Universities
Transforming and Transformational

Professor Caroline McMillen
Vice-Chancellor and President
University of Newcastle
Understanding the Starting Point: The ‘genetic code’

Each institution has a unique ‘genetic code’ and origins which are a product of:

- The geopolitical, national and community drivers which resulted in its conception
- The time and the place of its birth
- The vision and values of the institutional ‘parents’- it’s founders and early leaders

While retaining a strong connection to their origins and values, universities develop and transform to:

- Build excellence for a purpose and be confident on the world stage
- Adapt their strategic approach to predict, influence and respond to the changing needs of the global and local environment
- Innovate practice to meet the needs of new generations of learners and assimilate new bodies of knowledge
- Engage with partners to fast forward delivery of innovation and impact which adds value at the right time for the communities they serve
- Understand the critical importance of leadership and culture in driving transformational change
Great universities maintain their genetic identity and respect their origins but can transform to adapt their purpose and strategy across decades to be transformative agents in their communities.

“It’s good for every one of us to have a history, but to have a past that we cannot break away from is not good.”

Pradeep Khosla Chancellor University of California San Diego

National higher education systems are comprised of universities which adapt and transform to provide governments with confidence that the system has the scale and agility to respond to national and global changes and to make major contributions contribute to national prosperity and social cohesion.
Changing Environment: The 2030 Agenda for Sustainable Development
THE SHIFTING DYNAMICS OF THE EARTH’S ECONOMIC CENTER OF GRAVITY AD 1 TO 2025

SOURCE: McKinsey Global Institute, Urban world: Cities and the rise of the consuming class
GLOBAL CONTEXT

Advanced economies transitioning to knowledge economies

Top performing global economies derive >30% of GDP through knowledge-based economy

NATIONAL CONTEXT

Historical reliance on resource-based economy
<5% economy derived through knowledge

Requires an innovation ecosystem connecting education and research excellence in partnerships with industry, government and academia to deliver new businesses and jobs

REGIONAL/CITY CONTEXT

Regions and cities exposed differentially to slowing of growth in the mining and resources sector and in traditional manufacturing.

Universities working in partnership with government and industry to transform the future of their cities and regions
Australia: The transition from the old economy to the new economy is not a choice

- Five million jobs - high probability of being replaced by 2035 – an additional 18% of jobs have a medium probability of being eliminated.

- Jobs with low levels of social interaction, creativity, mobility and dexterity are more likely to be replaced by automation.

- Two million new jobs by 2025 and 65-75% will hold a post-school qualification and 1 in 3 new jobs will be for professionals.

- Future skills education must be around the creative application of technology to solving problems and a focus on innovation and entrepreneurship skillset

*Committee for Economic Development of Australia Report 2015*
New Roles for Universities
Co-Creators of Innovation Ecosystems

Civic ... Community ... Business ... Universities ... Government

‘Joined Up’ Leadership and Vision

Connectivity----Collaboration---- Partnerships

Co-Creation of an Innovation Ecosystem

Quality of Lifestyle/ Sense of Place

Magnet Cities and Regions
Industrial cities in the developed world have undergone a period of decline as manufacturing has moved off-shore.

Formerly known as ‘rustbelts’ many of these regions are emerging as hubs of smart innovation
- strong universities as anchors
- visionary civic leadership
- governmental support for basic research
- research facilities with deep, specialist knowledge
- traditional manufacturing skills
- appealing work and living environments
- capital

“Companies have learned to compete not on price, since they can’t necessarily win against emerging markets, but making things smarter. That smart innovation is today’s real competitive edge”

Van Agtmael and Bakker 2016
‘Brain Belt’ Case Study: Akron, Ohio, USA

- Formerly a major global centre of tyre manufacture and a key transportation hub in America’s manufacturing supply chain

- Suffered towards end of 1990s as big companies abandoned tyre plants and freight trains no longer stopped there

- From 2000 expertise in polymer science from the University of Akron and collaborations harnessed to drive revitalisation of the region
The Akron Case Study: Transformative leadership

- Visionary University leadership developed a plan, *The Akron Model: The University as an engine for economic growth*

- Focus on the University as a ‘tool chest’ for economic success, acting as a convener, developer and anchor for clusters of innovation

- Founding principles: productivity, connectivity, relevance

- Two primary development drivers

http://www.uakron.edu/akronmodel/
Self-regenerating feedback cycles have existed between most universities and their communities, but recent seismic rumbles of economic and technological change have made it abundantly clear that universities must serve not only as anchors for regional economies, but also as stimulators, facilitators and connectors.

- The University of Akron, Akron Model 2010-11 Report to the Community
Co-Creation of Innovation Ecosystems

Key Elements

Universities
- Research excellence across traditional discipline boundaries
- Equity of access for talent
- Entrepreneurial education

Business/Industry
- Engagement
- Work Integrated Learning
- Co-design
- Innovation

Access to Global Knowledge and Industry Supply Chains of Talent, Partners, Networks

New Businesses and Jobs
- Productivity
- A One Speed Economy
Research Excellence
Total Research Income/FTE
Australian Universities: Age Matters ...to a Point
Universities- Transforming to Meet the Challenge
Building Capacity

Building a Research ‘Engine Room’
A need to build staff research careers, areas of research excellence and establish credibility and reputation of the university with external partners all at the same time - the need to trade on vision, strategy and brand to recruit – rather than on traditional measures of excellence.

Transforming the Leadership Group
Hire great Professors who are tired of ‘more of the same’ where they are, who want to come to a University where they are intrigued by the vision, the energy, and innovative strategies - where they can do something as a ‘capstone’ for their career.
Leaders who are generous to a fault and prepared to lead major pieces of new initiatives.
Establishment of Global Innovation Chairs at UON – outstanding outcomes.
Research Excellence is Necessary But not Sufficient
Understanding the Power of ‘Convergence’ of Disciplines

Convergence

- a result of the sharing of ideas and methods by chemists, physicists, computer scientists, engineers, mathematicians, and life scientists across multiple fields and industries.

- forms comprehensive frameworks that merge areas of knowledge from multiple fields to address specific challenges.

- it goes beyond collaboration to integrate historically distinct disciplines and technologies to create fundamentally new opportunities for life science and medical practice.

Convergence of Disciplines

Growing New Tissues
Building New Limbs
Post Trauma

Multi-disciplinary

Inter-disciplinary
Being at the Research Front

“A specialty whose foundation literature is young represents a fast-moving area, when coupled with high levels of citation, frequently reveals a hot or emerging topic.”

18 Research Fronts defined in: Biology and Medicine, Energy, Scholarly ‘Hits’, generation electronics, environmental and evolution

Pendlebury D: Clarivate’s Web of Science (previously the Science Citation Index) Cited in THE

**Being at the Cutting Edge Can Take Time**
**Great Universities Can Retain Youth and Vibrancy**

Proportion of Lead Universities/Research Institutes Contributing to ‘Research Fronts’ by Institutional Age: Age Can Matter
Light touch’ interdisciplinary structures may not deliver a transformative impact - excellence within disciplines in an interdisciplinary mix working together on major difficult challenges is required.

A bold focus on the key questions and challenges can transform the future of a university

Overcoming ‘drag force’ of disciplinary rivalry set up in established Faculties, Schools, Departments over decades - requires cultural and structural transformation.
Being on the World Stage
The Global Reputation of Universities can Transform National Economies

THE World University Ranking 2016-2017

Total University Research Income ($M) vs. THE World University Ranking 2016-2017

- The graph shows a downward trend, indicating a correlation between university rankings and research income.
- Universities with higher rankings tend to have lower research income, and vice versa.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 50</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Top 100</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Top 200</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Top 300</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Top 400</td>
<td>19</td>
<td>19</td>
<td>20</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>Top 500</td>
<td>N/A</td>
<td>N/A</td>
<td>27</td>
<td>25</td>
<td>29</td>
</tr>
</tbody>
</table>
Universities to collaborate beyond national borders

- Critical to ensure researchers and research trainees are part of the ‘global academies’ in their fields
- Institutional partnerships built around shared mission, strengths, complementarity and defined priorities for mutual benefit
- Development of opportunities to introduce university industry partners into the global supply chain
- Building global consortia to deliver large scale capability through collaboration and access to world-class facilities
The Journey to Industry Partnerships
Australian Industry Research Contract Grants/FTE
Australian Universities: Age Does Not Matter
AusIndustry Connect
Performance Across the National Innovation Eco-System

Commonwealth Scientific and Industrial Research...  
The University of Newcastle  
Monash University  
The University of Queensland  
The University of New South Wales  
University of Technology Sydney  
Royal Melbourne Institute of Technology  
Swinburne University of Technology  
Deakin University  
University of South Australia  
Queensland University of Technology  
The University of Melbourne  
University of Tasmania  
University of Sydney  
La Trobe University  
The University of Adelaide  
The University of Wollongong  
Victoria University  
Central Queensland University  
University of Southern Queensland  
Department of Agriculture, Fisheries and Forestry,...  
Australian National University  
University of Western Australia
Top 75 Most Innovative Universities in the Asia-Pacific (Reuters/THE 2017)

Institutional Age

Proportion of Top 75 Universities in Each Age Group %

- POHANG Age 31
- HKUST Age 26
- Uni SA Age 26

Top 75 Most Innovative Universities in the Asia-Pacific (Reuters/THE 2017)
The need to engage with external partners to secure research funding builds staff skills in negotiation with business, industry and government. These can be skills for life – the right genes exposed to the right environment early can build remarkable careers.

Universities that build the skills and strategies for their students to engage with industry and be entrepreneurs and to act as key leaders in regional innovation ecosystems and drive economic transformation.
‘Reflections on the ‘golden triangle’ of business, university and government must be accompanied by deeper thinking about the role of infrastructure, labour markets, finance and intermediary bodies, such as Local Enterprise Partnerships, the Technology Strategy Board, the Catapult Centres and the Research Councils.

The more intense the means and patterns of connectivity, the more successful universities can become as anchors for the regions in which they are set and as smart innovation partners for companies.’
University of Waterloo builds a strong region and province through research and innovation:

- The source for over 20,000 jobs, and $1.4 billion in labour income
- $2.6 billion contributed to Ontario’s GDP
- $1.5 billion contributed to Waterloo Region’s GDP (6.1% regional GDP)
- $444 million in tax revenues attributable to University of Waterloo
- Focus on investment attraction targeted at ICT, financial services, nanotechnology and quantum information reflects the emergent, research-intensive strength of the Waterloo Region.

Why is this the best place to invest in Canada? Talented people! Our region is a magnet for talent.” — David Johnston, Governor General of Canada
Co-Creation Innovation Ecosystems
Mind the Gap: Research and Education

Innovation Ecosystems:

- Are not simply the sum of Research Excellence and Innovation Hubs and separate Teaching Schools staffed by either research focussed or teaching focussed academics

- Connect students to the frontier of interdisciplinary research through interdisciplinary education

- Ensure students have the opportunity to engage in technological and social innovation, entrepreneurship, global mobility and work integrated learning and this has to occur at scale
Mind the Gap: Equity and Excellence
Number of Fields of Research Rated 5 (ERA 2015) vs Proportion of Students from Low SES Backgrounds
The Importance of Institutional DNA and Values
Transforming the Next Generation: Being Bold

1984 UON introduced an Indigenous Medical Students Admissions process

UON now graduates more Indigenous doctors than any other Australian university

~Half of Australia’s indigenous doctors graduated from UON

UON’s first Aboriginal medical graduates
Dr Sandra Eades, Dr Julianne Schwenke, Dr Louis Peachey, May 1990.
Being a *leading academic* is important if you are to have the credibility to exercise leadership beyond a small group of staff.

*But*

A *leading academic* may not be an excellent *academic leader*.

There is a need to build a systematic and high caliber approach to leadership development within Universities that recognizes that Universities are often $bn enterprises and need strategic, skilled and vibrant leadership.
Exercising Leadership in a University - the Reality

- Academic leaders – perceived as ‘non-creative’ and as part of a managerial culture

- Institutions may need to move on a quicker time constant to respond to challenges or opportunities than staff are comfortable with - a strong culture of the ‘individual’ where a collective effort is required

- Some academic staff are challenged by a future in which their disciplinary excellence may not be as relevant as in the past to ensuring the employability of their students

- Internalisation of sense of failure in high achieving individuals in a system where failure is endemic generates a nervousness around change

- Many pressing teaching, research, engagement and innovation challenges – a fear of change bringing about increased ‘workloads’ or lack of choice on the nature of the mix in the workload
Transforming ‘The Future Workforce’

- Recruit those academics who can perform on the world stage who understand the institutional vision and will add value into global R&I clusters and will thrive in a culture where agility and engaging with external partners is key.

- Build structured programs to support mobility for careers across academia, industry and entrepreneurship – in the context of the institutional vision and mission.

- Developing the ‘future higher education professionals’ – a great university needs great professional staff working at the cutting edge of their area, but we are not always good at developing the
GLOBAL CONTEXT

Advanced economies transitioning to knowledge economies

Top performing global economies derive >30% of GDP through knowledge-based economy

NATIONAL CONTEXT

Historical reliance on resource-based economy
<5% economy derived through knowledge

Requires an innovation ecosystem connecting education and research excellence in partnerships with industry, government and academia to deliver new businesses and jobs

REGIONAL/CITY CONTEXT

Regions and cities exposed differentially to slowing of growth in the mining and resources sector and in traditional manufacturing.

Universities working in partnership with government and industry to transform the future of their cities and regions
The paradox is that while innovation is a global phenomenon, the role of regions is critical for innovation based economic growth …..

The Race to the Top:
A Review of Government’s Science and Innovation Policies
Lord Sainsbury of Turville October 2007
UON’s ‘Footprint’

• ~ 37,000 students across campuses in Newcastle, the Central Coast, Port Macquarie and Sydney and in Singapore

• 24,000 undergraduate
• 6,500 postgraduate
• 3,200 enabling
• 1,700 Higher Degree Research
• 1,200 English Language

• 7,000 international enrolments from more than 130 countries
The Challenge of Regional Economic Transition
The Hunter Region

PROJECTED CHANGE IN NUMBER OF PEOPLE EMPLOYED BY INDUSTRY UON REGION, 2015 TO 2020

-5,000 -2,986 -490 -227 -179 -317 1,044 1,321 1,411 1,445 1,470 1,622 1,780 4,424 4,460 4,709 5,927 7,967 18,413

Health Care and Social Assistance
Education and Training
Accommodation and Food Services
Construction
Professional, Scientific and Technical Services
Retail Trade
Transport, Postal and Warehousing
Administrative and Support Services
Public Administration and Safety
Other Services
Rental, Hiring and Real Estate Services
Financial and Insurance Services
Arts and Recreation Services
Wholesale Trade
Information Media and Telecommunications
Electricity, Gas, Water and Waste Services
Agriculture, Forestry and Fishing
Manufacturing
Mining
Our flagship research institutes, the Newcastle Institute of Energy and Resources (NIER) and the Hunter Medical Research Institute (HMRI), are supplemented by Priority Research Centres and a growing network of research clusters that focus on translating research into innovation.
Hunter Medical Research Institute
ECONOMIC IMPACT

- Jobs in IT, professional services, scientific, technical services, software development, advanced manufacturing, telecommunications & eHealth
- New jobs into the State’s economy
Central Coast Medical School and Medical Research Institute

- In partnership with the Central Coast Local Health District and Gosford City Council
- Funded by $65m from Australian & NSW Governments, and $20m from UON
- 150 medical students on the Central Coast + students in nursing, allied health and health leadership
- Opportunities for Technology Assisted Health Innovation Precinct
Urbanisation, the Changing Purpose of Cities and on ‘Universities’

Cities built on TRADE
Cities built on INDUSTRY
Cities built on PEOPLE

200 BC onwards 1750s onwards 2000s onwards

Haynes, C. ‘Magnet Cities’ KPMG 2015
Magnet Cities have strong leaders

Magnet Cities attract young wealth creators

Magnet Cities are fundraisers

Magnet Cities are connected to other cities

Magnet Cities undergo constant physical renewal

Magnet Cities have a definable city identity

Magnet Cities cultivate new ideas

Magnet Cities attract young wealth creators
How Pittsburgh became a Magnet City

Steel

Robotics

Medicine

Quality of Life

Bourbon

Press

UPMC

University of Pittsburgh Medical Center

The Atlantic
Roles for Universities in Creating Magnet Cities

Attracting and Creating Wealth Creators

Providing City Leadership and Vision

Malmo University

University of Chichester

Tulane University

University of Glasgow

University of Pittsburgh

University of Hull

The University of Newcastle Australia
Innovation Ecosystems: A Key Role of Universities as Partners in Activation of Magnet Cities

UON
Creative Industries & Innovation
Design for Health & Social Inclusion
Urban Informatics
People and Systems Lab

QUT
Innovation Ecosystems: A Key Role of Universities as Partners in Activation of Magnet Cities

RMIT
Design & Creative Practice
Global Business Innovation
Urban Futures
Social Change

Business Innovation and Entrepreneurship
Creative Industries
Regional Futures
Social Innovation
Innovation in Teaching and Learning:
Connecting Young Entrepreneurs
The University is a significant economic contributor to its regions. The University’s outputs and expenditure are expected to add an estimated Net Present Value of $5.5 billion of flow-on economic benefit over 2013-2022.
.....Transforming and Transformative....

- to make the grade, you need inspiring and persistent leaders, a strong strategic vision of where the institution is going, a philosophy of success and excellence, and a culture of constant reflection, organizational learning, and change.

- institutions which are complacent in their outlook, lack an ambitious vision of a better future and continue to operate as they have in the past with a growing performance gap compared with that of their national or international competitors

Jamil Salmi and Philip G. Altbach (2011)
THE UON 2025 VISION

UON stands as a global leader distinguished by a commitment to equity and excellence and to creating a better future for its regions through a focus on innovation and impact.