imagery taken over time.

Growth On Demand Enterprises

Growth On Demand is an information technology and software services company that specializes in on-demand enterprise software development. They offer contract development services and are building online applications targeted to small businesses and self-employed businesses professionals.

Biocrude LLC.

Biocrude is developing an economically feasible method of biodiesel feedstock production utilizing wastewater and biomass waste products in a systematic production facility. The implementation of the system nationwide would increase the current supply of diesel fuel by 2%.

Dynemotion Inc.

Dynemotion is focused on the design of hybrid electric plug-in vehicle technology utilizing intellectual property developed at MSU. The university has won the nation-wide ChallengeX Competition two years in a row and are established as leaders in this technology. Dynemotion is working with strategic partners to commercialize this technology.

These ten companies along with Camgian Networks (covered previously) have received funding, business planning support, FastTrac TechVenture training, and have worked with mentors and other business professionals from the Mississippi State University network of alumni and industry partners.

Summary

While the Mississippi State University Model for Technology Commercialization is a concept nearing realization, there are still areas that the university needs to improve on in the near future to continue to drive economic advancement. The components of the model described above must be more closely integrated. The university tenure process, in its current state, could deter young entrepreneurial faculty because there are no incentives to drive commercialization.
There has been much progress made at MSU in the area of economic development and technology commercialization. We are continuing to move forward as a university with our goal to become the economic driver for the State of Mississippi.