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The Role of the AMO enhancing HRM practices in Open Innovation performance in the high-tech industry

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Executive summary

This research investigated how Human Resource Management (HRM) practices, framed within the Ability–Motivation–Opportunity (AMO) model, influence Open Innovation (OI) performance in high-tech organisations. The study asked: *How can the Ability-Motivation-Opportunity (AMO) enhancing HRM practices lead to firm-level OI performance in the high-tech sector?* It explores how HRM practices can be systematically used to enhance OI performance. For this purpose, 13 in-depth expert interviews were conducted in the fields of biotechnology, AI, semiconductors, and advanced manufacturing, which all fall under the high-tech sector. Key findings show that HRM has an influence on the OI abilities of companies through HRM practices that enhance AMO, including skill-based recruitment (Ability), purpose-driven motivation systems (Motivation), and collaborative platforms (Opportunity). Thematic analysis shows that about 41% of the data fell under motivation-enhancing practices, which makes it central to maintain employee-led OI. Conversely, ability and opportunity practices contributed 34% and 25% respectively, indicating that there was an integrated but uneven impact of each AMO dimension.

The study finds that effective HRM not only empowers employees but also enables cross-boundary knowledge sharing, team autonomy and alignment of strategies with the OI goals. It focuses more on the interdependence and temporal adjustment of the AMO practices at various phases of the innovation lifecycle. Theoretically, the study expounds the AMO theory by combining it with dynamic capabilities and resource-based views and redefines the role of AMO into a strategic facilitator of OI rather than only productivity. Practically, it offers actionable implications in developing the HRM systems that enhance knowledge absorption, team collaboration and innovation responsiveness.

The results underline that motivation, particularly related to autonomy, purpose, and recognition, is the most reliable determinant of the OI performance. The data further shows that organisations can better respond to volatile knowledge-intensive markets when they dynamically deploy AMO-enhancing practices across innovation stages and integrate them into their organisational cultures.

For practitioners, the findings suggest three priorities for action examined in the thesis: (1) sustain ability through skill-based recruitment coupled with focused up-skilling aligned to each phase of the innovation life-cycle; (2) enhance motivation mainly with non-monetary reward and recognition schemes that focus on autonomy, purpose, and timely feedback; and (3) enhance opportunity by embedding collaborative platforms and cross-boundary project teams so knowledge transfers quickly across functions. These results are derived from a qualitative, cross-

sectional data set of 13 expert interviews in biotechnology, AI, semiconductor, and advanced manufacturing firms, so their generalisability is necessarily limited. Future research should therefore try to test the AMO–OI model with larger and more diverse samples, consider longitudinal or mixed-method designs in order to be able to examine causality over time, as well as compare the relative salience of ability, motivation, and opportunity between industries and cultural contexts.

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1. Introduction

Innovation is considered one of the key success factors of an organisation to sustain a competitive advantage. However, changing consumer needs, increasing R&D costs, rapid improvements in technologies, and extreme competition are making innovation more challenging (Hermawan, 2023; Romeo-Arroyo, 2025). Firms used to rely only on their own research to be able to innovate, but the challenges of nowadays push them more towards open innovation (OI) (Costa and Matias, 2020). Chesbrough (2003, p. XXIV) defined OI as "a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology". Such a change pushed companies to open up the innovation process by working collaboratively with external companies. By sharing and using internal and external knowledge, innovation success may increase, as well as the adaptability in dynamically changing markets (Baccarella et al., 2021; Bogers, 2018).

A collaborative method like this needs external partnerships and active participation from employees inside the organisation. The employees are the main drivers of innovation, helping the sharing of knowledge, problem-solving, and the integration of new concepts (Kremer, 2019). However, many companies still face difficulties with involving their employees in OI processes (Lenz, 2016).

Human Resource Management (HRM) practices such as recruitment and selection, training and development, performance management, and High-Performance Work Systems (HPWS) are fundamental enablers of OI (Podmetina, 2013). HRM does not merely manage people; it builds organisational capabilities that allow firms to absorb, adapt, and apply external knowledge, all of which are crucial for OI success. By fostering collaboration, enhancing knowledge exchange, and cultivating external partnerships, HRM practices create an environment conducive to OI activities (Engelsberger, 2023; Manzoor, 2025; Yu, 2025). They develop competencies essential for OI, including creativity, adaptability, and networking, while organisational structures such as cross-functional teams and reward systems support both internal cooperation and external engagement (Podmetina et al., 2018). Without a supportive HRM system, employees may lack the capabilities, incentives, or platforms needed to participate actively in OI processes.

While the contribution of HRM to innovation is well recognised, less attention has been given to the integrated role of the Ability-Motivation-Opportunity (AMO) enhancing HRM practices framework in enabling firm-level OI performance (Bandyopadhyay and Biswas, 2023). According to Bos-Nehles, Townsend, Cafferkey and Trullen (2023). The AMO enhancing HRM practices

framework contains three practice bundles of HRM, which enhance employee ability through skill development, creating motivational engagement and enhancing collaborative opportunity. Through the synchronisation of these bundles, organisations can both raise employee performance as well as link their human capital assets to OI requirements. Organisations need this alignment because OI operates through employees' abilities to acquire outside ideas and their motivations, along with their opportunities for external collaboration, as stated by Zobel and Hagedoorn (2018).

When researchers fail to understand the unique role AMO has in OI they make firms miss the opportunity to optimise their HRM systems, which help overcome cultural roadblocks and knowledge barriers and absorption limitations (Ferrarini and Curzi, 2022). Research progress in both theory and practice depends on a clear understanding of AMO–OI connection. This report develops the discussed mechanism further in section 2.4 by presenting a detailed evaluation of AMO systems that eliminate innovation impediments.

The combined delivery of ability, motivation and opportunity-enhancing practices through AMO's integrated approach creates an enhanced synergistic improvement of human capital (Nadeem and Rahat, 2021). Unlike isolated HRM practices, this integration addresses the multifaceted nature of OI challenges by ensuring that employees are not only capable and motivated but also structurally empowered to engage in knowledge-sharing and external collaboration (Shadmanfar and Makvandi, 2024). This integrative configuration is key to sustaining dynamic innovation ecosystems inside high-tech firms (Mousavi, Bossink and van Vliet, 2018).

1.1. Problem statement

OI has become a critical strategy for firms to sustain competitiveness, particularly in high-tech industries characterised by rapid technological advancements and short innovation cycles (Tiago Sá, Ferreira and Shital Jayantilal, 2023). However, despite the theoretical attractiveness of OI that is widely promoted in the literature, studies suggest that high-tech firms are not able to fully exploit its benefits (Chesbrough, 2014b). Many organisations face persistent inefficiencies in capturing, integrating, and commercialising external knowledge (Zahra, Neubaum and Hayton, 2020). These inefficiencies limit the ability of firms to leverage collaborative opportunities, ultimately reducing their innovation performance and market adaptability.

Although prior research highlights the role of organisational factors such as absorptive capacity, relational capability, and knowledge management systems in supporting OI (Fisher, 2018; Sánchez-López, 2023), it remains unclear how specific human resource management models,

such as the AMO model, could systematically address these challenges (Bos-Nehles, 2023). This represents a significant gap: while knowledge management structures have been studied, the role of employees' abilities, motivations, and opportunities facilitated by strategic HRM practices in overcoming OI barriers is underexplored.

The AMO-enhancing HRM practices model offers a promising but underutilised approach. By strategically enhancing employee competencies (Ability), incentivising knowledge-sharing behaviours (Motivation), and creating platforms for collaboration (Opportunity), AMO-based HRM practices could strengthen firms' capacity to absorb and apply external knowledge more effectively (Yang, Wang and Mohammed, 2019). However, empirical research on how AMO bundles operate in the context of OI at the organisational level, particularly in high-tech firms, remains scarce (Bandyopadhyay and Biswas, 2023; Bhatti, 2020; Çera, 2024).

If this gap is not addressed, high-tech companies risk underleveraging one of their most critical assets, human capital for innovation success. This can potentially result in reduced commercialisation rates, slower innovation cycles, and diminished competitive advantage (Asgari, 2022).

Thus, this thesis investigates how AMO-enhancing HRM practices contribute to OI outcomes within high-tech firms. It specifically seeks to uncover the mechanisms through which AMO supports OI, the challenges firms face in aligning HRM strategies with OI goals, and practical ways organisations can optimise their AMO practices to better capture, integrate, and commercialise external knowledge (Ferrarini and Curzi, 2022). By doing so, the study aims to make both a theoretical contribution advancing AMO and OI integration and a practical contribution providing actionable insights for high-tech firms striving to drive innovation through strategic human resource practices (Bos-Nehles et al., 2023).

This thesis is well aligned with the overall objectives of TU Delft's Management of Technology (MoT) program. Built on the Leadership & Technology Management course (LTM) covering the changing work environment, OI projects and teams, and the Resource-Based View, the study positions people-centric capabilities as the interface between technology and strategy. The thesis also applies to concepts from the Technology, Strategy & Entrepreneurship (TSE) course, such as the OI approach, the Resource-Based View (RBV), the conceptual framework for achieving a collaborative advantage, and how collaboration facilitates innovation. The alignment with LTM is further supported by the course's treatment of dynamic capabilities and knowledge processes, giving a practical view for using the AMO constructs examined in this thesis. Applying the AMO framework in considering the OI performance of a company illustrates how the MoT

program bridges the gap between technology and human resource practices and new strategies. By analysing Ability, Motivation and Opportunity as VRIN resources, valuable, rare, inimitable and non-substitutable, the thesis operationalises RBV theory into actionable HRM configurations that deliver collaborative advantage, echoing classroom lectures on RBV, performance management and rewards. The integration ensures that the thesis addresses a tangible management issue and further illustrates the acquired theory and analytic capabilities from the MoT program.

1.2. Research questions:

The following main research question will be answered in the thesis: *How can the Ability-Motivation-Opportunity (AMO) enhancing HRM practices lead to firm-level OI performance in the high-tech sector?*

Sub-questions:

The first sub-question deals with finding which AMO-enhancing HRM practices are used to drive OI outcomes: *What are the different AMO-enhancing HRM practices implemented in high-tech firms?*

The next sub-question deals with finding challenges faced by organisations and how they respond to them in order to overcome them: *What challenges do high-tech firms face in using AMO enhancing HRM practices, and how are these challenges addressed?*

The third question explores the contribution of each practice dimension of the AMO enhancing HRM practices framework that leads to OI outcomes: *How does each dimension (Ability, Motivation and Opportunity) of the AMO enhancing HRM practices framework associate with firm-level OI performance?*

2. Theoretical background

2.1 Human Resource Management

HRM is the management of people within an organisation, including their recruitment, development, involvement, and focus on the objectives of the organisation (Sepahvand and Khodashahri, 2021). This approach is adopted to make organisations more effective while maintaining fair and ethical treatment towards employees. Some describe HRM as achieving competitive advantages by using a highly committed and capable workforce while using various cultural, structural, and personnel strategies (Kareska, 2023).

HRM is not a new concept, as it evolved from "Welfare" in the 1920s and "Labour Management" in the 1940s to "Personnel Management" before becoming HRM (Raju et al., 2021). Key developments in the formation of the modern HRM function include the factory system, the welfare tradition, scientific management, and the behavioural science movement. Each of them added emphasis on the systemic approach to managing, motivating, and training employees. The movements also pointed out the importance of social aspects and group dynamics, which could impact workplace productivity (Gunnigle, Heraty, & Morley, 2011).

Outside traditional definitions of HRM the strategic developments of HRM have strongly responded to external forces, which include globalisation alongside digitisation and requirements from the knowledge economy. Workplaces are transforming the role of Human Resource Management (HRM) from offering support to also being a valuable and cooperative strategic partner (Pattanayak, 2020). Strategic HRM now occupies its pivotal standing in organisational development by ensuring that human resources are no longer a cost factor but the key elements driving the business to long term advantage by providing new sources of sustainability. Pattanayak (2020) states that HRM alignment with the business strategies through people people-focused approach allows firms that pursue OI to change adaptability, resilience, and innovation capabilities, particularly in volatile and rapidly changing business environments.

One of the relevant examples of the evolution of strategic HRM in high-tech surroundings can be traced in a project conducted in Google, where the importance of psychological safety in the teams was emphasised (Negara et al., 2023). Some usual methods for telling if someone will innovate, like counting on one exceptional person, did not give useful results. Having traits like inclusiveness, understanding of others and honest communication, however, turned out to be more predictive (Vladić et al., 2021). These traits are also connected to good HR strategies for the

company. This highlights how the leading firms of the tech frontier are integrating HRM within their innovation architecture, transitioning from administrative routines to strategic enablers of agility and learning. Human resource management is not only reactive, but a proactive creator of value through the orchestration of human capital, through such initiatives (Andersén, 2019).

2.1.1. HRM Practices

HRM practices are a main contributor to organisational performance and the well-being of employees. One of the essential practices is recruitment and selection, which determines that the right talent is employed for the formation of teams. Training and development improve the skills and adaptability of the workers (O'Donovan, 2019). Additionally, performance management and reward systems ensure continued motivation for higher performance. Diversity, inclusion, and employee relations foster fair and engaging workplaces. Finally, high-performance work practices bundle multiple practices together to achieve maximum efficiency and flexibility (Manresa, Bikfalvi and Simon, 2021). It should be noted that these practices are sometimes referred to under different names or grouped under diverse headings in different literature. All these practices, taken together, contribute to organisational growth and employees' well-being.

Traditional HRM approaches focus on administrative functions, but ongoing literature demonstrates that strategic bundling of HRM practices creates stronger synergy between different HRM practices (Vermeeren, 2015). High-Performance Work Systems (HPWS) serve as exemplary bundled HRM systems because their integrated approach of hiring, training, performance management, and empowerment produces substantial benefits when organisations align them with their strategic goals. A unified viewpoint of strategic coherence between ability-, motivation- and opportunity-enhancing HRM practices enables HRM to achieve holistic, instead of isolated, outcomes (Bos-Nehles et al., 2023). The learning and boundary-spanning capabilities, paired with experimental abilities that knowledge-intensive firms possess, find enhanced value in HR configurations which support these traits (Yu et al., 2024).

Real-world application of HPWS demonstrates their transformative potential when aligned with organisational strategy. For instance, IBM has utilised an HRM configuration that combines competency-based recruitment with continuous learning platforms and agile career pathing (Boudreau, 2010). Employees are given development materials suited to them, thanks to the learning platform’s use of AI (Jia and Hou, 2024). When integrated with recognition mechanisms (motivation) and collaborative workspaces (opportunity), IBM sustains a culture of continuous reinvention, vital for its OI goals (Tariq, 2024). This case claims that synergy across AMO bundles is key to transcending fragmented functionality and achieving innovation readiness.

2.2 Ability-Motivation-Opportunity Framework

The AMO enhancing HRM practices framework expanded its strategic focus to approach both employee performance outcomes as well as organisational factors, including innovation capability, adaptability and cultural transformation (Appelbaum et al., 2000). The Resource-Based View (RBV) of the firm is supported by the framework, as sustained competitive advantage develops from internal resources valuable and rare and non-substitutable and inimitable (Kabue and Kilika, 2016). VRIN stands for Valuable, Rare, Inimitable, Non-substitutable and is a framework for evaluating if a firm's resources and capabilities are ready for a sustained competitive advantage. The use of AMO practices contributes to the development of VRIN capabilities insofar as employee skills are acting as ability assets and engagement is working as a motivational tool, and collaboration platforms are working as opportunity assets (Mehralian, Moradi and Babapour, 2021). By demonstrating this dual role, AMO-enhancing HRM practices increase individual performance outcomes while strengthening core firm-level innovation and renewal strategies that aid competitive stability in unpredictable high-tech markets (Al-shahwani, 2020).

2.2.1 AMO-Enhancing HRM Practices: Foundations and Significance

The AMO enhancing HRM practices are the foundational principle of modern workplace strategic human resource management and provide a framework for developing employee performance through the targeted intervention across three interdependent areas (Marin-Garcia and Tomas, 2016), which are Ability, motivation and opportunity (Bos-Nehles et al., 2023). Based on expectancy theory and studies in organisational behaviour, the AMO model suggests that workers will be successful at work when they have the requisite skills (ability), are motivated to use them (motivation), and are given the appropriate environment where to exercise (opportunity) (Mbukanma, 2022).

Ability-enhancing practices aim to strengthen the human capital base by improving employees' competencies through recruitment, selection, and ongoing development (Vermeeren, 2015). These include technical training, continuous learning opportunities, and job-role alignment strategies that ensure staff are capable of meeting dynamic organisational demands (Roberts, 2020). Motivation-enhancing practices, in contrast, seek to elevate employees' willingness to contribute meaningfully (Alotaibi, 2025). These encompass performance-based reward systems, recognition mechanisms, psychological ownership initiatives, and value-driven leadership, all of

which align individual goals with organisational outcomes. However, as Nilsson (2023) cautions, excessive reliance on extrinsic motivators may crowd out intrinsic drivers, making a balance essential for long-term engagement.

In the field of motivation, companies such as Adobe have pioneered practices that go beyond traditional rewards by embedding innovation-focused feedback systems. For instance, Adobe's "Kickbox" program offers every employee a pre-funded toolkit complete with resources and autonomy to test out innovative ideas, regardless of rank (HiPeople, 2024). This mechanism acts as a type of extrinsic motivation as well as an intrinsic motivation catalyst, thus allowing employees to correlate their personal purpose to the firm-level innovation outcomes. As Shahzad et al. (2022) report, motivation-enhancing processes are most effective when they promote psychological ownership and creativity, specifically when the working environment is knowledge-intensive. Like with 3M's famous "15% rule" that allows people to spend a portion of their time on passion projects, this structured version of autonomy is another example of how it can amplify employee engagement with OI (Teboul, 2023). This means that strategies to motivate people should be developed for particular workplaces and help employees perform activities that promote innovation instead of only making them focus on basic tasks here and now (Zhenjing et al., 2022).

One example of using skill-building systems is Siemens' Digital Industries division, which has designed structured training for its employees in partnership with universities (Cozmiuc and Petrisor, 2018; Foroughi, 2020). There are programs such as the "Dual Study Program", in Germany, where participants can study and practice digital and engineering skills (Weitershausen, 2020). Such technical skills are useful for OI, mainly in industries that are changing rapidly, according to Ekwunife (2023). Also, Cisco is using AI to help identify employee skill gaps and customise learning plans for its employees. Such efforts increase the abilities of employees and make it easier for them to be involved in larger innovation activities (Newsroom, 2024; Tusquellas et al., 2024).

Practices that enhance opportunities set up environments under which workers get to express their ideas and be associated in the decision-making process, and even cross functionally work with others (Yin et al 2023). Jerab and Mabrouk (2023) demonstrate how structures surrounding teams, along with flat hierarchies, open communication systems, and flexible work roles increase autonomy and innovation in the workplace. The synergistic effects of bundling multiple HRM practices that the AMO-enhancing HRM practices draw their strength from this bundling generate better performance results compared to the independent intervention of HRM practices

(Nehles et al., 2023). The model realises that ability and motivation and opportunity do interact together via dynamic interactions, which requires context-specific strategic alignment for organisational goals.

Opportunity paradigmatic practices take special relevance in global distributed innovation networks. Think of, for example, IBM's "Innovation Jams" massively scaled events held virtually to generate ideas in real time in which employees, customers, and academic collaborators participate (Diasio, 2021). These events are a scalable opportunity structure that decentralises innovation authority to diversified voices to determine the direction of firms. These initiatives go in the same direction as Jerab and Mabrouk (2023) and Yin et al. (2023), who point out the need for flat hierarchies and dynamic collaborative platforms in opportunity-enhancing systems. Another convincing example is Haier's "RenDanHeYi" model that breaks hierarchies and replaces it with autonomous micro-enterprises, each having decision rights and open channels to actors outside the firm (Lago, 2024). These micro-structures are opportunity amplifiers that embed OI into the organisational texture. The success of these decentralised and participative opportunity structures affirms the belief that formal R&D departments do not have a monopoly on innovation (Tou et al., 2019); innovation flows where structural empowerment meets interfunctional involvement (Wu et al., 2024).

The AMO model is now being used in HRM, mainly in industries where employees' talents, skills and behaviour are central to performance outcomes (Bos-Nehles et al., 2023; Li et al., 2021). Studies have recently discovered that AMO-based HRM practices are important in supporting OI by promoting employee creativity, supporting learning in the organisation and helping it to take in new knowledge (Ferrarini and Curzi, 2022). AMO bundles that are carefully created can influence employees to have favourable attitudes and be more careful with their actions, which supports innovation. Even though Li et al. (2021) do not discuss AMO theory, their findings suggest that a mix of structural and psychological empowerment leads workers in Norway to be more involved in innovative activity and uphold the usefulness of HR policies that support innovation by each person.

Researchers have found that using AMO-based practices in HRM largely supports innovative activities in companies facing constant change. For example, a study done by Malik et al. (2025) illustrates that encouraging learning, rewarding progress with fresh approaches and involving employees in choices at work present an atmosphere that encourages both employee creativity and adopting new ideas in the company. Using set ideation systems that offer employees tools and the ability to work with colleagues and partners has been shown to lead to more innovative

ideas and prototypes in companies that value innovation (Hafkesbrink and Schaff, 2024). When teams use these practices together following the AMO system, they can cooperate better by getting a learning culture, which can support ongoing innovation. Using the AMO HRM systems, organisations can remain adaptable and keep innovating in rapidly changing environments (Naqshbandi et al., 2023).

Recently, AMO theory has been related to the Dynamic Capabilities framework, stressing the role it plays in helping firms handle shifts in technology and markets. As Johar et al. (2024) underline, strengthening HRM practices can help businesses sense new chances by helping workers understand outside developments and be flexible. Motivating workers helps them get busy exploring opportunities and practices that offer many possibilities helps them shift to new ways of doing things. As a result of this fit, AMO-based HRM matters a lot in high-tech industries, because workers there require continuous learning and to adjust quickly (Teece, 2014).

AMO operates as both an organisational resource alignment structure and a system which promotes learning within organisations (Rincon-Roldan and Lopez-Cabrales, 2021). The established structure enables single-loop as well as double-loop learning through established processes aimed at knowledge acquisition and critical thinking. According to organisational learning theorists Demetriou and Papageorgiou (2020), learning capacity acts as a vital element for innovation. OI ecosystems benefit from AMO, which provides both cognitive assets and cultural conditions that help employees use feedback and conduct experiments while iterating toward innovation (Ferrarini and Curzi, 2022).

2.3 Open Innovation

OI can be described as a theoretical concept where organisations are encouraged to actively seek external partners to enhance their innovation capabilities and outputs due to the constantly evolving and intensifying market environment (Ogink et al., 2023; Orlova, 2019). As described by Bogers (2018), OI refers to the interaction of external ideas with internal processes of an organisation in the purpose of improving innovation returns. This is because the model reconfigures conventional R&D approaches by encouraging the firm to open its boundaries to other players in the business world to create pathways for collaboration with other players in the system (Chesbrough et al., 2014a).

More recently, scholars have distinguished between inbound, outbound, and coupled OI, which focuses on different patterns of knowledge flows (Greco, Grimaldi, and Cricelli, 2016). This is due to the fact that OI is complemented by digital tools, increased globalisation, and mobility of

skilled workforce (Luo, 2021; Osorno and Medrano, 2020). These trends have helped firms to participate in innovation ecosystems, which are comprised of collaborative structures in which all the materials are co-created, tested, and then amplified by external agents and actors that check the innovativeness's costs and dangers of innovating in isolation(Barile et al., 2020).

Knowledge-Based View (KBV) supports that notion of OI since it views knowledge as the core strategic resource on which value is created (Grant and Phene, 2021). Each of the aforementioned factors has been identified to present a danger of lock-in of tacit knowledge (Spiegel and Marxt, 2015); nevertheless, to fully harness OI, firms need to come up with collaboration mechanisms (Sánchez-López et al., 2023). Potential and realised absorptive capacity is important to assimilate external knowledge in the innovation processes (Sjödin, Frishammar and Thorgren, 2018). Thus, OI is not just an approach but an aptitude that organisations have to build by investing in systems, people, and culture.

The understanding of OI requires analysing its development from conventional research-and-development models towards innovation ecosystems (Della Peruta et al., 2016). According to Köhler and Sönnichsen (2022) and Chesbrough's (2003) point, using both internal and external partnerships and a reliable style of sharing knowledge are crucial parts of innovative processes today. They follow OI, yet their main goal is to discuss how firms work together instead of emphasising how they differ from traditional closed innovation. The research by Vidmar et al. (2020) reveals that SMEs involved in OI usually go for flat organisations and transform their practices for creating new products. Even though the shifts are not directly about human capital management, they suggest that organizations as a whole must change and they may now need to focus on skills like managing boundaries, coordinating knowledge and being culturally adaptable, mainly in innovative companies in the high-tech sector (Nour Shakhour, 2024; Ferrarini and Curzi, 2022). High-tech firms participating in OI need to master specific new capabilities which include boundary management alongside knowledge orchestration and cultural agility to thrive within their dynamic innovation environments (Abbate et al., 2021).

The integration of knowledge remains essential for OI yet this process depends substantially on human behavioural aspects and technological innovations (Migdadi, 2020). The success of OI implementation depends equally on effective people management alongside the management of innovation systems (de Oliveira et al., 2019). AMO-aligned HRM practices build essential foundations for OI by creating absorptive capacity along with collaboration readiness and innovation-centric organisational culture (Ferrarini and Curzi, 2022).

The effectiveness of OI in high tech is illustrated by IBM's innovation ecosystem, an initiative that brings together R&D and cooperation with various startups, institutes and partners worldwide (Gao et al., 2019). With the help of its Innovation Jams and collaborative development initiatives, which are powered by HRM systems, IBM makes it possible for employees to work side by side with people from other organisations (Bjelland, 2008). The AMO framework is the foundation: continuous learning systems (ability), awards for good performance and purposeful leadership (motivation) and cross-functional teams that allow widespread innovation (opportunity) (Ferrarini and Curzi, 2022). According to Bogers et al (2018), such forms of open innovation mean HRM must integrate internal strengths with the knowledge of outside partners, as described by Lindblom and Martins (2022).

2.3.1 Advantages of OI

OI offers multiple benefits to organisations. Firstly, it introduces collaboration with outsiders such as universities, research centres, and other organisations. More talent and knowledge will be available to accelerate the innovation process (Costa, Neves and Reis, 2021). Secondly, it promotes resource sharing and usage to and from externals, especially for small and medium enterprises, because they often don't have the capability for large-scale R&D. Furthermore, cooperation allows companies to work with customers, suppliers and sometimes competitors to provide solutions designed to the specific requirements of the market (Hoffmann et al., 2018). Finally, digital platforms and ecosystems also integrate internal and external resources, reducing costs and risks while enhancing innovative opportunities (Nambisan, Zahra and Luo, 2019).

Organisational innovation through OI serves as a vital but understudied mechanism to spread innovation responsibilities throughout organisational teams. OI redirects innovation oversight from central R&D functions to all workforce members so they can actively participate in generating ideas and executing trials while validating proposed solutions (Schiuma and Santarsiero, 2024). Through AMO-based HRM practices, this inclusivity enables organisations to access their employees' complete knowledge base, including hidden and unknown capabilities (Ferrarini and Curzi, 2022). With OI, strategic advantages emerge because firms use real-time partner testing to reduce failed innovation costs for critical markets, demanding accelerated innovation delivery (European Commission, 2023).

Procter & Gamble (P&G) is also shown as a company following OI through its "Connect + Develop" method, which emphasises teaming up with outside partners to boost innovation (Akgün, 2018). While both inbound and outbound innovation are encouraged by the strategy, there are no comprehensive descriptions in the literature about how this is handled through HRM.

Furthermore, according to Gawarzynska (2025), for strategies like those at P&G to be effective through OI, companies must ensure their people management is in line with innovation, mainly by building systems that develop employee skill, encourage them and give them new opportunities. Currently, little is known about the structure of P&G's HR inside the company, but the way the company partners with outside firms calls for a more decentralised HRM system that involves employees in exchanging information with external groups (Day & Shea, 2021).

2.3.2 Challenges of OI

Despite the apparent benefits of OI, there are often various difficulties with regard to its actual implementation, and some of them are related to the internal processes within the organisation (Bereznoy, Meissner and Scuotto, 2021). The key issue that should be mentioned is the protection of intellectual property (IP) (Nweke and Nweke, 2024). Companies need to exchange knowledge, which should be a problem-solving one, but at the same time, protect their competitive advantage (Sánchez-López et al., 2023). Nonetheless, this act is hampered by the downside risks associated with governance, less well-defined contractual boundaries, and differential power relations with other collaborating partners, which escalate knowledge loss and problems of coordination (Ansell & Gash, 2007).

Internal cultural resistance adds to these challenges in the following ways. With regard to the above defining features, employees may be afraid of external collaboration due to threats posed by job loss or lack of control over change, resulting in structures such as Not Invented Here (NIH) and Not Sold Here (NSH) syndromes (Aquilani, Abbate, & Codini, 2017). These forms of resistance hinder the transfer of knowledge, hinder absorptive capacity, and hence constrain the firm from benefiting from external sources of innovation (Cuervo-Cazurra and Rui, 2017).

This thesis aims to further prove that AMO is enhancing HRM practices are a promising yet unexplored way to address these challenges with an onus on performance. Skill-augmented activities, such as training for cross-boundary knowledge integration provided to the employees, enable them to be in a position to integrate knowledge from outside. As for the solutions for handling resistance, motivation-enhancing mechanisms, like incentive alignment, can help with open behaviours. Furthermore, opportunity-enhancing practices promote trust and increase transparency with structures that legitimise collective contributions (Biswas & Bandyopadhyay and Biswas, 2023). As such, while there are sound theoretical grounds for how the AMO-enhancing HRM practices can decrease these OI barriers, they have not been explored in depth in terms of how this can be achieved systematically. This gap defines the focus of this study and

leads to the further investigation of how AMO-enhancing HRM practices can mitigate the organisational and cultural barriers to OI in high-tech firms (Ferrarini and Curzi, 2022).

These challenges become especially relevant in multinationals operating in divergent regulatory and cultural environments. Huawei, for instance, despite its investment in collaborative R&D partnerships worldwide, has struggled with knowledge transfer due to governance concerns and workforce mistrust in non-Chinese markets (El Kadi, 2022; Hammer and Yusuf, 2020). The company has responded by embedding intercultural training (ability-enhancing), local empowerment policies (opportunity-enhancing), and peer recognition systems (motivation-enhancing) to align its HRM approach with OI goals. This example affirms the insights from Alkhalaf and Al-Tabbaa (2023) that internal cultural misalignment and weak AMO coherence can constrain OI success despite technological readiness.

For OI to succeed, a tight relationship should exist between the way people are managed and the company's innovation targets. Nevertheless, many organisations struggle to see that employees are trained, encouraged and enabled to actively participate with other collaborators. Ferrarini and Curzi (2022) point out that HRM systems should help promote teamwork, flexibility and knowledge transfer for an organisation to achieve this alignment. Through well-planned HRM actions to boost abilities, raise motivation and enable interaction (Opportunity), firms can promote OI and overcome possible flaws within the organisation (Ferrarini and Curzi, 2022).

2.4 Linking AMO enhancing HRM practices framework to OI

It becomes especially obvious how important human resource practices are when considering how companies handle knowledge in OI (Engelsberger, 2023). According to Małgorzata Runiewicz-Wardyn (2022), a key driver of innovation for firms is their capacity to access, share and use knowledge together with external organisations. This suggests how useful OI is when the business has strong systems and practices for knowledge exchange and involvement of workers. Ability-enhancing practices ensure knowledge acquisition, Motivation-enhancing practices serve as an engagement system for knowledge sharing, and opportunity structures help enable knowledge utilisation (Kundu and Gahlawat, 2018). Organisations require these essential capabilities to develop absorptive capacity, according to the definition Gölgeci and Kuivalainen (2020) put forth as a firm's capability to identify and apply and assimilate external knowledge in OI ecosystems.

Integrating the KBV and Dynamic Capabilities Theory (Kero and Bogale, 2023) strengthens the idea that the AMO framework connects well with OI. Biotechnology and quantum computing

companies like Genentech and D-Wave are using talent strategies that stress the acquisition of external knowledge compared to workers learning on the job (Budden and Murray, 2025). Genentech, for instance, integrates cross-boundary scientific teams, invests in collaborative learning tools (ability), and uses peer-evaluated rewards (motivation), while offering role-shifting career mobility to fuel experimentation (opportunity). These configurations promote real-time organisational responsiveness and learning, validating Małgorzata Runiewicz-Wardyn's (2022) argument that AMO enhances a firm's capacity to translate individual knowledge into firm-level competitive advantage within OI ecosystems.

2.4.1 Strengthening the AMO enhancing HRM practices framework in the Context of OI

Organisations face an increased need to integrate human capital within their innovation ecosystems due to their engagement with OI to maintain knowledge-intensive market competitiveness (Małgorzata Runiewicz-Wardyn, 2022).

Organisational culture plays a pivotal role in enabling or constraining the implementation of AMO-enhancing HRM practices, particularly in the context of OI. Trust and openness help make it possible for companies to share what they know, which encourages innovation in joint efforts (Aquilani, Abbate, & Codini, 2017). Though they are not discussed in the language of HRM or AMO, these elements match other organisational activities that focus on teamwork and sharing information. Jiang et al. (2012) point out that ability-, motivation-, and opportunity-enhancing actions can boost a company's innovation. Conversely, cultures characterised by rigid hierarchies, risk aversion, or the NIH syndrome can significantly hinder external collaboration and absorptive capacity (Valminen, 2019). Within AMO, enhancing HRM practices, cultural factors moderate how effectively employees develop competencies, maintain engagement, and access collaboration platforms. Embedding cultural values that favour external knowledge integration strengthens not only innovation behaviours but also organisational learning processes critical for OI (Lam et al., 2021). Therefore, organisational culture must be considered as a key contextual enabler when analysing the application of AMO-enhancing HRM practices frameworks to support OI initiatives in high-tech firms (Ferrarini and Curzi, 2022).

AMO functions as a full HRM model which creates an organisational structure that supports OI readiness throughout the entire enterprise (Almutawa, Muenjohn and Zhang, 2016). AMO differs from standard human resource management models since it sustains innovation by connecting worker behaviour to company innovation targets through systems that combine flexible strategic

elements with systemic and results-oriented practices (Ferrarini and Curzi, 2022; Tunio et al., 2023).

External collaboration as well as high-tech environment speed has made it essential for companies to produce agile innovation processes which integrate organisational participation (Ju, Ferreira and Wang, 2019). The model of AMO remains suitable for this particular scenario because it refrains from separating the individual components of ability, motivation and opportunity. The model uses entrepreneurship-driven technologies as interactive elements which create innovation capabilities at their base level. Fernandes et al. (2023) indicate that this model establishes micro-foundational frameworks which depict employee activities that affect knowledge exchange outcomes at the firm level.

To illustrate AMO's systemic influence, Amazon Web Services (AWS) offers a relevant case (Wittig, 2023). Within its R&D-focused teams, AWS embeds weekly cross-functional scrums (opportunity), merit-based innovation bonuses (motivation), and targeted onboarding for customer-obsessed thinking (ability) (Kero and Bogale, 2023). These HRM elements are calibrated to cultivate external co-creation, particularly with cloud developers, startups, and academic researchers. The results, such as rapid API prototyping and community-driven solution scaling, affirm Fernandes et al.'s (2023) assertion that AMO functions as a micro-foundational mechanism for real-time knowledge diffusion in digitally intensive ecosystems. AWS's structural alignment of AMO and OI underlines how cultural agility and employee autonomy unlock dynamic capabilities within a high-velocity innovation setting (Wittig, 2023).

What distinguishes AMO in the OI landscape is its role in addressing latent organisational barriers such as resistance to external collaboration, low absorptive capacity, and siloed knowledge practices (Ferrarini and Curzi, 2022; Lundin et al., 2018). It equips firms to overcome these challenges not by imposing top-down change, but by reengineering HRM practices to organically foster openness, learning, and engagement. For instance, organisations that design reward systems to value idea-sharing, or that decentralise authority to empower cross-functional teams, are in essence building the capacity for OI through AMO-aligned strategies (Beretta, Björk and Magnusson, 2017; Floris and Pinna, 2024).

Furthermore, the AMO enhancing HRM practices framework enables organisations to sustain innovation momentum (Alkhalaf and Al-Tabbaa, 2023). While many OI initiatives falter after initial enthusiasm due to cultural resistance or fragmented execution, AMO's strength lies in establishing a continuous loop of development, motivation, and opportunity that embeds innovation as an organisational norm (Tunio et al., 2023; Zheng et al., 2020). It reinforces long-

term commitment rather than short-term experimentation. By focusing on the behavioural and systemic dimensions of HRM, AMO offers a robust pathway for high-tech firms to internalise the external. This positions AMO not just as a facilitator of OI, but as a strategic driver of competitive advantage in innovation-led markets (Ferrarini and Curzi, 2022; Mehralian, Moradi and Babapour, 2021).

To build the AMO enhancing HRM practices within OI settings, we need to redefine how innovation operates for employees (Lam et al., 2021). Standard HRM models present innovation transfer as a hierarchical process because strategic choices are assigned to employees for execution. Through the AMO-informed OI approach, employees actively participate in innovation alongside their implementation responsibilities (Vidmar et al., 2020). The transition demands human resources systems to facilitate power delegation alongside creative freedom and strategic purpose alignment (Holbeche, 2022). The implementation of agile methodologies alongside lean innovation models finds its backbone in AMO practices which allow organisations to create structural flexibility and maintain psychological safety needed for distributed ideation and iterative experimentation, which is key to strategic OI methods in high-tech environments (Alami et al., 2023; Alipour et al., 2022; Ferrarini and Curzi, 2022; Kumar, 2023).

2.4.2 Integrating HRM practices for OI success

As a concept, the practice of OI relies on the internal capabilities of an organisation to engage, encourage, and train its people. AMO enhancing HRM practices model is another strategic lens that helps in framing the HRM practices based on the collaborative and knowledge-intensive requirements of OI (Bandyopadhyay and Biswas, 2023; Ferrarini and Curzi, 2022). While other models tend to look at HRM as comprising many functions, the AMO model correctly coordinates the improvement of ability-enhancing systems, motivation-enhancing systems, and opportunity-enhancing systems in order to build up HRM readiness for innovation (Alkhalaf and Al-Tabbaa, 2023; Bos-Nehles et al., 2023).

Through a positive interaction between these AMO dimensions, the following factors enhance the OI outcomes (Ferrarini and Curzi, 2022). For instance, opportunity-enhancing activities such as participative decision-making and cross-functional teams improve local decision-making and create a supportive environment in the workplace, which are key fundamentals for collaborative innovation (Alkhalaf and Al-Tabbaa, 2023; Liehr & Hauff, 2024; Wu et al., 2024). Motivation-related strategies, such as awards, reward systems or purpose, create a culture of trust and other forms of staff engagement. Furthermore, the introduction, selection, and skills assimilation programs, such as hiring the right talent and training in ideas management, enable personnel to

acquire the ability to pour external knowledge, which is an essential part in many OI processes (Alkhalaf and Al-Tabbaa, 2023; Foss, Lyngsie and Zahra, 2013; Gölgeci and Kuivalainen, 2020).

However, it is important to note that these bundles are not just accumulative. In fact, ability and motivation can be substitutes for one another to some extent, and empowerment and competence are complements (Beltrán-Martín and Bou-Llusar, 2018). Altogether, the value of the AMO enhancing HRM practices framework lies in using configurations of practices to address OI challenges such as reluctance to share knowledge, resistance to collaborate with external parties, and capability deficits (Ferrarini and Curzi, 2022).

Compared to generic approaches to HRM, AMO provides a pragmatic route to increasing the connection between strategic human capital at the firm level and OI by integrating the process of human capital alignment into the development and management of innovation (Jarrar, 2023; Li et al., 2023; Moretti and Biancardi, 2018). This thesis places the AMO-enhancing HRM practices model not only as a theoretical tool but also as a supporter of the high-tech firms' OI performance improvements. The analysis is based on the AMO model, which is suitable for discussing OI implementation (Lam et al., 2021). Through the improvement of employee knowledge and incentives, as well as a suitably structured working environment, the organisational culture supports the principles of OI adequately (Lam et al., 2021).

Ability-enhancing practices relate to the strengthening of human capital, whereby one has to update, build, or create new capabilities of the human capital that are needed for innovation (Park, Bae and Hong, 2017). This has entailed such measures as training, education, staff development, mobility, staff recruitment, and selection targeted at the development of staff competencies relevant to OI activities. For instance, training that promotes collaborative skills allows the employee to interact with outside partners when acquiring and implementing external knowledge, which is an essential component of OI (Çera, 2024).

Recent research points out that using digital HRM with the AMO framework helps employees handle changes and take part in OI (Ferrarini and Curzi, 2022). For instance, many companies are now utilising AI-based learning to help employees learn individually, motivational games to keep them involved and virtual collaboration to boost autonomy and work with other departments (Davis et al., 2025). The use of digital technology in HRM shows how it’s becoming more flexible and focused on innovation in knowledge-based industries. Employees are empowered with AI-guided learning paths (ability), recognised using real-time feedback, collaborative scoring and gamified HRM dashboards to improve intrinsic and extrinsic motivation and are encouraged to self-nominate for OI-related project roles (opportunity) (Schöttl et al., 2025; Silic et al., 2020).

This digitally integrated AMO bundle mirrors Song's (2024) finding that HRM systems are most effective when ability-, motivation- and opportunity-enhancing practices are combined coherently and consistently with the organisational context (Alkhalaf and Al-Tabbaa, 2023). French manufacturing SMEs' support also indicates that these types of AMO practices improve firm performance mainly through employee-driven innovation improvement. The same patterns are seen in e-waste businesses in emerging economies, where lean digital practices that skill-enhance workers, tie rewards to green solutions and encourage frontline suggestions show how an AMO rationale can flourish even in resource-poor environments (Amankwah-Amoah & Durugbo, 2016).

In the real world, Google is an example of how following AMO-aligned HRM helps produce innovation in the workplace. Because of its “20% Time” policy, employees are invited to invest some of their working hours in personal projects, which helps boost their sense of independence and creativity (Krasteva et al., 2015). Continual training, technical growth and group collaboration allow the company to improve the skills of its people. People are motivated by why they work and by things outside work, such as bonuses or recognition from peers (Thomas & Karodia, 2014). In these practices, leaders show traits by supporting ideation and innovative experiments (Tran, 2017). The way Google sets up its HRM implies that using these three professional skill areas can support participatory processes and bring sustainable results in OI. Interestingly, similar positive effects of AMO practices are also found in smaller firms. For instance, empirical research in a study of SMEs in French manufacturing reveals that AMO-enhancing HRM bundles have a substantial effect in boosting innovation performance even in small, resource-constrained firms. In a study on SME employees, structured ability (recruitment and training), motivation (reward and performance feedback), and opportunity practices (decision-making participation) were found to positively impact firm innovation through enhanced internal and external innovation processes, a finding that is evidence that suitably designed AMO configurations are as effective in SMEs as in large tech firms (Alkhalaf and Al-Tabbaa, 2023).

Motivation-enhancing practices are designed to increase employees' readiness to participate in OI endeavours (Engelsberger, 2023). In this case, these lay down both the process and outcome-based incentives like the famous carrots and sticks, besides calling for what has been referred to as nurturance, which includes satisfaction from the job and encouragement of personal power (Deci, Koestner, & Ryan, 1999). However, it is necessary to use these kinds of motivating factors cautiously, as excessive use of extrinsic incentives could demotivate and disrupt other intrinsic motivators, which are not effective for the processes of OI (Deci et al., 1999).

Opportunity-enhancing practices enable employees to be equipped and to make valuable additions to OI (Paul et al., 2017). This entails decentralising decision-making, encouraging teams to self-directed work, and implementing a psychologically safe environment. In practice, firms establish such "psychologically safe" cultures through educating leaders in inclusive behaviours, setting up open feedback channels for reporting errors, and granting teams explicit voice channels (Edmondson & Lei, 2014). Such practices allow ideas to flow freely and cross-functional, in essence increasing the innovation capacity of the organisation (Kremer, Villamor, and Aguinis, 2019). There is a synergy effect when these AMO-based HRM practices are combined, as the impact of two or more practices combined is greater than the impact of each practice. It not only helps to introduce the principles of OI into new practical contexts successfully but also contributes to constructing a competitive advantage when organisations operate in today's complex environments (Çera, 2024).

Effectively optimising OI performance using AMO depends on organisations maintaining both internal practice coherence and their compatibility with external demands (Han et al., 2019; Obeidat, Mitchell & Bray, 2016). According to configurational analysis, a single HRM practice cannot produce effective outcomes independently (Bos-Nehles et al., 2023; Guerci et al., 2017). Training programs (ability) generate limited impact when organisations lack either recognition systems (motivation) or collaboration platforms (opportunity) (Al-kharabsheh et al., 2023; Jiang et al., 2012; Obeidat et al., 2016). When AMO elements operate together as bundles, they create powerful reinforcement instead of weakening their combined impact. The integrated nature of these arrangements bolsters OI and fuels organisational resilience, as well as enabling dynamic changes to HRM systems to fit evolving innovation environments (Han et al., 2019; Hansen, 2011).

2.4.3 AMO enhancing HRM practices as a Strategic Enabler in Open Innovation Ecosystems

In addition to being a useful micro foundational HRM model, the AMO enhancing HRM practices also acts as a strategic governance mechanism in OI ecosystems (Ferrarini and Curzi, 2022; Minbaeva, 2012). Under a complex innovation environment of broad participation and diffused knowledge flows, organisational control is decentralised and relies on trust, shared vision and interdependency (Wolmarans, 2020). In this sense, aligned AMO HRM systems play the role of scaffolds, building member coherence while spreading collaborative capacity to the outside. Firms such as Novartis and BASF provide examples of this phenomenon through their exploitation of AMO-based HRM interventions, like multi-disciplinary R&D incubators, co-development incentives and career mobility across global units, to govern innovation by reducing

the constraints typically coming from hierarchical structures (Song, 2024). Such arrangements enable employees to operate with autonomy without becoming disassociated from their organisation's agenda of innovation, a soft form of control necessary for controlling inter-organisational innovation projects (Willems et al., 2020).

AMO-driven HRM practices are not universally effective and are instead determined by institutional logics that reflect the rules of the labour market and levels of organisational maturity. The thesis, as explained by institutional theory, is that firms placed in diverse regulatory and cultural environments practice HRM systems based on locally expected standards while balancing global strategic achievements (Malik, Froese and Sharma, 2020). For example, in places like South Korea, where people tend to stay at the same employer for a long time, Samsung uses AMO by making sure teams are motivated, responsible and provided with equal opportunities. On the other hand, Spotify and Google adapt their approaches, focusing on motivating individuals through tailored rewards, allowing staff movement across job functions and giving them freedom (Chang, 2011; Mankins & Garton, 2017; Thomas & Karodia, 2014). This variation is confirmatory of the need for contingency-modulated variations of the AMO enhancing HRM practices in OI settings and it vindicates the use of qualitative inquiry for the discovery of sociotechnical embedded practices that quantitative generalisations may overlook (Floris and Pinna, 2024).

The leadership function is important as a mediator in transforming AMO practices to practical OI performance (Engelsberger, 2023; Obaid, Ahmad and Mumtaz, 2022). Transformational leaders, who speak an inspiring vision, stimulate intellectual drive, and demonstrate individualised consideration, contribute to the development of motivational and opportunity aspects of AMO, in particular (Waseem et al., 2025). In such high-tech companies as Nvidia, the leadership teams of such firms are very much committed to creating a culture where the practice of innovating on ideas, embracing risks and learning from failure is institutionally embraced (Olorunfemi, 2024). This leadership-driven magnification of AMO increases trust, disincentivises the fear of mistakes, and advances experimental mindsets, which are of necessity in navigating the uncertainty of OI (Kremer, Villamor, and Aguinis, 2019). Even if the best-designed AMO practices are implemented, a lack of aligned leadership behaviours may increase the risk of stagnation or symbolic implementation (Malik et al., 2025).

Empirical evidence suggests the optimal style is context-dependent within organisations: transformational leadership supports exploratory (break-through) innovation in dynamic, tech-oriented companies consider for example start-ups, whereas transactional leadership is more

appropriate for exploitative (efficiency-driven) development in more certain, process-oriented industries consider for example food production (Jansen, Vera & Crossan, 2009). Based on this approach, ambidextrous-leadership theory argues that effective leaders switch repeatedly between "opening" moves that induce experimentation and "closing" moves that shield reliability, adapting the mix to the company's innovation goals and environmental dynamism (Rosing, Frese & Bausch, 2011).

The digital transformation fundamentally reconfigures the way AMO practices inherit and scale up the functions of HRM roles. Ability-enhancing practices are now often delivered through AI-driven learning systems that identify gaps and personalise development paths, as seen in firms like IBM (Maheswari et al., 2024; Uttara Jangbahadur et al., 2024). Virtual HRM solutions like games and software now support motivation and encourage both staff engagement and coming up with new ideas. Organisations are using AI-powered platforms and regular feedback mechanisms since these are known to increase employees' interest in their jobs and creativity (Maheswari et al., 2024; Nivedhitha & Manzoor, 2019).

Also, organisations have grown opportunities by using virtual tools like Microsoft Teams, Zoom and Trello, which allow different teams to communicate and brainstorm in real time over the internet. Shared knowledge and innovation are possible on these platforms as they can use different groups of experts to communicate with (Hoque et al., 2025).

Diversity management within AMO configurations represents a critical influence point for OI. Workforce heterogeneity across nationality, gender, discipline, and cognitive orientation can enhance creative recombination of ideas, a key mechanism in OI performance (Hyunji, 2024). However, this potential is only realised when HRM systems proactively enable inclusive ability development, recognition of diverse contributions, and equitable access to collaboration platforms (Syech Idrus et al., 2024). Organisations increasingly incorporate AMO principles into HRM systems to unlock the innovating potential of diverse groups. Research suggests that the performance impact of diversity is highly context-dependent. Joshi and Roh (2009) find that task-related diversity has a small positive effect in high-tech and service sectors, but the effect is near zero, or even negative for manufacturing teams engaged in more routine, process-type tasks. Along the same line, van Knippenberg and Schippers (2007) infer that heterogeneous teams outperform homogeneous teams only when tasks are complex and non-routine; with simple, highly routinised tasks the same heterogeneity will hamper efficiency.

Bias-aware recruitment technologies that enhance ability make qualified candidates accessible on a broader spectrum (Singh, 2024). Personalised learning systems enhance motivation by

allowing personalised upskilling and leadership advancement, and feedback systems represent opportunity by enhancing recognition and valuing for diversity inputs (Singh, 2024). These AMO practices enable team-level innovation at its finest when productive, proactive behaviour, shared efficacy, and enabling leadership come together collectively (Krapež Trošt et al., 2016).

Organisational learning is a mediator and an effect of AMO-OI interaction (de Oliveira et al., 2019). Double-loop learning, which involves questioning basic assumptions and norms, is particularly relevant in OI environments where feedback from partners, and the results of experimentation can upset the current paradigms (Victoria and Furlan, 2023). AMO-enhancing HRM practices help build such learning cycles by providing employees with sensemaking tools (ability), creating reflective feedback loops (motivation), while giving organisational impulse to experimental routines (opportunity) (Bos-Nehles et al., 2023). Google's "g2g" learning network, where employees teach one another using peer-to-peer platforms, is one example of this mechanism (Pearson and Sadacharam, 2022). In turn, learning enhances the firm's absorptive capacity and its capability to integrate and exploit the external knowledge; key OI enablers (Bin, 2008; Hashem, 2024).

Although the AMO-OI literature has spent most of its time examining either individual- or firm-level effects, it is gradually coming to the conclusion that cross-level dynamics underlie sustainable innovation performance. For instance, practices that are capable of spurring team autonomy (opportunity), can result in emergent innovation behaviours that change departmental norms or even firm-wide HRM (Hodgkinson and J. Kevin Ford, 2012). These loops demonstrate a process in which broad-based objectives lead to specific day-to-day actions which in turn change the main system (Bai & Wang, 2016). Firms such as Spotify do it by grouping staff into squads that offer ideas for updating main HRM strategies (Kniberg & Ivarsson, 2012). This cyclical development of AMO systems is an indication of an organisational ability to foster HRM-enabled innovation, and theorised as a central component of open long-term innovation strategy (Ferrarini & Curzi, 2023; Škudienė, Vezeliene and Stangej, 2020).

Recent systemic shocks such as the COVID-19 pandemic and geopolitical volatility have exposed vulnerabilities in rigid HRM systems and underlined the strategic resilience of AMO-configured organisations. Lockdowns triggered an "explosive rupture" for office-bound HR practices, which made businesses into digitalizing recruitment, training and performance management and many traditional systems were left unprepared (D'Angelo et al., 2022). For example, during the pandemic, Microsoft accelerated virtual opportunity structures while reinforcing motivational practices through health-centric leadership and well-being bonuses (Hao, 2024). Similarly, by

applying remote onboarding and moving employees to newer technologies, Zoom and Salesforce avoided disruptions in their work (Gowrishankkar et al., 2025). These adaptations demonstrate how flexible AMO configurations support organisational resilience and innovation continuity in uncertain environments. Thus, AMO is not only a performance-enhancing framework but also a risk-mitigation strategy in innovation systems subject to external shocks (Ferrarini and Curzi, 2022).

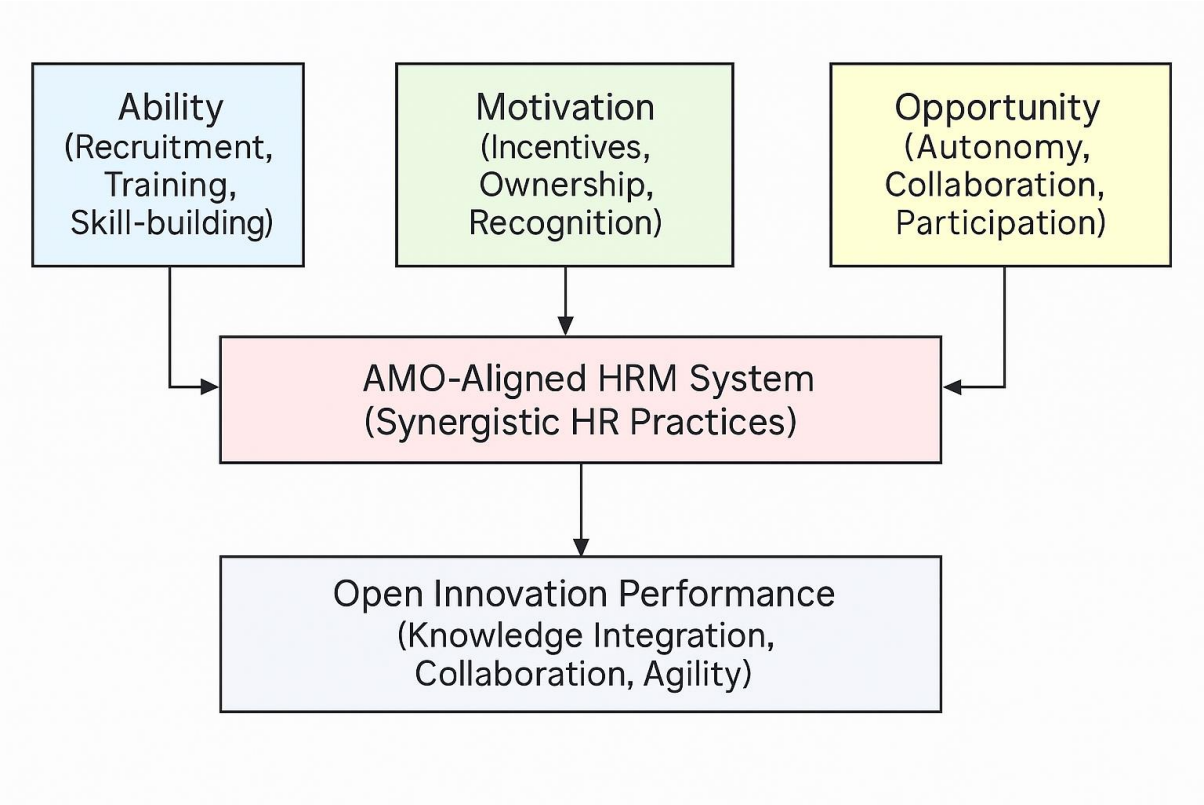

Figure 1 AMO- Aligned HRM System and OI performance (Metin, 2025)

Figure 1 illustrates the conceptual integration of AMO components into a unified HRM system designed to enhance OI performance. The model highlights that ability-enhancing practices such as skill development and training, motivation-enhancing practices like recognition, and opportunity-enhancing structures involving autonomy and cross-functional collaboration must operate in tandem (Joseph Eyo Duke et al., 2024). When strategically put together, these factors create synergistic HRM configurations that set up the behavioural setting in conjunction with structural circumstances necessary for knowledge absorption, but also for innovation flexibility and external partnership. This integrated system operates as a micro foundational promoter of OI results that supports the theoretical standpoint that AMO is not only a performance model, but also a strategic system for ensuring innovation in dynamic and high-tech environments (Ferrarini and Curzi, 2022; Nehles et al., 2023).

2.5 Knowledge gap and conceptualisation

While prior studies have shown that HRM practices facilitate OI through collaboration and knowledge sharing (Bandyopadhyay and Biswas, 2023), several gaps in knowledge remain about how the AMO-enhancing HRM practices model helps to further obtain OI performance at the organisational level. The AMO enhancing HRM practices framework incorporates the HRM practices into three related packages designed to improve employees' skills, motivation, and developmental opportunities, taking into consideration the OI's nature as collaborative and knowledge-based (Jiang et al., 2012).

Some recent studies show that, aside from AMO-enhancing HRM practices, there are other policies that also create the capability to absorb and apply external knowledge to work as aspects that are critical to OI (Bos-Nehles et al., 2023; Ferrarini and Curzi, 2022). Nevertheless, there is limited evidence on how the AMO-enhancing HRM practices framework can be connected to specific levels of OI at the firm level. Much of the prior literature has addressed AMO's effects on behavioural and organisational productivity and, in sum, organisational performance, but failed to explore how AMO affects OI that involves capturing, assimilation, and exploitation of external knowledge (Jiang et al., 2012).

To this end, this study seeks to fill this gap through the following objectives: To establish how the AMO-enhancing HRM practices model affects OI outcomes at the organisational level. In order to study the role of AMO bundles in OI, this study carried out explorative interviews to gain a deeper insight into how far these three bundles of practices interlink and add to the chances of success. This perspective presents a clear and broader picture of how the key parts of the AMO model enable OI performance, particularly in firms.

Extensive academic research exists for HRM and OI separately, yet little work investigates the interactive pathways AMO-based HRM practices utilise to affect innovation behaviours across multiple organisational levels (Cera, Cera and Elezi, 2023). What specific forms do AMO practices take at team and departmental, and organisational levels to drive OI results (Ferrarini and Curzi, 2022)? The research lacks sufficient investigation of how organisational culture, alongside leadership, influences or hinders the performance of these mechanisms. Empirical research conducted thus far mainly relies on a cross-sectional design, which provides little clarity on the time-based evolution of AMO practices accompanying OI initiatives (Marin-Garcia and Tomas, 2016). The time-dependent nature of these principles presents fundamental insights into enduring innovation sustainability.

This research aims to validate current theories and develop research which connects AMO practices with OI performance through mediation mechanisms that include absorptive capacity and potentially innovation climate and trust (Bos-Nehles et al., 2023; Lasisi, 2020). This research uses qualitative interviews in high-tech sectors to provide both theoretical insights and managerial guidance through its examination of AMO configuration implementation in real-world practice.

A critical oversight in current AMO-OI research lies in its underestimation of contextual contingency, particularly how national culture, industry-specific dynamics, and digital maturity mediate the impact of AMO bundles (Naqshbandi et al., 2023). For instance, the same motivation-enhancing practices, such as reward systems or recognition rituals, may yield very different outcomes in collectivist Asian cultures compared to individualistic western environments (Helali, 2024). Additionally, high-tech sectors differ in their openness to external collaboration based on regulatory intensity. In sectors like pharmaceuticals, where intellectual property protection is vital, opportunity-enhancing practices may be structurally constrained (Alkhalaf and Al-Tabbaa, 2023; Ferrarini and Curzi, 2022).

Moreover, while much of the literature captures the macro-to-micro pathway, which is how strategic HRM influences individual behaviours, the reverse pathway remains underexplored. But, how do micro-level innovations, generated by empowered individuals or teams through AMO, scale up to firm-level OI performance (Anlesinya and Susomrith, 2020)? Bosch's internal venture program “Open Bosch” is illustrative here. Through intrapreneurship programs, employees can pitch externally viable solutions that receive venture funding. These bottom-up innovations, initially motivated by AMO practices, ultimately contribute to new product lines and strategic partnerships (Robert Bosch GmbH, 2023; Yao et al., 2022). Yet, current research fails to capture these feedback loops. This thesis aims to address this blind spot by developing a multi-level conceptual model that links individual capability development and opportunity structures to strategic OI trajectories over time (Bos-Nehles et al., 2023; Iao-Jörgensen, 2023; Jiang et al., 2012).

Another gap relates to the absence of longitudinal insights into AMO practice evolution across different innovation cycles. Most empirical studies adopt cross-sectional designs, missing how HRM practices are adapted or reconfigured as firms move from ideation to diffusion phases (Rabiul, Mui and Nadia Newaz Rimi, 2023). For instance, ability-enhancing practices may dominate during early exploration phases, while opportunity-enhancing structures may become critical during exploitation and scaling (Agirre-Aramburu, 2024). Some high-tech firms

strategically adjust these HRM bundles over time via using talent mobility, hackathons, and internal OI challenges, depending on their innovation stage (Naqshbandi, 2023; Shan and Wang, 2024). Capturing this emergent feedback within the AMO-OI interface would enrich both theory and practical HRM models, advancing our understanding of dynamic strategic HRM systems in innovation ecosystems (Shahzad et al., 2022; Siregar et al., 2021).

3. Methodology

3.1. Research design and rationale

This research used a qualitative approach with interviews to explore *How the AMO enhancing HRM practices lead to OI performance in the high-tech sector*. Qualitative research is suitable here because the objective is to gain a deep exploration of managers' perspectives on how the AMO-enhancing HRM practices lead to OI at the organisational level (Mehran Khan Tunio et al., 2023). This allowed the researcher to get deeper information from participants regarding thoughts, experiences and approaches that may not be captured through quantitative methods (Cypress, 2018).

3.2. Insights from theoretical background

The literature review is done by searching academic databases to find peer-reviewed literature reports. The most used database is Scopus, but the ones that are used besides it are Web of Science, TU Delft's library, Erasmus University's library and Google Scholar. AI tools like Perplexity are also used in order to find correctly suitable academic papers. In order to achieve the papers that were needed, different keywords were used in the databases, like the following ones:

- "Ability-Motivation-Opportunity"
- "Open innovation"
- "AMO"
- "OI"
- "External collaboration
- "High-tech"

Furthermore, clusters of terms are used to get more specific results in the direction of the research objective. This is done with AND and OR operators, see the examples below:

- ("Ability-Motivation-Opportunity" OR “AMO” OR (“Ability” AND “Motivation” AND “Opportunity”) AND ("open innovation" OR “OI” OR "inter-firm collaboration" OR "external collaboration") AND ("high-tech" OR "technology-intensive" OR "knowledge-intensive" OR HRM)
- ("Ability-Motivation-Opportunity" OR “AMO” OR (“Ability” AND “Motivation” AND “Opportunity”) AND ("open innovation" OR “OI” OR "inter-firm collaboration" OR "external collaboration") AND HRM

The searches were done in the English language and critically analysed on the usability of the sources based on if it is peer reviewed, research alignment and data of publication. Reference lists of papers were also checked for alignment with sources and checked based on the same criteria. So, forward and backwards snowballing are both used during the literature review. The results of the searches were filtered by checking the titles, summaries, conclusions, scanning the full texts and when needed, reading the text parts that are needed.

3.3. Sampling

A non-probability purposive sampling strategy is used to ensure that participants are experienced with HRM practices and the AMO-enhancing HRM practices framework (Zaman et al., 2025). Non-probability sampling refers to techniques where not all members of the population have a known or equal chance of participating (Stratton, 2023). Purposive sampling, specifically, is a type of non-probability sampling in which participants are deliberately selected based on specific characteristics or knowledge relevant to the research objectives (Pace, 2021). It is particularly suitable when the researcher seeks in-depth, specialised insights from a particular group rather than broad generalizability. To ensure that participants are adequately informed, an informative document explaining the AMO-enhancing HRM practices framework was shared a week prior to the interviews. The sample is drawn from HR managers, HR specialists, innovation managers, R&D directors, and general managers working within the high-tech sector. These roles are selected because they are either directly involved in or have strategic knowledge of designing, implementing, or aligning HRM practices, particularly the AMO-enhancing HRM practices framework, with OI outcomes within their organisations (Bos-Nehles et al., 2023).

To enhance the generalizability of the study, this thesis focuses on participants from high-tech industries. The relevance of the high-tech industry to OI is based on its technological evolution, short innovation cycles and technology intensity. High-tech firms often engage in OI for the purposes of securing complementary resources, risk sharing and accelerating innovation processes. Evidence shows that technology-intensive sectors have a greater propensity to adopt

OI practices in response to calls for knowledge leveraging and new business models. OI in high technology fields promotes higher knowledge sharing, reduces R&D costs and promotes collective problem-solving, so it is critical to remain competitive in fast-moving markets (Linde, 2011; Sopinska, 2020). The "high-tech industry" that is targeted consists of the following (Terrell, 2016):

- High-tech manufacturing like, pharma, electronics and industrial machinery.
- High-tech services like software and IT services, telecommunications, scientific and engineering/ consultancy services, corporate and management services.
- Other high-tech sectors like energy and utility, etc.

Participants are recruited between 20 March and 20 April 2025 via LinkedIn Premium and personal networks in high-tech industry companies in the near vicinity of the researcher, so in the proximity of South Holland. This resulted in 13 interviews in total, with 8 established corporations and the rest are smaller companies like startups. The researcher invited 70 individual professionals from relevant industries and roles via LinkedIn and obtained 9 interviews by doing this. This is a success rate of 12,9%, which shows that it was an effective method for this research to obtain interviews. Once the connections were accepted, direct messages were sent to the individuals. Also, personal networks and referrals are used to source the relevant individuals. 2 interviews were gathered from the researcher's personal network, and 2 interviews were acquired from professional referrals. Two weeks were reserved as buffer time for recruiting, but this was not needed after all.

This research makes use of in-depth qualitative interviews with 13 experts (P1–P13) from a blend of high-tech sectors, for example, semiconductors, biotechnology, AI, industrial automation and digital technologies. The way people were chosen for the study was purposeful, so that there was diversity in organisations, roles (HR, operations, innovation areas) and sectors, to support finding insights from several dimensions in HRM connected to OI.

Among the participants were people from start-ups, SMEs and large global enterprises, enabling a wide variety of experiences dealing with innovation and successful HRM practices to be shared. Six of the participants were of established corporations, whereas the rest were from growing businesses, providing a chance for the study to analyse diverse HRM styles. Moreover, all partners played key roles in HR or innovation which

guaranteed comprehensive and meaningful coverage of how better practices are carried out at work.

The majority of the firms were set up in Western Europe's countries, mainly Holland and Belgium, but some of them operated worldwide, reflecting foreign impacts on their HRM and innovation approaches. The results are mainly from this region, so their impact can be applied across the world due to the international nature of OI, but the cultural aspect could play a role in differing circumstances around the world which would give different results.

For more details, refer to Table 1 (below) and find out more about each of the participants through their pseudonym, gender, role, organisation type, area of work and years of experience. Since the data are diverse, we can better check the findings from different themes using triangulation.

"I think we use almost all three [AMO dimensions] but tailored per role and project need" (P8)

The quote highlights the use of AMO practices by the different organisations in our sample that emphasised the importance of an effective HRM design for driving innovation.

Table 1 Interview participants

Participant	**Years of Experience**	**Expertise Area**	**High-Tech Sector Focus**	**Organization Type**
P1	17	HR Manager	Deeptech	Venture Builder
P2	12	HR Manager	Electric Mobility	Corporate Venture
P3	8	Operations and HR Manager	Laser Technologies	Startup
P4	6.5	CEO	Cybersecurity	SME

Participant	Years of Experience	Expertise Area	High-Tech Sector Focus	Organization Type
P5	17	CEO	Green Energy (Hydrogen)	Startup
P6	7	HR Manager Benelux	Semiconductors	Established Corporation
P7	11	HR Manager	Semiconductors	Established Corporation
P8	10	CEO	Deeptech	Startup
P9	22	Sr. HR Director	High-Tech Manufacturing	Established Corporation
P10	5.5	HR Manager	Industrial Automation	Established Corporation
P11	15	Director Operations	Pharmaceuticals/Biotechnology	Established Corporation
P12	3	HR Manager	Industrial Technology Services	Established Corporation
P13	4.5	HR Manager Ops & Supply Chain	Semiconductors	Established Corporation

3.4. Data collection

The data collection is done with semi-structured interviews and guided with an interview guide to stay consistent in the interviews. The semi-structured interview guide was developed based on key constructs identified in the literature review. The constructs are used with their conceptual definition and converted into open questions and follow-up questions. This ensured content validity. Questions were phrased in non-technical language and understandable for participants by first explaining some theory before asking the questions. The full interview guide is provided in Appendix A. Non-predetermined questions are asked as well to ask further about information of interest. Moreover, open-ended questions are used so the participants can explain their experiences. The interviews are done via video calls to have more insight into physical expressions, but some are also done in person if it was more convenient. Furthermore, all interviews are recorded but are not shared and are kept safe at the OneDrive servers of the TU Delft. The recordings are deleted after textual transcription. Also, an HREC application is done with an HREC checklist, informed consent form and data management plan (Reuver, 2023). The three HREC documents were checked with the TPM faculty data steward on 14 March 2025 for feedback and minor revisions. The submission to HREC was on 31 March and the approval was received on 8 April 2025.

3.4.1. Interview questions

The interview questions are asked in a funnel style, starting with broad perceptions of OI and the AMO enhancing HRM practices and moving to more specific mechanisms, problems and evaluation processes. The interview guide was kept adaptable to enable follow-up questions to track developing themes during interviews. The interview questions are split into the following sections during the interviews:

1. General idea of the AMO enhancing HRM practices and OI
2. AMO enhancing HRM practices for OI
3. Mechanisms and internal processes
4. Challenges in implementing the AMO-enhancing HRM practices for OI
5. Measuring and evaluating the AMO-enhancing HRM practices impact on OI

The complete interview protocol, including a small theory part that is explained to the participants in order to understand the questions, is shown in Appendix A.

The measurement in this study of the AMO enhancing HRM practices framework focuses on the ability, motivation and opportunity, which structures HRM practices into three bundles: ability-

enhancing, motivation-enhancing, and opportunity-enhancing practices. Recruitment, training and skill-building practices fall under ability-enhancing practices, whose role is to improve employees' capabilities. The motivation-enhancing practices include performance-based rewards, systems of recognition and systems of feedback, whose role is to increase the engagement of employees. Opportunity-enhancing practices include mechanisms such as participative decision-making, delegation and cross-functional collaboration, whose role is to offer employees opportunities to contribute to innovative processes. These bundles offer the platform to measure how the AMO-enhancing HRM practices framework gives rise to OI performance outputs in companies (Bandyopadhyay, 2023; Tran, 2022).

The measures of OI outcome are defined by the participants of the interviews. The measures are kept in line with the literature in order to stay consistent with other studies in terms of terminology. These dimensions are investigated in this study by conducting semi-structured interviews with HR managers, HR specialists, innovation managers, R&D directors and general managers in the high-tech sector. The questions in the interview are constructed to collect qualitative data on how the AMO-enhancing HRM practices framework affects OI outcomes. By using these indicators as topics of discussion in interviews, the study determines how companies that use the AMO-enhancing HRM practices framework see OI performance improvement.

3.5. Data analyses

After the interviews, the recordings were transcribed into textual form. Furthermore, the data was read through to get familiar with it. Subsequently, the data were coded with Atlas.ti, first using open coding, then axial coding, and lastly with selective coding (Reuver, 2023). Also, patterns and relationships are analysed to get the findings needed from the data.

3.6. Validity and reliability

The credibility of the data is guarded by checking the summaries of the findings with some selected participants to ensure accuracy. Additionally, a fellow academic student is asked to check some themes with the codes. Moreover, notes are made of my personal assumptions and thoughts to stay aware of my choices and handling. Furthermore, an audit trail is made to keep track of the decisions made during the data analysis. This gives the research more transparency and replicability.

4. Results

4.1 Introduction

This chapter presents the empirical findings of the study and provides answers to the main research question: *How can the Ability–Motivation–Opportunity (AMO) enhancing HRM practices lead to firm-level OI performance in the high-tech sector?* In addressing this, three sub-questions are systematically answered using data derived from 13 expert interviews conducted across different segments of the high-tech sector, such as semiconductors, biotechnology, industrial automation, AI services, and deep-tech ventures.

The analysis of qualitative data was carried out by following thematic analysis as explained by Kiger and Varpio (2020). This allowed us to use Atlas.ti for proper coding. Codes were created at first by using the main AMO dimensions Ability, Motivation and Opportunity and were enlarged when new themes were organically found in the accounts of participants. Specifically, the AMO pillars were originally operationalised into their core HRM-practice dimensions drawn from the literature ability (training, recruitment, skill development), motivation (Incentives, ownership, recognition, reward), and Opportunity (autonomy, collaboration, participation). These dimensions were entered in ATLAS.ti as a start-list codebook; as the transcripts were reviewed, any common excerpt which fell outside the start list was temporarily coded and ultimately merged with the closest AMO dimension or, where conceptual deviation occurred, upgraded to an emerging second-order theme. Because both deductive and inductive logic were used, the study managed to interpret many workforce practices that supported AMO, what challenges were faced and results in innovation across various circumstances (Bos-Nehles et al., 2023).

For greater accuracy, codes were calculated by the number of times each was mentioned to show their percentage in the entire data. Motivation-enhancing practices were present in 41% of the thematic codes, more than the Ability-related codes (34%) and Opportunity practices (25%). Data is reported and all results are tabulated by the main themes that appeared throughout all the interviews, discussing their connections to OI performance.

A separate part now deals with organisational issues and offers strategies to address them, along with supported evidence in a table. Appropriate quotes by participants are shared in the research to support the findings and improve transparency. An example quote is as following:

“We try to review who most likely wants to do it… so that it’s more intrinsically motivated” (P13)

The quote shows that those ways of improving Motivation were key to both leading and supporting lasting collaboration on OI with other businesses.

4.2. Answer to Sub-Question 1: AMO-Enhancing HRM Practices

What are the different AMO-enhancing HRM practices implemented in high-tech firms?

This section provides the key Ability-Motivation-Opportunity (AMO)-enhancing HRM practices identified in high-tech firms. With the thematic findings from the data, this subchapter presents a structured overview of how specific practices within each AMO dimension contribute to OI performance. A total of 672 coded AMO references were analysed from the 13 expert interviews: 276 codes (41%) pertained to Motivation, 228 (34%) to Ability, and 168 (25%) to Opportunity. This distribution not only reflects the relative emphasis placed by firms but also reveals the dynamic interdependence of the AMO components in innovation-oriented HRM.

This analysis of 13 semi-structured interviews employed a hybrid thematic analysis approach, integrating deductive (theory-driven) coding based on the Ability-Motivation-Opportunity (AMO) enhancing HRM practices with inductive refinement drawn from empirical insights. This methodological blend proved instrumental in uncovering the nuanced ways in which HRM practices differ in innovation-intensive contexts compared to traditional settings.

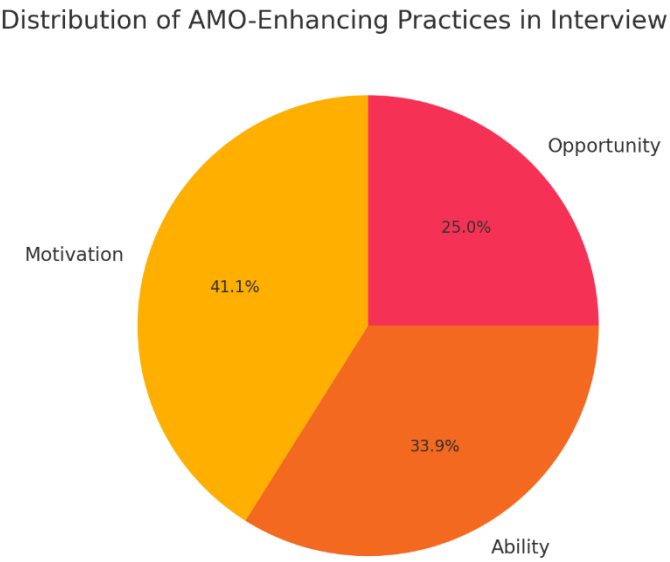

Figure 2 Distribution of AMO-enhancing practices in interview data

The process yielded 672 open codes, with motivation-enhancing practices comprising the largest share (41%), followed by ability (34%) and opportunity (25%). This distribution highlights the centrality of motivation in driving employee-led innovation, especially within high-autonomy

environments characteristic of high-tech sectors. See figure 2 for the visualisation of the distribution.

However, the findings also revealed significant interdependence among AMO dimensions, where individual HRM practices often spanned multiple categories, for instance, learning initiatives that simultaneously build ability and motivation.

4.2.1. Ability-Enhancing Practices

High-tech firms increasingly adopt ability-enhancing HRM practices to develop employees' capacity for boundary-spanning collaboration, rapid learning, and experimentation. These practices go beyond conventional skill-building and are rooted in strategic goals that align with innovation outcomes.

- Skill-Based Hiring: Rather than focusing solely on technical expertise, firms recruit for behavioural and cognitive traits conducive to innovation, such as curiosity, openness to learning, and teamwork. As P2 noted, "We go beyond technical skills when hiring, and check for open-mindedness, ability to learn fast, and the will to cooperate." This emphasis on adaptability and a collaborative mindset facilitates OI, where cross-functional engagement is key (Tobari et al., 2024).
- Digital Upskilling and Learning Ecosystems: Firms co-develop modular, role-specific courses with institutions like TU Delft and offer access to MOOCs and internal academies to promote on-demand learning. P10 shared, "We co-develop courses with TU Delft and employees take them during sprints," illustrating the fusion of formal and agile learning mechanisms that reinforce absorptive capacity.
- Institutional Partnerships and Ecosystem Exposure: Collaboration with academic and industrial partners plays a vital role in equipping employees with frontier knowledge. Employees rotate through customer-facing roles or R&D labs to bridge internal competencies with external trends. As P3 explained, "People rotate through customer-facing roles, which helps them understand external feedback better."
- Dynamic Capability Building: Ability-enhancing practices evolve across the innovation lifecycle. During ideation, generalist skills are valued, whereas the prototyping and commercialisation phases demand deep expertise.

4.2.2. Motivation-Enhancing Practices

Motivation-enhancing HRM practices emerged as the most influential category in the study, underlining their catalytic role in enabling employees to transform capacity into collaborative

innovative behaviour. These practices draw upon both intrinsic and extrinsic motivators and are deeply embedded in the organisational culture.

- Purpose-Driven Leadership: Firms strategically frame OI in terms of societal contribution, customer impact, and environmental relevance. This approach connects employees' daily tasks to a broader purpose, thereby reinforcing intrinsic motivation. As P5 emphasised, "Explaining the reason for OI makes employees value every task, even the usual ones."
- Non-Monetary and Symbolic Rewards: While bonuses remain in use, recognition systems increasingly reward impact, visibility, and peer endorsement. P6 noted, "What worked better was showing impact, highlighting how someone's prototype influenced the final customer delivery, made them feel ownership." This signals the shift from transactional incentives to psychological engagement (Bossaerts et al., 2023).
- Autonomy and Psychological Safety: Employees were granted decision-making rights in early-stage innovation or sprint leadership, encouraging risk-taking and ownership. As P7 highlighted, "Allowing them to run a short sprint makes them feel more comfortable with the process and makes them feel more involved." This builds confidence and supports psychological empowerment.
- Peer-Based Motivation and Cultural Rituals: Team rituals, informal ceremonies, and innovation storytelling promoted social contagion, where enthusiasm and commitment spread organically. P13 observed that people don't usually work extra hours unless everyone is enthusiastic about the project; this attitude is quickly shared and encouraged by others.

4.2.3. Opportunity-Enhancing Practices

Opportunity-enhancing HRM practices ensure that employees have the structural, cultural, and relational means to participate in OI. These practices open up access across boundaries and foster environments that enable experimentation and cooperation.

- Cross-Functional Teams and Mobility: Firms encourage employees to engage across departments and roles. P4 illustrated this by stating, "We established a virtual place where anybody from the organisation can suggest and become involved in innovation projects across different areas." Such platforms democratise innovation and unlock dormant creativity.
- OI Forums and Hackathons: Companies organised events where employees could propose, join, or lead innovation projects beyond their daily scope, also researched by

Crespin-Mazet et al. (2021). These forums created informal innovation pipelines that fed into formal product development processes.

- Time Flexibility for Creative Work: Employees were allowed to dedicate hours outside their core duties for innovation-related tasks. This temporal freedom was instrumental in enabling deep thinking and creative exploration, crucial for OI in fast-moving sectors like high-tech.
- External Linkages and Ecosystem Participation: Opportunity was also created through partnerships with start-ups, universities, and innovation consortia. These engagements broadened the scope of idea generation and knowledge absorption.

4.2.4. Skill and Ability Development as Foundations of OI Readiness

A number of technical firms put effort into structured learning to develop skills needed for OI, mainly those that allow employees to team up with people from other departments and companies. Li (2021) explains that working together, quickly reacting, and learning quickly matter a lot in the beginning of creating new solutions since a lot is unclear and new. In addition, participants pointed out that innovation readiness requires both technical skills as well as good social and mental skills.

For example, P3 pointed out, “You hire for skill, and you give the opportunity to pick up anything that people like to do within the company,” drawing attention to the way flexible, skill-based recruitment fuels OI readiness through the ability of newcomers to plug into cross-functional work right away.

The participant was pointing out how having particular traits makes people more open to new ideas.

In order to support this, some organisations used ability-based charts suitable for innovation and chose to speed up the learning process for new employees by giving them tailored onboarding. Studying was also improved by using digital tools, internal training, and joining efforts with universities to create group learning projects. An example from P10 shows how courses developed by TU Delft are taken during sprinter days including both formal learning and agile practices. Using these learning mechanisms improved OI by allowing for quick integration, increased success in developing new ideas, and effective work with outsiders.

4.2.5. Motivational Architectures for Sustained OI Drive

Across the interviewed participants, motivation-enhancing practices emerged as the most prominent strategy for driving innovation. Firms consistently recognised that fostering innovation

behaviours depended less on extrinsic rewards and more on cultivating intrinsic engagement through purpose, recognition, and autonomy. As Batanova (2024) argues, innovation flourishes when employees perceive their roles as meaningful and when their contributions are acknowledged beyond financial compensation. This shift toward intrinsic drivers was evident in how companies reframed their reward systems, emphasising impact and visibility over monetary gain. For instance, P6 explained, "We tried financial bonuses, but what worked better was showing impact, highlighting how someone's prototype influenced the final customer delivery, making them feel ownership."

4.2.6. Structural Opportunity and Cross-Boundary Access for OI

Participants stated that adopting opportunity-enriching HRM approaches allowed employees to take an active part in developing innovative ideas in their companies and in partnership with people outside the firm. The practices made it possible for employees in any department or position to take part in OI whenever they could. Companies introduced initiatives such as involving people from several teams on projects, moving employees to different positions, sharing new ideas, and hosting hackathons every now and then, which also aligns with Robu and Lazar (2021). Furthermore, companies gave workers time off and extra hours to be creative, so they did not have to focus only on their daily tasks.

During the interviews, P4 showed an initiative: "We established a virtual place where anybody from the organisation can suggest and become involved in innovation projects across different areas." This approach not only fostered a sense of inclusion and ownership over innovation but also enabled rapid mobilisation of interdisciplinary expertise, also seen before by Langley, Wolstenholme and Cooke (2018). Externally, companies were equally engaged, forming research alliances, joining innovation consortia, and mentoring or co-developing with start-ups. These mechanisms expanded the firm's innovation boundary, allowing for greater absorption and application of external knowledge.

However, the interviews revealed that mere structural access was insufficient. Opportunity-enhancing practices only translated into meaningful OI contributions when combined with strong managerial support and a psychologically safe culture as also seen by Johar et al. (2024). Employees needed to trust that their input would be valued and that taking risks would not lead to negative repercussions. Therefore, opportunity should be viewed as both a formal design principle and a cultural condition, co-created through supportive leadership and an inclusive HRM philosophy.

4.2.7. Cultural Enablers and Psychological Empowerment (Integrated AMO)

Many participants highlighted that an encouraging, innovation-supportive organisational culture served as the crucial glue binding together various HRM practices with broader innovation goals. Culture functioned as the underlying enabler that allowed the AMO-enhancing HRM practices to translate into meaningful employee behaviours and innovation outcomes. A culture grounded in mutual trust, openness, acceptance of failure, and psychological safety enhances the effectiveness of HRM initiatives, which is also seen by Williams (2024). In the organisations interviewed, these values were reinforced through a variety of social mechanisms such as team rituals, informal ceremonies, and friendly peer recognition systems. As P13 suitably noted, "People stay late not because they have to, but because their team is excited... it spreads," indicating the power of collective enthusiasm rooted in shared values. While discretionary effort of this sort reflects strong intrinsic motivation, managers must also shield against work–life balance erosion and the possibilities of burnout that prolonged overtime can entail (Cortina et al., 2017).

In the companies that placed great importance on innovation, experimenting and gaining experience from setbacks was typical and could end up being a part of their evaluation and bonus systems. Treating failures as part of learning meant something new was introduced into the traditional way of dealing with risks in business. Thanks to HRM, this innovation culture was made a part of some company cultures. Onboarding new hires involved sharing stories with them to teach the firm's core values. The CEO, along with other leaders, showed curiosity and openness as examples, and they started giving awards for the most creative and original ideas as opposed to just achievements.

4.2.8. Temporal Adaptation of AMO Configurations across Innovation Phases (Dynamic AMO)

Participants also pointed out that practices to support AMO development should be adapted to the group's development, the innovation strategy, and external challenges. The way HRM is done should shift from the first stages of development to the commercialisation of innovations. Organisations gave importance to flexibility and freedom during innovation's first stages, letting their employees take the lead, communicate with others, and try different ideas. P3 noted that during the design stage, people have more flexibility. However, when we grow larger, we must make the organisation's structure more rigid by tightening the AMO. The participant demonstrates how HRM systems respond to changes, for instance, going from flexible and local to strict and specific, as the implementation of innovation approaches.

This strategy matches the main idea of the contingency perspective, which points out that for HRM to be successful, it should be adapted for each situation and changed at the appropriate time (Iqbal, 2019). The main reason innovative firms remain so is that they continuously update their HRM systems based on the progress of the innovation. When COVID-19 came, companies had to change their workplaces and HRM services rapidly. Because of COVID, P5 started hosting their sessions online. At first, our work on OI slowed for about a month, but then we sped up once we started to use the new tools. Because of these virtual changes, the agency's framework shifted in accordance with changes happening beyond the company.

Being able to apply AMO methods to evolving situations, especially if they are technological, organisational, or social, greatly helped innovation remain steady and strong (Alkhalaf and Al-Tabbaa, 2023). Sustainable OI was possible for firms that created their HRM systems to be flexible and fast-changing. Consequently, mature and innovative companies succeed in dynamic AMO practices because they operate in highly volatile, high-tech industries.

4.3. Answer to Sub-Question 2: Challenges and Mitigation Strategies

What challenges do high-tech firms face in using AMO-enhancing HRM practices, and how are these challenges addressed?

High-tech firms implementing AMO-enhancing HRM practices to foster OI encounter a variety of organisational, structural, and cultural challenges (Ferrarini and Curzi, 2022). These obstacles can impede the effectiveness of AMO dimensions, particularly when practices are applied in isolation or without alignment to the firm's broader innovation strategy. This section outlines the most prominent challenges, illustrates them with participant quotes, and analyses how firms responded through HRM or managerial interventions. See Table 2 for the overview of this. The impacts of these responses on innovation outcomes are also critically evaluated.

Table 2 Key Challenges and Mitigation Strategies in AMO-Enhancing HRM

Challenge	**Illustrative Quote**	**HRM/Managerial Response**	**Impact on OI**
Siloed teams	"No one talked across units" (P4)	Cross-functional idea hubs	Improved interdepartmental collaboration
COVID disruption	"We had to reimagine sprinting" (P8)	Virtual jams, remote platforms	Recovered innovation momentum

Challenge	Illustrative Quote	HRM/Managerial Response	Impact on OI
Motivation fatigue	"Bonuses stopped working" (P6)	Purpose-led leadership, recognition shift	Increased intrinsic engagement
Cultural resistance	"They feared failure would cost them" (P10)	Safe-to-fail spaces, peer-led rituals	Boosted psychological safety and experimentation
Static skill development	"Our training lagged behind new tech" (P9)	Modular upskilling, real-time learning	Faster response to technological change
Hierarchical constraints	"Only managers could submit ideas" (P11)	Flattened innovation governance	Democratized innovation participation

Challenge 1: Siloed team structures were a recurring obstacle to effective opportunity-enhancing practices. In several firms, departments operated in isolation, preventing the flow of ideas across boundaries. As P4 noted, "No one talked across units," highlighting the disconnect that can stagnate OI. In response, firms created cross-functional innovation hubs, where employees from different units could collaborate informally on emerging ideas (Ungureanu et al., 2020). These hubs served as neutral zones to encourage horizontal dialogue. The impact was significant: enhanced knowledge exchange, faster prototyping cycles, and stronger joint ownership over innovation outcomes.

Challenge 2: The COVID-19 pandemic introduced urgent challenges to opportunity and motivation, especially by disrupting face-to-face collaboration and traditional sprinting methods. P8 reflected, "We had to reimagine sprinting," illustrating how in-person innovation rituals were abruptly halted. The response was agile: firms rapidly developed remote innovation platforms, including virtual hackathons and idea jams (Jaribion, 2021). This shift to digital formats not only salvaged momentum but also increased global inclusivity, as teams from different regions could now engage in innovation sprints asynchronously. The firms reported that innovation velocity rebounded quickly post-adjustment.

Challenge 3: Motivation fatigue is another challenge, as several participants identified the limitations of relying heavily on financial incentives. As P6 explained, "Bonuses stopped working," pointing to declining returns from extrinsic motivators. HR leaders addressed this by pivoting

toward purpose-driven leadership and symbolic recognition, emphasising impact, visibility, and alignment with organisational mission. These approaches revitalised employee engagement, particularly in R&D teams, by reinforcing psychological ownership and autonomy (Wang, 2024). The shift boosted sustained innovation participation and elevated discretionary effort across innovation lifecycles.

Challenge 4: Cultural resistance to the risks of fear of failure remained a challenge, especially in hierarchical or compliance-heavy cultures. P10 shared, “They feared failure would cost them,” indicating that risk aversion impeded experimentation. To mitigate this, firms introduced safe-to-fail spaces, where trial-and-error was normalised and even celebrated through informal rituals. Storytelling, team awards for experimentation, and debriefs of failed pilots helped destigmatise risk. These cultural interventions significantly increased employee willingness to engage in OI initiatives and improved learning cycles through reflective practice (Brady et al., 2024)

Challenge 5: Static Skill Development, in the form of ability-enhancing HRM practices, was sometimes constrained by outdated training systems. P9 stated, “Our training lagged behind new tech,” pointing to a misalignment between workforce capabilities and OI demands. Companies responded by deploying modular upskilling platforms that delivered real-time, role-specific content via internal academies or EdTech tools. This allowed firms to reduce time-to-competency, better align learning to innovation sprints, and increase employees’ absorptive capacity, particularly in emerging fields like AI, biotech, and automation (Patel, 2023).

Challenge 6: Hierarchical Constraints. Rigid hierarchies often stifled employee initiative. P11 said, “Only managers could submit ideas,” reflecting a top-down culture incompatible with OI principles. Firms countered this by introducing flattened innovation governance, allowing any employee to submit, champion, or lead innovation projects. This democratisation of innovation significantly improved idea quality and volume, empowered diverse contributors, and broke the reliance on senior leadership for creative input.

These findings offer a critical answer to Sub-Question 2, by not only identifying key barriers but also highlighting how responsive HRM strategies mediate their impact and contribute to sustained OI performance.

4.4. Ability Enhancement as a Foundation for Innovation Readiness

The ability of employees to engage in innovation processes is a foundational dimension of the AMO framework and a critical enabler of OI outcomes (Ferrarini and Curzi, 2022). In high-tech

firms where OI depends on dynamic collaboration, boundary-spanning activities, and iterative experimentation, HRM practices that enhance employee ability are pivotal. In this part, we look in-depth at how companies in high technology achieve innovation readiness by using targeted strategies, relying on what the interviewees noted: (1) recruiting employees with needed skills, (2) offering various learning opportunities and links to educational partners, (3) making sure teams have suitable abilities for every phase of innovation, and (4) helping staff learn to adapt.

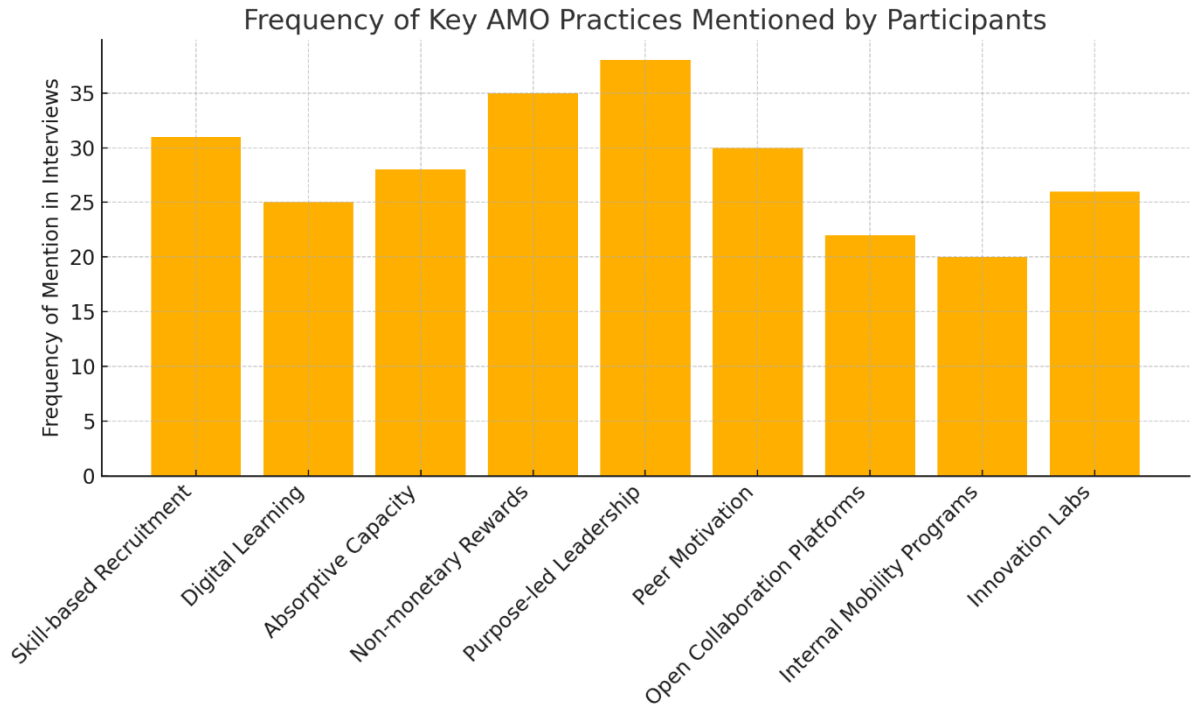

Figure 3 Frequency of key AMO practices mentioned by participants

In Figure 3, a bar chart illustrates the frequency with which key HRM practices tied to the AMO framework were mentioned across the 13 expert interviews. Notably, purpose-led leadership was the most frequently referenced practice (38 mentions), followed closely by non-monetary rewards (35 mentions) and skill-based recruitment (31 mentions). The prominence of these practices indicates a strong emphasis on motivational and ability-enhancing strategies in the pursuit of OI performance (Alkhalaf and Al-Tabbaa, 2023). The chart underscores how firms strategically integrate AMO principles into day-to-day HRM functions, ranging from how they recruit and develop talent to how they inspire and retain employees through purpose, recognition, and role alignment. This visual evidence reinforces the study's thematic findings and highlights the tangible pathways through which OI is enabled.

4.4.1. Skill-Based Recruitment and Dynamic Upskilling

Participant narratives consistently highlighted that innovation-capable employees are not solely defined by their technical credentials but also by their behavioural and cognitive profiles. In particular, recruitment strategies in high-tech firms increasingly prioritise traits such as openness to learning, collaborative orientation, and adaptability. There are traits that enable employees to function effectively in rapidly evolving, cross-functional innovation environments, which is also seen by Dimitrios (2020). See the following quote from P8 for an example quote about this:

"During the hiring process, we make sure we find enthusiastic people who are versatile … because we need a lot of different skill sets filled, and with their own personal ambitions." (P8)

This emphasis on versatility, enthusiasm, and personal growth potential underscores the way high-tech firms recruit for mindsets conducive to boundary-spanning collaboration and continuous learning, core requirements of OI. Such emphasis on non-technical attributes reflects an understanding of OI as a socially and cognitively intensive process, where the ability to form, sustain, and integrate knowledge from diverse external sources is paramount. T-shaped professionals, those combining depth of expertise with the breadth of interdisciplinary fluency, were particularly valued. These employees serve as the linchpins of boundary-spanning innovation, especially during ideation and problem-solving phases that involve external users, partners, or research institutions (Martin & Rees, 2019)

Firms operationalised this preference through behavioural interviewing, simulation-based assessments, and innovation aptitude profiling. For example, P10 described how applicants were placed in hypothetical co-creation scenarios to evaluate their response to ambiguity, stakeholder diversity, and iterative feedback loops.

Start-ups and scale-ups, where innovation cycles are fast-paced and resources are constrained, showed the greatest selectivity for innovation fit. Their recruitment practices focused on securing generalists with growth potential, whereas larger corporations emphasised systemic onboarding and skill development programs to mould recruits into innovation-ready contributors.

From an OI performance perspective, firms with mature skill-based recruitment pipelines reported:

- Higher conversion of external ideas into internal R&D projects
- More effective joint development with partners
- Greater alignment between HRM inflows and project-level innovation strategies

4.4.2. Role of Digital Learning and Institutional Partnerships

The cultivation of innovation ability did not end at recruitment. Firms in the sample viewed continuous, context-specific learning as critical to sustaining innovation momentum. Rather than relying on generalist training, HRM departments co-created modular, role-specific content that allowed employees to access learning 'on demand' and aligned to innovation sprints. Rather than relying on separate training sessions, organisations combine classroom workshops with extensive e-learning catalogues, organised with a 70-20-10 learning model, to enable the workforce to learn skills on demand. As P7 simply put it, *"We offer classroom trainings, but we also offer a lot of e-learning trainings, and we use the 70-20-10 learning model to broaden their perspective on how development can happen."*

This mix of formal classroom training (10 %), knowledge gained from others (20 %), like getting a mentor, and solo practice (70 %) accelerates absorptive capacity and keeps expertise current for open-innovation activities. These collaborative education models served two key purposes. First, they increased absorptive capacity by building deeper domain knowledge relevant to emerging innovation domains (e.g., AI ethics, bioinformatics regulation). Second, they reduced time-to-contribution for new employees, thereby closing the gap between onboarding and innovation participation.

Moreover, the use of massive open online courses (MOOCs), EdTech platforms, and internal innovation academies enabled distributed learning. This was particularly important for organisations with satellite teams or hybrid workforces, where face-to-face training may be logistically unfeasible. As a result, firms could ensure equitable skill development, allowing all employees, regardless of location, to contribute meaningfully to innovation projects.

Quantitatively, interviewees associated digital learning and external academic partnerships with:

- Reduced innovation onboarding lead times
- Higher internal mobility across innovation teams
- Increased co-invention and joint patenting with university partners

Critically, this finding aligns with Jiménez-Jiménez and Sanz-Valle (2008), who argue that learning-oriented HRM systems positively impact a firm's innovative capability, according to participants, especially when learning is embedded in the employee workflow rather than treated as a peripheral HR activity.

4.4.3. Differentiated Needs Across Innovation Phases

Another consistent insight from participants was that open OI-readiness is phase-specific, and HRM must evolve alongside the innovation lifecycle. Interviewees made clear distinctions between the skills required during idea generation, prototype development, and commercialisation.

"The early phases require broad skills; later it's about specialists who can industrialise the ideas" (P7)

Early-stage innovation efforts benefited from cognitive flexibility, cross-disciplinary curiosity, and fast learning, attributes typically found in generalists and creative thinkers. HRM practices at this stage included innovation labs, ideation bootcamps, and exploratory team assignments designed to harness divergent thinking and external scanning capabilities (Schiuma and Santarsiero, 2024).

However, as projects matured, the need for disciplinary depth, risk management, and regulatory precision increased. This shift prompted firms to reallocate HRM focus from broad skill promotion to deep role specialisation and procedural compliance. For instance, P11 explained how software architects were given regulatory certification paths once an OI project entered the product development phase.

The ability to strategically manage these shifts reflects a dynamic capabilities orientation (Teece, 2014), where HRM acts not as a static support function but as an agile enabler of OI continuity. From a performance lens, firms with HRM systems that recognised and adapted to phase-based skill requirements reported:

- Fewer bottlenecks in innovation stage transitions
- Improved coordination between upstream (R&D) and downstream (market-facing) teams
- Faster time-to-market for collaborative innovations (OI)

This adaptive method in HRM also resonates with Stokes et al.'s (2018), which says that strategic HRM must be sensitive to organisational ambidexterity and micro-dynamics of resilience that are happening in extreme moments and across the normal days of working.

4.4.4. Developing Absorptive Capacity Through Skills and Experience

One of the key and strategic aspects of the abilities dimension was building absorptive capacity, which allows a firm to recognise the worth of external knowledge, take it in and use it to make profit, as also noticed by Sjödin, Frishammar and Thorgren (2018).

“People rotate through customer-facing roles, which helps them understand external feedback better” (P3)

HRM plotted out different activities to help employees become familiar with the latest trends outside the organisation. Such paths were created to help people collaborate with others and consisted of rotations working with customers to learn more about the market and assignments in research centers to connect ideas with their practical use. Employees also joined workshops with suppliers for teamwork on products development and temporarily worked in entrepreneurial organisations for improved understanding of ecosystem-level action (Wikhamn and Styhre, 2022). Firms made sure their HRM systems included these experiences which boosted their employees’ focus on external matters and gave them the skills needed for dealing with open innovation networks.

Thanks to these methods, both teams within companies worked more closely with people outside of the company and strengthened what Sjödin, Frishammar and Thorgren (2018) refer to as “potential” and “realised” absorptive capacity. The initial process concerns learning and accepting what is learned, while the latter means applying and making use of what was learned. Actively supporting role flexibility and easy movement within the ecosystem allowed workers to successfully use research and client perspectives in design and prototyping tasks.

Participants linked these practices to:

- Higher quality of OI partnerships
- Greater success in knowledge-based licensing negotiations
- Increased rate of idea-to-commercialisation conversion

In addition, companies focused on using peer learning and dedicated time for reviewing and discussing their work such as after-action and innovation meetings, to make absorptive capacity beneficial for the whole organization. This group practice helped new discoveries from the outside become a part of their culture, allowing the team to stay innovative.

All in all, the improved HRM processes found in high-tech companies are carefully planned to foster, deploy and change innovation capabilities. They treated a person’s ability as something that could be developed through hiring the right people, providing training, exposing them to new ideas and keeping it connected to the needs of trends in the industry. As a result of this reform, firms could manage their teams so that they stayed up-to-date with the demands faced by OI,

where dealing with complexity, engaging externally and quickly adapting are ongoing tasks (Albats, Podmetina and Vanhaverbeke, 2021).

It is apparent from the findings that when AMO-enhancing HRM systems are fit to the organisation's setting, where they are in the innovation cycle and their overall environment, they greatly benefit the firm's initiative in innovation and overall innovation performance (Bos-Nehles et al., 2023). These strategies especially boosted different results that are key for success in OI environments. They consist in stronger absorption of external information, faster integration of new employees into innovation, greater effectiveness in teamwork across the company and increased ability to turn external resources into outcomes that can be sold.

Ability is not limited to only helping you start creating new ideas. As a result, it becomes a vital factor for shaping, steering and growing the organisation's OI. In high-tech industries where being flexible, acquiring knowledge from outside and working with different areas are crucial, improving abilities becomes a key part of successful HRM and innovation (Martínez-Sánchez, 2020).

4.5. Motivation as a Catalyst for Employee-Led OI

Motivation-enhancing HRM practices emerged as the most dominant of the three AMO dimensions in this study, accounting for 41% of all thematic codes derived from the 13 expert interviews. This empirical concentration underlines the pivotal role of motivation in shaping individual and collective innovation behaviours in high-tech firms (Le & Le, 2023). Motivation, in this context, is not a monolithic concept but a composite of intrinsic desires, leadership influence, and structural and social factors that collectively support innovation. It acts as the psychological driver that supports engagement and creativity to tangible innovation outcomes (Boxall & Purcell, 2003; Umesi, 2024).

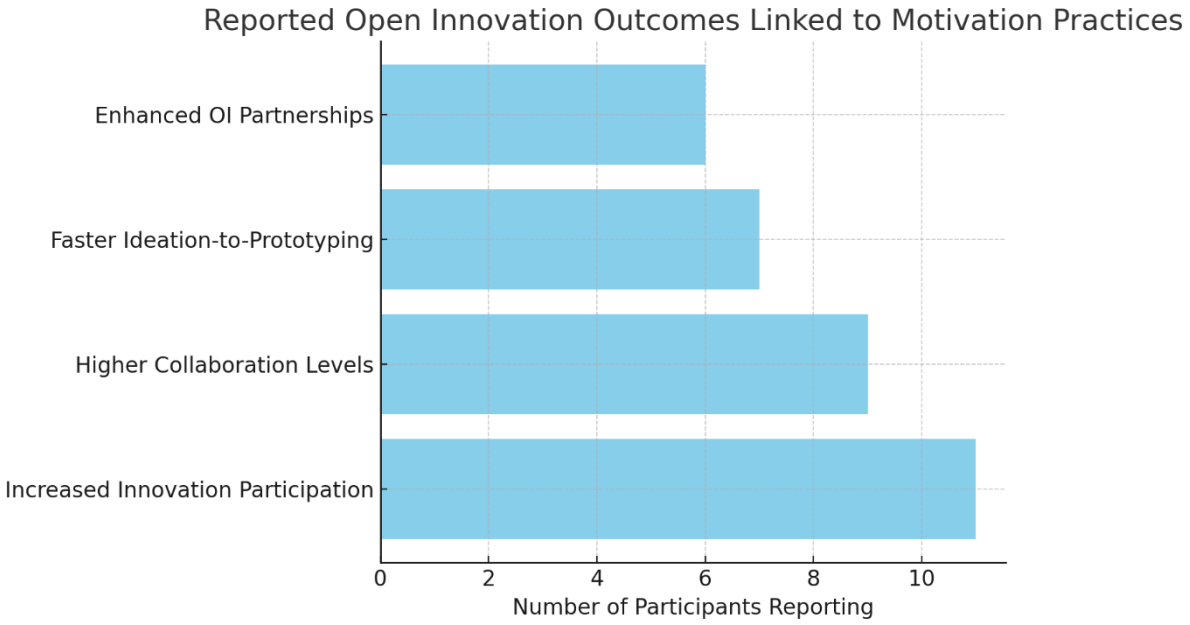

Figure 4 Reported OI Outcomes linked to motivation practices during the interviews

This chart displayed in figure 4 shows the number of participants who explicitly linked motivational practices to key OI performance outcomes:

- Increased innovation participation (11 mentions)
- Higher collaboration (9)
- Faster ideation-to-prototyping (7)
- Enhanced OI partnerships (6)

It provides clear evidence of how motivation-enhancing HRM systems translate into measurable OI gains.

The interviews suggest that firms deploy a multi-layered approach to motivation, encompassing non-financial recognition, purpose-driven leadership, psychological safety, peer reinforcement, and context-specific reward systems. These mechanisms do not merely stimulate creative output; they embed OI as a valued and celebrated behavioural norm across organisational levels. Critically, motivation is shown to be adaptively configured differently across functions, innovation stages, and organisational types. Four interlinked sub-themes are explored below: (1) reward systems tied to collaborative innovation, (2) purpose-driven leadership and psychological ownership, (3) balancing intrinsic and extrinsic motivation, and (4) cultural and peer-based motivation.

4.5.1. Reward Systems Tied to Collaborative Innovation

Although financial incentives such as bonuses, stock options, and innovation grants remain present in the high-tech HRM landscape, most interviewees emphasised that these were insufficient to drive long-term, meaningful innovation engagement. Rather than relying solely on extrinsic motivators, firms increasingly leaned on socially embedded and non-monetary recognition systems to stimulate innovation behaviour. As noted by Delavallade (2021), symbolic rewards and public visibility can enhance motivation with the use of visual incentives like personal identity and social status, which can help to drive sustained efforts toward innovation. P6 captured this sentiment by explaining: “We tried financial bonuses, but what worked better was showing impact, highlighting how someone’s prototype influenced the final customer delivery, made them feel ownership.” Similarly, P12 noted the value of peer visibility: “Through the innovation hub, when one of our employees solves a challenge others couldn’t, it’s highlighted across the hub and people love that visibility.”

These insights align with Johnsson (2017), who argues that team-based recognition and collective reward structures reinforce innovation behaviours more effectively than individualised financial incentives, particularly in environments requiring interdependence and collaboration. Leading organisations in the study set up these systems with peer-awarding, impact data, team rewards at important points, and public acknowledgements of leaders.

These practices created a collective psychological contract, where employees felt their contributions were seen, valued, and integrated into broader organisational outcomes. This visibility activated emotional engagement and discretionary effort, defined by Boxall and Purcell (2003) as the voluntary commitment to exceed role expectations in support of innovation and organisational goals.

Link to OI Performance: Organisations using socially embedded recognition systems reported higher rates of interdepartmental collaboration, ideation exchange, and innovation project participation. These behaviours were particularly concentrated during the early stages of OI, such as brainstorming, prototyping, and experimentation, where psychological engagement is critical to innovation momentum.

4.5.2. Purpose-Driven Leadership and Psychological Ownership

The second major motivational theme identified across the interviews centred on the role of purpose-driven and vision-based leadership in fostering innovation engagement. Unlike the target-focused style, high-tech firms began to explain innovation by linking it to society, consumers, and sustainability. This way of thinking gave a purpose to everyday work at the

company, inspiring innovation. P5 noticed that explaining the reason for OI makes employees value every task, even the usual ones. In essence, this approach gives way to genuine motivation that comes from workers' values and feelings of self-rule, while also focusing on the group's shared goals.

Such leadership approaches are often connected to psychological ownership, which describes how people can feel like they 'own' certain concepts. That happened whenever businesses used micro-empowerment, for example, by allowing employees to lead quick innovation efforts or make decisions in the first stages of planning. According to P7, when students lead a small part of the project, it helps their confidence, and they feel more responsible for what they do.

Furthermore, leaders who consistently grounded OI within the company's mission and end-user impact were perceived as authentic and trustworthy, enhancing employees' emotional and ethical alignment with organisational objectives. This authenticity was particularly impactful in high-autonomy, knowledge-intensive environments, where innovation requires personal initiative, resilience, and discretionary effort.

Link to OI Performance: The impact of purpose-driven leadership extended beyond internal morale. Firms that adopted these approaches reported higher voluntary participation in innovation initiatives such as hackathons, OI challenges, and customer co-creation workshops. They also experienced faster transitions from ideation to proof-of-concept, indicating that emotional investment and psychological ownership significantly reduced motivational dropout during uncertain early development phases.

4.5.3. Balancing Intrinsic and Extrinsic Motivation

While intrinsic motivation, the internal desire to explore, create, and contribute, was widely acknowledged as a core innovation driver, participants recognised the need to strategically balance it with extrinsic motivators, especially in different functional and temporal contexts.

"We offer equity in new ventures, but we also create an environment where people want to contribute without asking for more" (P9)

Interviewees described contextual tailoring of motivational systems. R&D personnel were typically more motivated by intellectual challenge and autonomy, while sales or commercial functions responded better to performance-linked bonuses and client impact metrics. Similarly, the stage of innovation influenced motivational preferences: early ideation required curiosity and intrinsic engagement, while scaling and commercialisation stages benefited from structured incentive plans.

Some firms integrated hybrid systems, offering small innovation stipends, time credits, or sabbaticals alongside symbolic rewards such as internal patents or knowledge badges, aligning with DiDonna (2025) research. Others used innovative KPIs in performance appraisals, subtly embedding innovation into the formal reward architecture without distorting intrinsic motives.

Critically, firms that overemphasised extrinsic incentives reported motivational fatigue and reduced knowledge sharing. Conversely, those that blended both forms with transparency and fairness succeeded in retaining motivation across complex, multi-stage OI projects.

Link to OI Performance: Balanced motivational ecosystems enabled firms to retain innovation contributors across project lifecycles, thereby improving continuity, reducing handover frictions, and accelerating time-to-market. Moreover, blended systems ensured that OI did not become the domain of "hero innovators" but a scalable, inclusive organisational activity.

4.5.4. Cultural and Peer-Based Motivation

The final and arguably most organic motivational driver for OI emerged from peer influence and a culture of collective enthusiasm. Participants consistently described how horizontal, team-oriented cultures functioned as accelerators of OI by generating an environment of "social contagion," where the excitement and commitment of a few individuals inspired others to engage. As P8 remarked, *"Besides being enthusiastic, everyone has an intrinsic ambition to solve the issue together, everybody contributes to that."* This illustrates how motivation is not always top-down but can instead emerge and scale through peer reinforcement and team cohesion.

Firms employed a range of organisational cultural mechanisms to institutionalise peer-based motivation. These included team-based innovation rituals such as idea jams, recognition of productive failure, peer-judged hackathons, and informal ideation platforms like Slack or Teams channels. Some firms even designated innovation 'avatars' or internal champions whose roles included encouraging ideation and sharing stories of experimentation. Unlike the target-focused style, high-tech firms began to explain innovation by linking it to society, consumers, and sustainability. This way of thinking gave a purpose to everyday work at the company, inspiring innovation. P5 noticed that explaining the reason for OI makes employees value every task, even the usual ones. In essence, this approach gives way to genuine motivation that comes from workers' values and feelings of self-rule, while also focusing on the group's shared goals.

Such leadership approaches are often connected to psychological ownership, which describes how people can feel like they 'own' certain concepts. That happened whenever businesses used micro-empowerment, for example, by allowing employees to lead quick innovation efforts or

make decisions in the first stages of planning. According to P7, “Allowing them to run a short sprint makes them feel more comfortable with the process and makes them feel more involved.”

The dominant role of motivation (41% of all codes) reflects the recognition that OI requires sustained discretionary effort, cross-boundary trust, and emotional investment, all of which are cultivated through well-designed motivational systems. Importantly, effective motivation systems were context-sensitive, adapting across departments, innovation phases, and employee types.

By leveraging both intrinsic and extrinsic motivators, promoting team-based recognition, enabling psychological ownership, and embedding innovation into culture, firms succeeded in transforming OI from a strategic aspiration into a behavioural norm.

Through the lens of enhanced OI performance, the results are faster idea generation, deeper partner engagement, higher participation in co-creation, and smoother innovation lifecycles. Thus, motivation in AMO-enhancing HRM systems is not only a catalyst, but it is a scaffold upon which high-tech firms build sustainable OI capabilities in the face of dynamic and competitive markets.

4.6. Answer to Sub-Question 3: Contribution of AMO Dimensions to OI

How does each dimension (Ability, Motivation, and Opportunity) of the AMO-enhancing HRM practices framework associate with firm-level OI performance?

This section critically analyses the contribution of each dimension of the AMO framework to firm-level OI performance in high-tech firms, drawing on empirical evidence from the interview data and linking it to theoretical perspectives such as absorptive capacity, Self-Determination Theory, and Dynamic Capabilities (Teece, 2014). Each dimension, Ability, Motivation, and Opportunity, enables distinct yet interdependent mechanisms that drive OI performance. This section presents each dimension’s unique contribution and interlinks it with participant insights and academic theory.

4.6.1. Ability: Enhancing Absorptive Capacity and OI Readiness

Ability-enhancing HRM practices contribute to OI primarily by strengthening absorptive capacity, accelerating innovation onboarding, and supporting knowledge integration across functions (Shuwen, 2023). This dimension ensures that employees are equipped with the cognitive, technical, and behavioural competencies necessary to detect, interpret, and utilise external knowledge for innovation.

This demonstrates that skill-based recruitment and dynamic upskilling are not simply HRM formalities but strategic enablers of OI. Echoing this emphasis on behavioural fit, P5 reaffirmed that the firm “hire[s] selectively for open-minded people, absolutely,” reflecting a deliberate search for boundary-spanning mindsets that facilitate knowledge absorption and collaboration. Such practices promote readiness to collaborate across disciplines and industries, key traits in OI settings.

Also, organisations develop their own in-house "gig" marketplaces that encourage short-term project engagements so that the employees learn in real time without leaving their core jobs. As P7 explained, “We’ve launched an internal marketplace where teams post small gigs, short projects that take maybe five or ten percent of your time, so people can sign up, try something new and experiment.” These micro-assignments can shrink time-to-contribution and enhance absorptive capacity since learning happens in actual innovation projects rather than in isolated courses.

From a theoretical standpoint, these practices reflect Cohen and Levinthal’s (1990) argument that absorptive capacity is path-dependent and builds over time through cumulative knowledge development. Additionally, exposing employees to diverse learning environments (e.g., customer rotations, research lab stints) enhances both “potential” and “realised” absorptive capacities (Zahra & George, 2002), which is essential for identifying and leveraging innovation opportunities in fast-paced sectors.

This dimension also strengthens cross-functional knowledge flow, as teams are increasingly composed of “T-shaped” professionals capable of connecting disparate knowledge streams (Feil et al., 2024). In sum, ability-enhancing practices form the backbone of innovation readiness by embedding learning agility and absorptive potential into the workforce.

4.6.2. Motivation: The Psychological Engine Behind OI Participation

Motivation-enhancing practices emerged as the most impactful contributor to OI, accounting for 41% of all thematic codes. These practices fuel discretionary effort, idea sharing, and sustained participation in collaborative innovation activities such as hackathons, innovation sprints, and user co-creation.

This demonstrates that fostering intrinsic engagement, via purpose, recognition, autonomy, and psychological safety, is more effective than transactional incentives alone in promoting innovation (Ali et al., 2022). As supported by P6’s remark, “Bonuses stopped working… what

worked better was showing impact," recognition of personal contribution and visibility within teams significantly increased innovation output and ownership.

The role of purpose-driven leadership is central here. P5 described how linking innovation to societal value created deep emotional engagement: "Explaining the reason for OI makes employees value every task, even the usual ones." This connection to meaningful work aligns with Self-Determination Theory, which posits that autonomy, competence, and relatedness are core psychological needs driving intrinsic motivation (Autin et al., 2021).

Moreover, motivational systems that encouraged team cohesion and peer-based recognition led to contagious innovation behaviour. As P9 contrasted, "If someone keeps going on a Friday afternoon, or even a Saturday morning, because a eureka moment hits and they want to write it down, that's when the innovation happens; it always comes after three o'clock. The other person stops at three and says, 'I'm done.' That's the difference." Such peer influence and informal rituals embed innovation as a social norm, not merely a formal expectation. However, to keep such late-hour bursts sustainable, managers must also schedule recovery time and prevent burnout (Cortina et al., 2017).

Motivation also enables psychological ownership, allowing employees to take risks, make decisions, and pursue novel ideas with resilience (Alshiha et al., 2024). These outcomes are critical in uncertain OI environments where ambiguity and iterative learning dominate.

In theoretical terms, these findings challenge the traditional, balanced view of AMO dimensions. Motivation, while structurally one-third of the model functions as the catalytic core in innovation ecosystems, activates and sustains the potential created by ability and the space provided by opportunity.

4.6.3. Opportunity: Structuring Access for Boundary-Spanning OI

Opportunity-enhancing HRM practices determine whether employees have the structural and cultural means to engage in OI. These practices shape decision-making autonomy, cross-functional engagement, and access to external innovation ecosystems.

This demonstrates that structural access alone is insufficient; opportunities must be designed as both a formal system and a cultural value (Rodrigues, 2023). As supported by P4's account, "We established a virtual place where anybody from the organisation can suggest and become involved in innovation projects across different areas." Opportunity structures were made open and inclusive.

Firms implemented flattened governance, open forums, and cross-functional teams that allowed participation beyond traditional roles (Adelina, 2024). These interventions not only democratised innovation but also accelerated co-development and knowledge integration. Employees engaged more deeply in customer co-creation, startup mentoring, and innovation consortia when given the autonomy to do so.

Importantly, effective opportunity-enhancing practices included time flexibility, such as off-calendar hours for creativity, and mechanisms for interdisciplinary rotation, allowing staff to connect with external environments. P3's reflection that "People rotate through customer-facing roles" exemplifies how these structures enhance ecosystem awareness and solution-oriented thinking.

From a theoretical lens, these practices align with Dynamic Capabilities Theory (Teece, 2014). Opportunity-enhancing systems help firms sense external signals, seize emerging opportunities, and reconfigure teams accordingly. They also enable the firm to foster OI culture, where collaboration across internal and external boundaries is not only permitted but encouraged and institutionalised.

Each AMO dimension contributes uniquely to OI outcomes: Ability builds absorptive and integrative skills, Motivation transforms capability into proactive innovation, and Opportunity provides the platform and culture to act. However, these elements do not operate in isolation. As the findings reveal, high-performing firms orchestrate all three dimensions as interconnected and adaptive systems, tailored to project stages and contextual demands.

The information reveals that AMO-enhancing HRM supports agility in innovation and is not a fixed system. Reorganising these elements whenever necessary ensures that companies can keep advancing in OI, despite both external and internal changes. Therefore, this analysis covers Sub-Question 3 and restates the value of the AMO framework as a multi-view leads to sustainable OI performance in high-tech businesses. The results in this chapter are summarised and structured in Table 3 and give the dominant HRM practice bundles with the OI performance outcomes structured according to the AMO dimensions.

Table 3 Summary of interview findings with the dominant HRM practices and OI performance outcomes structured with the AMO dimensions

AMO dimension	Dominant HRM practice bundles identified in interviews	OI performance outcomes reported by participants
ABILITY (34 %, 228 codes)	• Skill-based recruitment for curiosity, learning agility & teamwork (P2) • Modular digital up-skilling & university co-developed courses taken "during sprints" (P10) • Customer-facing / R&D-lab rotations to raise absorptive capacity (P3) • Phase-specific deep-specialist training as projects mature (P7)	• Faster innovation onboarding & time-to-contribution • Higher conversion of external ideas into internal R&D projects and more effective joint development with partners • Fewer bottlenecks in stage transitions and faster time-to-market for collaborative innovations • Higher-quality OI partnerships, better licensing deals, and increased idea-to-commercialisation conversion
MOTIVATION (41 %, 276 codes)	• Purpose-driven leadership that links OI work to societal or customer impact (P5) • Non-monetary / peer-visibility rewards highlighting prototype impact (P6) • Autonomy & psychological safety via sprint leadership and decision rights (P7) • Team rituals, informal ceremonies, and innovation storytelling creating "social contagion" (P13)	• Increased voluntary participation in innovation and higher cross-team collaboration • Faster ideation-to-prototype cycles and smoother proof-of-concept transitions • Enhanced external OI partnerships owing to sustained discretionary effort • Reduced motivational dropout during uncertain early phases
OPPORTUNITY (25 %, 168 codes)	• Cross-functional idea hubs / virtual platforms where "anybody can suggest and join projects" (P4) • Open forums, hackathons, flattened governance that lets any employee submit or lead ideas (P11) • Time flexibility for creative work plus start-up, university & consortium link-ups (P3)	• Improved inter-departmental knowledge exchange and faster prototyping cycles • Recovered innovation momentum when collaboration moved online (COVID pivot) • Democratized innovation participation, wider employee base generating and championing ideas • Rapid mobilisation of interdisciplinary expertise and broader idea generation across the firm's boundary

4.7. Cross-cutting themes in findings

Thematic analysis of the 13 expert interviews revealed five cross-cutting themes that synthesise patterns across ability-, motivation-, and opportunity-enhancing HRM practices in the high-tech OI context. These themes are more connected than discrete, often occurring in combination within the same practice. The themes are as follows:

- Skill and ability creation as foundations of OI readiness: Building specialist and generalist skills to initiate, adapt, and evolve innovation projects, through formal training, rotational assignments, and learning by doing.
- Motivational architectures for sustained long-term OI momentum: Autonomy, purpose, and recognition mechanisms that reinforce contribution over extended innovation cycles, complemented by phase-specific motivational "boosters."
- Structural opportunity and cross-boundary access: Formal and informal channels through which ideas and resources can be exchanged, e.g., innovation centres, cross-functional hackathons, and online platforms.
- Cultural enablers: Shared values, openness, and trust that allow employees to leverage opportunity structures and share ideas without fear of negative consequences.
- Temporal fit of AMO configurations: Changing the balance of ability, motivation, and opportunity-enhancing practices in accordance with the stage of the innovation process, with relatively more autonomy at the early stages and more coordination at the later stages.

5. Discussion

Chapter 4 of this thesis presented the empirical findings derived from 13 expert interviews across high-tech sectors such as AI, biotechnology, semiconductors, and industrial automation. These empirical patterns are interpreted here, linking them to the wider AMO and OI literature and showing how they respond to the thesis's research question: How are AMO-enhancing HRM practices converted into firm-level OI performance in the high-tech sector? This chapter also reflects on the study's aim to provide practical knowledge for HR and innovation managers.

The interpretation of the findings is done by applying five cross-cutting themes as formulated in Chapter 4: (1) Capability and skill development as foundations of OI preparedness, referring to technical and problem-solving capability that is needed to initiate and progress innovation. (2) Motivational frameworks for sustained OI drive, encompassing autonomy, meaning, and recognition, set that sustained contribution in the long term. (3) Structural opportunity and cross-boundary access, involving formal and informal channels that enable idea exchange and resource transfer. (4) Cultural enablers, defined as shared values, openness, and trust that translate access into active collaboration. (5) Temporal evolution of AMO configurations during innovation phases, capturing the shifting emphasis on ability, motivation, and opportunity as projects move from ideation to implementation.

The study verified prior research (Ferrarini & Curzi, 2022) that high-tech firms rarely implement AMO practices as standalone levers. Instead, they form synergy bundles where practices influence multiple dimensions simultaneously. For instance, rotational assignments built skills (ability) but also re-ignited enthusiasm (motivation) and expanded networks (opportunity). Bundling adheres to the conceptualisation of AMO as a system of inter-supportive but not independent interventions.

A key result, less emphasised in prior research, was the dominance of motivation-related practices, which suggests that ability and opportunity are necessary, but motivation is the catalytic driver. This aligns with the focus of Self-Determination Theory on internal drivers (Ryan & Deci, 2022), but builds upon it in showing that, in chaotic high-tech environments, motivation must be retuned adaptively throughout the innovation process.

Theme 2 (Motivation) was driven by mechanisms that brought workers into the purpose and direction of OI work itself, rather than by discrete reward stimuli. Purpose was sustained through visible alignments between individual contributions and strategic outcomes, and autonomy allowed workers to control both the process and pace of their contributions. Recognition, in turn, functioned as social proof within the organisation, deepening commitment and normalising continued participation. This arrangement is indicative that in high-tech OI environments, long-term motivation is not a product of incidental rewards but of placing employees into the innovation process itself, making them feel owner-like participants in the outcome. This is echoed in findings in high-tech R&D environments where high degrees of alignment between employees and organisational values (person-organisation fit) mediate autonomous motivation, which in turn drives employees' innovative work behaviour (Saether, 2019).

Theme 4 (Culture) bridged motivation into action by placing it within organisational and, in some cases, national cultural frameworks. Organisational norms of openness and peer support were reinforced at the organisational level through regular rituals, informal recognition ceremonies,

and leadership routines that conveyed psychological safety, rendering the intention of innovation work tangible in day-to-day routines. At the national level, prevailing perceptions towards hierarchy, risk, and cooperation influenced the frequency with which employees engaged with opportunity structures; for example, in power-distance cultures, direct endorsement from the top was required in order to legitimise cross-boundary knowledge sharing. This is generally in line with evidence that organisational culture mediates the effect of HRM on innovation performance (Jiménez-Jiménez & Sanz-Valle, 2008), but contrary to some cross-national evidence suggesting that high power-distance cultures suppress, rather than enable, cross-boundary collaboration (House et al., 2004; Pagda, 2019).

Theme 5 (Temporal adaptation) described when motivational levers needed to shift, greater autonomy and creative discretion performed optimally at early ideation stages, with later stages performing better with nearer coordination and formal checkpoints. Conversely, Theme 1 (Ability) and Theme 3 (Opportunity) acted as non-negotiable essentials: without deep reservoirs of skill and access to relevant networks and resources, even highly motivated employees could not convert effort into measurable OI outcomes. These interdependencies explain why motivation was only evident in the findings as a catalytic influence when supported by cultural alignment and founded on ability and opportunity foundations. This phasing effect is consistent with ambidexterity theory, which demands a balance between exploration and exploitation (O'Reilly & Tushman, 2013), but contrasts with much OI research that imposes AMO drivers across stages, arguing that the timing of HRM levers can be as important as their presence.

Some expected patterns validated literature predictions, for example, the precedence of cultural openness as the foundation for all three AMO dimensions (Jiménez-Jiménez & Sanz-Valle, 2008). Some others were less predictable, for example, deliberate avoidance of monetary rewards in favour of autonomy and recognition, even where the context is sales environments where extrinsic rewards are often given preference. This is to suggest a gradual redefinition of what sustains innovation interest in knowledge-intensive contexts.

However, sometimes the classification of practices into "ability," "motivation," or "opportunity" was not objective. There were many cross-boundary practices and thus questions about whether these categories are operationally different in practice. An example is that cross-functional hackathons were both classified as opportunity-enhancing but also employed as stringent skill-building (ability) and team-building (motivation) events. This ambiguity follows from the interdependencies of real HRM systems and suggests that strict categorisation is in danger of oversimplifying how these practices work in context. To keep the analysis defensible, each practice was classified according to its dominant managerial intent.

The study concluded that the most sustained barriers were hierarchical rigidity, cultural resistance (i.e., "Not Invented Here" behaviours), and structural silos. The findings are consistent with OI literature (Aquilani et al., 2017) but offer more insight in showing that firms reframing these barriers as a chance for system redesigning harvested greater OI benefits.

Hierarchical constraints, for example, were eased through flattened governance and cross-functional hubs that simultaneously accelerated opportunity and increased cultural trust. Motivation fatigue, finally noted in the AMO-OI literature, was indeed a known threat to long cycles of innovation, prompting firms to implement phase-specific motivational practices rather than fixed reward schemes.

A surprising finding was that digital collaboration tools were both an enabler and a challenge. They widened opportunity structures in times of disruptions like COVID-19 yet threatened to narrow informal knowledge flows that tend to drive motivation and capability building. This dilemma implies that digitalisation has to be equally conscious of cultural and motivational support to maintain OI.

If the study was repeated, there would have been (i) added a longitudinal component to study how motivational energy dissipated or replenished across phases, (ii) sample more organisational contexts and geographies to investigate cultural contingency across AMO bundles, and (iii) add comparative cases by level of regulation (e.g., pharma vs. software) to control for digital/tool effects separate from constraint pressures from compliance. These modifications would test explicitly hypothesised mechanisms here without placing outcomes too strongly on HRM architecture alone.

Findings reaffirm AMO as more than just a model of productivity; it is a strategic infrastructure when aligned with firm strategy and lifecycle requirements for OI. In contrast to rigid HRM templates, effective AMO systems in high-tech firms were dynamic, evolving at the same rate as cycles of innovation.

Empirical evidence strongly confirmed the interdependent functioning of the AMO dimensions. Skill creation only translated into OI performance when joined with motivational energy and structural opportunity to apply the skills. The reverse was also the case: motivated employees without sufficient skills or structural support could not sustain contribution levels.

The research advances dynamic capabilities theory by illustrating how AMO practices are micro-foundations for sensing, seizing, and transforming at various points along the innovation process. Generalist skills and freedom to think creatively dominated first-stage ideation; specialist skills, closer monitoring, and formal rewards dominated in later stages.

But a methodological note is warranted: to what extent is it subjective to ascribe a practice solely to ability, motivation, or opportunity? The lifecycle analysis revealed many "hybrid" practices, such as rotational assignments or innovation sprints, transversing all three dimensions. While analytical rigour is achieved through the AMO framework, practice application may require recognition and intentional working within these intersections. This suggests possible future AMO research to code practices along multi-dimensional continua rather than discrete categories.

Culture was the "glue" that enabled AMO practices to translate into behaviour. When leaders linked innovation work with meaningful societal or customer returns, they deepened intrinsic motivation and created a safe feeling, creating both opportunity access and ability application. Culture in this sample operated as a mechanism, rather than a context. Opportunity structures (e.g., hackathons, open platforms, forums) only produced boundary-spanning behaviour when trust and feeling safe were present, or else they turned symbolic; otherwise, they couldn't produce boundary-spanning behaviour. Purpose-linked leadership also converted structural access into active participation by norming risk-taking and reframing "failure" as learning. This is why cultural openness continued to reappear as the "glue" to enable AMO practices to become OI behaviour, and not invented here (NIH)/not sold here (NSH) patterns weakened when peer publicity and recognition rituals were involved. These findings affirm previous studies emphasising the mediating role of organisational culture in enabling the translation of structural access to innovative behaviour (Callagher & Smith, 2017; Ferrarini, 2022; Mazur & Zaborek, 2016),

but develop them further by specifying behavioural and relational preconditions, i.e. effective purposeful leadership communication, and peer-based recognition, under which this mediation takes effect in the context of high-tech innovation.

The study demonstrates how AMO-sustaining HRM releases OI performance as a system that is holistic, adaptive, and culturally embedded. Motivation was the catalytic force, but its potency was only actualised in tandem with the presence of related abilities and structural opportunity. The interlinked nature of the practices, often intersecting across multiple dimensions of AMO, serves to reflect both the strength and complexity of the framework.

While a strict formula, AMO in the high-tech OI context functions as strategic human infrastructure, reframing talent, culture, and collaboration to meet evolving OI needs. Sensitivity to the porous boundaries among ability, motivation, and opportunity not only captures organisational reality but also opens up opportunities for more valid, context-sensitive HRM design in future innovation systems.

While all three AMO components were validated in the study, one of the striking findings was the disproportionate influence of motivation-enhancing practices on OI performance. Participants across multiple organisations repeatedly emphasised that creativity, knowledge-sharing, and risk-taking were most strongly influenced by motivational drivers, particularly autonomy, recognition, and psychological ownership.

This finding challenges the implicit assumption in traditional AMO literature that the three elements contribute equally to employee performance. Instead, it suggests a contextual rebalancing of the model, where motivation becomes the catalytic lever, especially in high-discretion, innovation-centric roles.

In high-tech settings, where the nature of work is non-routine, problem-solving is collaborative, and outcomes are uncertain, motivation emerges as the differentiator. Ability may ensure competence, and opportunity may enable access, but without strong motivational incentives, the innovation process stalls. This insight aligns with behavioural theories such as Self-Determination Theory (Deci et al., 1999) and Psychological Empowerment Theory (Spreitzer, 1995), both of which emphasise intrinsic motivation as essential for creativity and sustained performance.

Moreover, the study provides empirical nuance to debates around intrinsic vs. extrinsic motivation. While earlier research (e.g., Morris et al. (2022)) cautions that extrinsic rewards may undermine intrinsic interest, this study finds that when extrinsic motivators are aligned with intrinsic values, such as autonomy, purpose, and contribution, they can enhance rather than erode OI behaviour.

Therefore, the study advocates a reweighted AMO model for OI environments, one in which motivational mechanisms are not merely supplementary but central to the activation of employee potential (Alkhalaf and Al-Tabbaa, 2023). This theoretical repositioning also has practical implications: firms seeking to foster OI should prioritise HRM practices that nurture not just capability or access, but commitment, ownership, and engagement.

Altogether, the results validate and strengthen the theory behind the AMO model by proving its model applies to OI problems. Especially, it promotes a theoretical update by redistributing focus in the model to make motivation more important. The updated approach reflects the increasing needs of modern technology and innovation and keeps AMO up to date in both fields (Li and Long,

2023). It is important for future studies to look at how these three components contribute differently in different kinds of organisations and across the different periods of initiating, developing and scaling an innovation.

6. Theoretical Implications

6.1. Contribution to AMO Theory: A Critical Examination

Appelbaum et al. (2000) introduced the Ability-Motivation-Opportunity (AMO) framework, which remains the main concept in strategic HRM for explaining why employees succeed by looking at three important aspects: ability, motivation and opportunity. For the past twenty years, many studies have relied on this model to investigate traditional HRM outcomes such as how people at work feel satisfied, how much work they achieve and their loyalty and staying power. Despite many organisations using the AMO model, only a few have tested it in contexts where dynamic or inventive work is taking place.

By looking at OI in the context of high-tech, knowledge-intensive companies, this study extends the Ability-Motivation-Opportunity (AMO) model. Because industries need fast sharing and teamwork, the usual way HR focuses internally should change. This research answers this call by showing that using AMO practices within HRM can support the growth of external innovation. Using data from leading European companies in AI, biotechnology and automation, the study finds that AMO is still a useful predictor of innovation-related behaviours in the latest workplace culture.

It is shown in the study that strategies to develop AMO, for example, offering tailored skill programs, setting personal targets and including all in decision-making, can both increase the skills of individuals and benefit the organisation by supporting its ability to take in new ideas and developing a climate for innovation. Such capabilities are especially important when OI ecosystems rely on knowledge exchange with people and organisations from outside. This approach helps companies develop the skills they need inside and the skills to adapt to what happens outside.

Using this concept, AMO goes further than standard performance management and now plays an important part in innovation strategy. It is argued by the research that managing human resources should be reconceived as a key driving force in innovation, instead of primarily being a supportive role. Through linking OI to AMO-inspired HRM systems, companies can better support their human workforce for lasting business success, so AMO continues to build market success.

Based on the study's findings and discussion, several distinct theoretical contributions to the AMO and OI literature emerge. Table 4 summarises the key contributions, highlighting their specific academic significance and how they extend existing theory.

Table 4 Key theoretical contributions

No.	Theoretical Contribution	Academic Significance
1	**Rebalancing AMO for OI:** Motivation-enhancing practices emerged as the dominant driver (41%), challenging the equal-weight AMO assumption.	Refines AMO theory by prioritising motivation in high-tech OI contexts.
2	**Dynamic AMO Configurations:** AMO elements shift across innovation stages (autonomy early, coordination later).	Extends AMO from a static to a flexible, stage-contingent HRM system.
3	**Micro-foundations of OI:** AMO bundles build absorptive capacity and dynamic capabilities.	Integrates AMO with RBV and Dynamic Capabilities Theory.
4	**Culture as the Enabler:** Opportunity only converts to OI when paired with psychological safety and leadership support.	Links AMO to cross-level cultural mechanisms.
5	**Nuanced Motivation View:** Extrinsic rewards can amplify, not crowd out, intrinsic drivers when well-aligned.	Refines AMO's motivation lens in innovation literature.
6	**Synergistic Bundles**: Practices often influence multiple AMO dimensions simultaneously.	Supports the conceptualisation of AMO as an interdependent system, not isolated levers.

6.1.1. Strengthening the Tripartite Model in OI Contexts

What this study shows confirms that the Ability-Motivation-Opportunity model consists of three elements for organisational OI. Unlike many past studies in HRM, which view elements of AMO as separate or related mainly to measures within the organisation, such as productivity or satisfaction, this work uses a broader and situation-specific application of the model. It confirms AMO's use throughout the steps of coming up with, producing and scaling innovations in high-tech, knowledge-intensive companies.

Having the right practices in place was key to bringing innovation, helping employees increase their technical and cognitive abilities required for working as part of a complex team. This

principle is very clear in companies like Cisco. They also use AI to improve learning, partner with colleges and offer training for specific jobs, such measures stand out from regular upskilling. They carefully link their ability-building projects to what technology is used for now and what it might involve in the future (Newsroom, 2024). It is clear from the research that these types of programs help students develop both knowledge and the ability to adapt, which is essential in fields like AI and industrial automation because new technologies develop very rapidly. As a result, these approaches help the organisation keep innovating, making learning a key function for the future.

Practices aimed at improving motivation were seen as the main force behind OI behaviour. When people felt motivated, were appreciated and allowed to work as they saw fit, their desire to think, try out new things and solve problems rose greatly, the study found. Using examples like Adobe's "Kickbox" and other firms' innovation sabbaticals, we can see that organisations can use different means apart from rewards to help employees feel connected to their work and value what they do. As a result, the company culture supports creativity and motivates both the mind and the heart of the employees. Motivation in these circumstances helps turn technical knowledge into practical innovation.

The presence of practices that enhanced opportunities enabled both ability and motivation to appear. According to the research, democratic access to innovation processes was made possible through decentralised governance, active involvement in decision-making and teamwork among various functions. As an example, Haier's RenDanHeYi model gives independent units within the company full responsibility to drive new ideas (Lago, 2024). This form of decentralisation helps ideas flow more freely, lets workers at every level influence new thoughts and prevents effective suggestions from becoming lost in red tape.

In short, the study points out that AMO's success comes from blending its various components together in a planned way. Having the ability, motivation, and opportunity-enhancing practices work together made the results greater than could be expected with each separate action. This result highlights that fit among HRM practices and the alignment with overall organisational aims are central to a sound HRM strategy. Because being flexible, working together and learning are important in OI, this kind of systemic coherence is crucial. Having separate or uncoordinated HRM initiatives probably will not result in lasting OI. A company's full potential for sustainable, growing OI can be reached when AMO is used strategically and continually updated along with the organisation's main OI efforts.

6.2. Integration with Innovation Theories: A Critical Perspective

The study makes a strong argument for linking the AMO model with innovation ideas such as absorptive capacity, dynamic capabilities and the resource-based view (RBV) (Floris and Pinna, 2024). Using a sample of high-tech firms practising OI, it clarifies that HRM practices that grow AMO performance can be fundamental parts of a company's overall strategy for OI. They help build knowledge, improve adaptability within the company and ensure it stays competitive.

Ávila (2021) define absorptive capacity as the firm's ability to recognise, assimilate and use outside knowledge and apply it to commercial ends. It is found by the study that this model matches the practical use of AMO practices. Advanced training and knowledge programs are used to ensure all employees have the skills they need to handle new information. With the help of motivational practices, like having purpose-driven leaders and a program like Adobe's Kickbox, employees are encouraged to find and get involved with new concepts. Social frameworks that let teams decide and collaborate are essential for people to use their knowledge (Shahzad et al., 2022). The findings reveal that AMO is useful at every stage of absorptive capacity, starting with finding knowledge and ending with its practical use.

This strategy model is especially useful under the dynamic capabilities framework. Teece et al. (2014) say that dynamic capabilities help firms notice chances in the market, act on them and adjust their resources as needed. This study shows that practices that increase AMO help to build the infrastructure that human societies need at every stage. Ability-enhancing systems allow firms to hire people able to recognise changes in the market and new technologies. Motivational structures bring together workers and the company's efforts to make innovations, encouraging them to act in advance. Likewise, teams able to operate quickly help, as do collaboration platforms, in allowing the structure of the organisation to be modified. Also introduced in Chapter 2, including innovation sabbaticals and Haier's micro-enterprise strategy, show how AMO-driven HRM efforts help a company adjust over time (DiDonna, 2025; Lagu, 2024). Therefore, AMO acts not only as a support for innovation, but also has its own power to keep innovation embedded in organisational routines that focus on people.

From the resource-based viewpoint, applying AMO, HRM practices can be understood as producing valuable, rare, inimitable and non-substitutable resources (Zvarimwa, 2025). It is revealed that ability-centred investments, such as personalised learning, are not generally transferable from one business to another. If tactics to inspire employees reflect the firm's mission and values, they increase a sense of unity and make the organisation more difficult to copy. Peer-led innovation platforms and simple management systems are part of how

opportunity structures develop within a company as it grows. Putting these elements together properly helps build a human capital system that satisfies VRIN, as identified by RBV theory (Kabue and Kilika, 2016; Mehralian et al, 2021). According to Chapter 2, these systems both help firms produce new ideas and make them unique among competitors, again proving AMO's strategic role.

Similarly beneficial is the way the study explores how AMO practices and the innovation life cycle relate to each other. It shows that each component in the AMO framework is used differently according to the stage of innovation. When generating new ideas, lasting motivation is the most important factor, due to how employee interest and personal purpose boost creativity. At this stage, being capable matters most as teams work to fine-tune design concepts many times (Lauff, Kotys-Schwartz and Rentschler, 2018). Collaboration inside the organisation and with external partners is key for putting education designs into action at scale. Such a change in the AMO's outcomes points out that workforce policies should be adjusted at each different development stage. Usually, literature on HRM views its activities as the same over time, but this research promotes a flexible method that matches Teece's (2014) concept of dynamic capabilities and recent opinions on strategic HRM.

In other words, using the AMO framework along with innovation theories shows it is a flexible and effective approach for promoting OI performance. The results reveal that AMO is strongly linked to absorptive capacity, dynamic capabilities and the RBV. Because HRM's influence shifts throughout the innovation process, managers should consider the timing and sequence of HRM policies. As a result, AMO is no longer considered only a tool for hiring, but a main structure in the current OI strategy.

7. Practical Implications

According to this study, HRM professionals, innovation managers and senior executives can take practical advice by shifting the AMO model to act as a main strategy in enabling OI within the organisation. It explains how HRM can do more than traditional HRM and positively shape OI in a company. According to the study, HRM policies should now reflect motivation, support employee learning and encourage people to participate. Effective training, links between rewards and creative ideas and involving all staff during important decisions are all valued as important factors. This can be achieved through targeted innovation workshops, organised reward schemes that compensate for ideas executed, regular cross-department brainstorming sessions, and official representation of employees in decision-making bodies such as innovation councils or project steering committees.

In addition, the study demonstrates how consistently guided organisations achieve better AMO practices. Those in charge need to be prepared to encourage OI by ensuring employees feel safe, offering freedom in their jobs and emphasising the purpose everyone shares. This can be achieved through open-door policies, allowing feedback without fear of retaliation, recognising idea-sharing, and training leaders to react favourably to mistakes. When culture emphasises experimentation and learning from mistakes, the effects of AMO-aligned systems increase hugely.

HRM should be strongly involved in the main OI strategy and counted as an advantage over rivals. Implementing AMO best practices into a strategy helps organisations develop flexible, united and knowledge-based workplaces. As a result of this strategic alignment, HRM plays a major role in forming and developing the organisation's ability to innovate with OI performance over the long run.

7.1. HRM Policy Design

These findings suggest that new HRM policies should promote ways for employees to be self-motivated and have freedom, while finding opportunities to innovate. OI ecosystems require companies to restructure how human resources are used so that everyone's AMO capabilities are maximised.

It is important that any such strategy be designed for one person and focused on the future. Following the example of Cisco in Chapter 2, the company invested in AI-based learning programs so their staff could learn what they needed to know about new technologies (Newsroom, 2024). Today, training that fits just one type of learner is no longer enough. Among

the high-impact interventions are individualised learning, being assigned a mentor and spending work time in another department.

Practising autonomy and purpose should replace dependence on only extrinsic rewards. Chapter 2 describes the innovative model set up by Adobe's Kickbox project (HiPeople, 2024). When every employee receives a toolkit for creating ideas, Adobe helps with ideation and also gives everyone a feeling of belonging and safety. For example, some companies also motivate their entrepreneurs through quarterly sabbaticals and by letting them have autonomy and appreciation from the company (DiDonna, 2025; Malik et al., 2020).

It is important to let employees take part and collaborate by enacting suitable systems. In Chapter 2, Haier's RenDanHeYi model allows employees to take part in decision-making and to make sure micro-enterprises are innovative (Lago, 2024). This process can be applied inside organisations by including employees in decisions, assembling teams from many areas and running open challenges.

To make use of such practices, HRM policies need to be viewed as important for strategy, not just administration. Its parts involve acknowledging OI metrics in job performance, adjusting roles to facilitate new ideas and encouraging workers to share their knowledge using peer recognition.

7.2. Leadership and Culture

The process of rolling out the AMO framework was largely aided by the use of leadership skills and culture in high-tech, fast-changing organisations. Despite the usefulness of the AMO model in designing HRM systems to boost employee capability, engagement and participation, the results demonstrate that how leaders behave and the prevailing culture play a major role in its success. The findings make it clear that if managers do not actively promote AMO principles, other well-designed HRM strategies could falter.

Good leadership here requires doing more than managing details or enforcing regulations. Today's managers need to develop a strategic mindset that allows them to support and encourage new ideas, instead of just following the rules. Ability is improved when leaders endorse ongoing learning, support unique growth plans and address obstacles in the system or politics that might stop progress (Ahsan, 2024). Leaders were discovered to promote trust and psychological safety at work, place employees' own values at the forefront of roles, and recognise both successful results and new ideas from the team. Leaders who champion bringing everyone into decisions, giving individuals freedom and teamwork provide more opportunity for all.

Chapter 2 highlights several case examples where leadership significantly impacted innovation outcomes. Notably, Ericsson's (Barnwal, 2021) distributed leadership model enables managers to empower globally dispersed teams through agile, project-based structures, allowing for autonomy and flexibility (Song, 2024). Such leadership practices ensure that the AMO framework does not operate in isolation but is woven into the daily experience of employees through supportive management behaviours.

To institutionalise such leadership, firms must move beyond generic management training toward targeted development programs that build competencies in innovation coaching, systems thinking, and emotional intelligence. Techniques such as 360-degree feedback, peer coaching cohorts, and real-time performance narratives can reinforce desired leadership behaviours and make them part of organisational DNA.

Equally vital is the organisational culture in which these leadership practices are enacted. If an organisation focuses on being curious, testing new things and learning together, AMO practices will be easier to implement. Adobe and some other companies created HRM programs such as innovation sabbaticals to support their workplaces' values of openness, adaptability and teamwork (DiDonna, 2025). In the case of companies with strict hierarchy graphs or who were hesitant to try new ideas, their AMO practices did not greatly influence behaviour, since workers were less likely to use their own judgment.

That is why culture should be seen as both a background and an important result of human resource management. Noticing innovation as a company and including leaders in piloting change can help create a culture of innovation, just like symbolic acts such as redesigning the workspace or altering word choices (Soleas, 2020). The connection between AMO theory and practice is formed by leadership and culture, which help turn HR designs into actual business strengths.

7.3. Organisational Strategy

The next implication is related to how HRM keeps up with the company's wider OI goals. This analysis proves that HRM should be treated as a main support for strategic planning, not just as a sub-unit. High innovation output was usually reached by involving HRM in the firm's decision-making processes.

Strategic integration begins with aligning HRM objectives with OI goals. For example, talent acquisition strategies should focus not just on technical competence, but on curiosity, collaboration, and adaptability (Patel and Abidi, 2023). Performance management systems

should reward not only outputs but also learning behaviours, knowledge sharing, and experimentation.

Moreover, HR professionals must be involved in OI governance. They should help design team structures, facilitate external collaboration, and anticipate capability gaps based on emerging technology trends. By participating in scenario planning and foresight exercises, HR leaders can proactively align workforce development with future innovation needs.

Organisations that treat HRM as a strategic partner also benefit from increased OI resilience. As noted in Chapter 2, firms with HRM systems capable of rapid reconfiguration (e.g., agile resourcing or internal talent marketplaces) were better able to pivot during periods of market or technological disruption. This agility is a direct outcome of HRM strategies built on AMO principles.

In line with the resource-based view (Zvarimwa, 2025), AMO-enhancing practices form part of the firm's human capital infrastructure that is valuable, rare, inimitable, and non-substitutable. When embedded strategically, they can become a source of sustained competitive advantage. Furthermore, the dynamic capabilities perspective (Teece, 2014) is reflected in how AMO systems allow firms to sense, seize, and reconfigure opportunities in rapidly evolving markets.

In short, this research lays out a detailed way to use the AMO model to help an organisation become more innovative. According to the findings, simply using HRM for performance management should be replaced by designing HRM practices that promote creativity, collaboration and how adaptable organisations can be (Maley et al., 2024). Organisations can better encourage OI by allowing employees to feel motivated and independent in their jobs as part of their HRM policies. Just like traditional learning, leadership training should highlight how leaders help people experiment, take risks and discover new things. Making HRM and wider OI strategies work together allows talent management, measuring performance and building capabilities to follow the firm's overall course. Thanks to this alignment, HRM becomes a key force behind a company's ability to adapt and compete successfully (Lewin and Teece, 2019). Today's uncertain and complex business world calls for applying AMO-based HRM, which helps firms be adaptable and succeed in the future. Whenever AMO principles are incorporated into how the organisation operates, HRM helps bring about ongoing success and stimulates OI.

8. Limitations

Even though the study has made considerable progress in studying and using the AMO model for OI, a few shortcomings should still be noted. They are due to difficulties with the method, the situation the research was carried out, the range of theories and the desire to collect more data. Handling these challenges sensibly ensures that the results connect with their context and inspire additional science.

One of the primary methodological limitations of this study is its cross-sectional design. By capturing data at a single point in time, the research restricts itself to a snapshot of relationships among AMO practices and innovation outcomes. While this approach provides valuable associative insights, it inherently limits causal inferences. Without longitudinal data, it is difficult to determine whether AMO practices lead to innovation outcomes or whether innovative firms are more likely to adopt AMO-based HRM strategies. A longitudinal design would allow for the observation of changes over time and better capture the dynamic evolution of HRM practices in response to innovation needs.

To address the limitations discussed above, future research should prioritise longitudinal designs. Such studies would allow researchers to trace how changes in HRM practices influence OI behaviours over time and whether the effects of AMO interventions are sustained, intensified, or diminished in different organisational phases. Longitudinal studies could also capture lag effects, where the impact of a new training program or motivational scheme only becomes evident after a certain period.

Another limitation is in the reliance on self-reported data from innovation leaders and HR, whose answers are vulnerable to social-desirability bias, a known threat to interview research (Podsakoff et al., 2003). Respondents might overstate the effectiveness of HRM practices due to social desirability or role-justification biases. This challenge could be exacerbated in organisations with strong internal narratives around innovation, where there is institutional pressure to present HRM systems as high performing. Although this study triangulated responses through multiple interviews and secondary data sources where available, the inherent bias in self-reporting remains a methodological constraint.

Second, future studies should adopt mixed methods approaches that combine qualitative insights with quantitative validation (Zhou, 2019). For example, ethnographic observations and narrative interviews could be paired with surveys measuring OI performance, employee engagement, and psychological variables. This approach would offer richer, more triangulated

data and allow for the examination of causal pathways. In particular, structural equation modelling (SEM) or multilevel modelling (MLM) could be used to test how AMO practices interact and influence innovation at individual, team, and organisational levels (Sukumarl Koednok and Mullika Sungsanit, 2018).

The contextual specificity of the study also imposes limitations on the generalizability of its findings. The research focused primarily on high-tech firms in the Netherlands and Belgium operating in innovation-intensive sectors, including AI services, biotechnology, and industrial automation, with only 13 interviews conducted. While these settings offer fertile ground for examining the AMO-OI nexus, they also represent unique cultural, strategic, and operational conditions. For instance, high-discretion roles and decentralised structures are more prevalent in these sectors, making it easier to observe the effects of motivation and opportunity-enhancing practices. The findings may not generalise to more traditional industries, such as manufacturing or logistics, where job roles are more routinised, and hierarchical control is stronger.

Future research should also explore cultural and institutional factors more explicitly. Comparative studies across countries and regions can reveal how national culture influences the design and perception of AMO practices. For example, how does employee autonomy, a core motivation-enhancing element, operate in hierarchical vs egalitarian cultures? This line of inquiry would contribute to the development of culturally sensitive HRM models.

Additionally, the study's regional focus further limits external validity. The participating firms were primarily located in Western contexts, with a few exceptions from Asia. As highlighted in Chapter 2, national culture and institutional frameworks shape how AMO practices are designed, interpreted, and internalised. Motivation-enhancing practices that thrive in individualistic cultures may not have the same impact in collectivist environments. This limitation calls for cross-cultural research that can validate or challenge the applicability of AMO as a universal model for innovation.

Third, researchers should explore additional mediators and moderators in the AMO-OI relationship. Digital transformation, for example, has emerged as a powerful force shaping both HRM practices and innovation ecosystems. How do digital platforms, AI tools, and virtual collaboration technologies influence the efficacy of ability, motivation, and opportunity? Similarly, organisational agility, defined as the firm’s capacity to rapidly adapt, may moderate the relationship between AMO and OI performance outcomes. In agile organisations, AMO-enhancing practices may produce faster and more pronounced effects.

Additionally, the study did not always include external environmental considerations, including economic environments, adjustments in the rules and the level of competition. This means that they can greatly impact the way HRM is used and the outcomes of a company's innovation efforts. Even with a clear strategy, companies struggling financially may stop investing in employee training, simply to cope with financial demands (Bobek, Kreinecker and Horvat, 2024). Just like crises, the COVID-19 pandemic also influences the importance and purpose of teamwork or job rotation.

Finally, there is an opportunity to develop more sophisticated theoretical models that integrate AMO with other strategic management frameworks (Bos-Nehles et al., 2023). These could include dynamic capabilities theory, institutional theory, or systems thinking approaches. Such integrations would reflect the complex, non-linear nature of innovation and OI and provide a more holistic understanding of how HRM systems contribute to strategic success.

Although this study adds value to the fields of strategic HRM and innovation management by examining OI through the AMO framework, some theoretical issues should still be examined. A significant problem is that research might oversimplify the AMO-OI connection. The study seems to view ability, motivation and opportunity separately, not always considering how they really interact. In other words, we are unsure if a lack of opportunity affects ability and motivation, regardless of how high each is. When we fail to study how the AMO elements cooperate or balance with one another, the model is not equipped to reflect accurately the link between AMO and OI.

Future research should explore cultural and institutional factors more explicitly and develop more sophisticated theoretical models that integrate AMO with other strategic management frameworks.

The study also notes that motivation strongly drives OI, but it has not examined how the components of motivation work together in various situations or as time passes. Investigating in theory if these elements act as moderators or mediators may greatly increase what the model can explain. This scholar explains that without it, the system can be seen as unidimensional or overly structured, and this might not fit the fact that OI processes are often not one-sided.

While this study provides valuable insights into the strategic role of AMO in organisational OI, it is not without limitations. Methodologically, the cross-sectional, self-reported nature of the data imposes constraints on causality and objectivity. Contextually, the focus on high-tech, predominantly Western firms limits generalizability. Theoretically, the study simplifies complex

interrelationships and underexplores the mediating mechanisms through which AMO practices translate into innovation. However, these limitations offer fertile ground for future research. By adopting longitudinal, multi-level, and cross-cultural approaches, scholars can deepen our understanding of the AMO-OI nexus and develop more adaptive, context-sensitive HRM frameworks capable of driving OI performance in diverse organisational environments.

Those carrying out research or working in organisations may find it useful to heighten the connection between Human HRM and OI. The results prompt scholars to increase their research on how AMO and OI impact each other. Future investigations should aim to follow the long-term changes in HRM systems that are in line with the AMO approach. It is also necessary to assess cross-cultural comparisons to find out how national culture, digital readiness and regulations play a role in the connection between AMO bundles and OI performance outcomes.

To sum up, this study shows that people are the main force behind OI. Using AMO-enhancing HRM methods in their institutions allows companies to use human capital to build a reliable and durable driver of OI performance even in rapidly changing environments in the high-tech industry. Future research should test the bundles further to confirm causality.

9. Conclusion

This study presents a comprehensive exploration of the Ability-Motivation-Opportunity (AMO) framework and its strategic application in fostering organisational innovation within high-tech sectors engaging in Open Innovation (OI) performance. Through qualitative empirical analysis of HRM practices across leading firms in AI, semiconductors, biotechnology, and advanced manufacturing, which all fall under the high-tech sector, it offers robust evidence that AMO-based systems play a critical role in enabling OI performance in the sector.

The study is grounded in 13 expert interviews conducted across firms in semiconductors, biotechnology, industrial automation, AI services, and deep-tech. Regarding the range of AMO-enhancing HRM practices implemented in high-tech firms, it was found that under each AMO dimension, various practices were utilised. Examples are hiring employees with certain skills, teaching them new technologies and encouraging learning with others (ability); granting bonuses based on new ideas, making recognition important among employees and leading with a strong purpose (motivation); cross-team cooperation, innovation meetings and workplace digital tools help (opportunity). Furthermore, high-tech firms use non-monetary and Symbolic Rewards to enhance motivation. They stated that while bonuses remain in use, recognition systems increasingly reward impact, visibility, and peer endorsement. By intentionally combining ability-, motivation-, and opportunity-enhancing HRM practices, firms achieve lasting, synergistic gains in OI, whereas partial or uncoordinated application yields only transient or suboptimal results.

Concerning the challenges high-tech firms face when deploying these practices, it was found through the research that employees sometimes do not participate in OI because of their company's strict hierarchy, their cultural views and how slowly they can pick up new knowledge. Those organisations that managed to face these challenges introduced new approaches, such as improving psychological safety, streamlining the organisational structure and championing diverse leadership, to join AMO goals with OI aims.

As for the way each AMO dimension associates with firm-level OI performance, it is clear from the findings that each part of AMO brings different benefits at each stage of the OI lifecycle. To create helpful concepts, teams used practices that enhanced abilities and strengthened their ability to absorb information, while motivational techniques helped them maintain interest and engage in risky pursuits, and cross-boundary structures made it possible for them to cooperate and unite different types of knowledge. Motivation played a key role in enhancing OI performance, especially when motivation was connected to autonomy, recognition and purpose. The main

conclusion points out that using AMO methods together provides the greatest benefits. Those companies that actively embraced these AMO-enhancing HRM configurations in their strategy and culture tend to do better in OI, as seen by rapid transfer of knowledge, higher idea conversion and a strong focus on adaptive innovation.

From a theoretical perspective, this research uses the AMO model to show its importance in OI. While earlier approaches to AMO just focused on increasing productivity and performance, this study positions it as a way to increase sharing, learning and collaborating across different teams. Moreover, the study demonstrates the AMO theory by combining it with dynamic capabilities and resource-based views and redefines the role of AMO into a strategic facilitator of OI rather than only productivity.

From a practical and strategic point of view, HRM supports and encourages OI. When AMO practices are used in all aspects of recruitment, learning, motivation and leadership and integrated into one system, organisations build the conditions for synergistic gains in OI. Practically, this involves bringing boundary-spanning talent into the organisation, rewarding for impact with concrete symbolic rewards instead of bonuses, and building flat and digitally supported collaboration platforms which force knowledge exchange. All these together charge up employees' ability, motivation and opportunity and transform outside ideas into lasting OI returns.

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Appendix A

Interview guide

Introduction

1. Could you give a brief description of your current role and your work experience?
2. Are you familiar with the concept open innovation?

If no:

Open innovation is the understanding that organisations work together with external collaborators like other companies, schools, or customers, to share knowledge and ideas. This is done to co-develop innovations, license out internal technologies or integrate external ideas to enhance their own product or services. This type of working contrasts with traditional closed innovation models as it deals with the flow of knowledge across different organisations. The goal is to enhance innovation by making use of knowledge and expertise from both within and outside the company (Bertello, 2023; Hossain, 2016).

3. How does your organisation approach innovation, especially open innovation? Could you provide some examples?

General Understanding of AMO and Open Innovation

The AMO model is a model used in human resource management. It describes how certain HR practices can improve employee performance. Under it, employees work best when they possess (Marin-Garcia, 2016):

Ability (A): The knowledge and skills necessary to do their jobs satisfactorily.

Motivation (M): The willingness and drive to apply effort for the accomplishment of organizational goals.

Opportunity (O): A supportive environment where employees are able to apply their skills and motivation, like working in collaborative projects or participative decision-making.

By implementing HRM practices that support these three dimensions, organizations can achieve improved performance and innovation on the part of the employees. So with this research the goal is to see how the AMO enhancing HRM practices lead to Open Innovation performance (Naqshbandi, 2023).

4. What kind of HRM practices does your organisation use to enhance Abilities, Motivation and Opportunities?
5. Could you give me examples of how the used practices affect each dimension (AMO)?
6. What were the challenges for your organisation to implement AMO-fostering HRM practices, and did you overcome them?

Implementation of AMO-enhancing HRM Practices
7. Can you describe how the HRM practices that support employee development you mentioned before lead to open innovation performance in your organisation? (Follow up: could you elaborate with examples?)

8. How do the motivational enhancing HRM practices you mentioned lead to open innovation performance in your firm? (Follow up: could you elaborate with examples?)

9. Could you describe how the opportunity-enhancing HRM practices you mentioned lead to open innovation performance in your firm? (Follow up: could you elaborate with examples?)

Challenges and Responses in Implementing AMO
10. How does the culture in your organisation facilitate or hinder the implementation of AMO HRM practices?
11. Could you describe the measures or modifications your firm has taken to overcome these challenges?
Reflective and Closing Questions
12. Do you believe AMO-enhancing HRM practices are currently overlooked or not sufficiently leveraged in your organisation for open innovation purposes?

13. How do you measure OI performance?
14. Based on your experience, what recommendations would you give to other firms in the high-tech sector aiming to better utilise the AMO, enhancing HRM practices to enhance their open innovation capabilities?
15. Which leadership styles do you use and which ones do you think fit best for enhancing open innovation performance?

I used AI tools like ChatGPT for feedback and to check spelling and grammar.

Sample Prompt: "Please review the following text for grammar, spelling, and clarity, and provide feedback for improvement."