

The Influence of Human Resource Management Practice on the Innovation of Research and Development Personnel

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Abstract:

Human resource management practices are a keyway to unlock the potential of a company's R&D personnel, enhance its innovation capabilities, and drive its long-term development. This article analyses the topic from three major aspects: talent acquisition and allocation, capability development and knowledge sharing, and performance and incentive mechanisms. It explores the core pathways and implementation methods through which companies can drive innovation via human resource management practices at different stages of development and in various industry contexts. The research in this paper focuses on high-tech enterprises and traditional manufacturing enterprises as case studies, highlighting effective approaches to significantly enhance innovation outcomes. These include breaking away from the 'academic credentials-centric' hiring philosophy, building cross-functional and diverse teams, prioritising the cultivation of innovative skills, and establishing inclusive performance evaluation systems and differentiated incentive mechanisms. This paper proposes recommendations such as establishing an 'innovation-first' management orientation, designing a dual mechanism model of 'error tolerance + incentives,' promoting innovation across all employees, and cultivating an innovative culture, providing reference for enterprises to formulate human resource management strategies to enhance their innovation capabilities.

Keywords: Human resource management; innovation of R&D personnel; capability development.

1. Introduction

In the current context of global competition and accelerated technological change, innovation has become the core driving force behind sustainable corporate development and the engine of corporate growth [1]. Especially in the current knowledge economy, the creativity and potential of R&D personnel, teamwork capabilities, and interdisciplinary thinking are key factors determining whether a company can gain a competitive edge in the fierce market competition. However, innovation does not solely rely on individual inspiration but requires systematic human resource management practices to stimulate and ensure it [2]. According to Griffith's research, there is a significant positive correlation between human resource management and corporate innovation [3]. Specifically, every stage from recruitment, training, and performance evaluation to incentives may influence the creative output of R&D teams. For example, some studies have found that the establishment of cross-functional teams not only helps break down departmental barriers and improve team efficiency but also promotes the integration of diverse knowledge; other research indicates that innovation-oriented performance evaluations and differentiated incentives can significantly enhance employees' exploratory behaviour, thereby stimulating their innovative potential and fostering the development of their innovative capabilities [4].

However, there are certain differences and variations in how different types of enterprises implement human resource management practices. High-tech enterprises often focus on talent innovation breakthrough capabilities and long-term innovation investment in their human resource management practices, while traditional manufacturing enterprises place greater emphasis on organisational process optimisation and incremental innovation development. These differences stem from industry characteristics on the one hand and are closely related to corporate culture and strategic positioning on the other hand, which explains why human resource management practices vary across different business models.

Based on this, this paper aims to analyse the core impact of human resource management practices on corporate innovation capabilities through a comparative analysis of different corporate cases and to propose targeted optimisation recommendations. The structure of the paper is as follows: the second part explores the mechanisms of human resource management in talent allocation, capability development, and performance incentives; the third part compares the differences and variations in human resource management practices and innovation outcomes between high-tech companies and traditional manufacturing companies; the fourth part presents optimisation recommenda-

tions for companies; and finally, the conclusion summarises the entire paper and outlines future research directions.

2. Core Pathways Through Which Human Resource Management Practices Influence

2.1 Corporate Innovation Capabilities

First, companies need to break free from the limitations of the 'academic credentials above all else' mindset during the recruitment process, abandoning this traditional notion and instead focusing on and evaluating candidates' comprehensive qualities across various dimensions, such as curiosity, critical thinking, and cross-disciplinary learning abilities—traits that are often more predictive of innovative potential than academic backgrounds. This approach enables a more comprehensive assessment of candidates' capabilities and potential. For example, a technology company introduced an 'unconventional problem-solving test' into its recruitment process, simulating complex problem scenarios to identify candidates with creative thinking abilities [5].

Secondly, forming cross-functional teams can bring together members from different backgrounds into a single team. Such teams can break down information barriers between departments, enabling the team to comprehensively promote the integration of cross-disciplinary knowledge. For example, by establishing a 'R&D + Marketing + Design' integrated team, companies can optimise and refine their team processes. Some consumer goods companies incorporate R&D, marketing, and design personnel into the same project team, forming cross-functional teams to collaborate. This allows designers to directly participate in research and user satisfaction assessments, while marketing personnel gain a deeper understanding of the product's design and advantages. Such cross-functional teams facilitate the development of products that are technically feasible and aligned with user needs, thereby maximising the creation of products that meet public demand. This effective team structure not only shortens the product development cycle but also increases the success rate of product innovation, thereby meeting public needs.

2.2 Capability Development and Knowledge Sharing

In terms of training, companies need to not only impart professional work skills and knowledge to their employees, but also systematically introduce creative thinking, innovative methodologies, and interdisciplinary knowledge research. Creative thinking enables employees to

think divergently, helping them develop open-minded problem-solving methods and apply them more broadly within the company. Innovative methodologies help employees learn and master innovation tools and apply them proficiently, while interdisciplinary knowledge promotes the systematic integration of knowledge from different fields, thereby stimulating employees' creativity and vitality after learning. In terms of implementation, companies should adopt a blended training approach combining online and offline formats, using detailed case analyses and role-playing exercises to enhance effectiveness. Additionally, companies should develop personalised management strategies, designing tailored programmes for employees at different job levels and career stages to ensure training content aligns with actual business needs, enabling employees to learn and improve effectively. This comprehensive training not only enhances employees' ability to tackle complex problems but also effectively promotes the application of interdisciplinary knowledge, thereby boosting the company's overall innovation capabilities.

Knowledge-sharing mechanisms also play an important role in driving corporate innovation. Companies can establish a comprehensive 'innovation case library' to systematically record past successful and unsuccessful innovation projects and analyse their own successes and shortcomings. The establishment of a case library provides employees with valuable knowledge assets for learning and discussion, enabling them to effectively learn from experience. Additionally, companies should establish innovative exchange platforms to provide employees with spaces for sharing and discussion, creating an open communication environment where diverse ideas can be shared. By sharing the challenges encountered in projects, the reasons for failures, and their own perspectives on projects, employees can help teams summarise experiences and lessons learned, thereby improving problem-solving efficiency. In-depth analysis of failure cases can stimulate teams' reflective awareness, promoting continuous improvement and further development. Additionally, knowledge-sharing mechanisms can enhance collaboration between different departments and teams, facilitate information flow and systematic integration of knowledge, thereby boosting overall innovation capabilities and fostering a proactive learning and reflective culture.

2.3 Performance and Incentive Mechanisms

In terms of performance evaluation, companies should reduce the weighting of short-term performance metrics to avoid prioritising short-term economic gains at the expense of long-term innovation activities. Companies should correspondingly increase the weighting of metrics

such as innovation input and output, exploratory attempts, and R&D project progress, encouraging employees to engage in forward-looking and risky innovation and R&D. Additionally, the performance evaluation system should clearly adopt a tolerant attitude toward innovation failures, especially those that follow the company's standard processes and reasonable experimental designs, which should not be used as grounds for punishment [6]. Such an evaluation system arrangement can effectively reduce employees' psychological burden during the innovation process and stimulate their enthusiasm for trying new technologies. Furthermore, companies can establish reasonable mechanisms for failure feedback and post-mortem analysis, transforming failure experiences into internal learning resources through established forums, thereby enhancing the organisation's overall risk-resilience. Companies should also use performance evaluation systems to convey the important message that 'failure is an inevitable stage of innovation,' fostering a tolerant and error-tolerant innovation culture to drive continuous technological breakthroughs and management innovation.

In designing incentive mechanisms, companies should clearly distinguish between the distinct roles of material and non-material incentives. Material incentives typically link innovation outcomes to direct economic benefits such as bonuses or patent conversion revenues, allowing employees to tangibly feel the material rewards of innovation and thereby stimulate their creative drive and enthusiasm. Non-material incentives focus more on fulfilling employees' spiritual needs and desire for recognition, such as granting them leadership roles in core innovation projects, increasing their influence within the team, providing more opportunities for decision-making participation, and acknowledging their value through public recognition or honorary awards. This dual incentive model not only effectively mobilises employees' enthusiasm and innovation drive but also significantly enhances their sense of identification, belonging, and loyalty to the company, promoting the sustained stability and development of innovative teams.

3. Differences and Effectiveness Comparisons in Human Resource Management Practices Among Different Types of Companies

3.1 Human Resource Management Practices in High-Tech Enterprises

As a leading high-tech enterprise in China, Huawei has implemented the 'Genius Youth Programme' to recruit and

allocate talent, aiming to attract top-tier innovative talent with exceptional innovative potential and professional capabilities on a global scale. Through rigorous screening and comprehensive evaluations, Huawei ensures that the talent it recruits can handle highly challenging R&D and innovation tasks, and grants them leadership roles in core projects, significantly enhancing the efficiency of innovation projects and driving the development of corporate innovation and entrepreneurship. In terms of incentive mechanisms, Huawei adopts a 'saturation attack' approach to resource allocation, concentrating efforts on supporting key R&D areas [7]. Additionally, by combining equity incentives with performance-based rewards, the company fosters a sense of long-term commitment and innovation motivation among its talent, aligning their interests with those of the company. Culturally, Huawei advocates the philosophy of 'the phoenix that rises from the ashes,' emphasising the importance of learning from failures to cultivate a strong culture of tolerance for mistakes and a continuous spirit of innovation. This culture encourages employees to boldly experiment and learn from mistakes, driving continuous innovation and progress. Thanks to these multi-dimensional human resources management measures and methods, Huawei has achieved significant achievements in multiple fields and areas. It has secured industry-leading achievements in 5G communication technology, the HarmonyOS operating system, and other domains, with annual patent applications exceeding ten thousand in recent years, demonstrating robust technological accumulation and innovation capabilities. The company continues to pursue larger goals.

3.2 Human Resources Management Practices in Traditional Manufacturing Enterprises

Haier, a renowned traditional manufacturing enterprise in China, has undergone organisational restructuring by implementing the 'human-single' model, breaking down traditional management hierarchies and delegating decision-making authority to frontline employees. This allows them to directly address user needs and independently initiate micro-innovation projects [8]. This model has stimulated the innovative enthusiasm of frontline employees, promoting the close integration of innovation outcomes with market demands, enabling employees to directly 'connect' with users. In terms of knowledge sharing, Haier has established the 'Interconnected Factory' platform, enabling real-time collaboration and information sharing of global R&D resources, breaking down geographical and departmental barriers, and facilitating the rapid dissemination and learning of experiences. In terms of incentive mechanisms, Haier has implemented an innovative

profit-sharing system, ensuring that innovation teams can share in the material benefits of their achievements. In addition, projects that fail due to team innovation can still apply for secondary resource support after post-mortem analysis, and the company will provide support and innovation after successful evaluation. These measures have not only helped Haier successfully transform into a provider of 'smart home' solutions, but have also enhanced the company's innovation speed and product diversity. With this support and development, Haier Group launches more than 500 innovative products on average each year, greatly enhancing its market competitiveness and successfully driving the company's development.

From the comparison between Huawei and Haier, it is evident that different types of companies adopt distinct human resources practices. These strategies are tailored to industry characteristics and specific business needs, employing differentiated human resources management approaches to drive innovation. Huawei, as a representative of the technology sector, focuses on attracting top-tier innovative talent. The company grants these individuals primary decision-making authority over core projects, invests significant resources, and implements equity incentive programmes to foster a culture that tolerates failure in the pursuit of innovation. This approach has effectively promoted the development of innovation within the company. Haier, representing traditional manufacturing, differs from technology companies. It adopts a 'people-centric' management model, empowering frontline employees to drive innovation aligned with user needs. Companies utilise information technology platforms to facilitate knowledge sharing and R&D, while implementing effective profit-sharing incentives and error-tolerant mechanisms to support incremental innovation and product diversification. The differences in talent allocation and incentive mechanisms between the two types of companies they represent fully reflect their strategic positioning and innovation pathways, providing important references and unique approaches for different types of companies to optimise human resource management and enhance innovation capabilities.

4. Recommendations for Optimising Corporate Human Resource Management Practices

4.1 Establish a Management Orientation that Prioritises Innovation

Senior management should clearly define innovation as the core of their strategy, positioning it as the most im-

portant goal for the company's development and integrating it into the company's long-term planning and daily operations management. In terms of resource allocation and performance evaluation weighting, priority should be given to ensuring adequate funding and human resources for innovation projects. Additionally, innovation performance should be incorporated into the performance evaluation systems for executives and employees, using institutional mechanisms to incentivise employees at all levels to actively participate in innovation, thereby fostering a virtuous cycle of innovation-driven development and sustaining the company's competitive advantage [9].

4.2 Design a Dual Mechanism of 'Tolerance for Failure + Incentives'

Companies should establish clear standards for 'tolerance for failure' to encourage employees to boldly explore new ideas and technological innovations, avoiding stagnation due to fear of failure and hesitation to break new ground. Simultaneously, differentiated incentive measures should be designed to provide generous rewards for successful innovative behaviours and reasonable support and resource guarantees for projects that follow procedures but fail to meet expectations. Through a mechanism that balances tolerance for failure and incentives, innovation risks are reduced, employee innovation enthusiasm is enhanced, and the organisation's overall innovation resilience is promoted.

4.3 Promoting 'Innovation by All' Rather than 'Innovation by a Few'

Companies should actively foster an atmosphere where everyone innovates, encouraging frontline employees to propose practical improvement suggestions and solutions based on their work experience. By establishing internal innovation platforms or forums, providing channels and solutions for discussing and showcasing ideas, and promoting the widespread dissemination and exchange of innovative ideas [10]. Additionally, supporting incentive measures and supporting incentives measures should be established to provide employees with dual rewards at both material and spiritual levels, recognising and rewarding their innovative contributions, fostering a sense of ownership among employees, and ensuring a continuous flow of innovative outcomes.

4.4 Cultivating an Innovation Culture

Corporate leadership should lead by example, actively promoting the dissemination and implementation of innovative concepts, reducing the suppressing effects of traditional authoritarianism and the oppressive work

atmosphere, and creating an open and inclusive work environment. By sharing successful innovation cases and establishing heroic role models, employees' cultural identity can be strengthened, fostering a team mindset that 'innovation is valuable.' Simultaneously, cross-departmental collaboration and the exchange of diverse perspectives should be encouraged to deeply integrate innovation culture into daily operations, thereby enhancing the organisation's overall innovation capabilities [11].

5. Conclusion

This paper is based on the three core dimensions of human resource management: talent acquisition and allocation, capability development and knowledge sharing, and performance and incentive mechanisms. It analyses the mechanisms through which these three dimensions influence a company's innovation capabilities and, through a comparison of two representative companies, Huawei and Haier, reveals the practical differences between companies in different industry contexts. The study findings indicate that breaking away from traditional recruitment standards, strengthening cross-functional teams, focusing on cultivating innovative skills, establishing inclusive performance evaluation systems, and designing differentiated incentive mechanisms are effective pathways to enhancing corporate innovation capabilities. Future research could further explore the promotional role of digital human resource management tools in innovation capabilities, as well as team adaptability strategies in cross-cultural contexts.

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