Dr. Elmer J. Guy, President

Navajo Technical University

Structured to Meet the AI Age and the Needs of the Navajo People

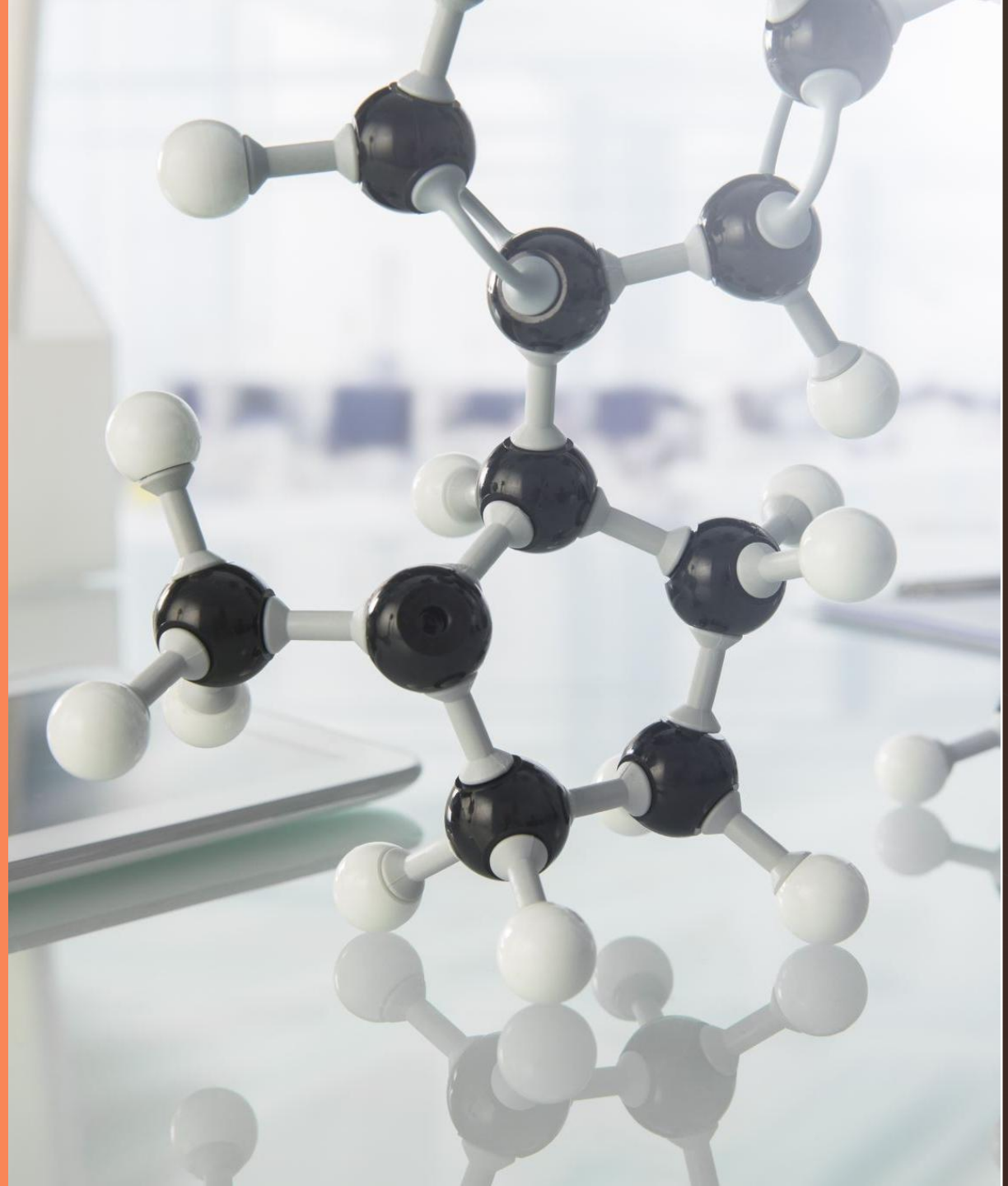
developing a self-reinforcing ecosystem that trains and educates talent, generates innovation, creates businesses, and retains wealth within Navajo communities

What we are working toward at NTU is an educational system with both vocational/technical and a rigorous series of both academic, centered on Science, Technology, Engineering, Math, and health, and research degrees that can help the Navajo Nation develop a strong Navajo cultural core paired with the aim to prepare students for high skill, high wage jobs. This is paired with research labs designed to develop intellectual property that creates new economic opportunities in the emerging AI Age for the Navajo Nation and its people.

At the core of what NTU is all about is the Navajo Philosophy of Education

We are currently working to develop an implement a structure for education designed to allow both students, professionals, and people from the community to access the university through multiple entry points. The NM legislature has approved dual credit programs in the past, and these entry points allow even high school students to enter the university and earn up to an associate degree along with the high school diploma.

- Micro-credentials that provide certifications
- Certificates
- Associate degrees
- Baccaluareate degrees
- Master’s degrees
- Doctoral degrees



This structure is paired with laboratories at both our campuses designed to further intellectual properties capable of resulting in commercialization of student expertise developed through experiential models of education and products from the research activities at NTU

Our faculty and students are working in a number of areas to implement this design

Advanced Manufacturing

Computational Science (including AI, networking, and cybersecurity)

Chemistry (concentrating on research into next generation battery storage and the chemical properties

Health

Environmental Science (especially in water resiliency and crop production in a high desert environment)

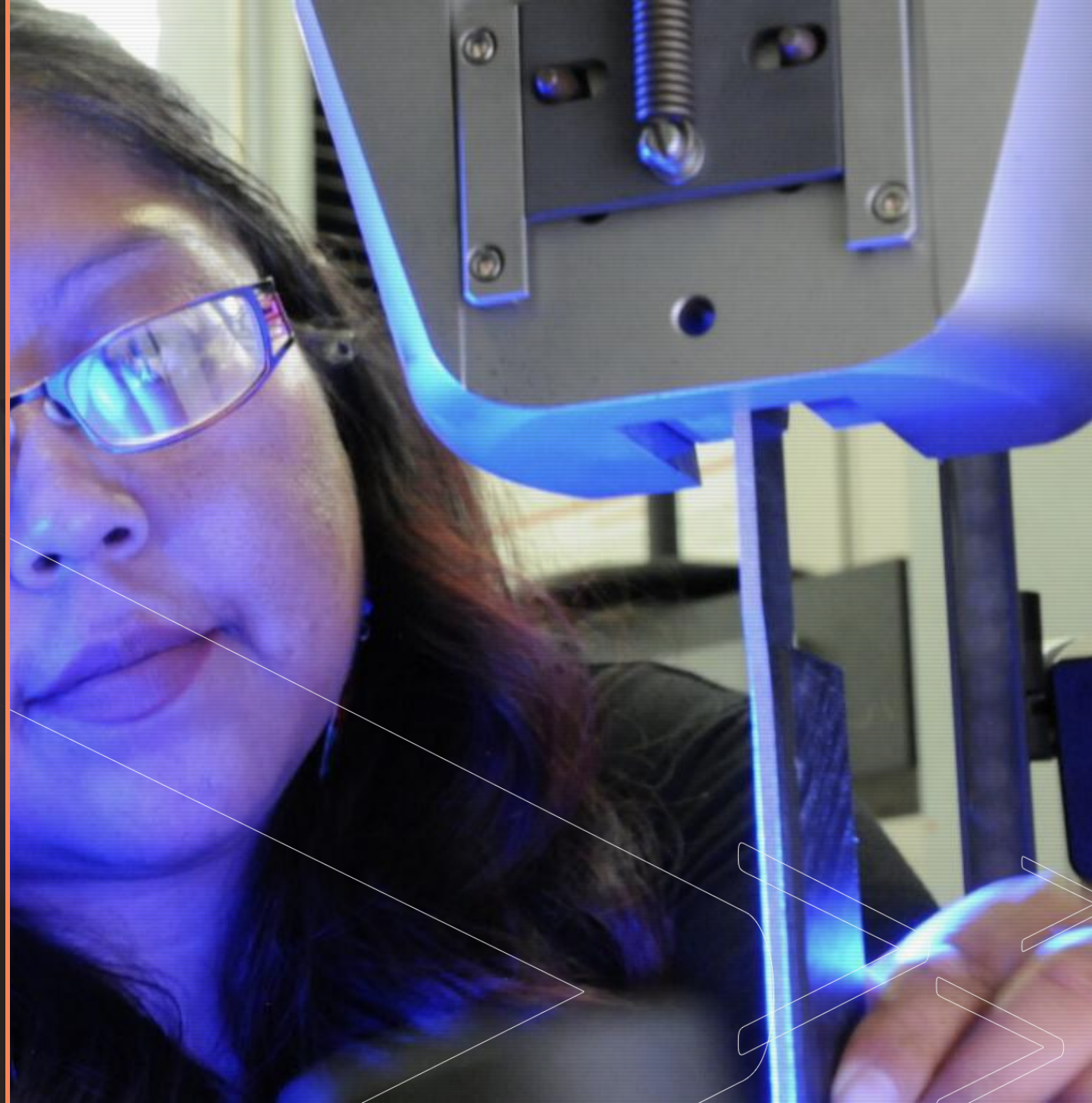
Alternative Energy

Veterinary Science, especially large animal diseases

Developing educational models for the AI Age

One of the examples of this intellectual properties and commercialization is the effort in Advanced Manufacturing

- Advanced Manufacturing is not only a national priority exemplified by legislation such as the CHIPs Act,
- But NTU believes it has the opportunity to commercialize several aspects of what it has achieved through its Center for Advanced Manufacturing so that this area of New Mexico and the Navajo Nation can become one of the driving forces of economic development in the southwest.



The Center for Advanced Manufacturing has a comprehensive eco-system of technologies

Additive Manufacturing (AM): Includes polymer printers and a rare Optomec LENS MTS 500 Hybrid Controlled Atmosphere system for Directed Energy Deposition (DED) 3D metal printing.

Computer Numerical Control (CNC) & Machining: Includes 5-axis CNC mills, CNC lathes, and wire Electrical Discharge Machining (EDM) for precise metal shaping.

Metrology & Scanning: Features Coordinate Measuring Machines (CMM) (such as Hexagon and Quest), FaroArm portable CMMs, laser trackers, and 3D laser scanners.

Non-Destructive Evaluation (NDE) & Imaging: Equipped with industrial CT scanners, Scanning Electron Microscopes (SEM), and high-resolution digital microscopes.

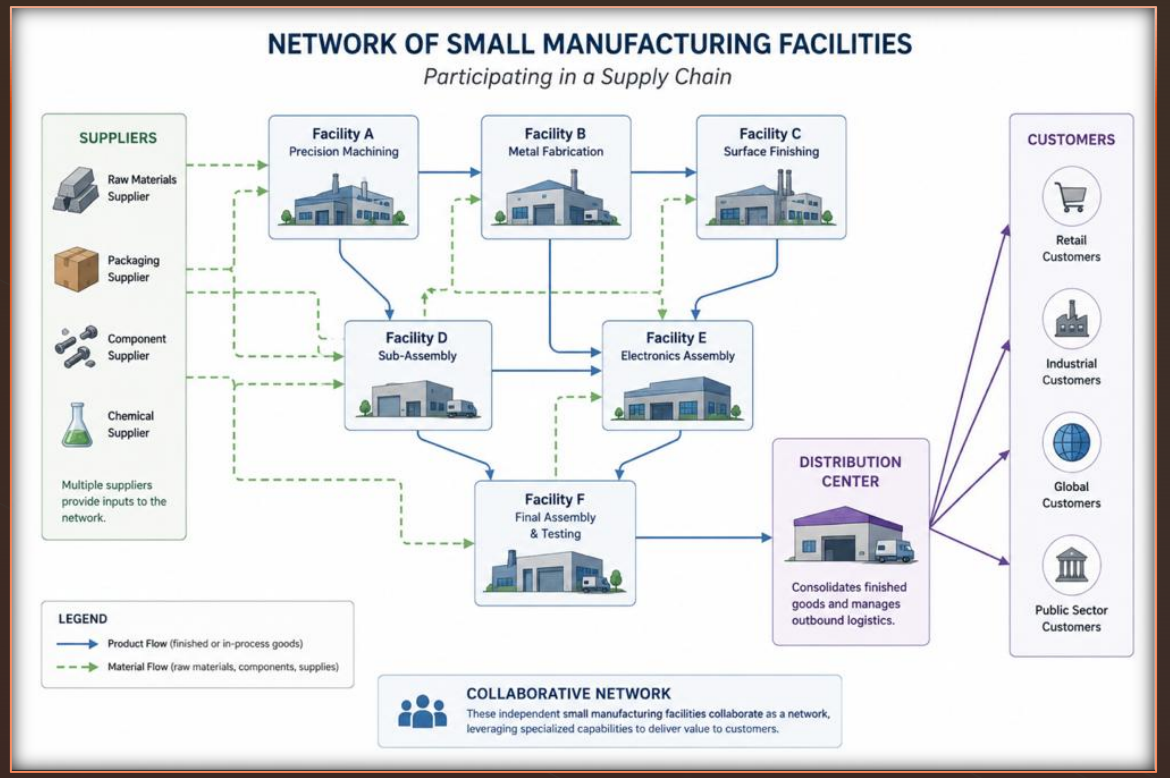
Materials Testing: Includes Instron systems for tensile and compression testing, alongside complete metallurgical specimen preparation tools.

Industry Software: Utilizes software for process simulation, CAD design, and spatial analysis like Magics, Verisurf, Geomagic, and Spatial Analyzer.

Powder Manufacturing

To commercialize and pursue making this part of NM a key player in a multi-billion-dollar world market…

- NTU has started an LLC that is totally owned by the university that will be dedicated to using any profits generated to establish a distributed manufacturing model of production designed to create high skill, high wage employment in various Navajo communities. This design will provide a model for how advanced technologies can be used to tackle rural communities that have faced multi-generational poverty.



In addition to what we are doing with Advanced Manufacturing, another example of what we are doing that is important to NM

- We are on the cusp of introducing a PhD in Electrical Engineering to embrace the needs of both NM and the Navajo Nation
- The U.S. economy is undergoing rapid transformation driven by three interrelated technological revolutions:
- Artificial intelligence systems requiring specialized hardware acceleration and embedded systems
- Semiconductor manufacturing reshoring and advanced packaging
- Robotics and autonomous systems across manufacturing, defense, and logistics
- **Electrical engineering sits at the core of all three domains.**
- Industry and federal analyses consistently show that shortages in semiconductor engineering, systems engineering, and hardware-oriented AI infrastructure design are constraining national capacity. These shortages are not short-term cyclical gaps but reflect decades of underinvestment in advanced manufacturing talent pipelines.
- As AI systems move from cloud-based software toward edge computing and autonomous physical systems, the demand for electrical engineers capable of integrating sensors, embedded systems, and power architectures is accelerating.
- Our new PhD program is designed to meet these specific needs

In pursuing this effort, NTU could use the help of the NM legislature

- One of our goals right now is to create an argon recapture process that can make the process of metal HM more efficient and cost-effective.
- We need help from the state in terms of a grant/loan to locate an Iina LLC production/research facility in Gallup

- A sample of the partnerships:
  - Sandia Labs
  - Los Alamos Labs
  - New Mexico State University
  - New Mexico Tech
  - University of New Mexico
  - Arizona State University
  - University of California—San Diego
  - Harvard University
  - Berkely University

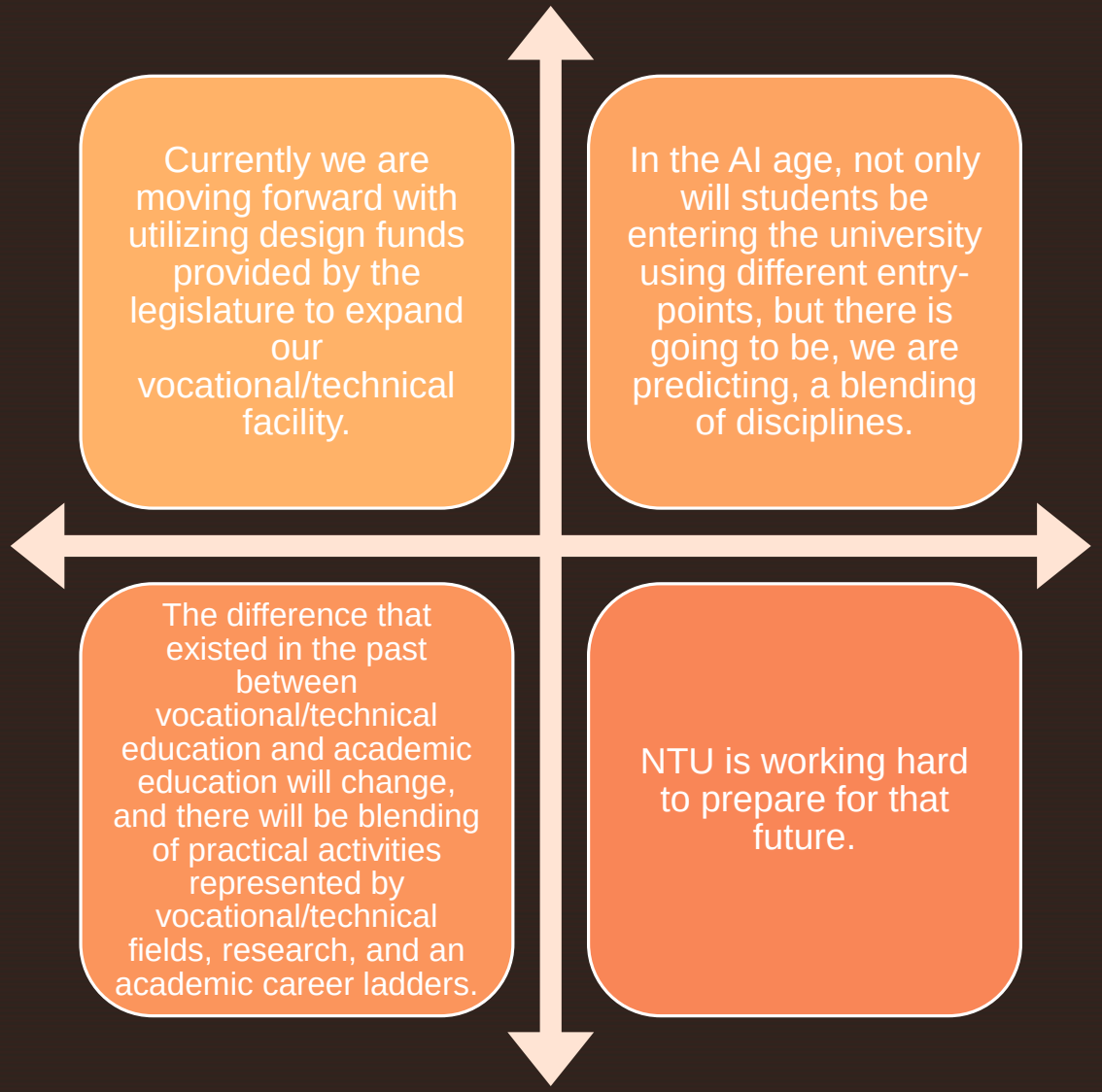
All our research activities have involved partnerships from around the United States

Another effort that could use this committee's support is the effort to create a cyber-security mentoring program

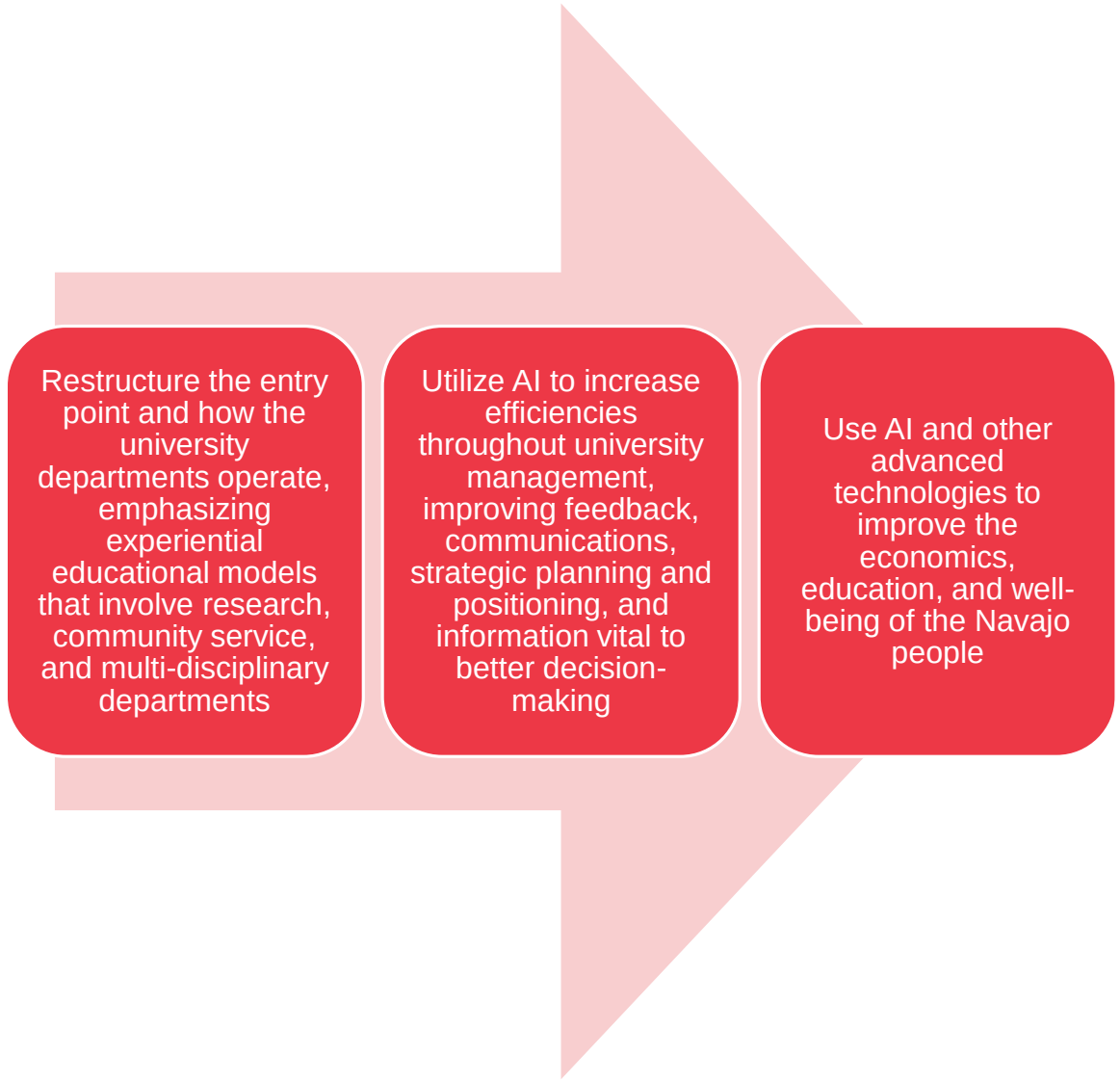
Headed by Tom Bowles, a former Science Advisor to the Governor and the Director of Research at Los Alamos, this initiative will involve multiple NM university once the model has been developed at NTU.

I can give you more information if you request that.

We could also use help with our effort to achieve a bond sponsored by the state to help implement our educational design that emphasizes the career ladder at NTU that ranges from micro-credentials through doctoral work and research labs



Our efforts to rethink the structure of a university as a result of the power of AI and how it will operate in the future has three legs in our current formulation



I’d like to welcome all of you here today

- NTU is aiming to embrace the 21st century in a way that protects Navajo culture, language, and spirituality while providing a model of a university for the Age of AI that is upon all of us.
- I hope you have time to spend exploring what we are doing to meet the future

Thank you