

School of Innovation, Management, and Economics: Leading Innovation, Managing for Change

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1. Executive Summary

Management and Economics are core academic components of every major research university. At UC Merced, undergraduate programs in these areas already serve more than 8% of students, as of Fall, 2013. We propose to go even further, building on current success to create novel and innovative programs for research and education in Management and Economics by taking advantage of strengths in health, resource, spatial organizational and business economics and management in SSHA; in technology, operations, information and service management in SoE; and in sustainability, cognitive science, health science, computation and data science across the campus. Our strategy will create effective programs that advance the campus's research missions in target areas such as health, the environment, and technology innovation, among others, while at the same time building a unique niche in management of complex, real-world systems. With economies of scope and scale, we can avoid duplication of effort and investments by (a) leveraging Economics faculty to deliver an undergraduate program in Management and Business Economics (MBE) starting in 2014 and a Ph.D. program in Economics starting in 2016; (b) leveraging faculty in Management, Engineering, and Science to develop a unique modular, graduate program in Management of Innovation, Sustainability and Technology (MIST) starting in 2016; and (3) collaborating across campus to focus on excellence in research and education in analytics, value networks, health care, regional development, trade, technology management, environmental management, and service management, bringing new and unique programs in management, economics and related areas together in a new School of Innovation, Management, and Economics (SIME) starting in 2020. This proposal encompasses all Economics and Management related SAF initiatives from Round 1 of this process.

2. Themes: Innovation, Sustainability, and Technology

Global challenges require global innovations that create broad social and economic opportunities. To address today's global challenges effectively, we need to establish a new understanding of the nature of business and value, one that enables us to address at once socio-economic challenges, environmental challenges, and challenges related to the increasing pace of change, especially change that arises from new technology, engineering, science, and understanding of human behavior. Economics studies the behavior of individuals, groups, and organizations managing and using scarce resources, modeling decision making to achieve optimal outcomes given limits on information, cognitive capacity, and time. Management Science focuses on technology and implementation of solutions to business and management challenges. To meet new demands of the 21st century, informed research and learning requires integration of these perspectives. Technology management can be informed by knowledge of economic behavior, and Economics can be informed by the insights of Management Science on practical, real world constraints on technology, resources and implementation that critically affect optimal strategies to solve contemporary problems in business and society. This critical need for interdisciplinarity is why UC Merced is uniquely positioned to achieve distinction and excellence in management and economics with a joint School for related programs, the proposed School of Innovation, Management and Economics (SIME). Overarching themes for the proposed School are *economic sustainability* and *technological innovation*. Now is the time to create innovative academic programs based on quantitative research in organizations, economics, innovation, science, and technology, with a focus on sustainable processes and practices at all levels.

This proposal fits under the "Innovation and Entrepreneurship" theme. Related themes include "Environmental Sustainability," "Information, Computational and Data Sciences and Engineering," "Disparities: Equity, Diversity, Social Inequality," and "Human Health Sciences." Related initiatives include "Environmental Sustainability," "Computation and Data Science," and "Applied Philosophy".

3. Intellectual Merit: Intersection of Knowledge Gaps and Skill Needs, Locally and Globally

Modern views of business have recently moved away from the simple measure of shareholder value to more complex ways of evaluating how organizations create value in context and with others. Specifically, the view is that all value is co-created through interactions among organizations¹ and that value is best measured along multiple dimensions, including social, environmental (or ecological), and financial, the so-called *triple bottom line*.²

Understanding context means understanding all the stakeholders (including suppliers, competitors, governments, and others), technologies and artifacts (including data and computational capacity), and the natural environment (including limited natural resources), and ultimately aligning value propositions across all stakeholders to increase value in all dimensions.³ Complex systems theory represents a new scientific approach that investigates how relationships among parts give rise to the collective behaviors and how systems interact and form relationships with the environment,⁴ with big data analytics, modeling, and simulation key methods of the approach.⁵ For instance, the rise of global service-based business models have transformed the way the world works, enabled by new information and communications technologies, specialization of businesses and professions, global regulations, and increased use of external services. National priorities aim toward economic improvement, driven by scientific understanding and systematic innovation.⁶ It is time to focus deep scientific and engineering attention on innovation in services, technology, and sustainability, among other areas.⁷ UC Merced is uniquely positioned to create such new and novel management programs at the graduate and undergraduate levels, and to lead in research and practice in areas of management relevant to the Central Valley, California, the US, and beyond.

The San Joaquin Valley is directly faced with many of the grand challenges seen in our society in general: air quality, clean water, access to clean energy, access to good healthcare, and socio-economic disparities fueled by the lack of jobs. It is increasingly clear that the solutions to these challenges are found at the intersection of traditional academic fields. Research priorities should be set at these intersections to collectively meet the challenges of our area, the State, and beyond. For example, how can policies and incentives be exploited to increase technological innovation and its diffusion, advance efficient health delivery systems, reduce health disparities, improve environmental conditions, promote trade, improve the spatial organization of commerce and peoples, increase the efficiency of local and higher governance, promote regional growth and efficient adjustment to migration, reduce economic and social inequality, and improve efficiency in the organization of retail, on-line and other markets? How can technology be used to meet contemporary business and policy challenges generally? More specifically, how can data analytics enable better management of natural resources? How can management of technology promote better access to healthcare? How can

¹Vargo, S.L. & Lusch R.F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68 (1), 1-17.

²Porter, M.E., and M.R. Kramer (2011), The Big Idea: Creating Shared Value, *Harvard Business Review* Vol. 89, No. 1.

³Maghroori, R. and E. Rolland (1997), Strategic Leadership: The Art of Balancing Vision with Policy, Procedures, and External Environment, *Journal of Leadership Studies*, Vol. 4, No. 2, pp. 62-81.

⁴Senge, P.M. (1990), *The Fifth Discipline*, Doubleday/Currency, ISBN0-385-26094-6

⁵Sterman J.D. (2000). *Business Dynamics: Systems Thinking and Modeling for a Complex World*. McGraw-Hill/Irwin.

⁶Council on Competitiveness (2005). *Innovate America: National Innovation Initiative Summit and Report*. (<http://www.innovationtaskforce.org/docs/NII%20Innovate%20America.pdf>);

⁶European Commission (2011). *Policies in Support of Service Innovation*. INNO-Grips project Policy Brief No. 3. (http://ec.europa.eu/enterprise/policies/innovation/files/proinno/inno-grips-policy-brief-3_en.pdf);

⁶National Science Board (2010). *Science and Engineering Indicators: 2010*. National Science Foundation, National Center for Science and Engineering Statistics. (<http://www.nsf.gov/statistics/seind10/start.htm>).

⁷National Academy of Engineering (2007). *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. Washington D.C.: National Academies Press.

entrepreneurial activities promote job growth locally? How can better understanding of services yield better management of public services and public resources? How can sustainable business models help align value propositions across different interest groups to help avoid conflict and create socio-economic and environmental change? It is increasingly clear that such complex questions can best be addressed in cross-functional environments, with the broader systems-approach aiding us in addressing new research questions, which in turn can inform practice. The SIME represents precisely such an institutional environment.

4. Opportunity: Interdisciplinary Research and Education

UC Merced has an opportunity to address industry needs for management education and research that complement field-specific skills and knowledge. By building deliberately from the foundation of Economics, and Management programs that connect to innovation, sustainability, and technology, UC Merced can quickly become a world leader, helping to define a new whole approach to management and innovation. We will achieve these goals with the following programs:

1. Undergraduate Programs: There are currently two undergraduate programs in Economics and Management. These are the B.A. in Economics and B.S. in Management and Business Economics (MBE). Combined, these two programs account for 8.4% (Fall 2013) of campus undergraduate enrollment. With the recent change in the Management and Business and Economics (formerly Management) and its oversight by the Economics group, we have taken necessary first steps to bolster the growth in this program between now and 2020. Undergraduate programs will be expanded and strengthened going forward, including added curriculum and programmatic opportunities in innovation, sustainability and technology, focused on the tenants of MIST; extra-curricular programs to link students with research and the business community; possible additions of targeted undergraduate minors; the addition of a B.S. in Economics; and potential tracking opportunities for MBE majors.
2. Ph.D. Programs: Economics will be starting its Ph.D. program in fall semester of 2016. Anticipated student enrollments are 30-50 by 2020. A proposal for a research-driven MIST Ph.D. program is being developed. These programs will build on the themes of SIME, *economic sustainability* and *technological innovation*, by offering fields of study in health, environment, development, trade and growth, among others. All these fields leverage existing strengths of current faculty at UC Merced; are growing in importance in the broad community of policy choice, scholastic inquiry, and demands for Ph.D. talent; and are particularly appropriate to campus-wide themes, which make them uniquely fertile ground for interdisciplinary collaboration.
3. Other Graduate Programs: MIST will develop a modular one-year professional Master of Management program that provides a unique educational experience that can be delivered in several formats (e.g., intensive residency sessions, online sessions, on-campus classes, and others). This program will have tracks in innovation, sustainability, and technology, can generate revenue to help support a corresponding undergraduate program and the Ph.D. programs. Offering a one-year graduate degree in management makes sense given recent data showing that applications to full-time, two-year MBA programs are down over the past four years while interest in specialized one-year master's programs is up over the same period.⁸ In addition to these programs, the School will take ownership of UC Merced's existing executive programs in Parks and Protected Areas, as well as a multi-university collaborative graduate program instituted at UC Merced in 2010.

We also plan to form specialized centers within the school, initially to be launched and overseen as collaborations between Economics and MIST in concert with cross-campus constituencies. For example, a named Institute for Innovation, Management and Economics Research will provide a focal center for

⁸Mangan, K. (2013). Business-School Accreditor Approves New, More Flexible Standards, *The Chronicle of Higher Education*, April 9. (<http://chronicle.com/article/Business-School-Accreditor/138447/>).

research on economic sustainability and technological innovation. In addition, a UC Merced-based entrepreneurship center will serve as a local business incubator and promote related research, outreach, and linkages between students, faculty, the business community, and the public (see, for example, <http://tsoulouhas.info/ERI.pdf>).

SIME creates a single school to leverage faculty expertise in Economics and MIST, and integrate the multiple perspectives crucial to solving problems and delivering value in the 21st century economy. Within the school, the study of networks for value creation and analytics in MIST link closely with international trade, economic development, organizational design, and regional growth in Economics. Similarly, resource management and technology management in MIST link closely with environmental, health, and innovation foci of Economics. Drawing on faculty expertise in both MIST and Economics, SIME will serve as a campus-wide center of excellence in these fields.

Focus Areas for SIME

First, the theme, *sustainable economics*, leverages existing areas of distinction in Environmental, Health, Development, Trade, and Growth in the Economics group. Second, this theme links closely with, and will contribute to, emerging campus-wide areas of excellence in Health, Environment, Community Engaged Research, Disparities, and Spatial Sciences. Third, the theme resonates with the many stakeholders – students, faculty, staff, employers, funding agencies and donors- who are committed to building the world class Economics program at UC Merced. SIME will allow the campus to create world class programs at UC Merced by focusing on a niche covering innovation, technology, sustainability, management and economics that is underserved yet of increasing importance in our ever changing global environment. Creating *sustainable economies*, the new challenge for 21st century economists and managers, require expertise in the following academic fields:

- Health Economics (e.g., providing cost-effective health care and alleviating health disparities)
- Environmental Economics (e.g., effectively managing our global resources and managing pollution)
- Development (e.g., alleviating poverty and providing access to resources that empower individuals)
- International Trade (e.g., coordinating the production and marketing of goods globally)
- Regional Growth (e.g., equipping cities and regions with policies to grow sustainably)

Managers face constant opportunities and challenges associated with scientific and *technological innovation*, and to be prepared, managers must acquire skills that are drawn from many disciplines. Management, as a discipline, intersects with any other discipline in practice, as organizations rely on managerial principles to organize work. This is the case for public agencies, private organizations, and non-profits alike. It is also true for engineering and scientific organizations, as well as retailers, water-districts, national parks, manufacturing, service, and other diverse industries. For example, we have seen an increase in engineering management, healthcare management, and other specialized management programs that are served by a diverse set of disciplines. For example, business and big data analytics address the challenges associated with making decisions based on an ever-increasing amount of collected data. Being able to make decisions using large amounts of data, perhaps in real-time, opens opportunities ranging from eradicating diseases to understanding and identifying fraud. This requires deep knowledge and research in a diverse set of areas. SIME will build from existing faculty and campus strengths, which include services, logistics, analytics, cognition, health, the environment, and technology, and address technological innovation in four broad strategic areas of research and education:

- Analytics (e.g., Spatial Analytics, Health Services, Smart Infrastructure, Econometrics)
- Networks for Value Creation (e.g., Network Security, Logistics and Supply Chains)
- Technology Management (e.g., Services, Innovation, and Leadership)
- Resource Management (e.g., Protected Lands, Renewable Energy, Sustainable Land Use)

To be competitive, UC Merced must leverage available skillsets from both UC Merced and other UC campuses. Initiatives for leveraging a UC-wide faculty are already under way in two areas: (1) The California Center for Service Science, with broad participation from the other UC Management, Engineering, Information, and Medical Schools; and (2) A new proposal for the UC Center for Parks, that affirms UC Merced's global reputation in leadership programs for Parks and Protected areas and resource economics, and brings in other UC campuses that offer synergistic opportunities for research and education, along with outside organizations. These programs serve as examples as to how we can generate a home at UC Merced for innovative cross-functional research and education programs that are based on value creation from a complex systems perspective. Indeed, UC Merced has already invested in the Spatial Analysis and Research Center (SpARC), which is well-aligned with the strategic direction of this proposal.

While SIME seek to integrate, and thereby mobilize, multi-campus research efforts using system-wide talent, it does not seek to replicate existing schools on other UC campuses, but rather carve out a new underserved niche in thematic areas relevant to the challenges of the new century.

5. Faculty Participation: Cross-Campus Synergies and Linkages

Beyond the integration of Economics and MIST faculties in SIME, this proposal represents a cross-disciplinary and cross-campus approach SIME and its faculty will be intertwined with the fabric of the campus in multiple ways.

MIST and Economics faculty will be closely tied to multi-disciplinary initiatives and programs related to our thematic foci. Our environmental economics and management staff will be linked with the Earth Sciences (ES, ENVE, LES, SNRI) in their integrative efforts to study living systems, non-living systems, and their interactions, to promote sustainable and equitable futures through their proposed Sustainability, Energy, Climate and Communications, and Environmental Sustainability initiatives. Our health economics faculty and relevant management faculty in technology and services will join with related faculty in the Health Services area of UC Merced's public health program and facilitate the execution of a PhD in Health Services that leverages existing strengths in the respective disciplines. Our health economics faculty and relevant management faculty in technology and services will join with related faculty in the Health Services area of UC Merced's public health program and facilitate the execution of a PhD in Health Services that leverages existing strengths in the respective disciplines. Our regional development and trade faculty will be linked with scholars in Sociology and the new Blum Center for Community Development. We are collaborating with our Political Science colleagues on a graduate program and research initiative on Political Economy (see Political Science SAF proposal). Our MIST faculty will build on cross-functional knowledge already available across the campus, including business analytics (computer science, mathematics, geography, economics, cognitive science, and management), decision-analysis (cognitive science, psychology, management), logistics (science, mathematics, geography, engineering, and management), resource management (environmental science, engineering, and management), and services (engineering, cognitive science, psychology, and management). Plans for MIST are tied specifically to existing programs, including all existing campus ORUs, (CITRIS, SNRI, HSRI), the new cross-UC California Center for Service Science, the Blum Center at UC Merced, proposed Center for Human Adaptive Systems and Environments, proposed new focus areas of Cognitive and Information Sciences in data science and human-technology interaction, and the program in Applied Philosophy (Applied Ethics; PPE). Faculty will be engaged in quantitative research that aligns with the proposed Center for Quantitative Research and the proposed Center for Theory and Computation.

6. Programmatic Needs: Timeline and Resources

Through 2020, Economics and MIST will build their programs at the undergraduate and graduate levels, remaining closely aligned by sharing plans, resources, and courses. In the short-run, there will be strong

collaboration between Economics and MIST in program planning and implementation through formal affiliations of faculty across groups; and in the long-run, there will be deep integration through research and educational programs in SIME.

Today, the Economics faculty manages two undergraduate programs, one in Economics (128 students in Fall 2013) and one in Management and Business Economics (previously known as Management) (363 students in Fall 2013). Over several years, we expect to add new Management-related programmatic opportunities for undergraduate students, particularly in areas of emphasis in MIST such as Business Analytics, Information, Operations, Technology Management, Sustainability Management, and others. We expect collective enrollments in our majors to total roughly 800-900 students by 2020. Our programs will share common core courses, including accounting, finance, marketing, information systems, and economics. In addition, we will be launching a Ph.D in Economics and a Ph.D. in MIST, a one-year professional Masters of Management program, and self-supporting executive education programs in a number of areas related to SIME (totaling 150-200 students by 2020). Overall, we anticipate that SIME's programs will serve about 10% of the campus, both at the undergraduate and graduate levels. To run these programs, SIME will need roughly 35-40 ladder-rank faculty, and roughly 10-15 lecturers overall by 2020. This proposal envisions the building of Economics and MIST faculties in tandem between now and 2020, with symmetric allocation of new hires. Economics and MIST will merge their faculties and programs into the new SIME by 2020, which will have its own administration and building and facilities to house faculty, administration, students, and related programs.

Resource commitments for a new School do not involve costs above those that thriving programs would otherwise require. Indeed, the inception of a new School promises delivery of endowment, grant, and tuition resources that will cross-subsidize many of these costs and thereby reduce the University's financial commitments overall. SIME faculty focus on economic sustainability and technological innovation requires interdisciplinary approaches that are well suited to the goals of many granting agencies. Robust endowment support will be created not only by naming opportunities for the School and new building, but also by contributions from the business community and alumni. Income from these endowments and grants will help defray some of the required off-scale increments to faculty, support graduate students, cover some administrative expenses, and support extra-curricular programs (including conferences and faculty research funds). Further, the opportunity to attract students globally may positively impact the financial sustainability of the proposed school.

In sum, our strategy requires several broad commitments at the campus level: (1) commitment to the two faculties (Economics and MIST) on the proposed approach in the near-term; (2) commitment to incorporating a new SIME building in space planning in the near-term; and (3) commitment to administrative planning for the inception of the new School, starting by AY 2017-18 for anticipated opening in AY 2020-21. By creating a new school that builds on the strengths of UC Merced, and also on the strengths of the University of California at-large, SIME will emerge as a system-wide leader in its area of focus, creating a UC Merced-based, UC-wide, interdisciplinary hub for all research and education related to innovation, enterprise and economics, benefiting our campus, the local community, the state, and beyond.