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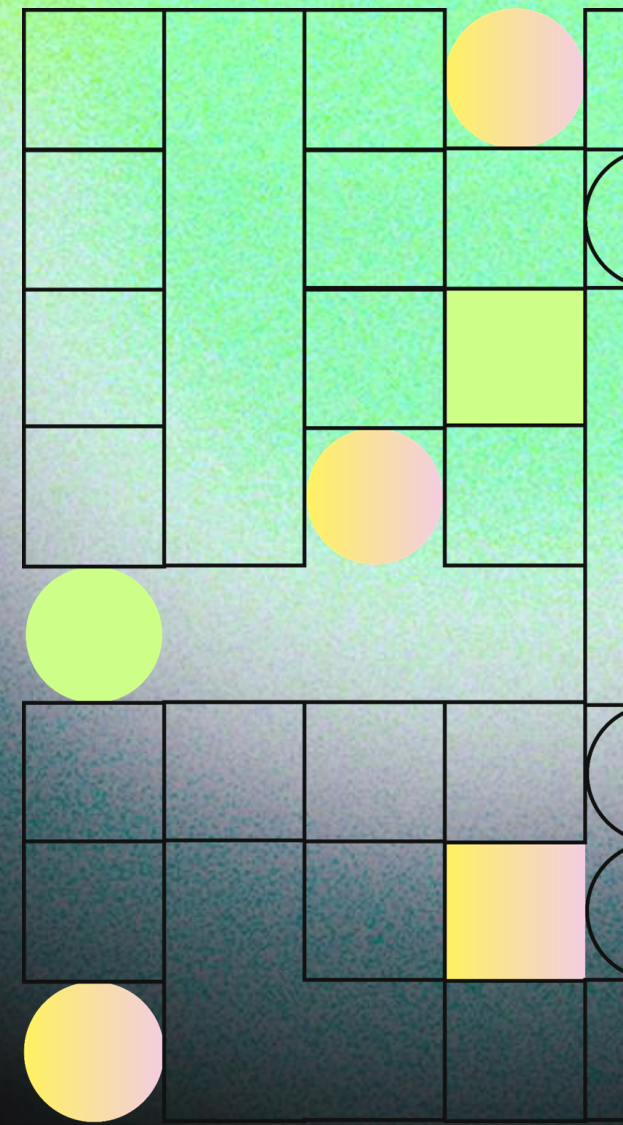
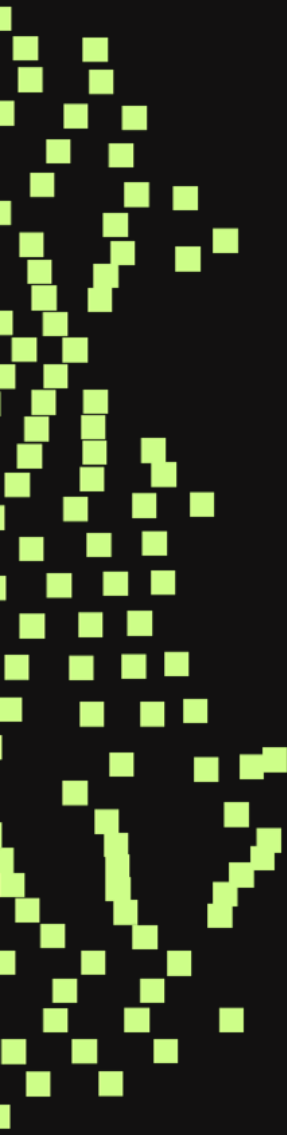
Dissertation Plan Presentation

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The Research Question

How has the implementation of AI coding tools, such as generative AI and large language models, transforms the roles and responsibilities of software developers?



Why Coders and A.I

The Future of Digital Technology Development

AI tools can automate various aspects of coding, including generating code from natural language descriptions, predicting the next lines of code, and creating entire functions. This automation accelerates coding, reduces human error, and allows developers to focus on more complex and creative tasks rather than routine coding

The Reduction in Junior Roles

Over the past three years, there has been a noticeable decline in junior software development roles. The employment of software developers in the U.S. has been decreasing since 2020. This decline is partly attributed to the increasing adoption of AI tools that automate coding tasks.

Employment Decline: The U.S. employed fewer developers in January 2024 than it did six years ago.

Pay Growth Lag: Between January 2018 and January 2024, the median base pay for developers grew by 24%, while pay growth for total U.S. workers grew 30%.

Research Question Breakdown

What Am I asking and what do I want to find out?

How has the implementation of AI coding tools, such as generative AI and large language models, transforms the roles and responsibilities of software developers?



Implementation of AI coding tools

How have businesses implemented these new tools and how are they being applied in a business context effecting the worker technology relationship

Hypothesis 1:

- **Statement:** The integration of AI tools, such as generative AI and large language models, significantly reduces the time software developers spend on routine coding tasks.
- **Rationale:** AI tools automate repetitive tasks, allowing developers to focus on more complex and creative aspects of software development.

Hypothesis 2:

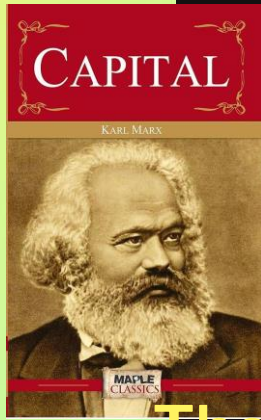
- **Statement:** The adoption of AI in software development leads to a shift in developers' roles from manual coding to curatorial and managerial responsibilities.
- **Rationale:** Developers are increasingly overseeing AI-generated code, ensuring its quality, and integrating it into broader projects.

Hypothesis 3:

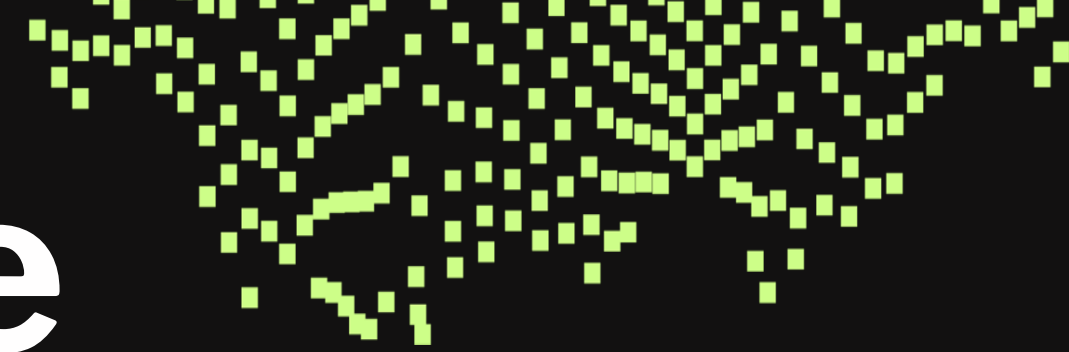
- **Statement:** The integration of AI in software development reduces the number of junior roles
- **Rationale:** AI systems can replace the need to hire new staff and can allow existing programmers to do more

Transformed the roles and responsibilities of software developers

How has this changing relationship effected the tasks, role and abilities of software developers in the workplace (Business context is key)



Academic Landscape



There is tangential research in my field, mainly on the types of tools used and how they are implemented

Typical Academic papers on my research Topic

AI-Driven Innovations in Software Engineering: A Review of Current Practices and Future Directions

Mamdouh Alenezi and Mohammed Akour – January 2025

The paper explores the integration of AI into software engineering processes, aiming to identify its impacts, benefits, and challenges. It provides a comprehensive analysis of current AI applications in software engineering, supported by case studies and theoretical models.

Impact of Artificial Intelligence on Software Development Processes

Cuddapah Anitha, Nirmal Kumar Gupta, Balaji Chintala – 2025

Studies how AI development reduces costs, and improves precision across various phases of software development, including coding, testing, and deployment. It examines the influence of AI on software development using qualitative and quantitative assessments.

Impact of Artificial Intelligence on Software Development: Challenges and Opportunities

Krishiv Garg – 2023

This research paper explores the challenges and opportunities presented by AI technologies in software development. It investigates how AI technologies, such as machine learning and natural language processing, are revolutionizing various aspects of the software development lifecycle, including requirements engineering, code generation, testing, and maintenance.

Some Academic

and Theoretical Motivations

Technological Determinism: This theory posits that technology drives changes in society and human behaviour.

I'm exploring how AI technologies drive change in the roles and responsibilities of software developers.

Actor-Network Theory (ANT): This theory examines the networks of relationships between human and non-human actors.

I'm analysing the network of interactions between software developers, AI tools, and other stakeholders in the software development process.

Socio-Technical Systems Theory: This theory emphasizes the interrelatedness of social and technical aspects of an organization.

I'm examining how AI integration affects the social dynamics within software development teams and the overall organizational structure.

Practical Motivations

- Optimization In Firms
- Innovation In Organisational roles
- Project Management Guidance
- Collaboration Enhancement with AI
- Efficiency Improvement In Coding
- Industry Best Practice Guidance

50

Interviews with Participants

30-45min

Interview Length

70%

Expected to be usable

Data Collection Plan - Qualitative

Participants

Target Group: Software developers and project managers with experience in AI tools.

Sample Size: 50 participants (40 software developers and 10 project managers).

Data Collection Method

Semi-Structured Interviews: Conducting semi-structured interviews to gather in-depth qualitative data. This method allows for flexibility in exploring emerging themes while ensuring consistency across interviews.

Interview Guide: Using an interview guide to structure the conversations, covering key topics consistently

Data Management

Transcription: Transcribing the recorded interviews verbatim to capture all details accurately.

Data Storage: Storing transcripts and recordings securely with GDPR in mind too.



Potential Friction or Bias

Confirmation Bias

Developers may have preconceived notions about AI

Fear of Job Displacement

Some developers may feel threatened by AI's potential to automate their tasks, leading to reluctance or defensiveness during interviews

Variability in AI Experience

Developers with varying levels of experience and exposure to AI tools may provide inconsistent feedback

Social Desirability Bias

Participants may provide responses they believe are socially acceptable or expected, rather than their true opinions

Geographic and Cultural Differences

Developers from different geographic regions and cultural backgrounds may have diverse perspectives on AI

How Am I Going to Pull this off?

Not going to be easy



Research Plan

What will I have to do

Planning Phase

Create a strong interview template with semi structured questions and identify potential interviewees.

Compile Data and Results

Bring all of my conclusions together and get about tracking common themes, expectations and current trends in the development landscape from my interviews

Conduct Interviews

Go and interview around 50 or so Coders and Technical Product Managers to get my data. Already have 22 contacted, will also try and partner with a external firm.

Methodology and Generate Findings

I write my paper and generate my findings and future predictions using the information I have gathered. My analysis methodology will be Thematic Analysis, Content Analysis, Grounded Theory, with a focus on thematic.

Shift from Manual Coding to AI-Assisted Development

Automation of Routine Tasks: AI tools, such as generative AI and large language models (LLMs), are expected to automate routine coding tasks, allowing developers to focus on more complex and creative aspects of software development

Reduction in Junior Roles: The automation of repetitive tasks leading to a reduction in junior developer roles, as AI can efficiently handle these tasks. Also increased efficacy reducing the need for more staff in firms.

New Roles and Responsibilities



Curatorial Roles: Developers may increasingly take on curatorial roles, overseeing AI-generated code, ensuring its quality, and integrating it into broader projects

AI System Management: Developers will be responsible for managing AI systems, training machine learning models, and ensuring ethical considerations are addressed.



Expectations and Findings

Challenges and Ethical Considerations

Integration Challenges: Integrating AI-generated code into larger systems may present challenges, requiring developers to ensure seamless integration and functionality

Ethical Implications: Developers will need to address ethical considerations related to AI, such as data privacy, bias, and transparency. Not to forget the widespread replacement of developers for these systems.



Limitations of My Study

- **Generalizability**

The results may not be representative of all developers, particularly those in different industries or geographic regions.

- **Self-Reported Data**

Participants may provide socially desirable responses or may not accurately recall their experiences, affecting the validity of the findings.

- **Variability in AI Experience**

This can complicate the analysis and interpretation of results, making it challenging to draw general conclusions. Firms will use it differently and this will show in the thematic analysis.

- **Ethical Considerations**

Failure to address these ethical considerations can undermine the credibility and integrity of the research. The why and how is very important.

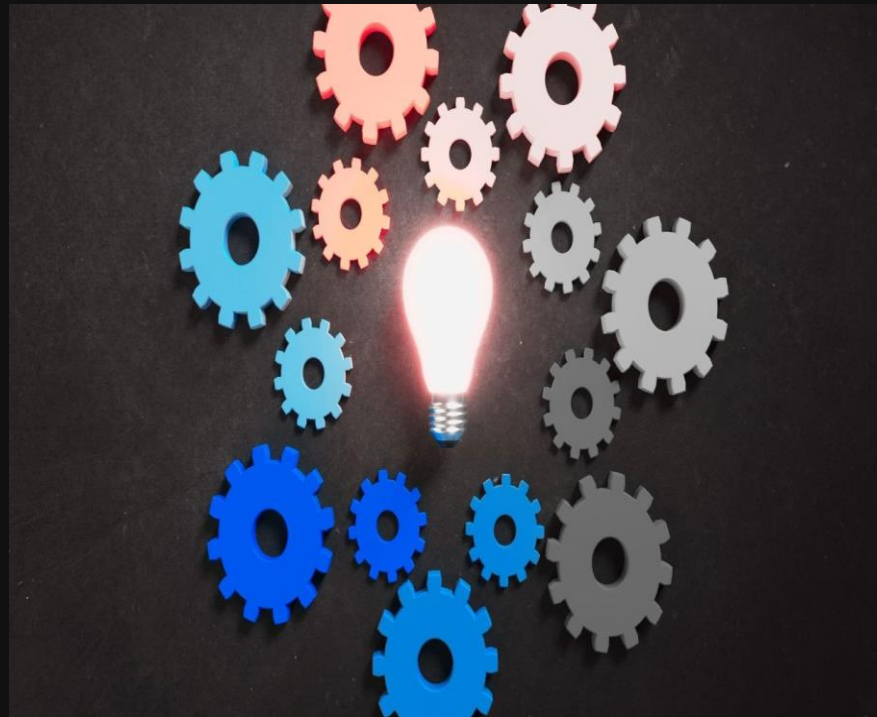
- **Rapid Technological Changes**

The fast-paced evolution of AI technologies means that findings may become outdated quickly. The study's relevance may diminish over time as new AI tools and practices emerge.



Future Research

What is Next?



Cross Industry Studies

How AI effects other roles in the industry or beyond



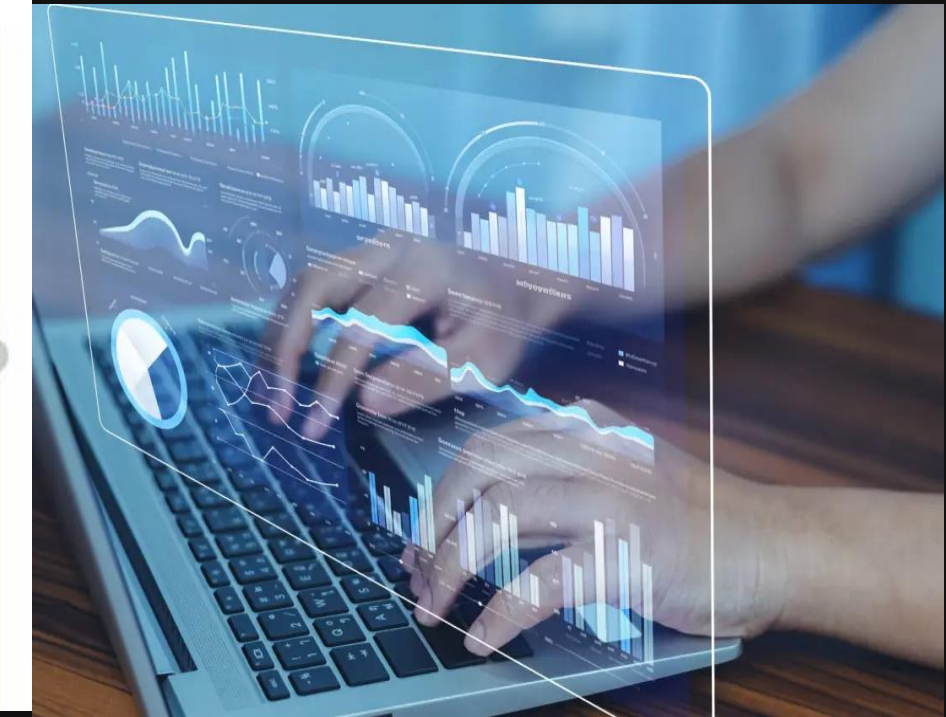
Ethical implications

Investigate the ethical implications of AI in software development, including data privacy, bias, and transparency.



AI and Team Dynamics

Study the impact of AI on team dynamics and collaboration in software development.



AI Tool Evaluation

Evaluate the performance and usability of different AI tools used in software development.



"Change is the law of life, and those who look only to the past or present are certain to miss the Future."

John F. Kennedy

Thank you for your time!

Any questions please ask.

**Looking forward to hearing your
feedback on my Dissertation Topic**