ASU: Building Arizona’s Future
The Role of Universities in Knowledge Economies

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In the emerging economy, universities are being forced to answer the central question:

What role do universities have in meeting the challenges of the global economy in the 21st century?
Universities are also considered economic entities. They began assisting employers and are recognized for local expenditures.

Universities were automatically “worthy.” They created thinkers and well-rounded citizens.

Recent history has seen the university’s societal role transform:

- **Academies**: small, isolated, disengaged
- **European experience**
  - European universities (guilds)
  - German universities (for industrial development)
- **American research universities**: open, but narrow access, indirect engagement

- **30 years ago**
  - Universities were automatically “worthy”
  - Created thinkers & well-rounded citizens

- **20 years ago**
  - Universities are also considered economic entities
  - Began assisting employers & recognized for local expenditures

- **10 years ago**
  - Universities legitimizad as a workforce developer
  - Value of imported out-of-area money

Overview
- History
- Functions
- Challenges
- Opportunities

New American University
- Case: Phoenix, Arizona
- Design Imperatives
- ASU Exemplar Initiatives

Looking toward the Future
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Currently, as centers of education, knowledge, innovation, talent and business, universities are expected to provide society with three primary functions:
These new functions of the university are aimed toward addressing our societal shift back to city-state structures and the desire to establish knowledge economies.

Region composed of one or more historical, central sites surrounded by towns and cities which:

- Have a shared identity
- Function as a single zone for trade, commerce and communication
- Are characterized by social, economic, and environmental interdependence

Based on communities that create, distribute, and exploit knowledge and information for increasing economic wealth and improving quality of life.
Challenges in Knowledge Economies

Thus, universities are faced with critical challenges while priming to address society’s needs, which include:

- Transformation from Industrial to Information age
- Knowledge Economy and Knowledge Society
- Rapid Growth and Urbanization
- Population Diversity and Immigration
Example: Urbanization

- While city-states emerge as economic and cultural hubs, massive **urban-led growth** exists on national and international scales.
- Roughly 36 cities around the world, mostly in developing countries, will each have over 8 million inhabitants by 2015.
- The world’s urban population could double from 2.6 billion in 1995 to 5.2 billion in 2025.
Universities Provide the Core for the City-State

However, universities are the primary locus of opportunity to address challenges associated with innovation, economic expansion, and population growth for the city-state. They:

- Cultivate creative capital
- Generate knowledge capital
- Train human capital
- Build social capital
- Attract financial capital
- Preserve natural capital
- Produce spillovers to regional and national economies
Academic Success, Economic Strength

For example, trends indicate that highly educated populations and higher university funding influence a higher per capita income.


Geographic concentration of highly cited scientists
http://www.casa.ucl.ac.uk/citations/citations_maps.htm
Since its passage, American universities have:

- Spun off more than 2,200 firms to commercialize innovations born of research
- Created 260,000 jobs in the process
- Contributed over $40 billion annually to the U.S. economy

In addition to these statistics, the U.S. Bayh-Dole Act spurred university/industry interaction by allowing universities to retain titles to their inventions created under federally funded initiatives.
More specifically, the U.S. Small Business Administration highlights that university R&D expenditures directly contribute to regional economic growth:

- **Spillover effects in and around universities directly proportional to the amount of funds contributed to the university**
- **Birth of new business firms**
- **Secondary effects of the employment growth generated by those new firms**

Science, Technology & Economic Growth

These trends illustrate that public and private investment in universities marks a cyclical process of innovation and economic growth in city-state and university partnerships.
The future will belong to those regions that have strong knowledge-based economies, built on the success of their universities as knowledge producers.
ASU, guided by the New American University model, is geared toward facing these challenges and launching Arizona to participate in the “knowledge economy”.

Arizona State University
Building a leading comprehensive metropolitan research university

Phoenix, Arizona
Exemplifying the numerous rapidly urbanizing regions across the globe

- 4th largest U.S. university
- Projected 90,000 students on four campuses by 2020
- $130 million in research activity

- 5th largest U.S. city
- 2nd fastest growing state in U.S.
- $140 billion economy, 5th largest in nation
The design imperatives address the societal functions of the university.
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Looking toward the Future

Entrepreneurship & Spirit of Innovation

Design Imperative:
ASU as Entrepreneur

Initiatives:

- ASU Technopolis
- Arizona Technology Enterprises (AzTE)
- Virginia G. Piper Center for Creative Writing
Exemplar Initiative: Arizona Technology Enterprises (AzTE)

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Entrepreneurship & Spirit of Innovation

Exemplar Initiative: ASU as entrepreneur

Design Imperative: ASU as entrepreneur

ASU is currently the state's leading technology-transfer enterprise

Arizona Technology Enterprises (AzTE)
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**Looking toward the Future**

**Entrepreneurship & Spirit of Innovation**

**Design Imperative:**

**Use-Inspired Research**

Initiatives:

- ASU-US Army Flexible Display Center
- Consortium for Science, Policy and Outcomes
- Homeland Security Initiatives
Exemplar Initiative:

- ASU-US Army Flexible Display Center

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Entrepreneurship & Spirit of Innovation

Design Imperative:

Use-Inspired Research

Exemplar Initiative:

ASU-US Army Flexible Display Center

- $43 million federal grant, the largest in the university’s history
- Catalyst for a potential multi-billion dollar industry
- Magnet for the evolution of the ASU Research Park
New American University

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Platform for Sustainability

Design Imperative: Leveraging Place

Initiatives:

- International Institute for Sustainability (IIS)
  - Consortium for the Study of Rapidly Urbanizing Regions
  - Greater Phoenix 2100 Project
- Decision Center for a Desert City
- Decision Theater for the New Arizona
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Platform for Sustainability

Design Imperative: Leveraging Place

Exemplar Initiative:

Decision Theater for the New Arizona

- $3 million gift from Ira A. Fulton
- New facility for the presentation of immersive, 3D scientific visualization
- 270-degree screen for "what if" analysis and modeling
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New American University

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Platform for Sustainability

Design Imperative: Transforming Society

Initiatives:

- Center for Research on Education in Science, Mathematics, Engineering and technology (CRESMET)
- ASU in Your Community
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Looking toward the Future

Platform for Sustainability

Design Imperative:
Transforming Society

Exemplar Initiative:

Center for Research on Education in Science, Mathematics, Engineering, and Technology (CRESMET)

- $20 million - federal, state, and industry grant funding
- Promotes excellence in K-20 science, math, engineering, and technology-based education policies
Initiatives:
- Polytechnic Campus at ASU
- Barrett Honors College
- Student Programs
  - Edson Student Entrepreneur Initiative
  - Tech Venture Clinic
  - W.P. Carey School of Business
  - Ira A. Fulton School of Engineering

Design Imperative: Focus on the Individual
Initiatives:
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Looking toward the Future

Platform for Sustainability
Design Imperative:
Focus on the Individual
Exemplar Initiative:

Polytechnic Campus at ASU
- Emphasis on experienced-based learning and applications-based problem solving
- $27.5 million in new classroom and research space added
- 30% enrollment increase for four consecutive years
Initiatives:

- ASU Scottsdale Center for New Technology and Innovation
- Downtown Phoenix Campus
- University Public Schools project
- Stardust Center for Affordable Homes and Family
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Looking toward the Future

Platform for Sustainability

Design Imperative:
Social Embeddedness

Exemplar Initiative:

ASU Scottsdale Center for New Technology and Innovation

- Mixed use: Education, arts, research, business, housing
- Great design that creates interactivity
- 24/7 environment
- Community engagement
- Clear theme(s)
- Strong builder-developer partner
- Niche and general marketing
Initiatives:

- The Biodesign Institute
- Institute for Computer and Information Science and Engineering (INCISE)
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Design Imperative:
Intellectual Fusion

Exemplar Initiative:
The Biodesign Institute

Sponsors and Centers include:
- TGen, Mayo Clinic, Barrows, Private Sector
- Applied NanoBioscience
- BioOptical Nanotechnology
- Evolutionary Functional Genomics
- Infectious Diseases and Vaccinology
- Neural Interface Design
- Protein and Peptide Therapeutics
- Rehabilitation Neuroscience and Engineering
Initiatives:

- Enhanced Partnerships with Mexico and rest of the world
  - Executive MBA with ITAM Mexico and the People’s Republic of China
- CONACYT Fellowship program
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Looking toward the Future

Design Imperative:
Global Engagement

Exemplar Initiative:

Executive MBA with ITAM Mexico and China

- Executive MBA program for top Mexican business leaders
- Focus on emerging international business climate

W.P. Carey MBA Beijing & MBA Shanghai

- Executive MBA program for top Chinese business leaders
- Partnership with the Chinese government, Shanghai National Accounting Institute, Tsing Hua University, and Motorola
While ASU moves along its 10-year transformation into the “New American University,” it is committed to:

- Becoming a catalyst for entrepreneurship and innovation
- Creating a platform for sustainability
- Promoting a globally engaged network
In order for universities to be catalysts of entrepreneurship and innovation, they must:

- Assure that new technologies will be adopted in the marketplace
- Spin off and nurture new enterprises
- Design structures that will facilitate scientific and industrial advancement
- Avoid replication
Universities must also position themselves to become **platforms for sustainability**: 

- Conduct proprietary Research and Development
- Create designs that enable flexibility and change (interdisciplinary and school-centrism)
- Foster regional competencies to secure global competitiveness
- Maintain and enhance linkages between science, technology and humanism
Finally, universities must be committed to ensuring a **globally engaged network**:

- The pooling of resources by Asian and European universities has resulted in better societal and economic engagement with lower overall transaction costs.
- Thus, in North America we should focus on partnership building between universities in Mexico, Canada, and the United States.
- We can then use these partnerships to develop strategic clusters where research, technology, and knowledge are fostered.
However, each university and region is unique and will need to develop its own methods for improvement by considering these strategies:

- Focus by area (urban, regional, national, international)
- Determine the desired niche of each university and avoid replication
- Develop a unified, interdisciplinary approach to support all universities and surrounding communities
- Build partnerships to pool resources and create regional clusters of innovation
Tec de Monterrey is implementing these strategies to address the functions of the 21st century university as it launches its “Mission for 2015”

- This new mission highlights a turning point for Tec de Monterrey as a partnership builder with cities in Mexico and Latin America.

- Monterrey is just one example where academic and business communities are closely integrated and working toward entrepreneurship and innovation, sustainability, and a globally engaged network.

- Thus, Tec de Monterrey is pacing itself to become a local, regional and global leader in promoting the roles of the universities in the new, global economy.
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