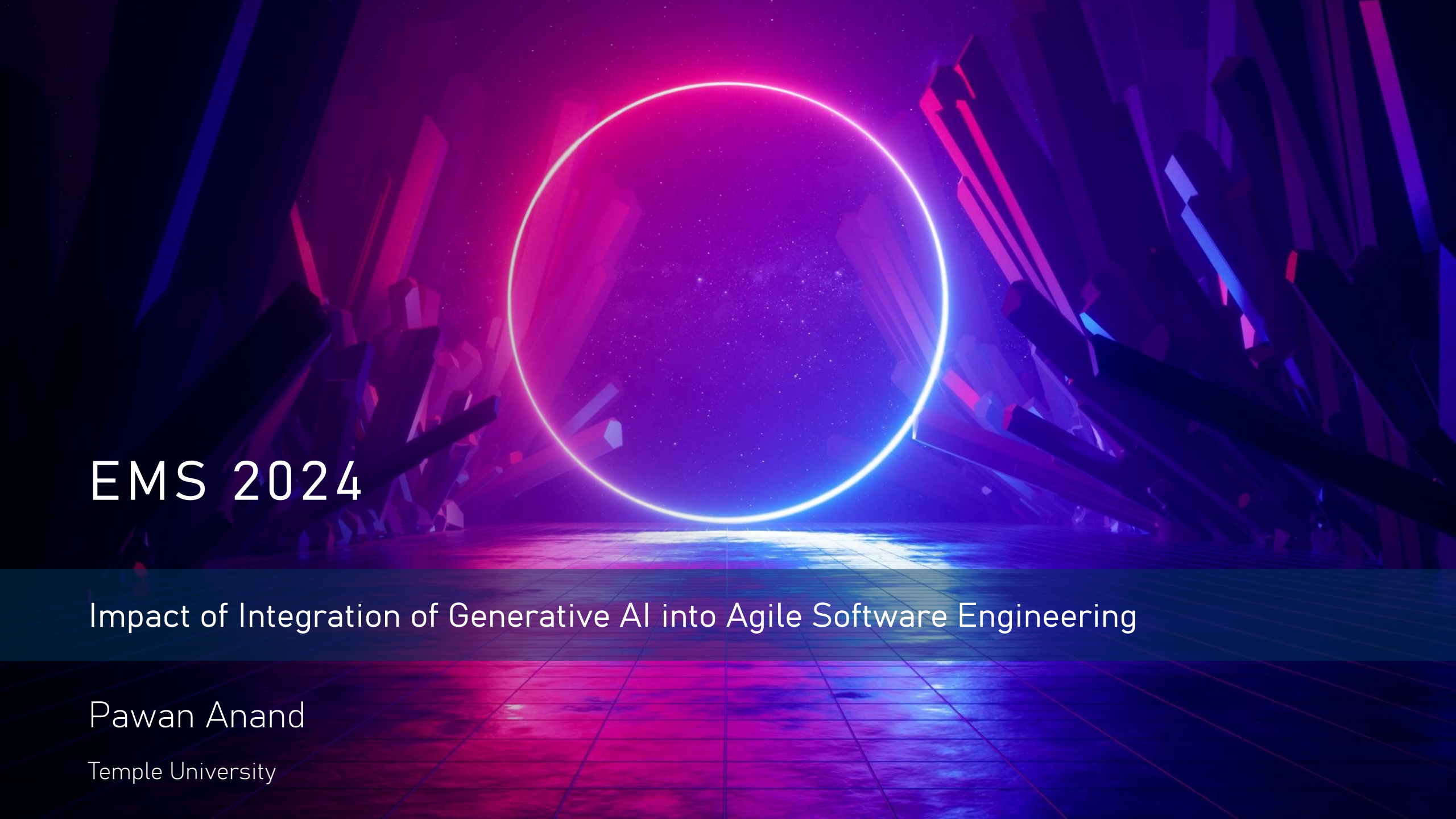


The background of the slide is a vibrant, futuristic digital landscape. It features a large, glowing circular portal in the center, emitting a bright magenta and blue light. The portal is set against a backdrop of angular, crystalline structures that resemble a digital city or a complex data network. The floor is a grid of glowing lines, and the overall color palette is dominated by deep blues, purples, and magentas, creating a high-tech, cybernetic atmosphere.

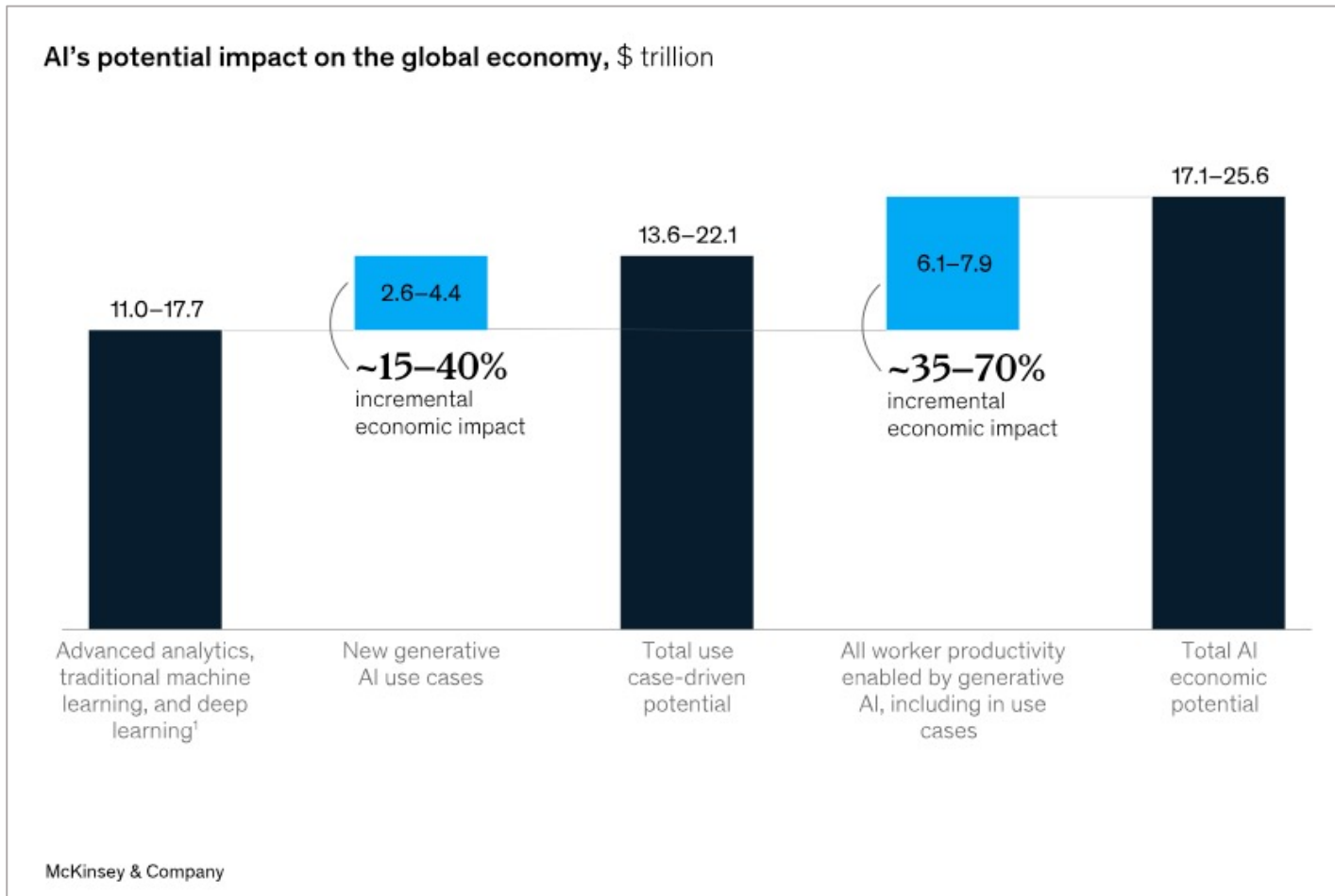
EMS 2024

Impact of Integration of Generative AI into Agile Software Engineering

Pawan Anand

Temple University

MOTIVATION AND RESEARCH QUESTION



Motivation

- As per McKinsey's report from June 2023, Generative AI is estimated to add equivalent of up to \$4.4 trillion to global economy **
- As per McKinsey's report from June 2023, the direct impact of AI on the productivity of software engineering could range from 20 to 45% of current annual spending on the function

Research Question

How does the integration of Generative AI impact the Agile Software Engineering?

WHAT ARE WE OBSERVING IN THE INDUSTRY

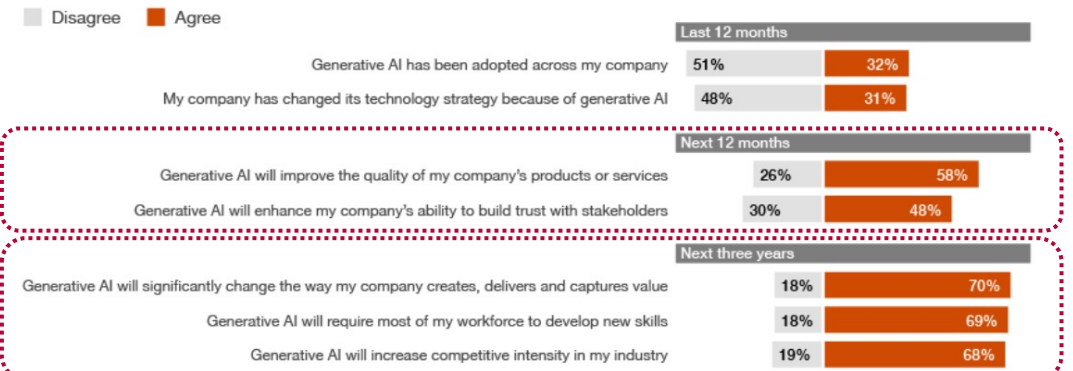
Expectations for impact are higher among CEOs who have already adopted generative AI

Question: To what extent do you agree or disagree with the following statements about generative AI?



Although generative AI adoption and strategic integration has been somewhat limited, CEOs anticipate greater impact ahead

Question: To what extent do you agree or disagree with the following statements about generative AI?



Source: PwC's 27th [Annual Global CEO Survey](#),

The survey, which interviewed 4,702 CEOs across 105 countries

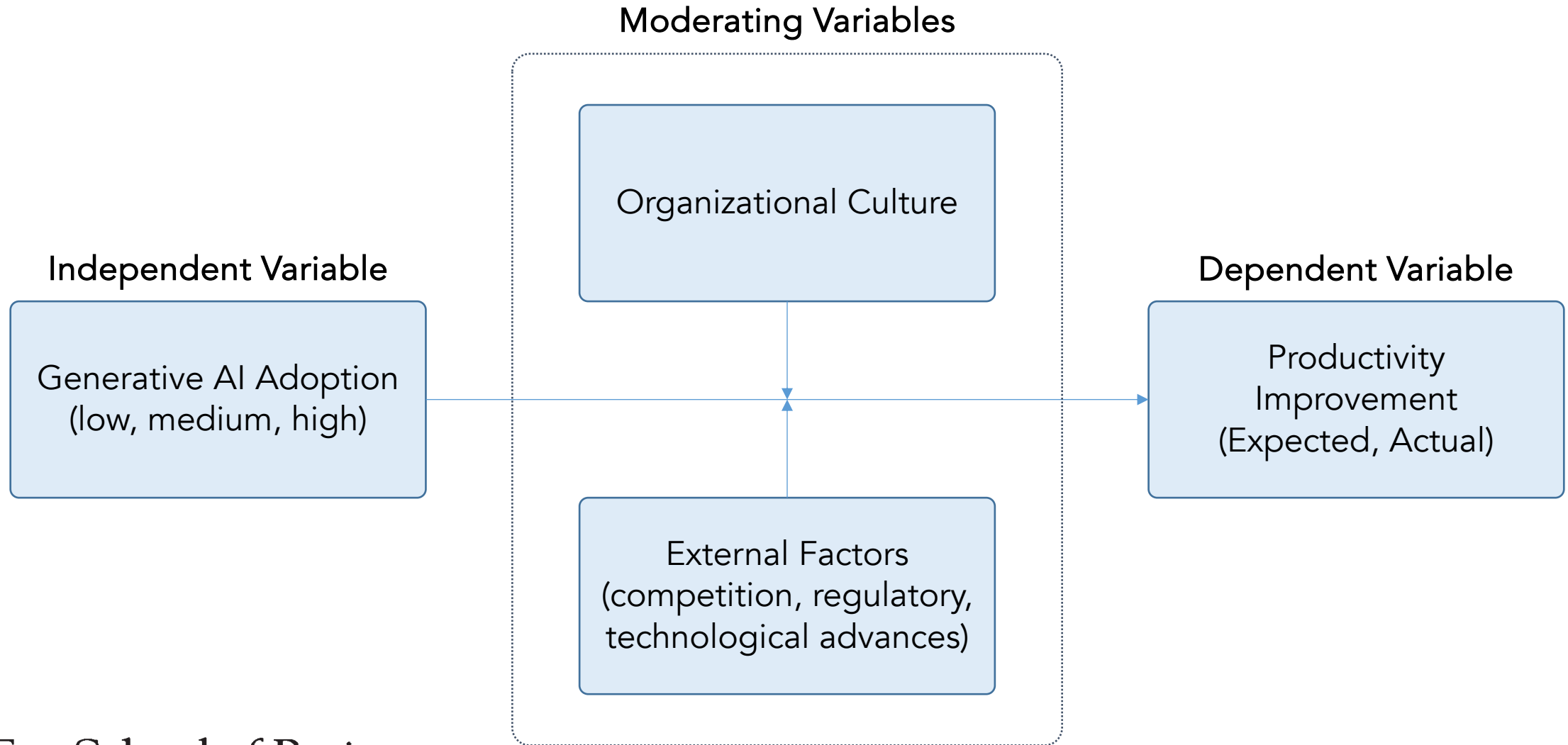
PROPOSED IDEA RELATING TO GENERATIVE AI

Integrating Generative AI in Software Engineering: A Paradigm Shift

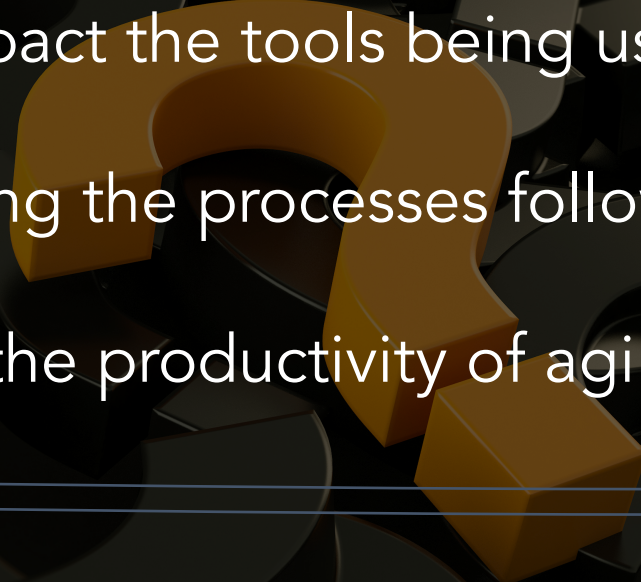
- Research explores merging Generative AI with Agile methodology in software engineering, an uncharted frontier rich with potential.
- Integration of Generative AI with Agile methodologies promises a new era of efficiency and innovation in software engineering.
- Envisioning a future where Generative AI revolutionizes industries, enhances productivity, and drives global economic progress.
- McKinsey predicts a \$1.5 trillion increase in global GDP by 2030 through Generative AI integration, streamlining IT processes and enhancing customer experiences.
- Industry data indicates a 20-45% reduction in annual software engineering expenditure.
- Microsoft's GitHub Copilot showcases up to 56% task completion time reduction, highlighting productivity gains.
- Through meticulous exploration, we aim to uncover untapped possibilities and navigate transformative landscapes, reshaping software engineering and beyond.



CONCEPTUAL MODEL



RESEARCH QUESTIONS

- 
- RQ1: How does Generative AI impact the tools being used by agile teams?
 - RQ2: How is Generative AI effecting the processes followed by agile teams?
 - RQ3: Impact of Generative AI on the productivity of agile teams?

MIXED METHOD FOR RESEARCH

This research would use mixed-methods approach, starting with

- **Qualitative research** with grounded theory with inductive approach – semi-structure interviews with senior leadership from technology organizations and will follow this up with
- **Quantitative research** to better understand the impact of Generative AI on global agile teams by conducting surveys with engineers working in agile methodology for software engineering



APPROACH AND DATA ANALYSIS

Approach

- Semi-Structured interviews of Senior Leadership of technology organizations

Data Analysis

- Coding: systematically tag of text within the interview transcripts with descriptive labels and codes (Open coding → Axial coding → Selected coding)
- Thematic Analysis: identification of recurring themes or patterns that emerge from the coded data
- Constant Comparison: continuously compare new data with previously coded data and existing themes



DATA ANALYSIS

Open coding

Organization Vision

Customer Integration Needs

Business Impact

ROI Measurement

Cost Considerations

Confidence in Gen AI

Infrastructure and Security

Productivity Metrics

Stakeholder Alignment

Ethical Considerations

Security Concerns

Implementation Challenges



Axial coding

Business Impact

Current Technology Maturity

Stakeholder Alignment and
Confidence in Gen AI

Infrastructure and Technology
Considerations

Productivity Metrics and ROI
Measurement

Implementation and Scaling
Challenges



Selective coding

Business Impact and ROI
Measurement

Stakeholder Alignment and
Confidence in Gen AI

Key Considerations

Implementation Challenges

SUMMARY OF FINDINGS FROM QUALITATIVE STUDY

1. Business impact and RoI measurement guide strategic decisions on Generative AI integration, vital for assessing effectiveness
2. Stakeholder alignment and confidence in Generative AI are essential for successful implementation, requiring transparent communication and collaboration.
3. Key considerations like ethical, security and scaling.
4. Overcoming implementation challenges ensures a comprehensive approach





PROPOSAL FOR QUANTITATIVE STUDY

- **Objective:** Complement qualitative insights with broader, quantitative data
- **Focus:** Global survey of software engineers
- **Areas of assessment:**
 - Productivity
 - Software quality
 - Ethical and security concerns
 - Innovation in Agile teams



RESEARCH DESIGN AND DATA COLLECTION

Research Design

- Cross-sectional survey design.
- Target population: Software engineers experienced in Agile and GenAI.
- Stratified random sampling for diversity

Data Collection

- Data collected via a structured online survey.
- Survey sections:
 - Demographics
 - Productivity
 - Ethical and security considerations
 - Challenges and benefits
 - Innovation
- Distribution channels: Professional networks, social media, industry forums



PROPOSED DATA ANALYSIS

Descriptive Statistics: Summarizing demographic and key variables.

Inferential Statistics:

- T-tests and ANOVA for group comparisons
- Regression analysis for relationships
- Factor analysis for underlying dimensions

Ethical Considerations

- No personal data or PII will be collected
- Adherence to ethical principles:
- Confidentiality and anonymity
- Avoidance of harm to participants

EXPECTED RESULTS FROM QUANTITATIVE STUDY

- Evidence of quantum of impact by Generative AI on productivity of Agile teams
- Improvements in software quality (fewer defects, higher reliability etc.)
- Insights on ethical and security concerns
- Correlation between Generative AI use and innovation
- Guidance for organizations on leveraging AI in Agile practices
- Comprehensive assessment of Generative AI in Agile environments
- Informing best practices for AI integration in software development

QUESTIONS



Thank you

