The Future of Higher Education

The Real Innovations We Need

ASU + GSV 2017 Summit

Salt Lake City, Utah
May 10, 2017

“A nation’s present well-being and future destiny are no longer constrained only by its “givens” (its geography, its population, its natural resources). **Knowledge has become the prime mover….** Unlike other assets, whose utilization and investment are constrained by the law of diminishing returns, **knowledge is autocatalytic**, enlarging in the hands of its users; expanding in the range of its usefulness, even as it is applied; **growing in scope**, even as it is shared, increasing in refinement, even as it is questioned, challenged, and contested.”

— Frank Rhodes, *Creation of the Future: The Role of the American University* (2001)

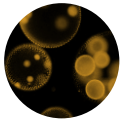
“We live at the center of a **knowledge** explosion…. Knowledge is now the key capital resource…. Knowledge is now also the key social resource: it empowers people in a knowledge-based economy; it is what underpins any kind of critical thinking. It is civilizing. In a phrase, what counts is ***knowledge power***.”

— Alan Wilson, *Knowledge Power: Interdisciplinary Education for a Complex World* (2010)

Knowledge is Not Static

Until 1900, human knowledge doubled every **100 years**

By 1945, it doubled every **25 years**

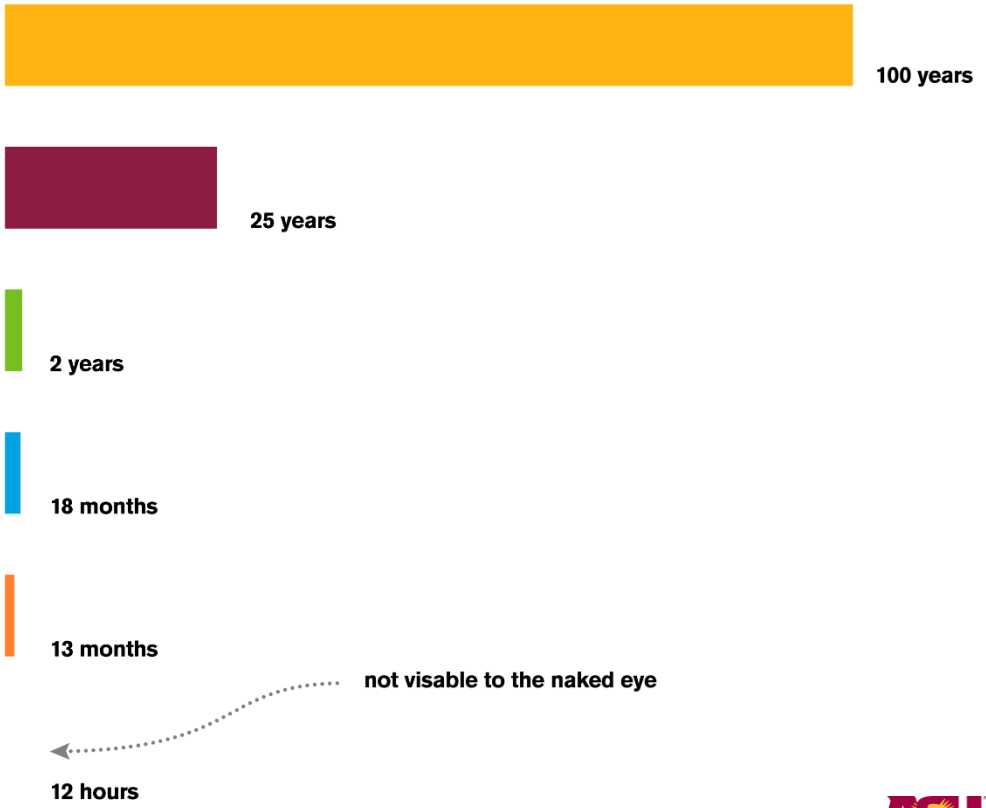


Nanotechnology: Every **2 years**

Clinical Knowledge: Every **18 months**

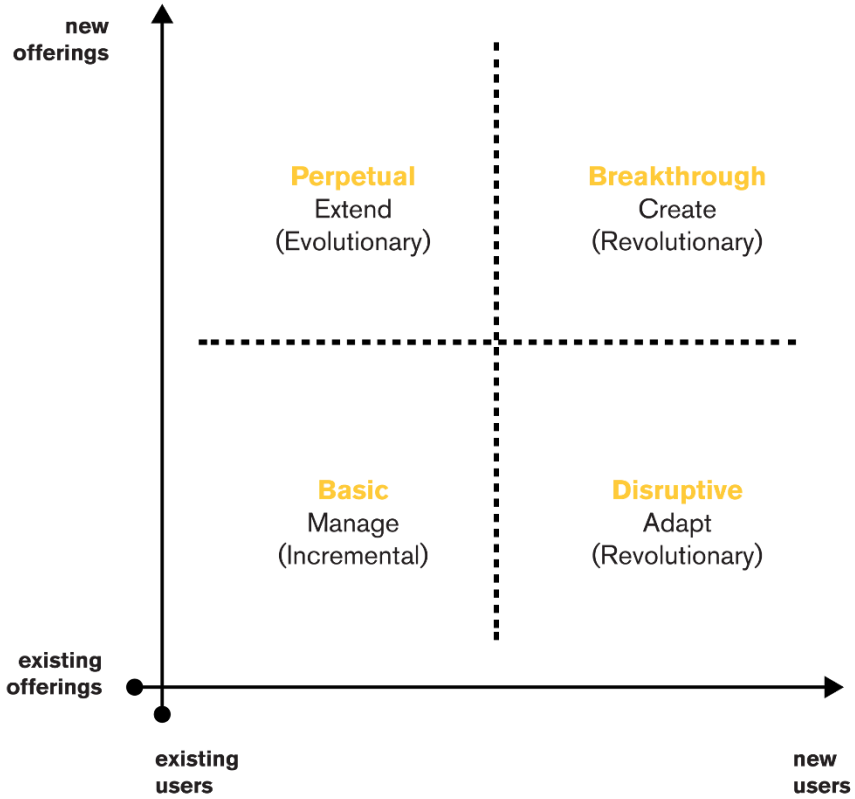
Basic Human Knowledge: Every **13 months**

The Internet of Things: Every **12 hours**

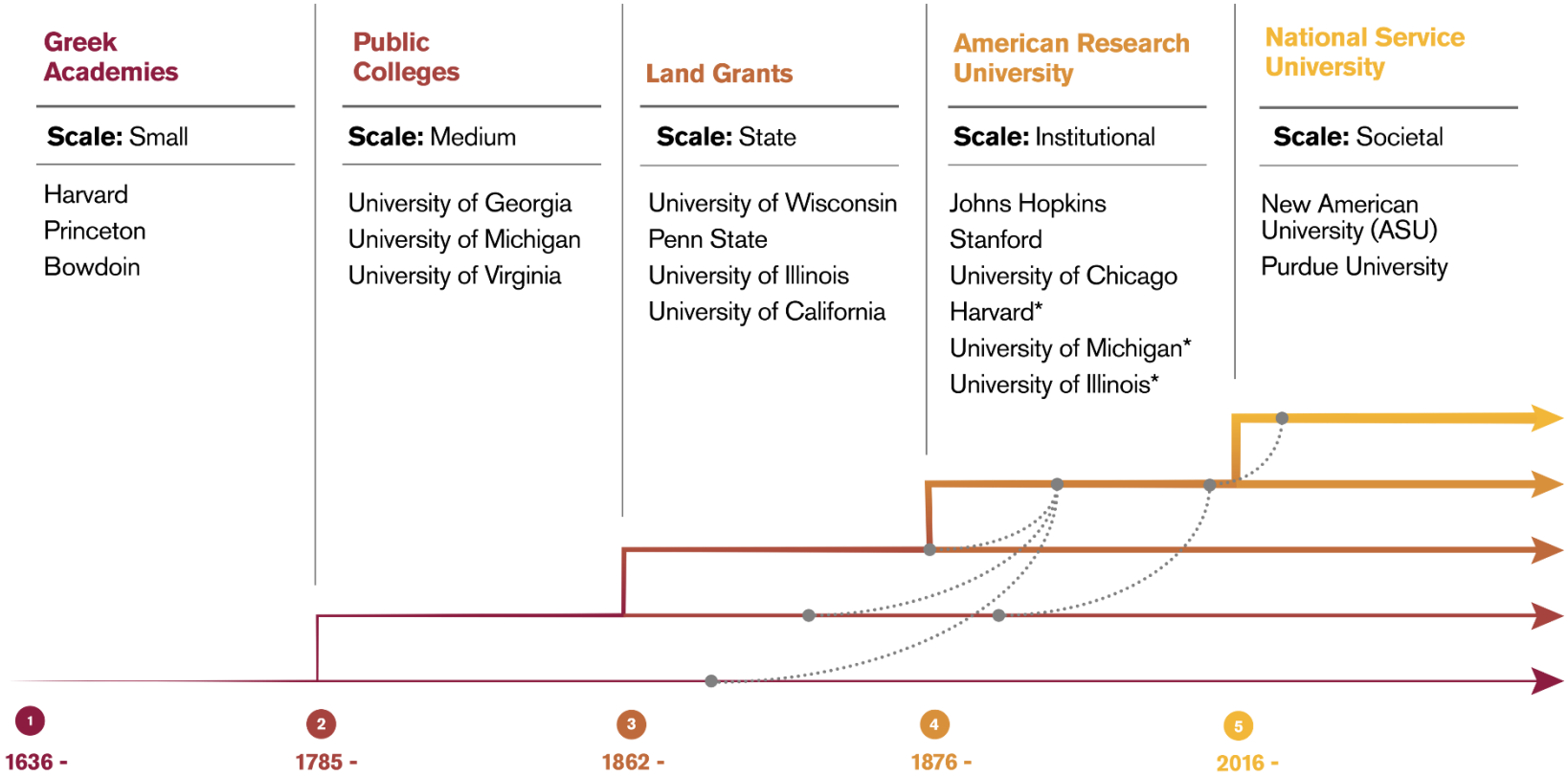


The British Library

Education as Innovation Anomaly



Evolutionary History of American Higher Education



Wave 1

Greek Academies

1636 -

Scale: Small

Harvard
Princeton
Bowdoin

The College(s)
- Classic Structure
- Internal Control

Characteristics
- Small, elite, classical
- Separate
- Not scalable

Type A
Private, Historical
- Bowdoin College
- Williams College
- Oberlin College

Type B
Private, Modern
- Bennington College
- College of the Atlantic

Evolutionary Form
- Olin College

1 1636 -
2 1785 -
3 1862 -
4 1876 -
5 2016 -

Wave 2

Public Colleges

1785 -

Scale: Medium

University of Georgia
University of Michigan
University of Virginia

The College(s)
- Classic and Post-classic Structure
- Public Control

Characteristics
- 19th century elites
- 19th century teachers colleges and non-elites
- 20th century non-elites
- Specialized public and a few privates

Type A
Public Historical
- College of William and Mary

Type B
Public Modern
- Evergreen State College

Type C
Community Colleges

Evolutionary Form
- Cal Poly San Luis Obispo

1 1636 -
2 1785 -
3 1862 -
4 1876 -
5 2016 -

Wave 3

Land Grants

1862 -

Scale: State

University of Wisconsin
Penn State
University of Illinois
University of California

Characteristics
- de Tocqueville (practical)
- Local, regional focus
- Focus on the working class/masses
- Focus on science practice

Type A
Classic, Agriculture/Engineering
- South Dakota State University
- Montana State University
- Mississippi State University

Evolutionary Form
- UC Santa Cruz
- UC Merced

1 **1636 -**
2 **1785 -**
3 **1862 -**
4 **1876 -**
5 **2016 -**

Wave 4

American Research University

1876 -

Scale: Institutional

Johns Hopkins
Stanford
University of Chicago
Harvard*
University of Michigan*
University of Illinois*

Characteristics

- Transformative American innovation
- Inherent tension between missions
- Large scale, but limited

Type A

Prototype

- Johns Hopkins
- Stanford
- University of Chicago

Type B

Classic

- Columbia University
- Harvard University

Type C

Land Grant

- University of Wisconsin
- Penn State
- University of Illinois

Evolutionary Form

- Boston University

1 1636 -
2 1785 -
3 1862 -
4 1876 -
5 2016 -

Wave 5

National Service University

2016-

Scale: Societal

New American University (ASU)

Purdue University

Characteristics

Adaptive knowledge creation is at the core of the university and is essential.

Complex adaptive scalable university

New Evolutionary Form

Type A

New American University

- Arizona State University

Type B

National Service Land Grant

- Purdue University

1 1636 -

2 1785 -

3 1862 -

4 1876 -

5 2016 -

Wave 6

Global Research University

TBD -

Scale: Globally Interactive

Characteristics

- Organizational culture independent of geography
- Polycultural knowledge production methods
- Diversify financial base with funding from for-profit business spin-offs, competitive grants for technology innovation, corporate partnerships, and private donors
- Cultivation of post-national student and faculty talent base

Rapidly Emerging Prototypes

- MIT
- Carnegie Mellon
- NYU
- Duke

1 1636 -

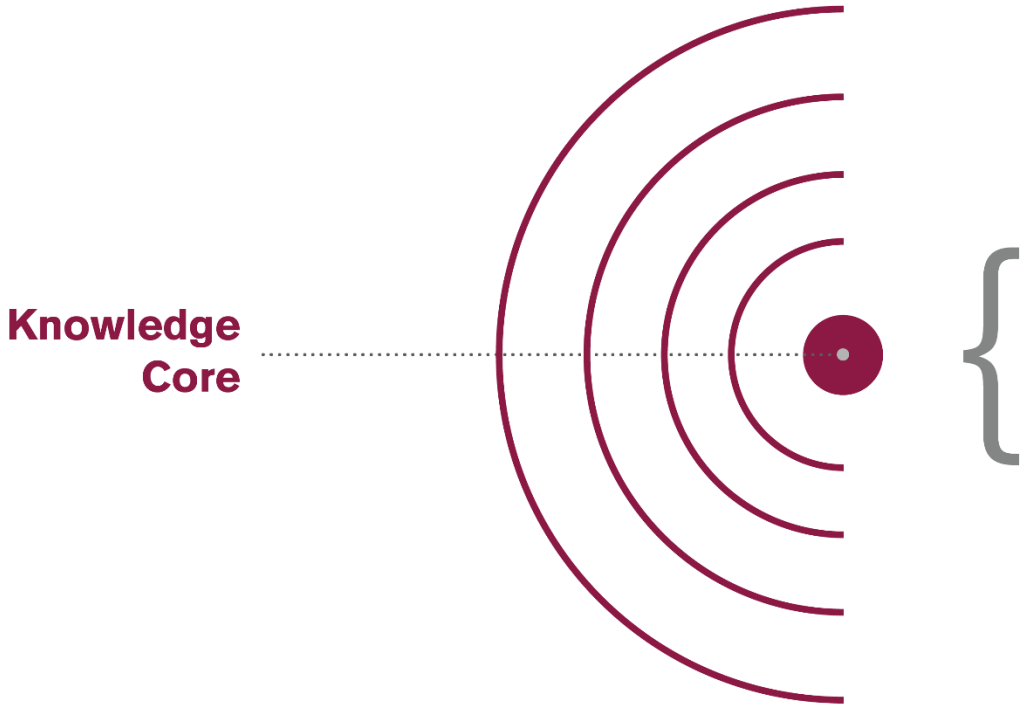
2 1785 -

3 1862 -

4 1876 -

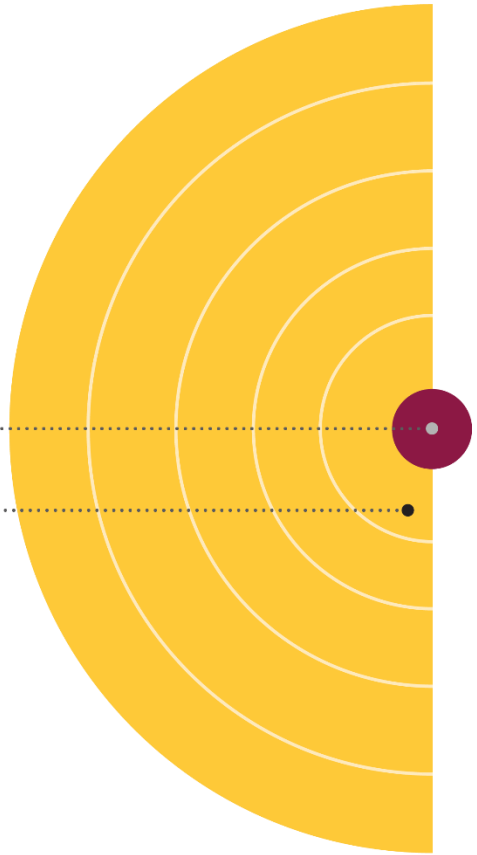
5 2016 -

Knowledge is the Driver



Advancing the pursuit, understanding and sanctity of knowledge, as well as the storage, synthesis, analysis, creation and transfer of knowledge.

Realm 1



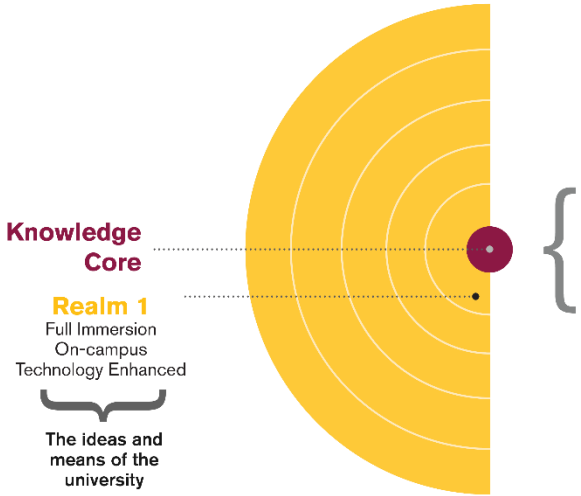
Knowledge Core

Realm 1

Full Immersion
On-campus
Technology Enhanced

The ideas and means of the university

Realm 1



Needed Innovations:

21st century digital learning spaces

Artificial intelligence-based advising

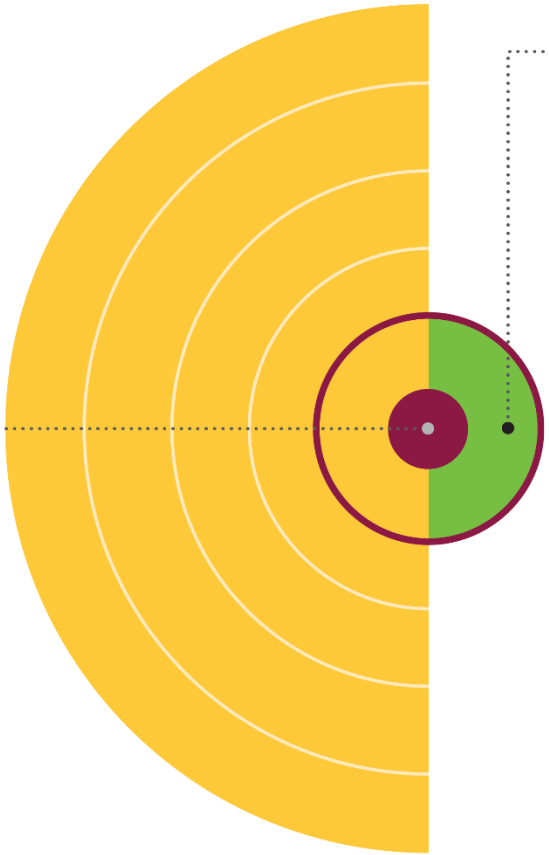
Ubiquitous content delivery mechanisms

Intelligent tutoring platform

Personalized learning at scale

Math and science mastery for all

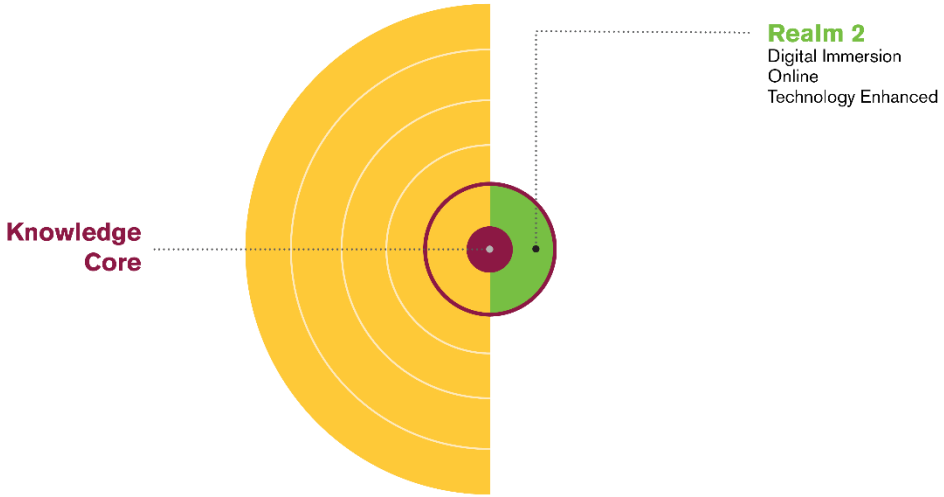
Realm 2



Knowledge Core

Realm 2
Digital Immersion
Online
Technology Enhanced

Realm 2



Needed Innovations:

Technology to support human relationships and build organizational affinity

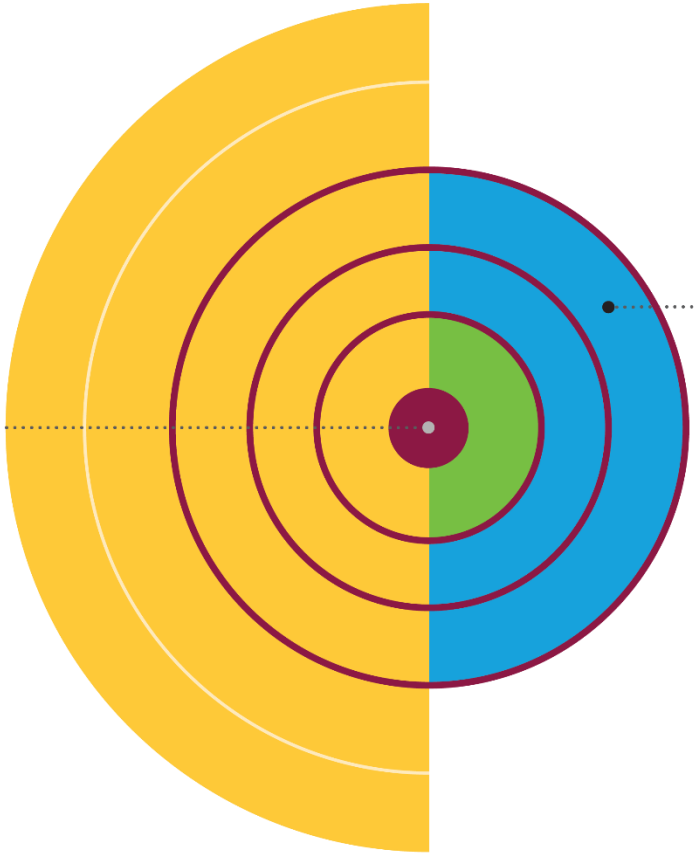
“Integrated” human-tutor interface

Real time assessment

Development-based assessment

Math and science mastery for all

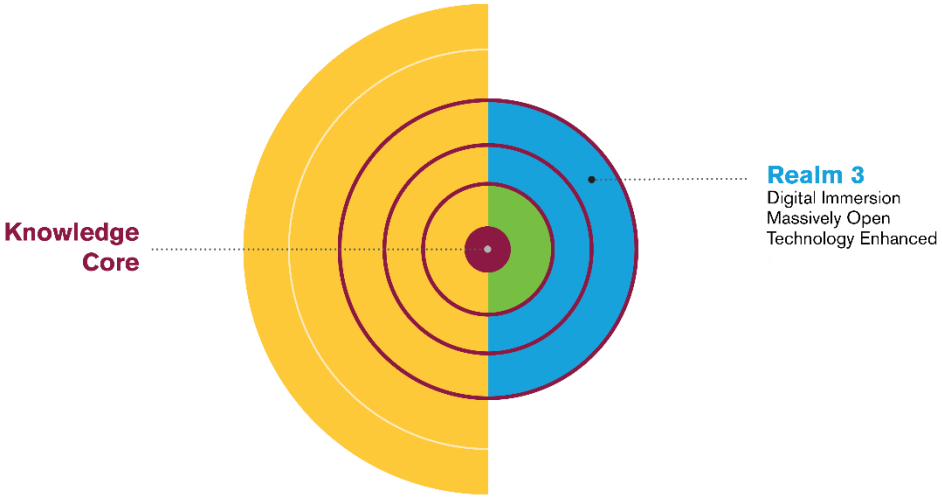
Realm 3



Knowledge Core

Realm 3
Digital Immersion
Massively Open
Technology Enhanced

Realm 3



Needed Innovations:

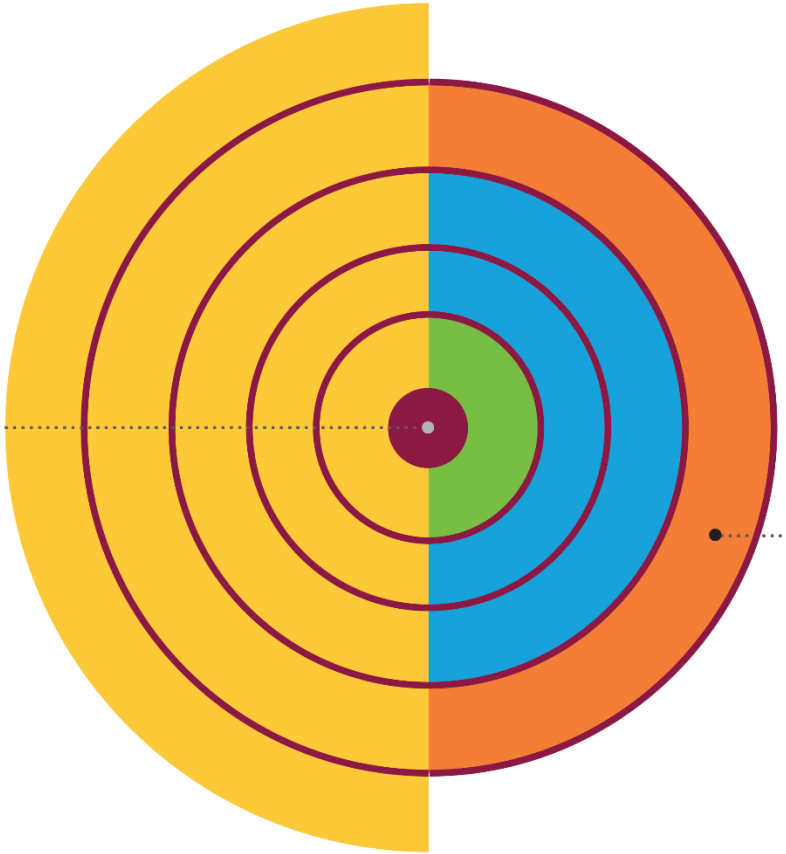
Technologies that derive value from scale

Content and delivery for any life stage

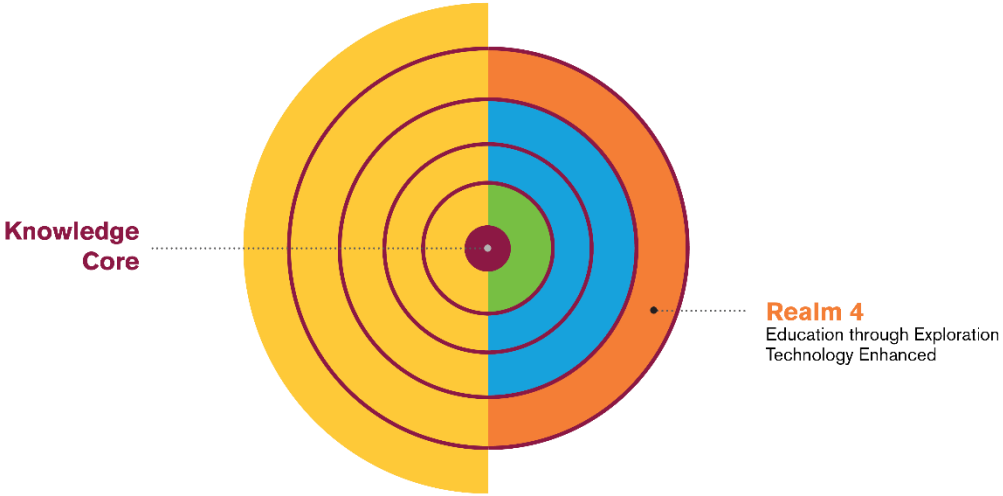
Multi-organizational pathway mapping

Math and science mastery for all

Realm 4


Knowledge
Core
Realm 4
Education through Exploration
Technology Enhanced

Realm 4



Needed Innovations:

Virtual augmented reality for learning

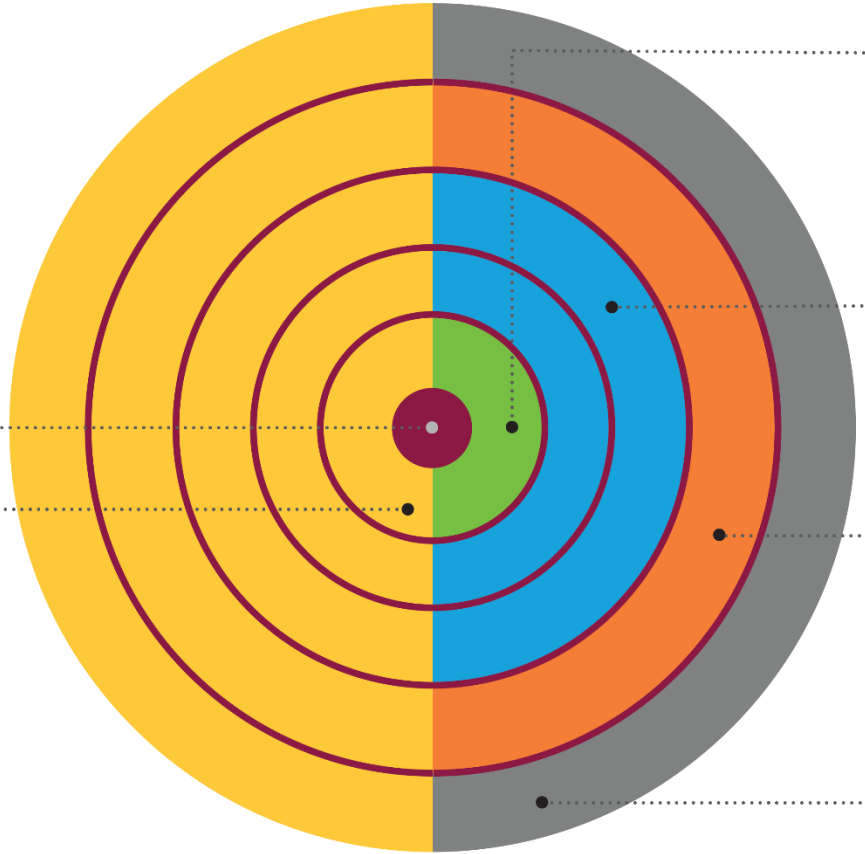
Direct human cognition linkages

Intelligent tutoring through verbal query

Group learning tools

Math and science mastery for all

Realm 5



Knowledge Core

Realm 1
Full Immersion
On-campus
Technology Enhanced

The ideas and means of the university

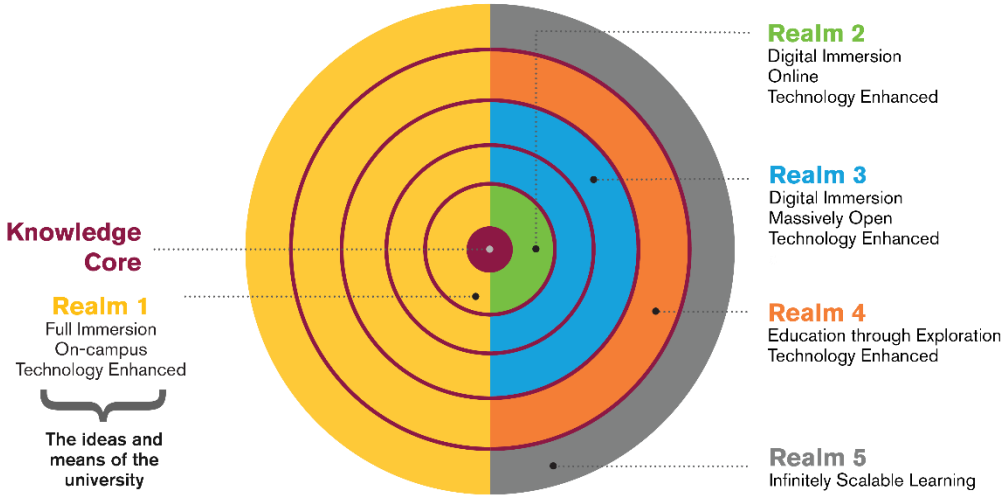
Realm 2
Digital Immersion
Online
Technology Enhanced

Realm 3
Digital Immersion
Massively Open
Technology Enhanced

Realm 4
Education through Exploration
Technology Enhanced

Realm 5
Infinitely Scalable Learning

Realm 5



Needed Innovations:

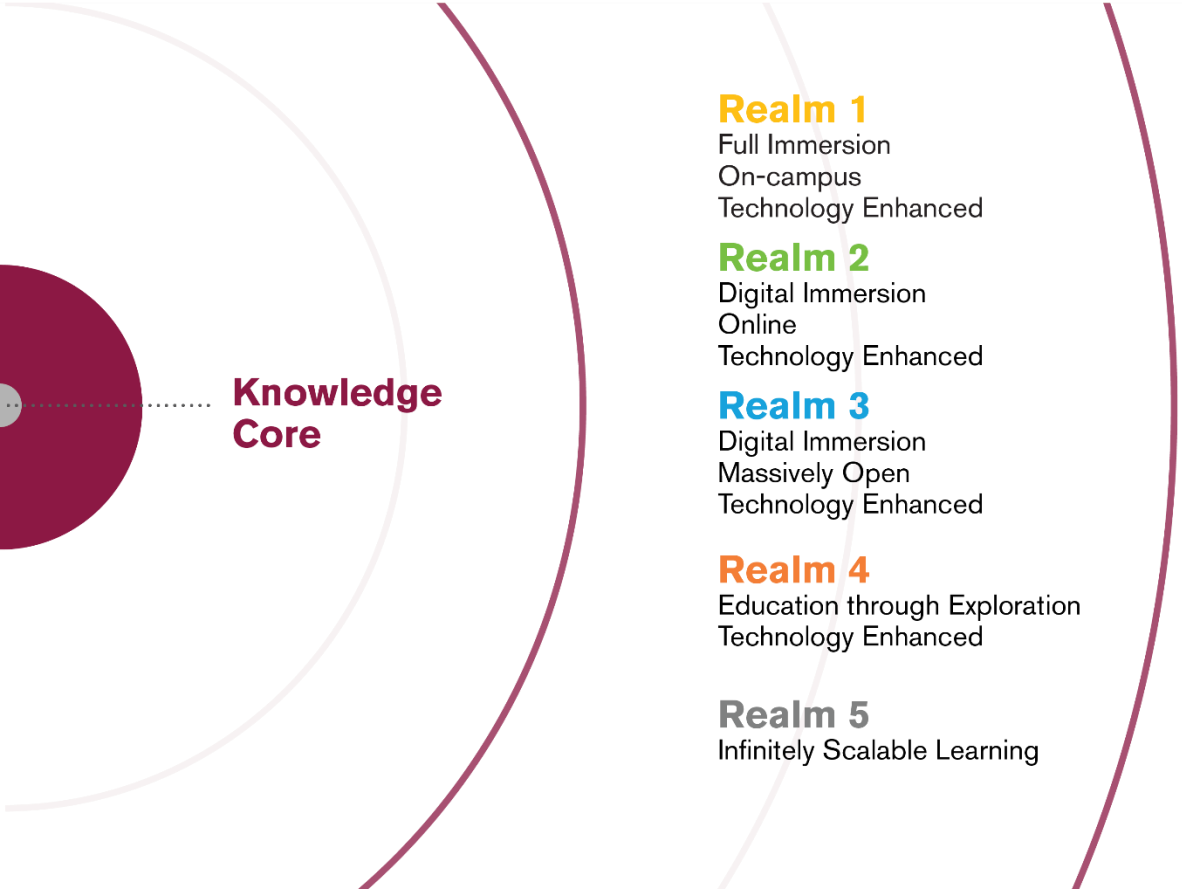
Infinitely scalable teaching

Seamless integration of individualized learning across life stages

Lifelong intelligent tutoring

Math and science mastery for all

Innovations Needed



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Artificial intelligence-based advising
Ubiquitous content delivery mechanisms
Intelligent tutoring platform
Personalized learning at scale
Technology to support human relationships and build organizational affinity
"Integrated" human-tutor interface
Real time assessment
Development-based assessment
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Content and delivery for any life stage
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Infinitely scalable teaching
Seamless integration of individualized learning across life stages
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Math and science mastery for all


ASU
Arizona State
University