OUTLINE

VISION: A GUIDE TO ORGANIZATIONS

VISION: A GUIDE TO RESEARCH PROPOSALS

WHY A VISION?

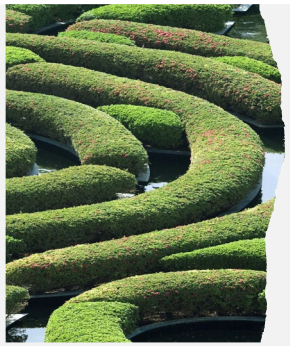
INTERNAL FACTORS

Continuous Improvement of the Organization – *Leadership & Innovation*

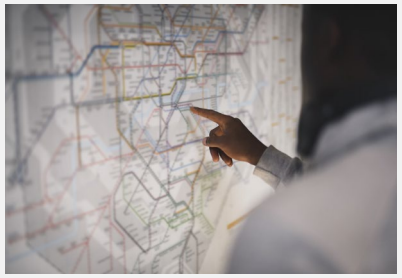
EXTERNAL FACTORS

Cope with New Market Challenges and Changed Circumstances – *Leadership & Adaptive Change*

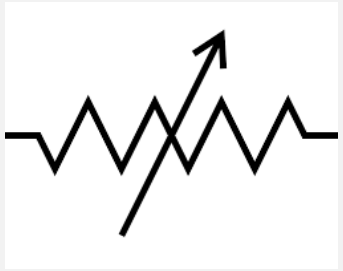
WHY A SHARED VISION?



The Path is Never Straight and Often Filled with Obstacles



With a Shared Vision We Can Navigate Together from Point A to Point B



Resistance to Change Will Always Exist. It is Part of How We Grow

WHAT IS A VISION?

VISION

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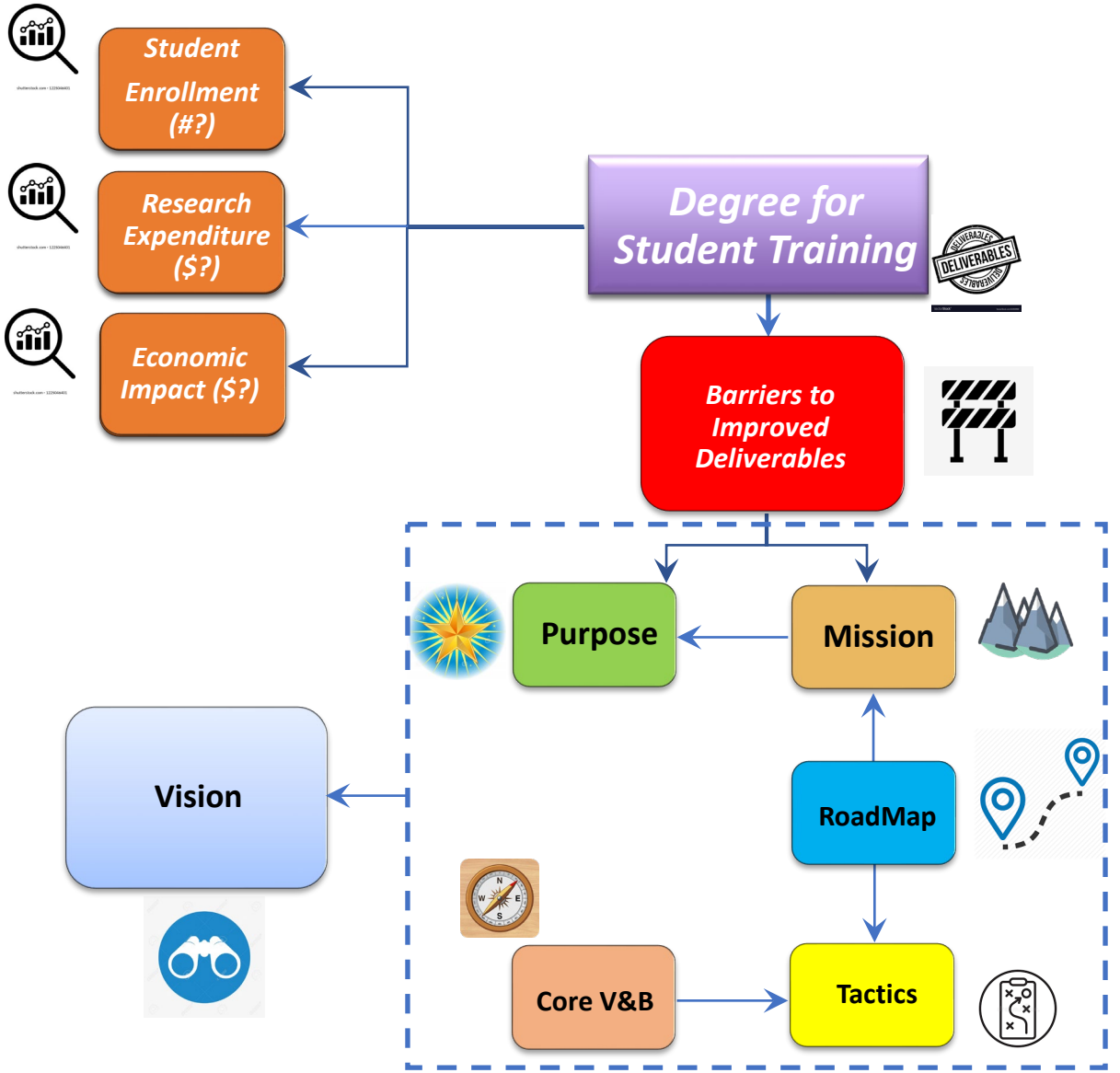
PURPOSE

+

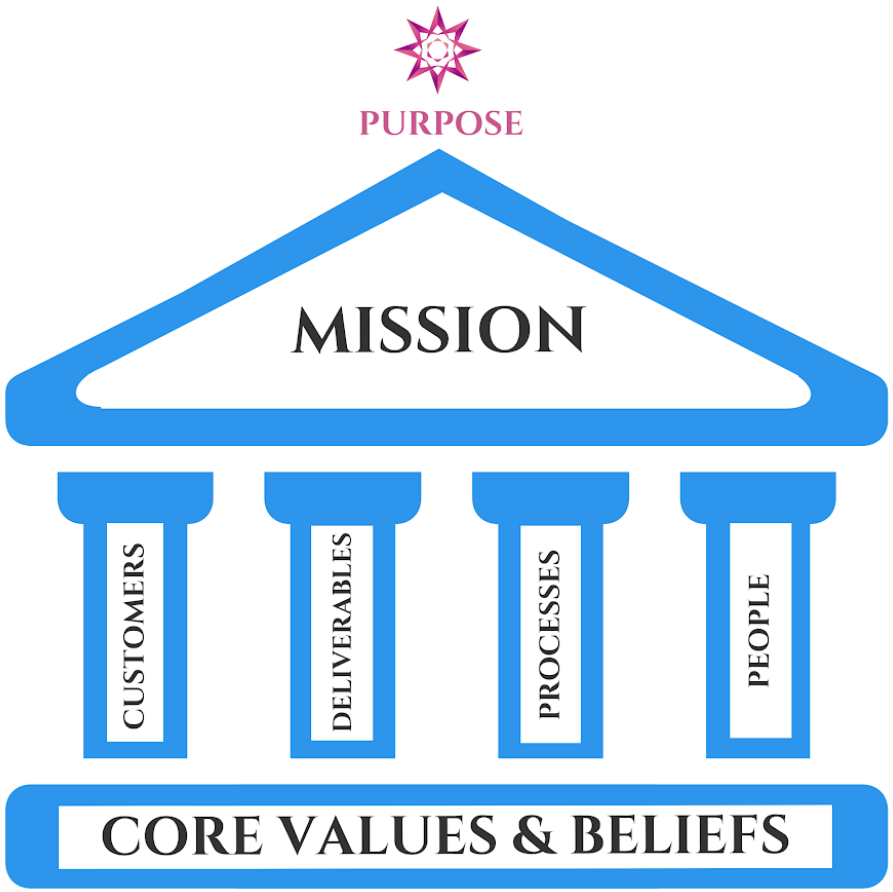
MISSION

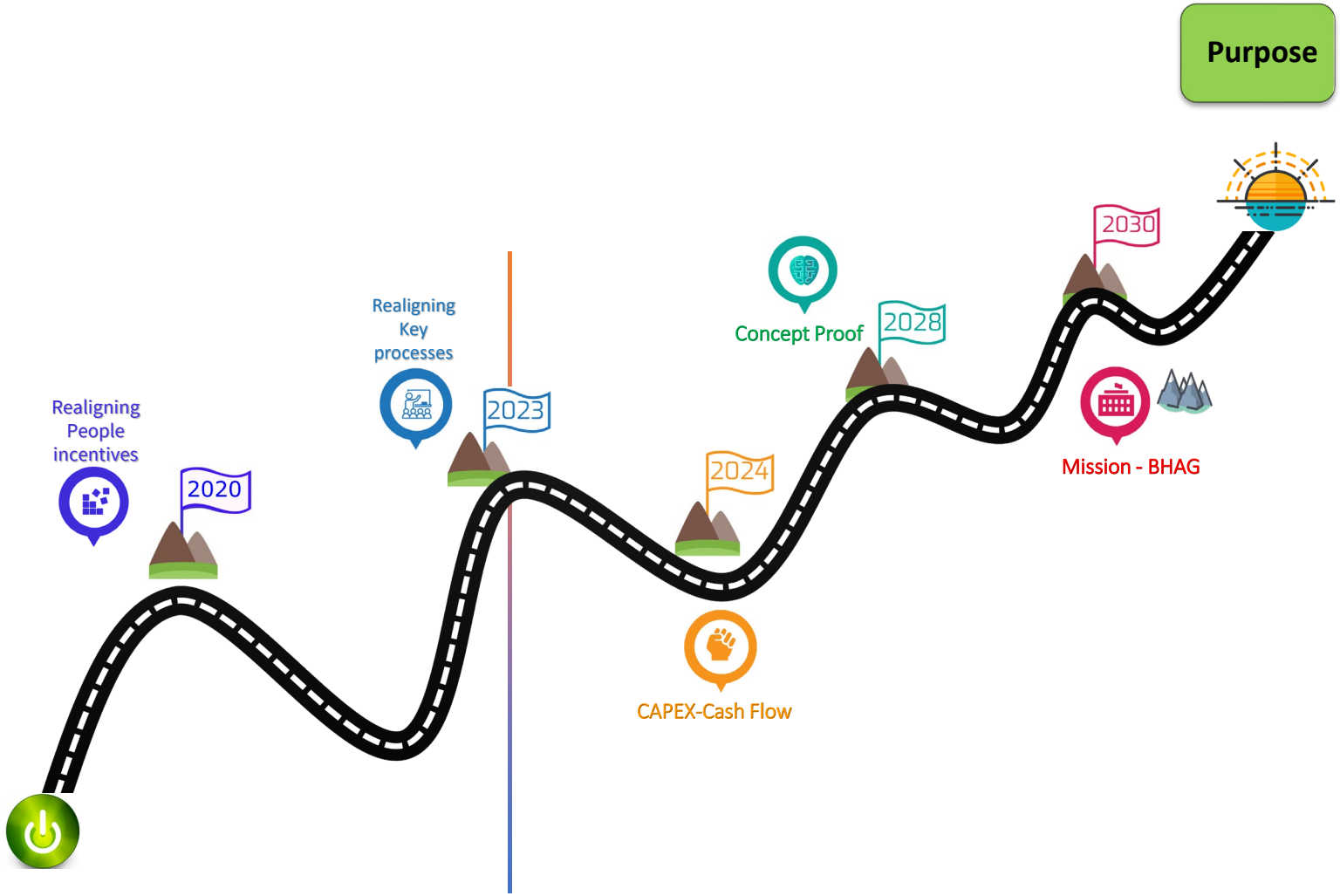
+

CORE VALUES & BELIEFS



ROADMAP


PURPOSE
MISSION
CUSTOMERS
DELIVERABLES
PROCESSES
PEOPLE
CORE VALUES & BELIEFS


Purpose
Realigning People incentives
2020
Realigning Key processes
2023
2024
CAPEX-Cash Flow
Concept Proof
2028
2030
Mission - BHAG

PURPOSE

Long Term Operational Status

Must Solve for the Stated Problem

5 Why? About Customers

Why on QCDR?

PURPOSE

MECHANICAL ENGINEERING EXAMPLE

PURPOSE

We the Mechanical Engineering Department excel at connecting higher education to the market by enabling/training our students (customers) to be top talents in solving for market-relevant technology challenges and thus offering them a life-changing experience on campus.

5 Whys

MECHANICAL ENGINEERING EXAMPLE

1. Why? To provide unique experiential learning (both hands-on and critical thinking) training to our students.

2. Why is that important? So that our students can learn the engineering fundamentals in the mold of the real world

3. Why? To engage students in solving for market relevant technologies and offering them a life-changing experience on campus

4. Why is that important? To reduce the lead time for our graduates to create technologies for their future employers or the businesses they own

5. Why ? So that our university can attract students with diverse and high talents and industry R&D funding.

PURPOSE

TDM AEROSPACE EXAMPLE

PURPOSE

We, TDM Aerospace, enable our customers to sell more of the aerospace products they make and afford to develop new ones.

5 Whys

TDM AEROSPACE EXAMPLE

1. Why? Because we provide unique value in innovative supply chain and process solutions.

2. Why is that important? So that our products are best in delivery

3. Why? To lower the cost and increase the reliability of the systems we support.

4. Why is that important? So that our customers can sell more of the aerospace products they make and afford to develop new ones.

5. Why? To grow and sustain the aerospace market.

MISSION

- Key Goal Systematically Leading to Purpose
- Better when Contains the Value Proposition
- Measurable and Time Limited

MISSION

MECHANICAL ENGINEERING EXAMPLE

MISSION (BHAG)

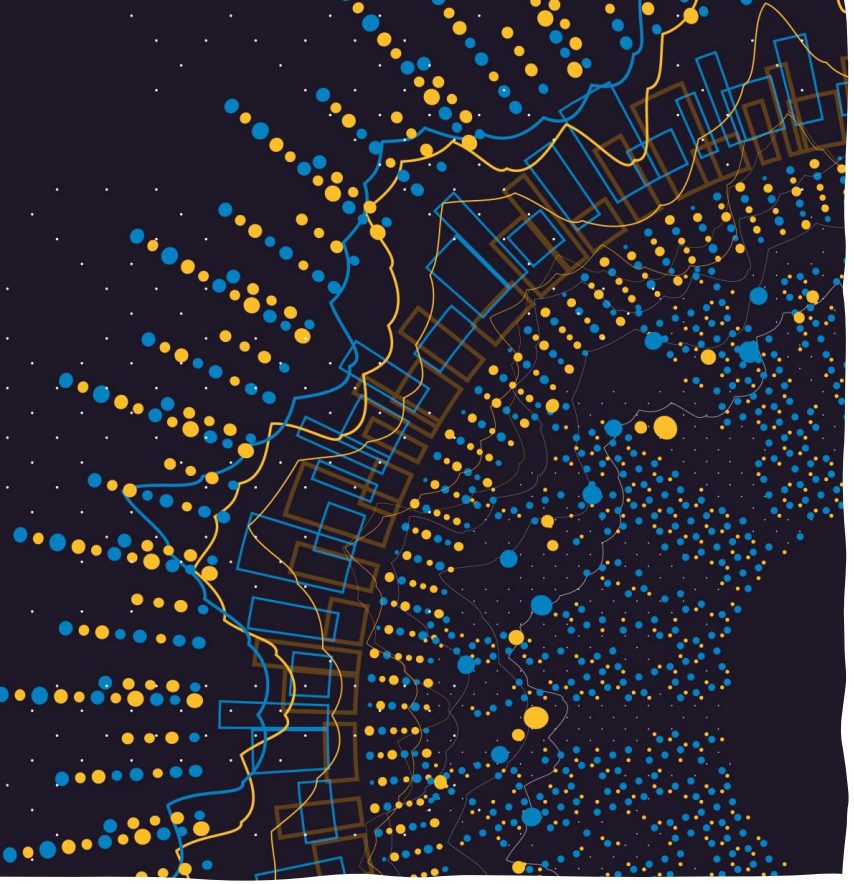
*By 2030, the ME department will demonstrate that every year, each **Innovation Faculty** successfully performing "innovation" research can generate at least 1 successful tech-based start-up involving students, or 1 annual revenue growth of $500K for an industrial customer.*

MISSION

TDM AEROSPACE EXAMPLE

MISSION (BHAG)

By December 2021, TDM Aerospace will be a qualified supplier to the Boeing Company.

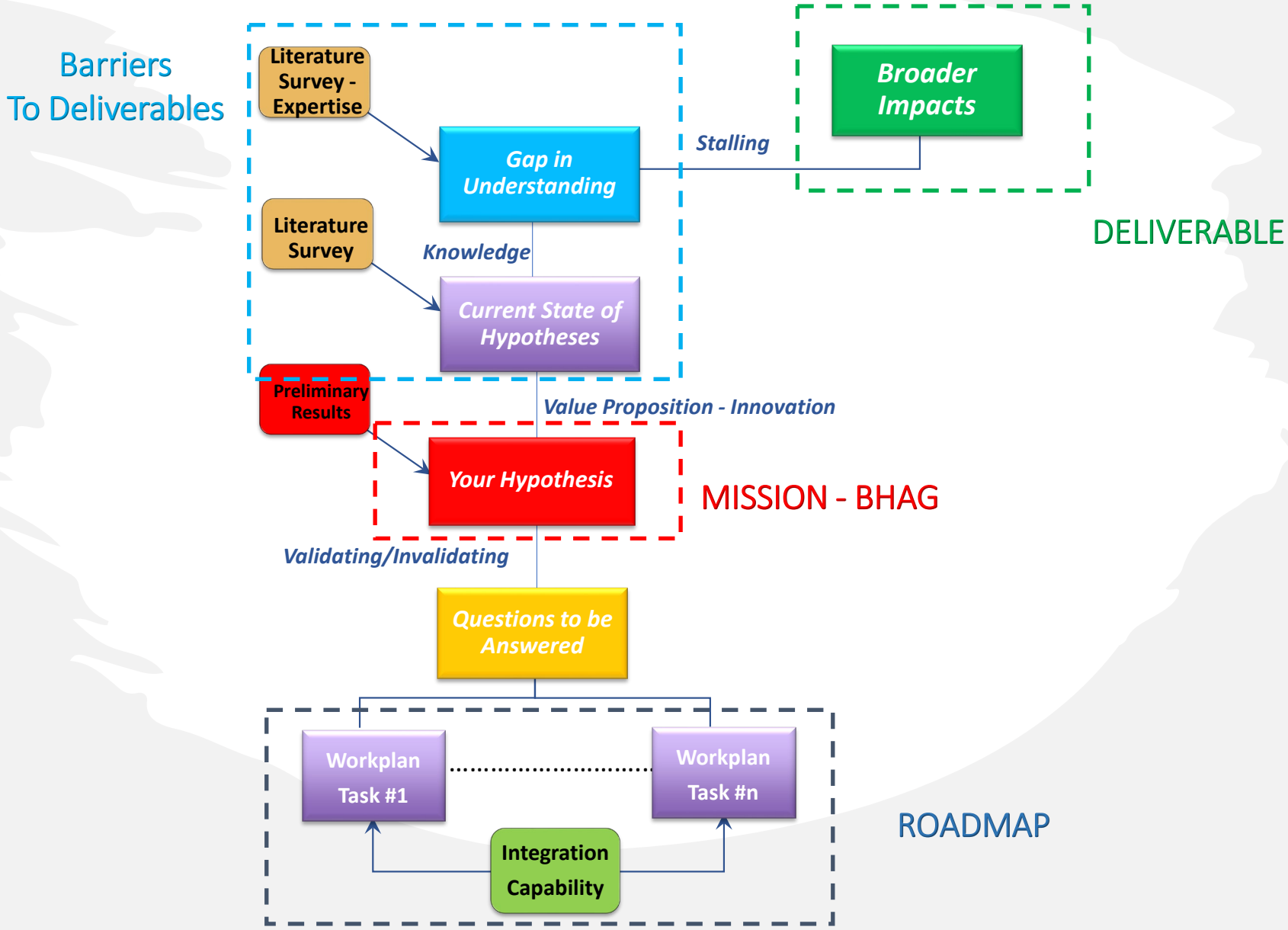


CORE VALUES & BELIEFS

1. Above all things, we protect the health and safety of our people, our customers, and our environment;
2. Students (Customers) come first, whether internal or external and we understand their needs;
3. Students (Customers) deserve satisfaction based on capable processes managed by qualified Faculty and Staff;
4. We operate in an environment of honesty, openness and mutual respect;
5. We give and take constructive criticism, then act to improve;
6. Our faculty & Staff deserve opportunities to learn and grow;
7. Our shareholders deserve measurable benefits from our work.

VISION: A GUIDE TO RESEARCH PROPOSALS

PROPOSAL FOUNDATION

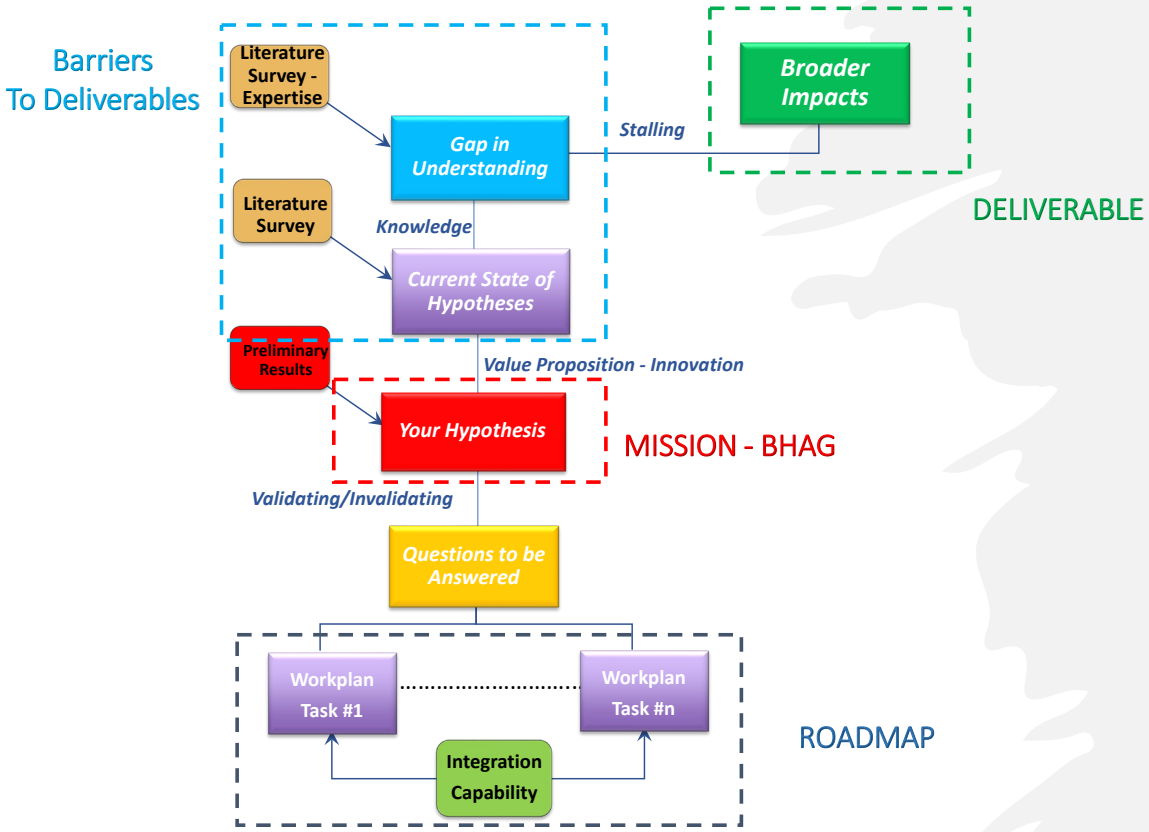


TRANSLATION TO OVERVIEW

Magnesium (Mg) alloys have long been viewed as futuristic materials for energy saving applications in a wide range of industries owing to their superior specific strength. However, they have not yet achieved significant technological penetration, largely due to their intractable low room temperature ductility, and the ensuing low impact energy absorption and formability . With the additions of rare earth elements (REEs), significant improvements in ductility by means of texture weakening have been reported, and there are strong indications that further enhancement are possible if texture is weakened at a sufficiently small scale . However, despite sustained research over a long period of time, a full explanation of the mechanisms through which REEs modify texture and lead to "special" orientations (so-called "RE-texture") is lagging

Supported by preliminary results, this proposal hypothesizes that the effect of REEs resides largely in the way they alter the landscape of grain boundary (GB) energy and mobility. While dislocations drive the formation of subgrains, their orientation, as they rotate during continuous dynamic recrystallization (CDRX), tends to settle at GB energy cusps, especially those having maximum mobility. This allows each nucleated grain to rapidly mature by absorbing surrounding dislocations in favor of its GB area (i.e. size). REEs would act by moderating these cusps and mobilities, thereby promoting "equal opportunity" for orientation selection, i.e. texture weakening Hypothesis; hard core science.

Motivated by this transformative concept, this proposal aims at testing this hypothesis by answering the following questions. How do REEs (1) upset CDRX mechanisms and with which mechanism(s)? (2) promote nucleation of various types of orientations? (3) promote survival/elimination of nucleated orientations during grain growth including the RE-texture? and (4) affect the process conditions (e.g. binding effects and co-segregation) in ternary compositions Question to be answered to prove or disprove the hypothesis.



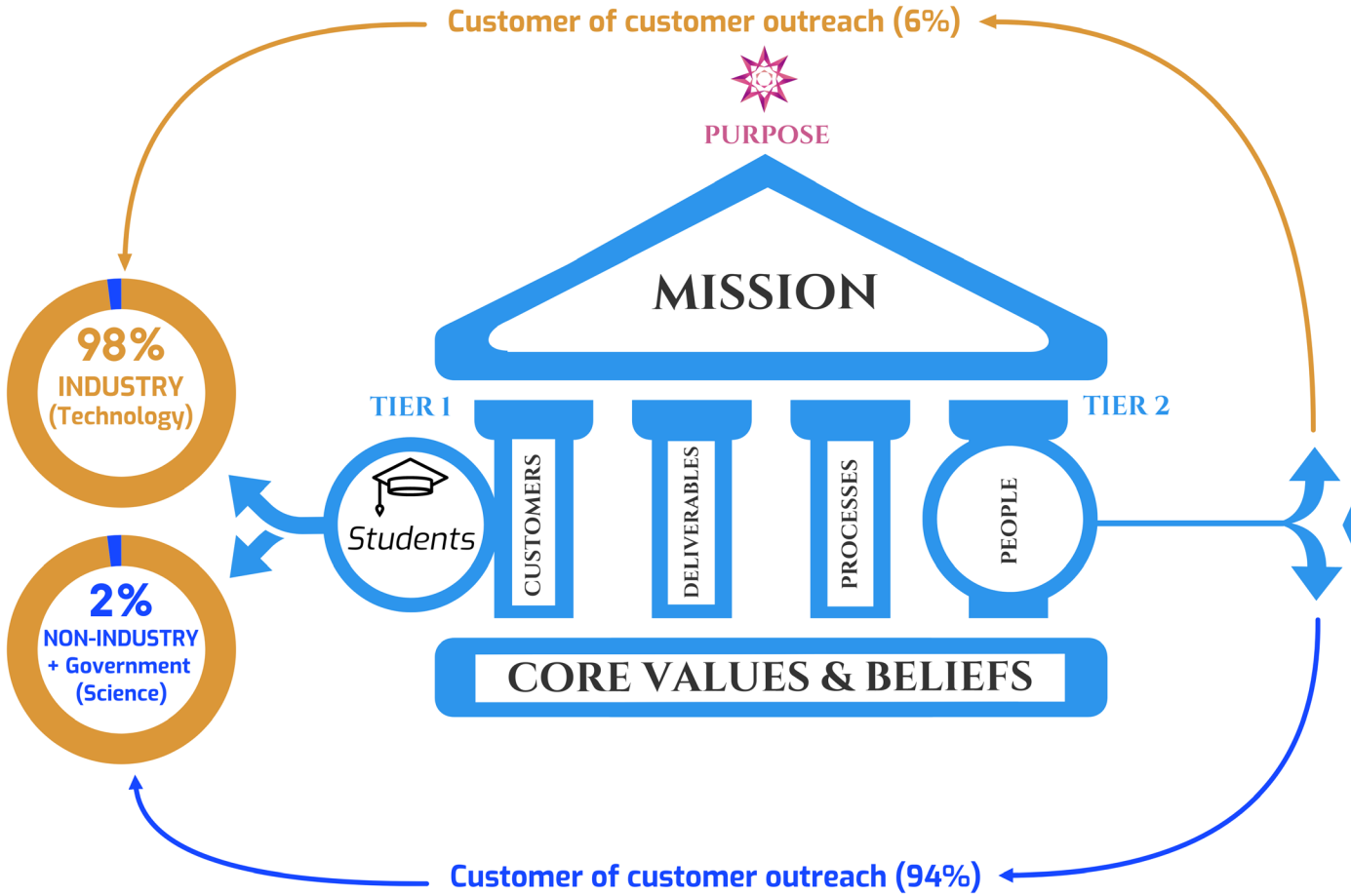
BACKUP SLIDES

BARRIERS TO IMPROVED DELIVERABLES

- Understand your Institution
- Research the Field - Experience
- Listen & Listen
- Be Engaged and Innovative
- Assess the Bureaucratic Battlefield

Barriers to Improved Deliverables

MECHANICAL ENGINEERING EXAMPLE



ROADMAP

Incentivizing Innovation

Realigning Incentives for Faculty

1. Recognize IP, Startups, Industrial Sponsorship, &
2.Rational Staffing

2020

People Incentive Realign

Enhancing Education

Realigning UG Curriculum & Graduate Catalogue

1. *Critical Thinking and Hands-on*
2. *IP Development, Startups*

2023

Process Realign

Generating Technology

5 IPs/year Involving 15 Students

Industry or Students Owned IPs, Patents, Copy Rights, Trade Secrets…etc

2024

Enabling Students

Realigning the Infrastructure

Creating A Technology Innovation Lab – iDEELab – Innovation, Design, and Engineering Education Laboratory

PROCESS CAPEX

2028

Concept Proof

MARKET EDUCATION

2030

Impacting The State & MSU

1 Successful Startup

>$500K Annual Net Earning

1 Successful Industrial Impact

>$500K Increase in Annual Revenue

Expect Higher Enrollment
Higher Industry R&D
Higher Economic Impact

Mission - BHAG