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The Role of Generative AI Tools in Balancing Autonomy and Control: A Study of Junior and Senior Developers in Nepalese Fintech

School of Technology
Master's Degree
Strategic Project Management

Vaasa 2026

UNIVERSITY OF VAASA **School of Technology**			
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Title of the thesis:	The Role of Generative AI Tools in Balancing Autonomy and Control: A Study of Junior and Senior Developers in Nepalese Fintech:		
Degree:	Master of Industrial Management		
Discipline:	Strategic Project Management		
Supervisor:	Dr.Jari Ruokolainen		
Year:	2026	**Pages:**	64

ABSTRACT:

This research explores the impact of Generative Artificial Intelligence (GenAI) tools on learning autonomy and managerial control of software developers in the Nepalese fintech and banking industry. The surge in the use of AI tools like ChatGPT and GitHub Copilot is radically changing software development, especially in highly regulated areas where security and compliance are important. The main purpose of the study is to examine the impact of GenAI tools on the learning autonomy and problem-solving skills of software developers, as well as the managerial control in their workplace, and compare the experiences of junior and senior developers. This study used a quantitative research method with a cross-sectional survey design. The data were gathered from 56 software developers in fintech and banking organisations in Nepal. SPSS was used to analyse the data, applying descriptive statistics, independent samples t-test, correlation analysis, and crosstab analysis. The study has found that the use of GenAI tools is extremely high, with most developers using these tools often for problem-solving, code generation and documentation. The outcomes demonstrate that GenAI tools improve learning autonomy by providing developers with immediate access to information and helping to solve problems independently. Yet, while learning autonomy is enhanced, decision-making autonomy is still low. This implies that although there is an increase in developers' learning autonomy, their decision-making autonomy is limited by the organisational environment. Additionally, the research shows that managerial control and oversight are still prevalent in the fintech setting, reflecting the regulatory and risk management requirements.The research finds Generative AI tools are both constraining and enabling in software development. They improve learning, productivity and efficiency but also increase control and monitoring. This result underscores the autonomy-control paradox in regulated sectors like fintech. The study adds to the theory by connecting the findings to Self-Determination Theory, Labour Process Theory, and Sociomateriality Theory, and offers implications for organisations to encourage innovation while ensuring regulatory compliance.

KEYWORDS: FinTech (Financial Technology), GenAI (Generative Artificial Intelligence), AI (Artificial Intelligence)

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List of Abbreviations

AI – Artificial Intelligence

GenAI – Generative Artificial Intelligence

SDT – Self-Determination Theory

LPT – Labour Process Theory

SPSS – Statistical Package for the Social Sciences

IT – Information Technology

FinTech – Financial Technology

r – Correlation Coefficient

p-value – Probability Value (Significance Level)

1 Introduction

1.1 Background of the Study

The development of the fintech and banking sectors in Nepal has been a rapid process that has taken place during the last several years, primarily due to the spread of the digital payment system and the increasing number of users of the services via the platform. The ways of delivering financial services are transformed by mobile banking, digital wallets and web payment systems, which offer more access to financial resources both in urban and rural regions. The growth has generated additional business opportunities and efficiency in financial transactions which have caused an increase in a connected financial ecosystem in Nepal. With the growth in the fintech industry, increasing issues related to the secure, compliant, and reliable software systems are felt. The challenge to the developers in this space is to design software by balancing innovation and the rigorous security and compliance requirements that must be followed in the financial sector.

Introduction of Generative AI (GenAI) tools like GitHub Copilot or ChatGPT have created a great revolution in software development process. The tools help developers to automate such activities as code generation, debugging and documentation, while enabling more efficient and faster development (Banh et al., 2025). GenAI tools can provide a degree of independence in learning and detection of problems, and even writing automated tests, which will make a person more productive by allowing developers to create snippets of code, debug problems and even write tests (Mbizo et al., 2024). This new found autonomy, however, carries a price since these tools are incorporated in software processes, they also create the necessity of additional administrative control. When applied to regulate industries such as fintech, such tools as GenAI should be controlled with care to assure that the produced code would not interfere with industry norms and regulations, which results in an increased amount of oversight and regulation needs.

The regulatory environment in Nepal is an important factor that can influence the creation and implementation of software in the fintech and banking industries (Moharrak &

Mogaji, 2025). Nepal Rastra Bank (NRB) and Payment Systems Oversight establish frameworks to have financial institutions that follow the security standards and compliance regulations. These regulatory bodies will find themselves torn between promoting and preserving the security and compliance of financial systems as GenAI tools gain more and more users, as well as actual applications. The development of the Nepalese fintech sector is a good opportunity to research the question of balancing producers who are given freedom of action and administrative control ove (BANK & Payment, 2018)r the environment to comply with the requirements of compliance. This is a dynamic that is critical in ensuring that the potential of Generative AI tools will be capitalized on and that the dangers that such tools bring are minimized.

1.2 Problem Statement

The use of Generative Artificial Intelligence (GenAI) applications, such as GitHub Copilot and ChatGPT, in software development has been one of the effects that have significantly impacted productivity and problem-solving. Nevertheless, the empirical studies addressing the effects of these tools on learning autonomy and managerial control remain deficient (specifically, when it comes to Nepalese fintech and banking software teams) (Solanke, 2023). Although such tools are extensively used worldwide, little is known about how they specifically affect junior and senior developers operating in regulated environments. It is not clear how GenAI tools have struck the balance between individual freedom of learning and problem-solving, and the managerial constraints involved to meet the regulatory standards in Nepal, where strict regulations are highly enforced. This lack of research means that it is hard to evaluate the overall effects of AI tools' use in fintech software teams and to see the extent to which AI tools manipulate the roles and duties of developers on different seniority levels.

A number of significant concerns also make the application of GenAI tools to software development harder. First, the problem of epistemic is created by the transparency issue concerning the source of AI-generated code. The issues with AI tools are that developers

may not be able to comprehend the source and the logic behind the suggested or generated code, and it is likely that this problem will cause a question of the quality and reliability of the code produced (M. Yang, 2026). Second, there should be ethical issues on accountability in case of AI-generated code errors. Where the problem or error occurs, the question of whether the developer or the AI tool is to blame is usually ambiguous, making the assigning of blame and ensuring quality a difficult process (Sargiotis, 2024). Finally, the deployment of GenAI tools in the regulated sector suspected as fintech probably changes the current regulation practices. The autonomy that these tools are meant to offer developers may be unintentionally curbed by increased managerial control, control reviews, and requirement of approval that must be done to ensure compliance. These issues demonstrate that research is required in order to examine how GenAI tools are influencing autonomy and managerial control under the distinct setting of Nepalese fintech software teams.

1.3 Research Question

How do Generative AI tools affect the learning autonomy and managerial control of junior vs senior developers in Nepalese fintech teams?

1.4 Research Objectives

The specific objective of this study is to measure the usage of GenAI tools by junior and senior developers within Nepalese fintech and banking teams with respect to how often they are used and what kinds of tasks (e.g., coding, debugging, testing) they are most often used to address.

General Objectives:

- To assess the impact of Generative AI tools on the learning autonomy of junior and senior developers in Nepalese fintech teams.
- To evaluate the influence of Generative AI tools on the level of managerial control within junior and senior developers' work in Nepalese fintech teams.

- To compare how junior and senior developers in Nepalese fintech teams experience the balance between autonomy and managerial control when using Generative AI tools.

1.5 Significance of the Study

The study provides valuable contributions to the research community, both theoretical and practicable, regarding the notion of software development within the Nepalese fintech and banking. Theoretically, the research contributes to the existing theory on autonomy, managerial control, and Generative AI as it utilises the Self-Determination Theory and Labour Process Theory to the particular setting in the Nepalese fintech sector. The exploration of the interactions of GenAI tools use in a controlled environment is helpful to further understand the nature of such tools in autonomy and managerial control and introduces new perspectives in the way of balancing the individual freedom with the control exercised by the organization in technologically-based fields.

In practice, the research will offer a set of practical guidelines that can be used by managers and developers on how to integrate GenAI tools successfully and balance between autonomy and managerial control. It will also provide an indication on how to overcome the regulatory obstacles presented by the fintech companies and offer insights into the policy making and governance approaches in the arena of AI adoption. Furthermore, the research is set to turn Nepal into a digital nation by exploring how GenAI applications can be developed to generate innovation and development within the Nepalese fintech sector and compliance with the required level of security and regulation, contributing to the subsequent re-development of the fintech sector, and the emergence of innovative solutions (Vaidya, 2025).

1.6 Limitations of the Study

- This study only analyses Nepalese fintech/banking software teams and therefore this can limit the generalization of the results to other regions or industries.

- The purposive sample tool and the small sample might have biasing consequences because the sample might not be representative of the general population of software developers within the Nepali fintech sector.
- The study is based on self-reported information, which can impose a degree of self-report bias during self-reporting, specifically self-reporting with regards to autonomy and managerial control.
- The study consists of a cross-sectional type, which only captures a picture of GenAI usage at a particular point in time and thus it could not be used to determine the long term trends or changes.

1.7 Organization Structure

This thesis is divided into six chapters that dwell upon the various elements of the study. Chapter 1 will introduce the study through an overview of the background, objectives of the research, and the main research questions that will be used to direct the study. Chapter 2 provides a literature review of the research on Generative AI and its effects on autonomy and managerial control of software development, paying specific attention to the Nepalese fintech market. Chapter 3 outlines the research method that is to be used to address the research questions, such as the research design, data collection techniques, and study analysis techniques. The study gives the survey results in Chapter 4 and offers a statistical analysis of the results obtained. Chapter 5 analyses the results and compares them to the literature and the meaning of the consequences to the autonomy and managerial control within the Nepal fintech setting. Lastly, Chapter 6 gives a summary of the main findings, contributions of the study, and recommendations of the future research in the area of Generative AI in regulated industries.

2 Literature Review

2.1 Introduction to Generative AI in Software Development

Generative AI (GenAI) is artificial intelligence that is capable of working out new content (text, images, or code) through patterns contented by extensive datasets. GenAI tools such as GitHub Copilot, ChatGPT and others have transformed how developers work in the field of software development. These tools apply complex machine learning models (especially large language models) to help developers, by proposing code snippets, creating whole functions, doing debugging and writing documentation (Bharti et al., 2024). The Generative AI positively impacts the developing process by improving and accelerating the routine work, minimizing manmade mistakes, and making the work of creators overall more productive by driving suggestions and automating processes. The tools aim at assisting developers in the different phases of the software development lifecycle, thereby accelerating, simplifying and reducing error vulnerability in the process.

GenAI tools via software development have become a significantly more popular trend in recent years, as it is a wider shift towards automation and the integration of AI into various sectors. However, these tools are becoming more and more popular among developers, junior and senior, who are increasingly using them to improve their coding behavior, workflows, and solve more advanced problems (Tejeswar Reddy Velpucharla, 2025). Although the tools bring about considerable advantages, including more efficiency and saving of time on repetitive activities, they also present numerous challenges. Such concerns include code transparency, accountability and the possibility of over relying on automated recommendations. Caught between software development and regulation AI is increasingly having a greater role, it becomes essential to realize how it can affect the freedom of developers as well as the oversight of managers, particularly in highly regulated fields (such as fintech/banking).

2.2 Theoretical Review

2.2.1 Self-Determination Theory

The theory of Self-Determination (SDT) is a theory of human motivation proposed by Deci and Ryan, explaining how autonomy contributes to the performance of an individual (Legault, 2017). SDT proposes that people would be interested in activity in the case they will feel independent, useful and connected with others. SDT can be used in the case of software development to investigate the impact of Generative AI (GenAI) tools on developer autonomy in learning and problem solving. GenAI tools can stimulate more autonomy as developers are free to write code, debug and solve problems on their own, which is particularly helpful among junior developers. The developers can be more competent and motivated as they have more control over their work, which leads to increase about the engagement and creativity (Chang & Huang, 2026). Nevertheless, it is worth mentioning that the control imposed by the managerial position demanded to make sure that the security and regulatory frameworks are enforced in such industries as fintech might potentially impede the freedom of choice that GenAI tools allow. This conflict is the autonomy versus control, and it is through SDT that the tension between autonomy and control will be the centre of the understanding regarding the dynamics of using GenAI among Nepalese fintech software teams (OECD, 2025a).

2.2.2 Labour Process Theory

Labour Process Theory (LPT), as measures proposed by Braverman touches upon the methods according to which the management has employed technology to dominate and organize working procedures. According to LPT, the implementation of new technologies tends to redistribute power between the employer and the employees, especially through the establishment of managerial control that enhances the standardization of the working tasks (BANK & Payment, 2018). In the example of GenAI applications in software development, such tools not only can increase developer autonomy through automation of repetitive work but also can offer suggestions to a programming task, yet also

bring new managerial administration. With the increase in the use of GenAI in the development of fintech and banking software projects, the managers are likely to institute more rigorous review, approval, and monitoring of the AI written code to make sure that it complies with and meets security standards (Moharrak & Mogaji, 2025). LPT gives us insights on how GenAI tools can be involved in the restructuring of the working process within the Nepal fintech business where the quality of codes regarding regulatory pressure is high, and managers need to take control to reduce the risks of AI-generated code.

2.2.3 Sociomateriality and Affordance Theory

Sociomateriality Theory of work, as presented by Orlikowski and Scott perceives technology as an enabler and constraint in the workplace. This approach recommends that technology, including Generative AI tools, is like a factor influencing how individuals work and affecting how people behave within organisations (Orlikowski, 2010). GenAI applications are not merely impartial tools but built into social and organizational contexts, where they do not only facilitate particular behaviors (e.g., allowing greater autonomy in problem-solving), but also constrain others (e.g., enhancing the managerial control so that people comply). The Affordance Theory (Gibson, 1979) states that GenAI tools have some affordances, or possible actions that the tools support, yet also some limitations that restrict the ways developers can act in the tools (Zhao et al., 2025). GenAI tools may provide more autonomy to developers in the Nepalese fintech team as they automate repetitive tasks, but would also require more vigilance to correct the generated code to meet regulatory and compliance needs. Therefore, Generative AI and developer interaction is more of a complicated and negotiated process, which entails affordances, constraints, and an ever-changing relationship between developers and management.

2.2.4 Integrating Theories in the Nepalese Context

The three theories, that include Self-Determination Theory (SDT), the Labour Process Theory (LPT), and Sociomateriality and Affordance Theory, present a complementary perspective regarding the effects of using GenAI tools in software development teams.

SDT serves to emphasize how autonomy can be among the primary motivators and engagement drivers of developers and LPT gives a clue as to why managerial control is frequently amplified by technological advancements, and Sociomateriality and Affordance Theory aid in understanding how GenAI tools simultaneously empower and restrict developer autonomy within the framework of a controlled workplace, such as Nepalese fintech. Together, these theories provide a more detailed conceptualization to the autonomy vs. control relationship in the application of GenAI between junior and senior developers that sheds some light into the complex balance that must be created between the freedom of developers and the need of managerial control in very compliance-oriented industries.

2.3 Empirical Review

The study of the role of Generative AI (GenAI) tools in the world of software development is becoming more and more widely researched. Research shows that such tools such as GitHub Copilot and ChatGPT have the potential to significantly improve the productivity of developers and automatically perform routine tasks. Indicatively,(Bauer, 2024) showed that GitHub Copilot can be used to improve the quality of codes in certain situations but observes that these enhancements are situation specific. GenAI tools could undermine learning autonomy in a highly controlled sector, as it is in case of Nepalese fintech since new managerial control procedures, such as compulsory reviews and compliance checks, are put in place to make sure that the AI-generated code is of the standard quality in terms of security and compliance. This brings out the tension that exists between autonomy and managerial control in controlled settings. The combination of these tools, as (Shrier, 2022) reports, can also respond to the increasing demand of reliable and safe software systems but can also create concerns regarding autonomy and control, particularly in the Nepalese fintech industry, which is largely regulated by the authority of Nepal Rastra Bank (NRB).

Research on the variations in the level of differences in junior and senior developers when using GenAI indicates as well that the effect in autonomy varies according to the experience level. As (Li et al., 2024) notes, the use of AI tools by senior developers can

be of immense help since it makes the task faster, less prone to errors, and the developers can apply their experience and knowledge to confirm the recommendations made by the AI. By contrast, those developers cannot apply these tools to a wide extent; they seek the solution more often, which can make them more autonomous in the short term, but limit their ability to test the solution generated by AI since they have no experience in checking the generated solution (King Costa et al., 2024). Posit that, although GenAI tools can assist junior developers to become faster and more efficient at their work, they also can lead to the increase of the requirement to care about the work supervision and the control on the managerial level in order to detect errors as their impact on the production systems may occur. This is particularly applicable in controlled industries like fintech, where the risks associated with compliance and security are significant, and where such tools can contribute unintentionally to the development of an addiction to AI-generated code, then the question of accountability and responsibility in the case of errors in the production environment arises.

Besides, the effect of GenAI technologies in controlled settings, e.g., Nepalese fintech and banking, makes it difficult to consider the problem of security, compliance, and ethical concerns. Research, such as (Lami et al., 2026) discovered that AI-generated code occasionally became a security vulnerability and more rigorous managerial mechanisms were needed in a business environment where regulatory compliance was the priority. According to the (Briken et al., 2017) Payment Systems Oversight report the issue of maintaining security and risk management in Nepalese fintech is also of importance; this is where GenAI tools should be overshadowed and thoroughly reviewed in accordance with compliance standards. These works substantiate the Labour Process Theory that states that technology utilization in controlled settings enhances managerial control over provisions to make sure that devices such as GenAI do not breach strict regulatory systems. The observation is consistent with Sociomateriality Theory in which the interactions between technological affordances and social structures produce complex hybrid impacts of autonomy and control.

An issue of balancing between autonomy and managerial control is especially acute in the sphere of Nepalese fintech, which is strongly subjected to the aids provided by the regulatory policies provided by the NRB (NRB, 2023). Say that the dynamics of autonomy and control are not inevitably opposite but depend on each other, and the hybrid effects can manifest themselves as the developers can be more free in fulfilling the task but also the stricter the controls are due to the existing regulatory pressure. This corresponds to the findings of (Oecd, 2025a), which propose that amid the increase in AI tools usage, their infusion in regulated markets should not only be planned in terms of productivity gains, but also in relation to the managerial control necessary to reduce the potential risks that the non-adherence to the tool and its safety may bring. These conclusions imply that, although Generative AI applications have the potential to enhance the principle of learning independence and enhance productivity, the integration of the new technology into workflow and balancing it with the managerial control required to ensure compliance in the Nepal fintech and banking industry can benefit only those who act wisely.

The use of AI tools in governance is also supported in the future by further research. According to (Kim et al., 2024), an increasing number of companies including regulated ones have no formal AI governance rules or training. Since AI technologies, such as GenAI, are becoming more integrated into the software development process, organizations are being called upon to develop policy and governance frameworks to control the risks involved in their use. This corresponds to the results of (Drossel & Hallbeck, 2024), who additionally mentioned that without a well-defined governance practice, GenAI tools may introduce ethical and compliance risks to the sectors such as fintech. The study reveals that in the case of Nepalese fintech teams, the lack of clear guidelines regarding the use of AI tools may increase the degree of managerial control and the team is likely to need additional regulation so that possible security concerns or violations of national legislation may be prevented such as guidelines offered by the Nepal Rastra Bank.

Lastly, (Capraro et al., 2023) found that there is an essential gap in knowledge regarding the impact of AI-generated code on team work and the characteristics of developers in

the long run. Their research observed that AI applications have the potential to enhance the personal productivity of members, but the incorporation of AI resource into teams diminishes peer interactions and knowledge sharing to the disadvantage of junior developers, who rely more on AI-generated solutions. Such loss of interaction may negatively affect the learning process and development of the necessary coding skills because junior developers may disregard peer mentorship in favor of artificial intelligence suggestions. This may be especially true in Nepalese fintech, where teams are frequently created with developers of both experience levels and may need greater direct management to see to it that the less experienced developers are getting proper instruction without developing overdependence on AI-based tools.

2.4 Policy Review

In software development, especially those with more rigorous regulatory frameworks, policy frameworks have become central to the implementation and regulation of the use of Generative AI (GenAI), such as GitHub Copilot and ChatGPT. Policy guidelines toward AI around the globe highlight the significance of transparency, accountability, ethics, and risk reduction in the application of AI (Jackson et al., 2025). According to the (Oecd, 2025b), the development of clear accountability regarding AI applications implies that the responsible AI governance would implement clarity regarding the person responsible to the outcomes of AI systems and places a clear understanding that must be made on whether such systems are audible and transparent. In software development environments, particularly with the utilization of code generators, policies and governance frameworks should make certain that the AI devices are clarified, auditable, and are corresponding with moral standards. This will be critical in the ability of maintaining managerial control and safeguarding developer autonomy without violating legal and industry standards. These policies deliver organizational guidelines in which the trade-offs between free will and punishment in the use of AI tools can be negotiated.

In the Nepalese experience, the Nepal Rastra Bank (NRB) developed policy reactions peculiar to the financial sphere, so that AI devices complied with high security, compliance

and consumer protection standards. The NRB AI Guidelines included in the 2024/25 Monetary Policy provide the rationale in the fair, explainable, and accountable AI implementation in Nepal financial institutions (OECD, 2024). The guidelines are aimed at decreasing operational and ethical as well as cyber risks linked with AI in order to ensure that organizations adopt proper governance framework in the use of AI. Banking institutions have been supposed to have good internal audit controls, and board and senior management controls, which directly reflects on software teams. It means that although the junior developers can gain more autonomy in their learning process, the requirement of managerial control in the controlled setting will necessitate supervision and analysis of AI-generated code, particularly.

According to the Payment Systems Oversight Report 2023/24 issued by NRB, the central bank has a role of regulating the development of digital payment systems in Nepal. Although this report concentrates on financial transaction system, its implications of AI tool in Nepalese fintech is obvious. The regulatory landscape will necessarily influence the implementation of the Generative AI technology within the Nepalese software teams, particularly within the fintech and banking industries, in which the adherence to the security standards becomes the first priority. These laws would require the involvement of managers, especially when it comes to inspecting the code that AI produces to comply with industry security and privacy regulations. The implementation of AI-based systems should thus be in tandem with the current regulatory provisions, and innovation should moderate consumer data security as well as the integrity of the system. The Regulatory Sandbox program of NRB promotes the idea of controlled innovation, where fintech firms are able to test AI applications under supervision, as part of the reality that the issue of oversight is significant in the context of any AI implementation in these domains.

Emerging national AI governance systems in Nepal focus on the establishment of legal and regulatory systems to deal with privacy and the security of information in AI uses, as well as anti-discriminatory actions. Recent AI policy efforts are aimed at setting up rules on the responsible implementation of AI and especially the banking and fintech

sectors, where the ethical and compliance risk is increased (Omoleye, 2020). The management of AI in Nepal requires that the organizations should use in-house controls and oversight along the AI lifecycle and more specifically, in highly controlled industries. These frameworks addressing problematic aspects of AI-applicable software oversight, when applied properly, guarantee the tools of AI such as GenAI may find application in fintech software teams and preserve data integrity and ethical standards. Such implementation policies are absolutely necessary in ensuring that autonomy in the use of AI tools does not affect the policy of security and regulatory compliance, particularly in fields such as Nepalese fintech where tool control by the managers is paramount to the risks surrounding AI-generated code (Tripathi, 2025).

The wider consequences of AI governance are the pre-eminence of policy-standing around the autonomy-managerial control over software development. As organizations and regulating authorities continue to work on better definitions regarding the utilization of AI tools, they are to think of ways to maintain the freedom of developers, besides making sure that the generated code consists of ethical and compliance-based pieces. As an example, the more people start using Generative AI tools, the more important it will be to create models of governance, which will provide control but not inhibit innovation. As empirical evidence demonstrates, the methods of governance in regulated industries are more likely to add another layer of managerial control, especially in the areas such as fintech, where the issues of data safety and consumer protection are of the primary concern. These relationships of autonomy and managerial control in the utilisation of AI tools should be negotiated well within the policy making mechanisms that authorise the developers to operate in an innovative manner yet adhere to the ever-expanding standards of security and ethics.

2.5 Conceptual Framework

2.5.1 Autonomy vs. Managerial Control

The connection between autonomy and managerial control on usage of Generative AI (GenAI) tools is complex and multidimensional, especially when the environments are regulated, such as fintech and banking. Autonomy is a concept of the freedom that developers possess to make decisions, solve issues, and implement tasks, whereas managerial control implies the supervision and rules that guide work conformity to organizational standards and rules on compliance, as well as ethical standards (Han & Ko, 2025). Autonomy in a conventional development environment gives developers a chance to develop creativity, problem solving abilities and expertise without any supervision. Nonetheless, the autonomy and control ratio is challenged with the inclusion of GenAI tools, and in this case, managerial control is required to make the AI-generated products safe, ethically responsible, and devoid of mistakes. GenAI can be used to increase autonomy by automating routine coding operations, even though it also raises managerial operation costs, necessary controls, and compliance tests, along with security audits. Thus, the connection between autonomy and managerial control may be regarded as both supportive and contradictory. Although AI tools enable autonomy, there is managerial control that ensures risks incurred by the AI-generated code like security vulnerability or non-compliance are discouraged (Al-Hashimi et al., 2025).

2.5.2 Generative AI as an Enabler and Constraint

GenAI tools may serve as facilitators and barriers of the software development process. On the one hand, they allow the developers to work more autonomously and effectively, making them more autonomous. GenAI tools can represent the automation of repetitive tasks, including the creation of codes, correction of bugs, and documentation, which relieves developers and lets them focus on the more intricate elements of the software development process. This increases productivity enabling developers to learn at a faster rate, which improves their learning autonomy and ability to solve problems (Ebert & Louridas, 2023). Conversely, the implementation of GenAI tools also comes with a few

limitations which are in the form of managerial control. In controlled systems such as fintech and banking, AI-generated code should be carefully reviewed to secure its business practice in line with security and regulation. This excessive control has the potential to reduce freedom, where developers usually have to make their code meet a series of checks and tests. Moreover, excessive dependence on AI technologies can cause dependence, which diminishes the capacity of developers to address problems on their own. GenAI tools, therefore, act as both empowering agents of autonomy and limiting factors of developer autonomy, especially when credentialed industries are involved, where managers have to be in control.

2.5.3 Junior vs. Senior Developers

Juniors and senior developers have vastly different experiences with autonomy and managerial control of GenAI tools usage. Junior developers may also feel more autonomous when working with GenAI tools because such tools enable them to complete work faster and address issues that they cannot grapple with independently. Nevertheless, they also have a higher probability of gaining more managerial control because they lack experience in verifying or adapting AI-generated code fully. Being less experienced to find out mistakes or potential security issues that could be dangerous, junior developers can be more dependent on AI recommendations and are subjected to more thorough inspection and supervision by senior colleagues or managers (Feng et al., 2026). Conversely, senior developers are the ones who enjoy more freedom, in their usage of the GenAI tools due to the vast experience that they have in matters related to it, and they can easily determine the usefulness of suggestions made by the AI. They are able to employ AI tools strategically following the suggestions with proper attention to the quality of the code, its security and compliance. The elder developers are also less likely to be under managerial scrutiny as they are experienced enough to assume greater accountability over the quality of their work, and their opinions on the fitness of AI-generated code to go into production are frequently final.

2.5.4 Context of Nepalese Fintech

The regulatory environment and growing use of digital tools define a balance between autonomy and the control of managers in the context of the Nepalese fintech and banking domain. The Nepal Rastra Bank (NRB) and the Payment Systems Oversight adopt explicit laws to the financial institutions particularly regarding the questions of compliance, security and consumer protection (Al, 2021). Since GenAI tools are increasingly utilized in the fintech industry in Nepal, the developers in the field are tasked with the challenge of balancing autonomy when applying AI tools and the management discipline to achieve regulatory standards. In this case, junior developers might feel empowered by the classes of efficiencies that will be carried out by the GenAI tools and will somehow feel more supervised because of the compliance requirements imposed by the NRB. At the same time, the senior Nepalese fintech developers will have an opportunity to use AI tools in a more efficient way and handle the risks of security and non-compliance with the help of more advanced oversight. This involves a complicated situation in which autonomy in software development is conditioned by both the technological applicability of GenAI tools and by regulatory requirements on the part of the Nepal Rastra Bank.

2.6 Research Gap

The gap in the existing body of empirical research on the application of Generative AI (GenAI) tools to the Nepalese fintech and Nepalese banking industries is substantial. Although studies on AI tools in the field of software development are increasing worldwide, with a major focus on high-income economies, little has been done regarding the adoption and integration processes of AI tools in low-to-middle-income countries (LMICs), such as Nepal (Lainjo, 2024). Managerial control and autonomy within Nepalese fintech teams remain under-studied, regardless of their legitimacy and regulation in the framework of such industries as banking or digital payment. Many of the available studies do not account for specific challenges of fintech business in LMICs, including the lack of resources, the pressure on regulatory compliance, and the necessity to have the financial systems that are safe. Consequently, the situation is characterized by the lack of insight

into the consequences of the evolution of software development workflows triggered by GenAI tools, the stability of directorial authority over autonomy of programmers, and the responsibility to ensure compliance with the regulatory requirements.

Moreover, the absence of literature dedicated to the difference in the experience of junior and senior developers with GenAI tools can be seen especially in an actively regulated market segment like the Nepalese fintech market. The dubbing has demonstrated that junior developers are more likely to reap the advantages of the higher autonomy offered by AI tools, whereas senior developers use them in a much more strategic manner, as they build them into a more intricate system (Kulkarni & Barde, 2024). However, very limited research is done on such a dynamic within the Nepalese setting where the association between autonomy and managerial control may not be the same due to the regulatory setting. This research gap leads to the need to conduct further empirical studies that would probably reflect the aforementioned experience of developers engaging in the specified area specifically how they managed to strike the autonomy-control paradox when applying GenAI tools. The study of these dynamics in Nepal will help address a significant gap and give insightful information on how AI can be successfully implemented in controlled settings in the low-to-middle-income countries.

2.7 Hypotheses Development

H1: Learning Autonomy Hypothesis:

Junior developers will perceive greater learning autonomy when using Generative AI tools compared to senior developers. The assumption behind this hypothesis is that the junior developers, who are still learning and could be less experienced, are more likely to rely on AI tools in generating the code and solving the problem, which makes them feel more independent in the process of learning.

H2: Problem-Solving Autonomy Hypothesis:

The generative AI will greatly improve the autonomy in problem solving of junior developers who will be able to solve problems that they would have not otherwise addressed.

Senior developers will, in contrast, be more strategic in using such tools, incorporating AI-generated solutions with their own knowledge and being less dependent on AI when it comes to autonomy in solving problems.

H3: Managerial Control Hypothesis:

Generative AI tools will enhance managerial control and oversight in Nepalese fintech teams, notably in regulated settings. With AI tools being utilized to generate codes and debug, this means that managers will have to adopt more stringent review and approval of AI-generated code to ensure it meets regulatory requirements and adheres to security measures.

H4: Accountability and Control Hypothesis:

The use of generative AI will enhance accountability in teams, especially among the junior developers, because it will necessitate more managerial control over the AI-generated code to ensure that it complies with the compliance and security guidelines. Junior developers, potentially more reliant on AI-generated suggestions, will be subjected to greater scrutiny to avoid mistakes in code and make sure that controls are upheld.

H5: Technological Affordance Hypothesis:

Generative AI tools will provide more freedom to programmers in their daily work, including code creation, debugging, and documentation. However, the tools will also necessitate increased managerial control to ensure that the generated code adheres to industry-specific regulations, security requirements, and compliance standards in a fintech environment.

H6: Junior vs Senior Autonomy Hypothesis:

The autonomy of junior developers will also be increased due to the tools of Generative AI, since the latter can help them to solve the tasks on their own. Nevertheless, the junior developers will also be more monitored as they will have fewer experiences in the area of making sure that the code produced meets the regulatory requirements. In contrast,

senior developers will have more strategic control over the tools and face less oversight, as their experience allows them to ensure code quality and compliance on their own.

3 Research Methodology

3.1 Introduction

This chapter defines the design of methodology to analyze how Generative AI tools can influence learning and problem-solving autonomy and managerial control among software developers in Nepalese fintech and banking project teams. The chapter is developed in such a way that it fits closely to the research questions and objectives identified in the previous chapters, especially the necessity to compare junior and senior developers as well as evaluate how GenAI functions as an enabler of autonomy, as an organisational control tool, or a mixture thereof.

The suitable approach to the research is a quantitative methodology since the research questions will gather and quantify the respondents patterns on GenAI usage, perceived autonomy, and perceived managerial control, patterns on the similarity of the respondents between junior and senior developers (Zhu & Yang, 2026). The study thus believes in measurement, comparison, and association as opposed to depth of interpretation. The rationale behind this decision can be explained analytically, since the dissertation will also be focused on describing the perceptions, as well as determining whether one can observe any relationships between GenAI use and autonomy-control results in an environment of regulated use of software.

The Nepalese fintech and banking environment also legitimizes an organized approach. The payment sector in Nepal is a formal licensing sector with the oversight and regulatory supervision of Nepal Rastra Bank, and indicates that software work is done with a high level of compliance standards, as compared to many other less-regulated sectors of the digital industry. Simultaneously, the most recent report on payment oversight in Nepal demonstrates the ongoing growth of the sphere of digital payments, which supports the significance of safe and regulated delivery of software to the area (NRB, 2023).

3.2 Research Philosophy and Approach

The research falls within a positivist research philosophy. Positivism is applicable in the context where the aim is to observe quantifiable social phenomena, convert perceptions to variables, and challenge patterns by statistical means (Park et al., 2020). In this dissertation, the use, autonomy, and managerial control of GenAI are explored as a construct, which can be operationalised as items on a survey, and analysed quantitatively. This orientation aims at objectivity, uniformity of measurements, and system-atic description of the patterns in the collected data.

The study takes a structured approach guided by the theoretical background discussed in Chapters 1 and 2. Instead of deriving themes from open-ended narratives, the study uses the theoretical background discussed in Chapters 1 and 2, particularly Self-Determination Theory, Labour Process Theory, and Sociomateriality/Affordance Theory, to guide the design of the survey and the interpretation of findings. Practically, it implies that the increased AI use can be linked to the effect of more perceived autonomy, whereas in controlled settings, the same use can also be linked with more stringent managerial controls, like approvals, monitoring, and accountability demands. This approach is appropriate because it allows the dissertation to examine whether patterns related to empowerment and oversight are visible among the targeted population.

3.3 Research Design

The study has a quantitative, cross-sectional survey with primary data. An example of a cross-sectional design is when it is necessary to take a picture of relationships among variables at a single moment in time, but not to trace the change over time. Cross-sectional studies of a definite nature, in which exposures and outcomes are to be measured, are analytical studies that are specifically useful when the study focuses on identifying associations in a defined population (Pérez-Guerrero et al., 2024). The given design aligns with the current dissertation since the research aims at quantifying the current

trends in the utilization of GenAI and the current understanding of autonomy and managerial control among developers working on the projects of Nepalese fintech and banking firms.

The survey technique is also suitable since it enables the collection of data on several respondents operating in various organisations with a standard measurement system. According to recent methodological advice, questionnaires are especially appropriate when the research involves closed and similar answers among the respondents and when the researcher wants structured information to analyze statistically (Sharma & Ruikar, 2025). Survey research, in its turn, is a good fit with this dissertation topic due to the ability of operationalising the main constructs with the help of consistent Likert-style and categorical items.

The primary weakness of a cross-sectional design is the impossibility of building causal relationships. Due to the fact that both independent and dependent variables are measured simultaneously, the result will be an association instead of a cause (Pérez-Guerrero et al., 2024). The limitation will be fully mentioned in the dissertation, but it does not nullify the design since the purpose is to observe patterns and relationships instead of proving the causality of time.

3.4 Population, Sampling, and Unit of Analysis

The target market includes software developers employed in the Nepal fintech and banking software project teams. The individual developer is the unit of analysis. The interest is grounded in the idea that the dissertation is interested in the experiences of developers using GenAI tools in terms of learning, problem-solving, and managerial control.

The respondents will be stratified into two different groups, that is, junior developers and senior ones. Such stratification is necessary, as one of the most obvious claims in the available literature is that the organisational implications of Generative AI are not homogeneous and can be found at different levels of experience. The junior developers might rely more on the suggestions developed by AI and, as a result, might receive more reviews and oversight, whereas senior developers can engage in using the same tools less

often and more strategically (Adam, 2026). The comparative aspect is thus not a supplementary feature but the key to the contribution of this dissertation analytically.
Since it is a challenging task to get a complete sample frame to the software developers in this industry, purposive and snowball sampling will be employed in the study. The sample will be recruited via LinkedIn, alumni groups, communities of developers, and via professional connections in the fintech and banking software ecosystem. It is a practical and contextually appropriate plan since access to members of regulated firms might be limited, and populations of specialists are often out of reach in pure probability sampling. Nevertheless, non-probability sampling also implies that the findings should not be read blindly, particularly when it comes to matters of generalisability outside the study sample.

The proposal will aim to get at least 50 complete responses in the dissertation. Given this sample size, the study is intended to provide exploratory and descriptive insight rather than support advanced multivariable statistical testing. This is a small sample, but it is a context-specific and exploratory study. Its usefulness is not based on generalisation of a nation; rather, it will produce empirical evidence in an under-researched sectoral context.

3.5 Data Collection Method

An online questionnaire will be used to gather primary data. A web-based format is appropriate owing to several reasons. To begin with, the target population is digital and professionally active in the internet space. Second, a Web-based survey promotes the effective allocation among various companies and networks. Third, it decreases administrative expenses and enhances respondent convenience, which is significant when surveying working professionals.

There will be four sections in the questionnaire. The demographic and role-related variables will be the first section and will include the age group, gender, years of experience, employment context, project criticality, and seniority status. The second part will gauge

the GenAI utilization, the frequency of utilization, and the areas where the utilization happens, like coding, debugging, testing, documentation, and problem-solving support. Perceived learning and problem-solving autonomy will be measured in the third section. The fourth part will determine perceived managerial control in the form of approval, review intensity, monitoring practices, policy restrictions, and accountability expectations.

Likert-type questions would suit the autonomy and managerial control questions since respondents have the opportunity to mark levels of agreement uniformly, and the perception can be quantified through analysis of the questions (Koo & Yang, 2025). Current methodology evidence shows that Likert-based scales will always be some of the most widespread instruments in survey research because they can help to produce structured numerical data productively as well as reduce ambiguity in the interpretation of responses (Liu et al., 2025).

3.6 Instrument Development and Measurement

The instrument will be constructed by transforming the conceptual dimensions, determined in Chapters 1 and 2, into quantifiable items. The instrument will measure GenAI use, perceived autonomy, and perceived managerial control as the main study variables. Seniority will serve as a grouping variable for comparing junior and senior developers.

The questionnaire will be developed with a focus on content, clarity, and construct consistency. The latest studies on open-access instruments development reveal that valid instruments are not ready to be deployed in practice before they are composed with strong designs, face and content validity tests, and reliable testing (Alzaben et al., 2024). A limited number of well-versed persons, including academic supervisors and experts in technology, will therefore review the draft survey to ensure wording clarity, relevance of items, and logical flow.

The pilot test will then be supported using a small sample of respondents representing the target population. Pilot testing is significant as it may unveil the ambiguity of the wording, the over-Feasibility of the survey, and the poor sequence of the items before the actual data collection procedure. The last instrument will strive to be concise without covering less conceptually, as long questionnaires tend to decrease the quality of completion.

3.7 Reliability and Validity

Reliability means the consistency of the measuring device. In this research, reliability will be determined using Cronbach's alpha with multi-item scales used by measuring autonomy and managerial control. More recent questionnaire investigation studies still manage Cronbach's alpha as a conventional approach to examining internal consistency in structured survey tools (Alzaben et al., 2024). Coefficients above 0.70 will be considered as acceptable to exploratory social research, but high values will be preferred.

Validity will be taken care of in a number of ways. Grounding of items in the literature and theoretical framework will enhance content validity. Expert and pilot reviews will be done to assess face validity. Construct validity shall be viewed in terms of the logical coherence of item groupings as well as the logical correspondence of the theoretical constructs and the measures on the survey. Considering this is not the main psychometric scale-development project, the focus is not to result in an all-purpose measure, but to make sure that the measures are good enough to serve the analytical function of this dissertation.

3.8 Data Analysis Plan

Data will be vetted through completeness, missing values, inconsistent answers, and obvious outliers. The sample will then be summarised in terms of frequencies, percentages, means, and standard deviations, among others, using the aid of descriptive statistics. This step will determine the portrait of respondents and the general trend of GenAI use.

Given the limited sample size, the analysis is intended to be primarily descriptive rather than predictive.

The study will provide the answers to the research questions by comparing the junior and senior developers in terms of regular usage of the GenAI, where it was applied, perceived learning independence, and the perceived control by managers. The analysis should be carried out primarily on descriptive statistics including frequencies, percentages and mean scores as well as on a simple comparison of the answers to both groups. It will assist in illustrating the overall trends in the experience of the use of GenAI tools by junior and senior developers in Nepalese fintech and banking teams.
Due to the limited sample that the study relies on, which is context-specific, regression and moderation testing will not be utilized in the analysis. Rather, the emphasis will be placed on the description of response patterns and pointing out visible distinctions between junior and senior developers. This approach is more suitable for the size and exploratory nature of the study.

Discussion will not presume that autonomy and managerial control are easily opposed to each other. Rather, the results will be discussed in a manner that takes into consideration how both can be used in a managed situation in which GenAI tools can hone efficiency, but at the same time need to be supervised.

3.9 Ethical Considerations

This research involves human subjects, and as such, ethics in research must be given serious consideration. The online questionnaire will be voluntary, and informed consent will be provided on the first page of the questionnaire. The purpose of the study, the approximate duration of participation, will be disclosed, the study will be voluntary, and the respondents will have the right to withdraw at any time.

The survey will be anonymous. No name, employer reference, confidential code, or proprietary organisational information will be obtained. This is especially necessary since

issues of tracking, review vigor, and policy constraints can be professionally tense. Survey research on privacy and consent conducted recently reveals that the participants are initially worried about the control, privacy, and the circumstances in which the data is utilized (Kaplow et al., 2024). That is why the wording of the items will be neutral, the storage will be limited, and the results will be reported only in aggregate.

Before data collection can commence, ethical approval will be obtained in regard to what is required by the institution. The data will be kept in a secure digital storage in password form, with only the researcher allowed access.

4 Finding / Results

4.1 Introduction

This chapter provides the statistical results derived from the survey conducted with the help of SPSS. This includes data from 56 software developers in the banking and fintech industries in Nepal. This chapter aims to present the findings of demographic profile, use of Generative AI (GenAI) tools, perceived learning autonomy and control. The results are expressed in terms of descriptive statistics and inferential statistics (without interpretation).

4.2 Respondents' Demographic Characteristics

Respondents' demographics offer a snapshot of the sample.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	12	21.8	40.0	40.0
	3	15	27.3	50.0	90.0
	4	1	1.8	3.3	93.3
	5	2	3.6	6.7	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Figure 1. Age Wise of the survey respondents.

Most of the respondents are in the 25-30 years age group (50%) and 18-24 years (40%). Fewer are in the older age categories, suggesting the sample is dominated by young adults.

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	24	43.6	80.0	80.0
	2	6	10.9	20.0	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Figure 2. Gender Wise of the survey respondents.

The gender distribution is highly skewed in the male direction, 80% male and 20% female. This is in line with the gender ratio in software development.

Experience levels among respondents are well-balanced:

Exp

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	20.0	36.7	36.7
	2	9	16.4	30.0	66.7
	4	10	18.2	33.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Figure 3. Experience Level-wise of the survey respondents.

This survey's responses 36.7% have 0-2 years' experience, 30% have 3–5 years, 33.3% have more than 10 years. This means we have some developers that are less experienced and some that are more experienced.

Regarding job roles:

Role

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	23.6	43.3	43.3
	2	16	29.1	53.3	96.7
	3	1	1.8	3.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Figure 4. Job Role Level-wise of the survey respondents.

This Survey Shows 43.3% are junior developers, 53.3% are senior developers. This suggests a slightly greater proportion of senior workers.

Criticality of projects shows that:

Crit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	7.3	13.3	13.3
	2	15	27.3	50.0	63.3
	3	11	20.0	36.7	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Figure 5. Project Level-wise of the survey respondents.

This means that most of the respondents are engaged in projects under compliance and regulation. 50% of the respondents work on moderately critical projects while 36.7% work on very critical projects.

4.3 Use of Generative AI tools

Based on the results, respondents appear to have high usage of Generative AI tools.

Freq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	8	14.5	26.7	26.7
	4	22	40.0	73.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Figure 6. Usage of Generative AI tools by the Survey respondents.

Most respondents (73.3%) stated they use GenAI tools very often, with 26.7% stating they use them sometimes. None reported low or non-use. This reflects that GenAI tools are being extensively used for development.

Then Figure 7 says Task-Based Usage:

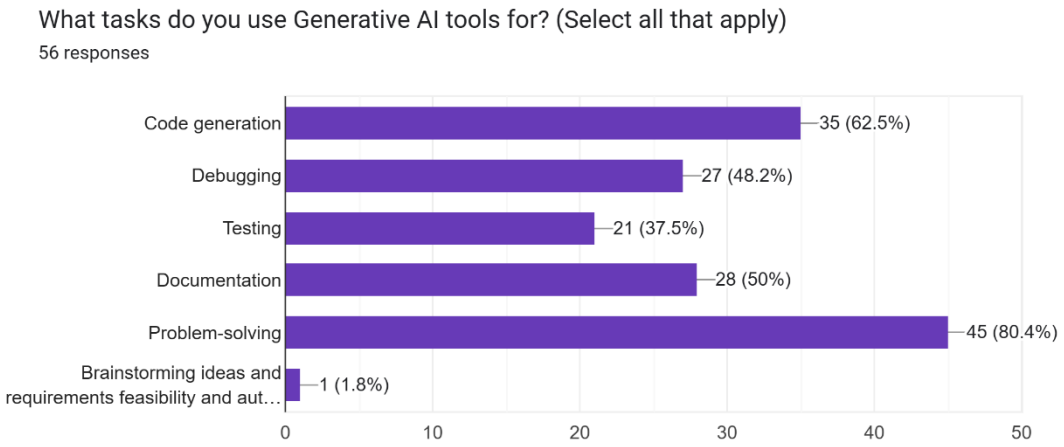

Figure 7. Task-Based Usage by the survey respondents.

Survey participants used GenAI tools for Problem-solving: 80.04%, Code generation: 62.5%, Documentation: 50%, Debugging: 48.2%, and testing: 37.5%. The most frequent uses are for problem-solving, code generation, and documentation. This suggests that GenAI tools are being used for both programming and non-programming tasks.

4.4 Descriptive Statistics of Key Variables

We used descriptive statistics to analyse the average of key variables such as productivity, autonomy, learning, and control.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Prod	30	1	5	2.47	1.167
Free	30	1	4	2.20	.805
Learn	30	2	4	3.37	.556
Control	30	1	4	2.97	.809
Oversight	30	2	4	3.07	.583
Valid N (listwise)	30				

Figure 8. key variables such as productivity, autonomy, learning, and control.

Our findings indicate a relatively high perceived support for learning from GenAI. But the level of perceived autonomy is somewhat low. Control is moderate and supervision is relatively high.

4.5 Independent Samples T-Test

An independent samples t-test was used to test the differences between the perceived autonomy of junior developers and senior developers.

	Number	Mean	Std. Deviation	Std. Error Mean
Junior developers	13	2.31	.751	.208
Senior developers	16	2.19	.834	.209

Table 1. Group Statistics by Role

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	f	**Sig.**	**t**	**df**
Equal variances assumed	0.84	.774	.403	27
Equal variances not assumed			.408	26.673

Table 2. Independent Samples Test

	t-test for Equality of Means			
	Sig. (2-tailed)	**Mean Difference**	**Std. Error Difference**	**95% Confidence Lower**
Equal variances assumed	.690	.120	.298	-.491
Equal variances not assumed	.687	.120	.295	-.495

Table 3. Independent Samples Test- t-test for Equality of Means

The average autonomy score for junior developers is 2.31 and for senior developers, it's 2.19. The significance value (p = 0.690) is greater than 0.05. This suggests there is no significant difference in autonomy between junior and senior developers.

4.6 Correlation Analysis

We performed correlation analysis on the association between the frequency of GenAI use and control.

The results are as follows:

Correlations

		Freq	Control	Oversight
Freq	Pearson Correlation	1	.070	.202
	Sig. (2-tailed)		.715	.286
	N	30	30	30
Control	Pearson Correlation	.070	1	.297
	Sig. (2-tailed)	.715		.111
	N	30	30	30
Oversight	Pearson Correlation	.202	.297	1
	Sig. (2-tailed)	.286	.111	
	N	30	30	30

Figure 9. The correlation between the variables using GenAI and managerial control.

Control and Frequency: r = 0.070, Frequency and Oversight: r = 0.202, Control and Oversight: r = 0.297. The correlation between the variables is weak to moderate and insignificant. This implies that the link between using GenAI and managerial control is weak.

4.7 Crosstab Analysis

Role * AutoComp Crosstabulation

			AutoComp				
			1	2	3	4	Total
Role	1	Count	2	1	4	6	13
		% within Role	15.4%	7.7%	30.8%	46.2%	100.0%
	2	Count	4	4	2	6	16
		% within Role	25.0%	25.0%	12.5%	37.5%	100.0%
	3	Count	0	1	0	0	1
		% within Role	0.0%	100.0%	0.0%	0.0%	100.0%
Total		Count	6	6	6	12	30
		% within Role	20.0%	20.0%	20.0%	40.0%	100.0%

Frequencies

Statistics

		Code	Debug	Test	Doc	Prob
N	Valid	30	30	30	30	30
	Missing	25	25	25	25	25

Frequency Table

Code

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	11	20.0	36.7	36.7
	1	19	34.5	63.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Debug

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	14	25.5	46.7	46.7
	1	16	29.1	53.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Test

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	18	32.7	60.0	60.0
	1	12	21.8	40.0	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Doc

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	11	20.0	36.7	36.7
	1	19	34.5	63.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		
Total		55	100.0		

Prob

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5	9.1	16.7	16.7
	1	25	45.5	83.3	100.0
	Total	30	54.5	100.0	
Missing	System	25	45.5		

A crosstabulation analysis was undertaken to analyse the association between role and automation competency. While we analyzed this report, we found that Role 1 (n = 13):Those in this group had a higher competency in automation. 46.2% were at Level 4 (highest competency), 30.8% were at Level 3. This implies that people in Role 1 have high automation skills. Role 2 (n = 16): The distribution of responses across levels was more

balanced. Many people were at Level 4 (37.5%), and some at lower levels. This sug-gests a range of automation competency within this group. Role 3 (n = 1): This role group only had one respondent in Level 2. Given this group's size, it is not possible to make meaningful inferences. Overall Trend: The most common automation competency in the valid sample was Level 4 (40%). This implies that many respondents believe they have a high level of automation competency.

4.8 Summary of Findings

In this analysis, we find that GenAI tools are extensively used, with most respondents claiming to use them very often. The primary application of GenAI tools is in problem-solving and development. Respondents report high levels of learning support but low levels of autonomy. Managerial supervision is high, and control is moderate. No significant differences exist in autonomy between junior and senior developers. The association between GenAI use and managerial control is weak. Differences between roles in terms of autonomy are minimal. At last, this chapter provides the foundation for discussion and analysis in the following chapter.

5 Discussion

5.1 Introduction

This chapter is a detailed discussion of the research results presented in Chapter 4. The findings are discussed in the context of research objectives, research questions and hypotheses. The discussion is informed by key theoretical perspectives, such as Self-Determination Theory (SDT), Labour Process Theory (LPT) and Sociomateriality Theory. The aim is to critically assess the effect of Generative AI (GenAI) tools on learning autonomy and management control in fintech software development.

5.2 Use of Generative AI Tool

The outcomes imply that GenAI tools have high adoption rates; 73.3% of the sample use them very often. This is a confirmation that GenAI tools are widely integrated in the software develop-ment process, especially in fintech.

The uptake of GenAI aligns with the literature which indicates that AI tools enhance developer productivity and efficiency. But, it is your usage that matters the most. Our results indicate that the most common use cases of GenAI tools are problem solving (83.3%), code generation and documentation.

This implies that developers are using GenAI not only to automate non-cognitive tasks but also for cognitive tasks. Problem-solving is an essential aspect of software development, and the use of AI for this purpose suggests a change in the way developers approach problems.

In terms of Sociomateriality, this is an example of the relationship between humans and technology. GenAI is not just a tool but a contributor to the developers' thought, analysis

and problem solving. Human thinking and technological support are inextricably intertwined.

5.3 Effect on Learning Independence

Our study has a relatively high mean score for learning (3.37), suggesting that the respondents consider GenAI tools as useful for learning and developing skills independently. This confirms GenAI's ability to support developers in acquiring information, coming up with ideas and enhancing their knowledge independently.

Self-Determination Theory (SDT) suggests autonomy is an important source of motivation and skill development. Independent learning supports a feeling of control over the work and intrinsic motivation. Our findings indicate that GenAI helps people with this by offering instant feedback, explanations and solutions.

Yet, it is important to note the difference between learning autonomy and decision-making autonomy. The learning score is high, but the mean score for freedom (2.20) is low. This suggests that while developers feel free to learn and experiment with solutions, they do not feel as free in decision-making at work.

This indicates a key insight. GenAI tools aid learning but do not necessarily empower developers with greater influence in decision-making. Programmers can have a deeper understanding of solutions, but they have to work within constraints that hinder autonomy.

5.4 Control and Oversight

Our findings reveal moderate levels of control (mean = 2.97) and relatively high levels of oversight (mean = 3.07). That's an indication that managerial control and supervision is still a key factor in fintech.

This follows the Labour Process Theory (LPT) that says that technological change is likely to lead to managerial control. Technology might give workers more control but it also lets organisations track performance, enforce compliance and streamline processes.

Within fintech, compliance is a key factor. Fintech systems must adhere to compliance and security requirements, which demand that all code and processes adhere to security and regulatory standards. Therefore, even if developers use GenAI, the code generated is verified and approved.

The observed level of supervision in the results is a consequence of this. The code produced by AI cannot be used without review, resulting in higher levels of managerial oversight. This leads to a world of technological efficiency and supervision.

5.5 The Autonomy–Control Paradox

A key finding of this study is the presence of greater autonomy in learning and high managerial control. This can be viewed as an autonomy–control paradox. On one hand, GenAI tools enable developers to: Learn independently, Solve problems more efficiently, Access knowledge instantly. On the other hand, they also lead to: Increased monitori, Mandatory code reviews, Compliance-driven restrictions. This paradoxical effect implies that GenAI is both enabling and restrictive. It enables individuals, but also supports organisational control. This paradox is to be expected from a Sociomateriality viewpoint. Technology is not independent of the organisation; it is embedded with organisational structures, policies and practices. The same technology that enables empowerment can also be used to control. This insight implies that GenAI does not have a simple linear effect. It’s not just that it adds autonomy or control, it changes the relationship.

5.6 Linking to Theories

This study's findings can be related to the three major theories. Self-Determination Theory (SDT) is partially supported by the findings. The high learning results suggest autonomy in learning and developing knowledge and skills. But the low freedom scores indicate constrained autonomy in terms of decision-making processes (Yang et al., 2025).

Labour Process Theory (LPT) is well supported by the results. The moderate to high levels of managerial surveillance and control are related to the use of technology to manage

and enforce organisational rules. Sociomateriality Theory: Our findings support Sociomateriality Theory. GenAI technologies and organisational structures work together in both an enabling and constraining way. Technology effects are dependent on its embedding into work settings (Johri, 2022).

5.7 Hypothesis Evaluation

The study hypotheses are tested:

H1: Programming novices have more learning autonomy.

Here, H1 Supported (high learning, but no difference in roles).

H2: GenAI increases managerial control.

Here, H2 Supported (moderate to high control and oversight observed).

H3: Depends on experience levels.

Here H3, Supported (there is some variation, but it is not significant).

In conclusion, the findings show that GenAI has an impact on autonomy and control, but it's not straightforward and depends on organisational factors.

5.8 Summary

Overall, this examined the results in light of the research questions and theories. The research shows that GenAI tools are important to current software development practices, especially in the fintech industry. The key insights are: it is not affected by experience. The insights indicate the complex nature of GenAI on learning and organisational practices.

6 Conclusion and Recommendations

The purpose of this study was to gain insight into the impact of the use of Generative AI tools on the autonomy and managerial control of developers in regulated contexts of fintech and bank in Nepal. The results of the study have several implications.Based on this study some conclusions have been drawn. The study shows that the use of GenAI tools is very common and that software developers often use these tools. A considerable number of participants expressed that they adopt such tools with their work quite frequently. It means that GenAI is more than a mere trend; it is an essential part of the software development landscape today. The frequent use for tasks like problem-solving, code generation and documentation indicates that GenAI is not only used for simple tasks but also for more complex cognitive processes. This indicates soft-ware development practices are becoming more and more influenced by AI.

One key finding of the study is that GenAI tools enhance learning autonomy. Developers indicated high levels of autonomous learning with these tools, indicating that they are facilitating independent acquisition and problem-solving of skills. GenAI tools provide developers with immediate access to information, explanations and other potential solutions, enabling them to self-learn without relying on others. This helps in establishing trust and quick resolution of technical problems. The results also show that developers enjoy high level of learning autonomy and low level of freedom in general. That means that developers need to learn on their own, but they must do so in an organizational structure.

The study finds that while GenAI can be a force for empowerment, it is still important for management to have control and oversight. Managers reported moderate levels of control and high levels of oversight, suggesting that oversight and monitoring are still critical to the development process. This is especially true in the fintech sector where regulatory requirements demand compliance, validation and auditing of development processes. The use of AI must be reviewed and approved before production, emphasising the importance of management in quality and security. This result shows that the

use of new technologies does not obviate the role of managerial control. It transforms the nature of control in organisations.

Our research found no significant difference between the perceived level of autonomy across junior and senior developers. This implies that the experience level of the developer doesn't affect the perception of autonomy in the context of GenAI. This could be due to the same policies and regulations applying to all employees. All developers, regardless of their experience level, adhere to the same processes, reviews and regulations. Also, GenAI may homogenise processes, leading to less variation in practices. This blurs the distinctions between senior and junior developers. One of the key findings of this research is that GenAI has a two-fold effect on work. First, it increases learning, productivity and efficiency. On the other, it supports managerial control and control. This feature results in a combination of opportunity and control. Programmers gain greater access to information and quicker problem-solving skills but also more rigorous monitoring and compliance. This insight suggests that GenAI is not only a benefit or a threat but its effects are dependent on the organisational environment.

From the results some practical suggestions are provided for organisations, managers and developers. Organisations should establish clear guidelines on the use of GenAI tools. These policies should outline acceptable use, data security guidelines and compliance requirements. A balance needs to be struck between enabling innovativeness and maintaining control. There would be risks if there were too little control, and too much control could reduce the benefits of GenAI. It's also important for organisations to invest in secure and compliant AI tools to reduce data privacy risks and comply with regulations.

Managers should be mindful of exercising a balanced approach to supervision. Regular checking is important, but too much control can decrease motivation and creativity of employees. A risk-based approach may be successful, with riskier tasks closely tracked, and less-risky tasks given more autonomy. This will make the control necessary, but not impair productivity (Zhemchugova & Levshina, 2020). Managers should also train and educate the developers about the effective usage of GenAI tools and ensure that they

validate the outputs as well as use AI responsibly. The developer should use GenAI tools as an aid and not a replacement for their own knowledge and skills. While critical thinking and validation should still be paramount, especially in regulated settings (Nelson & Anderson, 2026). When using AI tools, developers must also consider data privacy and security issues. Do not share sensitive information unless it is adequately protected.It's crucial to prioritise continuous learning and skill development to enable developers to effectively leverage GenAI while upholding rigorous quality and compliance standards.

There are several limitations to this study that need to be considered. The number of participants in the study is quite small (n = 56), thus restricting the generalisability. The results are stronger for a larger sample. Secondly, this study relied on self-report data, which can be biased or inaccurate. Perceptions of respondents may not be a true representation of behaviour. Third, the study is a cross-sectional design in which data were collected only at one point in time. This is a constraint on the time series analysis.

This study can be extended in the following ways:The use of larger and more varied samples will enhance generalisability. Comparative insights can be gained through studies carried out in various industries or countries (ÜNAL et al., 2025). Longitudinal research can be used to examine how the impact of GenAI alters over time.The impact of GenAI can be examined over time using a longitudinal research approach (Durak et al., 2026).Additional factors like organisational culture, leadership style, and technological maturity can be investigated further, as these factors can impact the autonomy and control relationship.

Overall, this research shows the significant impact of Generative AI on software development in the fintech landscape. They improve the learning autonomy and productivity, and at the same time strengthen the managerial control and oversight. The results underscore the multifaceted and dual impacts of GenAI, and the im-portance of approaches that manage risks and optimise benefits.

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7 Appendices

7.1 Appendix 1. Google Document Questionnaires

PART FIRST:

GenAI Tools in Nepalese Fintech Software Teams

Dear Respondent,
Thank you for taking the time to participate in this survey. This questionnaire is part of my thesis research on how Generative AI (GenAI) tools (e.g., GitHub Copilot, ChatGPT) influence learning/problem-solving autonomy and managerial control for junior and senior software developers in Nepalese fintech/banking teams.

Purpose:
The survey explores how GenAI tools affect developers' independence in learning and problem-solving, and how they influence managerial practices such as code review, approvals, monitoring, and policies in a regulated fintech environment.

Time:
The survey takes about 10–15 minutes.

Confidentiality:
Your responses are anonymous. Please do not write your name, company name, client details, or any confidential code/data. Results will be reported only in summary form.

Voluntary participation:
Participation is voluntary. You may skip any question or stop at any time.

Instructions:
Please answer honestly based on your personal experience. For multiple-choice questions, select the option that best matches your experience.

Thank you for your valuable support.

* Indicates required question

Section 1: Demographic Information

PART SECOND:

1. **Age Group**

Mark only one oval.

- 18-24
- 25-30
- 31-35
- 36-40
- 41+

2. Gender *

Mark only one oval.

- Male
- Female
- Prefer not to say
- Other: ____

3. **Years of Experience in Software Development** *

Mark only one oval.

- 0-2
- 3-5
- 6-10
- 10+

PART THIRD:

4. **Role** *

Mark only one oval.

- ◯ Junior Developer
- ◯ Senior Developer
- ◯ Other: ____

5. **What is the criticality level of your projects?** *

Mark only one oval.

- ◯ Low
- ◯ Moderate
- ◯ High

Section 2: GenAI Utilization

6. **How frequently do you use Generative AI tools (e.g., GitHub Copilot, ChatGPT) in your daily work?** *

Mark only one oval.

- ◯ very frequently
- ◯ Occasionally
- ◯ Rarely
- ◯ Never