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Conceptualizing the Competitiveness of Pharmaceutical R&D Sites

A Case Study of AstraZeneca's R&D Site in Gothenburg
Master's thesis in Management and Economics of Innovation

TOR LEANDER
LUKAS LILLIEROTH GAN

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND ECONOMICS
DIVISION OF ENTREPRENEURSHIP AND STRATEGY

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www.chalmers.se

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Department of Technology Management and Economics
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone + 46 (0)31-772 1000

Cover:
AstraZeneca's R&D Site in Gothenburg.

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SUMMARY

In the context of increasingly decentralized innovation models, understanding what makes individual pharmaceutical R&D sites competitive has become strategically important for multinational corporations. While most research on global R&D focuses on firm-level outcomes, this thesis addresses the underexplored question of how competitiveness is shaped and sustained at the level of the individual site. Through a qualitative case study of AstraZeneca's R&D site in Gothenburg, the study investigates how internal and external factors contribute to site competitiveness within a global pharmaceutical R&D network.

Drawing on 21 interviews with internal and external stakeholders, as well as written material analysis, the study explores site competitiveness as a dual construct: external competitiveness, defined by the site's ability to deliver high-value projects to the global pipeline and internal relevance, its perceived strategic importance within the multinational corporation. The findings reveal that pipeline delivery and site perception are the key drivers of site competitiveness. These are shaped by internal success factors, such as talent, infrastructure, operations, and culture and identity, and external conditions such as ecosystem dynamics and quality of life.

The study also highlights several tensions that site managers must navigate, including the balance between external competitiveness and internal relevance, the paradox of pipeline delivery, how to increase visibility without losing trust, talent loyalty and renewal, and being a builder of a local ecosystem while needing to demonstrate global value. The thesis contributes to the literature by providing a conceptual framework for understanding site-level competitiveness in pharmaceutical R&D. It offers practical insights for managers seeking to sustain relevance in an increasingly globalized innovation landscape.

Keywords: R&D site competitiveness, pharmaceutical innovation, internal relevance, external competitiveness, innovation ecosystems, multinational corporations, AstraZeneca.

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1 Introduction

The pharmaceutical industry faces increasing pressure to improve research and development (R&D) efficiency and sustain innovation (McKinsey & Company, 2025). While the costs of R&D have increased over the past decade, the return on these investments has remained stagnant. Scannell et al. (2012) demonstrate that the industry has experienced a decline in R&D productivity over the past 60 years. They describe this phenomenon as Eroom's Law, an inverted version of Moore's Law, which states that computing power doubles roughly every two years while costs decrease. In contrast, Eroom's Law suggests that the number of drugs approved per billion USD spent on R&D has approximately halved every nine years, indicating declining productivity despite scientific and technological advances.

However, based on recent data, this long-standing trend may be beginning to reverse. Deloitte (2024) reveals that the internal rate of return (IRR) for a cohort of the 20 largest biopharmaceutical companies increased from 1.2% in 2022 to 4.1% in 2023, signaling early signs of improvement in productivity. McKinsey & Company (2025) notes a modest recovery in R&D return metrics but emphasizes that fundamental transformation is required to sustain long-term gain. Although recent data indicate progress, the industry faces challenges in establishing more cost-effective and scalable innovation models.

With this background, understanding the conditions that enable innovation performance at R&D sites is increasingly essential for firms in the pharmaceutical industry. An R&D site is a distinct location within a multinational corporation's (MNC) innovation network with the mission of conducting R&D activities (Julian & Keller, 1991). This thesis builds on the increased pressure within the pharmaceutical industry, exploring how the competitiveness of pharmaceutical R&D sites is shaped and sustained.

1.1 The Changing Landscape of Pharmaceutical R&D

In response to the pressures in pharmaceutical R&D, the industry landscape is transforming, shaped by internal challenges and external developments such as stricter regulations and technological developments that drive this transformation (Deloitte, 2024; McKinsey & Company, 2025). Schuhmacher (2024) argues that this transformation can be understood through evolutionary economics, in which firms adapt to shifting technological, regulatory, and market environments through processes of variation, selection, and replication. New business models, emerging therapeutic modalities, digital technologies, and collaborative innovation networks are reshaping the organizational models, pipelines, and collaborations in pharmaceutical R&D in ways that may define its future path. In the pharmaceutical industry, the pipeline refers to the portfolio of drug candidates under development, typically spanning from early clinical trials (Phase I) to late-stage trials (Phase III) (Büssgen & Büssgen, 2023). It reflects the company's future innovation and commercial potential.

The transformation can also be seen in the evolving organizational structures of pharmaceutical firms. One representation of this evolution is the shift from the traditional fully integrated pharma company model to more networked and collaborative structures

(Schuhmacher, 2024). The dominant model in recent years has become the biotech-leveraged pharma company, where firms increasingly rely on partnerships with external actors to source innovation, particularly from biotech startups, universities, and other collaborations. According to McKinsey & Company (2025), over 70 % of new molecular entity (NME) revenues since 2018 have originated from externally sourced products. This reflects a move toward innovation ecosystems, where value is co-created through interdependent relationships among various ecosystem actors (Bogers et al., 2017). As large, established firms have embraced greater openness in innovation, evidenced in practice by increased technology licensing and collaborations with university research, companies are now considered nodes of a broader innovation ecosystem (Iansiti & Levien, 2006).

These developments form the setting for this thesis, which conceptualizes the competitiveness of a pharmaceutical R&D site within an MNC.

1.2 AstraZeneca's R&D Site in Gothenburg: An Empirical Context

The competitiveness of a pharmaceutical R&D site within an MNC has been studied empirically through a case study of AstraZeneca's R&D Site in Gothenburg (AZG). AstraZeneca (AZ) is a leading global pharmaceutical company headquartered in Cambridge, United Kingdom (AstraZeneca, 2025b). With a strategic focus on discovering, developing, and commercializing prescription medicines, the company operates across major therapy areas such as oncology, biopharmaceuticals, and rare diseases (AstraZeneca, 2025c).

AZG represents one of the company's six strategic R&D centers alongside Cambridge, Gaithersburg, Boston, Shanghai, and Beijing (AstraZeneca, 2025d). Established in 1954, AZG plays a critical role in AZ's global R&D pipeline, supporting the entire life cycle of medicines, particularly within the therapy areas of cardiovascular, renal, metabolic, and respiratory diseases (AstraZeneca, 2025a). AZG employs approximately 3.000 employees, including a wide range of scientific, technical, and clinical experts. AZG has increasingly engaged with Sweden's broader innovation system in recent years, collaborating with academic institutions, biotech startups, and other initiatives.

As an empirical context, AZG presents a theoretically interesting case for examining how a pharmaceutical R&D site assesses its competitiveness within an MNC in a changing pharmaceutical R&D landscape. Studying how AZG describes and works with its competitiveness provides valuable insight into how an individual R&D site contributes to the MNC's overall competitiveness.

1.3 Problematization

Sommer and Bhandari (2022) categorize the research on global R&D strategy into three established streams: the motives and drivers of R&D internationalization, the geographic patterns and destinations of R&D, and the organization and management of global R&D networks. The authors emphasize that most existing studies rely on secondary data and tend to focus on firm-level outcomes, thereby overlooking the performance and competitiveness at the level of MNC's individual sites. The research gap can be argued to be especially

interesting in sectors like pharmaceuticals, where the complexity of local regulations and cross-sector collaboration makes site-level dynamics essential to innovation performance.

Building on this theoretical gap, this lack of site-level research is relevant from both academic and managerial perspectives. As global pharmaceutical firms adopt increasingly decentralized and collaborative innovation models, individual R&D sites are becoming critical in aligning global strategies with local capabilities, institutional conditions, and innovation ecosystems (McKinsey & Company, 2025). Nevertheless, there is limited understanding of how site-level competitiveness should be conceptualized. The case of AZG presents an opportunity to address this gap by examining how the site's competitiveness is shaped and sustained within the context of an MNC. One can argue that it is particularly valuable to gain insights into how key stakeholders at an R&D site perceive the factors that shape and sustain a site's competitiveness. This provides a deeper understanding of the practical aspects of site-level competitiveness. As such, this study complements existing research by offering an empirical perspective based on the lived experiences of site leaders and other key stakeholders who actively contribute to innovation, collaboration, and delivery.

1.4 Research Purpose and Question

The purpose of this thesis is to conceptualize competitiveness by studying how a pharmaceutical R&D site's competitiveness is shaped and sustained within an MNC. As pharmaceutical firms increasingly operate through decentralized innovation structures, it is important to understand how individual sites contribute through scientific output, maintain internal relevance, and strengthen external competitiveness.

To address the purpose of this thesis, the research question has been developed:

- What shapes and sustains the competitiveness of a pharmaceutical R&D site within an MNC, and which factors influence it?

1.5 Scope and Delimitations

The empirical scope of the research is limited to AZG, which serves as a single case study. The research is limited to a single company and site, which means that while the findings offer in-depth insights, they may not be generalizable to all pharmaceutical R&D sites. The study is also primarily qualitative, based on interviews and internal documentation, which means that the findings reflect perceptions and experiences rather than quantitative comparisons or formal performance metrics. However, the themes explored will likely be relevant in similar contexts.

Finally, the time aspect and confidentiality have resulted in certain limits on data access. Some sensitive information has been excluded or anonymized, and the project has been conducted over 22 weeks. This may have limited the depth of some findings, particularly those related to internal considerations or competitive performance. Despite these limitations, the research provides valuable insights into the dynamics of R&D site competitiveness in a global pharmaceutical context.

2 Theoretical Framework

To address the research question, the theoretical framework incorporates insights from multiple streams of literature. While existing literature, to some degree, emphasizes competitiveness at the firm level, there is a gap in understanding competitiveness at the site level for pharmaceutical MNCs. Given this gap, the theoretical framework integrates viewpoints from multiple streams of literature to establish a foundation for examining site-level competitiveness rather than relying on a single main theory.

The theoretical framework is structured in three parts, each grounded in the research purpose:

1. **Framing Success in Pharmaceutical R&D at the Firm Level:** The theoretical framework begins at the firm level to clarify what success means for pharmaceutical firms and how it is measured. This is necessary to understand what R&D sites are expected to deliver. The literature about R&D productivity, decision-making under uncertainty, and tolerance for failure is selected to highlight the tensions that shape corporate R&D strategy and to frame the expectations placed on R&D sites.
2. **Site-Level Enablers of R&D Performance:** Having established what pharmaceutical firms aim to achieve, the next step is understanding how R&D sites contribute to these aims. This section focuses on internal enablers of site-level performance. The literature is selected to highlight the strategic role of R&D sites, key capabilities within them, and the organizational culture. This unpacks why MNCs maintain distributed site networks and how internal site characteristics shape scientific output and perceived relevance.
3. **External Factors Shaping the Context of R&D Sites:** Finally, the framework turns outward to the external context, recognizing that R&D sites operate in context with conditions they cannot fully control. This section builds on the previous two by demonstrating that site-level competitiveness is not only a function of internal capabilities or alignment with corporate strategy but also of its location and engagement with its surroundings. Therefore, the selected literature includes global investment trends, R&D site selection criteria, innovation ecosystems, and keystone roles to illustrate how regional conditions increasingly shape R&D site relevance.

2.1 Framing Success in Pharmaceutical R&D at the Firm Level

At the core of pharmaceutical firm-level success, improving and maintaining population health is a driver for researchers and pharmaceutical companies (Wallmark, 2016). Another embodiment of success in the pharmaceutical industry is the creation of new drugs that incorporate innovative elements and offer new or enhanced treatments (Kim & Kim, 2014).

Achieving consistent success efficiently is inherently challenging within the pharmaceutical industry. Wallmark (2016) illustrates that there is no path to success in pharmaceutical R&D and launching one drug does not guarantee a continuous pipeline. Accurately predicting which drugs will succeed is nearly impossible, as breakthrough medications often result from luck, persistence, and strategic focus (Shaywitz, 2024). The exploratory phase of R&D is particularly unpredictable, and many therapies initially faced skepticism before their true potential was recognized and developed into market-leading or blockbuster drugs. Given the

unpredictable nature of pharmaceutical R&D and the current challenges surrounding stricter regulations, declining productivity, and global competition, pharmaceutical companies need a high level of managerial openness and strategic cognition (Kim & Kim, 2014).

Shaywitz (2024) illustrates that pharmaceutical firms with a high tolerance for failure often gain a competitive advantage. In contrast, many pharmaceutical companies are reluctant to invest in early-stage, high-risk projects because their leadership worries about the consequences of failed investments. This risk aversion can hinder the pursuit of groundbreaking innovations and limit the ability to capitalize on new opportunities.

Despite the inherent unpredictability of R&D, companies strive to structure through financial discipline (Shaywitz, 2024). Metrics such as net present value (NPV) and likelihood of approval (LoA) are used to improve decision-making. LoA refers to the probability that a drug candidate fulfills its defined efficacy, safety, and market benchmarks while also meeting the regulatory agency’s approval standards (Schuhmacher et al., 2025). Shaywitz (2024) argues that such metrics can create a false sense of precision, offering illusory comfort rather than meaningful strategic insights. While structured decision-making is essential, true success in R&D relies on a balance between disciplined evaluation and embracing uncertainty.

With those limitations in mind, R&D productivity remains a crucial indicator of R&D success (Schuhmacher et al., 2025). The level of output is central to this discussion, and it varies among pharmaceutical companies. Although some metrics may lack strategic insight, R&D productivity still provides pharmaceutical firms with a structured way to benchmark themselves with competitors. Table 1 presents a summary of major pharmaceutical companies, their number of new active substances (ID), their number of clinical trials in each phase, and their corresponding LoA rates (Schuhmacher et al., 2025).

Table 1: Clinical Development Activities of Pharmaceutical Companies (2006-2022)

Sponsor	Total IDs	Phase I	Phase II	Phase III	PhI:PhIII	Trials	New	LoA (%)
AbbVie	86	192	131	244	0.79	567	7	8.14
Amgen	95	180	150	177	1.02	507	13	22.81
Astellas	58	288	134	60	4.80	600	5	8.62
AstraZeneca	129	770	336	426	1.57	1597	17	13.18
Bayer	82	196	205	261	1.13	764	14	17.07
BI	59	812	392	95	8.55	1299	8	13.56
BMS	164	510	162	74	2.06	1150	23	14.02
Eisai	38	156	64	65	2.15	349	7	18.42
Eli Lilly	108	558	321	338	1.65	1217	12	11.11
Gilead	82	97	64	61	1.59	457	14	17.07
GSK	187	935	696	464	1.50	2204	17	9.09
Roche	234	525	466	497	1.06	1488	27	11.54
J&J	143	621	466	497	1.25	1629	21	14.69
Novartis	174	412	471	331	1.25	1826	29	16.67
Novo	29	352	86	67	1.37	691	6	20.69
Pfizer	234	1123	514	453	1.94	2215	27	11.54
Sanofi	128	227	320	455	0.72	1002	17	13.28
Takeda	62	189	342	191	0.55	722	10	16.13
Total	2092	8281	5455	6191		19927	274	
Mean	116	460	303	344	1.40	1107	15	14.31

Note: Data retrieved from Schuhmacher et al. (2025)

However, the impact of individual R&D sites on these measures remains unclear. Today's most favored strategies in the pharmaceutical industry include outsourcing and offshoring, which enable pharmaceutical firms to access innovative knowledge from external sources, leading to an increased volume of innovative output (Kim & Kim, 2014). This suggests that firms increasingly rely on distributed networks to access external knowledge and capabilities.

2.2 Site-Level Enablers of R&D Performance

As pharmaceutical firms increasingly distribute their R&D operations geographically (Kim & Kim, 2014), understanding what drives site-level performance is important for assessing how sites contribute to broader corporate goals and sustain their strategic relevance within the global network. This section begins by examining the role of individual R&D sites in MNCs and then explores the internal enablers a firm that shape R&D performance. Drawing on literature on organizational capabilities and culture, it highlights how internal structures, resources, and cultural factors influence a site's ability to absorb knowledge, deliver innovation, and align with the evolving expectations of global leadership.

2.2.1 The Role of Individual R&D Sites in MNCs

Rising costs and stagnating innovation output have made R&D productivity and efficiency important indicators and benchmarks of competitiveness within the pharmaceutical industry (Schuhmacher et al., 2025; Scannell et al., 2012). At the same time, pharmaceutical companies are restructuring their R&D operations by closing sites and establishing new ones near leading academic institutions to access external expertise (Schuhmacher et al., 2016). Therefore, assessing the role of individual R&D sites becomes relevant.

Wang and Zhou (2013) explores this topic by examining the role of local R&D sites in developing countries for high-tech MNCs and their benefits in developing technological capabilities. They found that local collaborations with universities and research institutes significantly impact technological capability building, followed by the enrollment of local R&D personnel and collaboration with industrial community members. Kyle (2004) further illustrates that knowledge spillovers are primarily a local phenomenon and matter largely for R&D productivity regarding patent count.

Additionally, firms with drug discovery labs near publishing researchers achieve twice the benefits from those publications compared to companies without such proximity (Kyle, 2004). This indicates that firms with R&D sites in regions with a high concentration of research benefit from local spillovers, enhancing R&D productivity. This further underscores the motives to establish R&D sites near leading academic institutions as Schuhmacher et al. (2016) emphasized and the important role that individual R&D sites play.

2.2.2 Internal R&D Capabilities for R&D Organizations

Spithoven and Teirlinck (2015) illustrate that internal R&D intensity is positively associated with firms' R&D outsourcing intensity, underscoring the importance of prior knowledge in effectively absorbing external knowledge. When considering such factors at the site level, one can assume that an R&D site must have robust internal capabilities to fully leverage the

advantages of the nearby academic institutions. As a result, the competitiveness of an R&D site can be seen to depend on both its internal capabilities and its external environment.

Poteralska and Mazurkiewicz (2019) defines organizational capability as a potential ability or capacity and classifies the capabilities of R&D organizations into four main categories:

1. **Financial Capabilities:** originating from an organization's own or third-party resources.
2. **Material Capabilities:** property, plant, research infrastructure, and material.
3. **HR Capabilities:** headcounts, structure, education, qualification, and experience.
4. **Information and Management Capabilities:** structures, management, brand, and IP.

While these capabilities are recognized at the organizational level, they offer a more comprehensive understanding of capabilities at the site level. A site's internal R&D capabilities play a crucial role in its ability to absorb and effectively use external knowledge, as highlighted at the firm level by Spithoven and Teirlinck (2015). As R&D sites are increasingly located near external knowledge, internal capabilities in fostering positive spillovers have become even more important.

2.2.3 The Influence of Organizational Culture

Culture plays a crucial role in R&D, but it is challenging to measure and link to tangibles like profitability or market value (Knott, 2012). The offshoring trend, emphasized by Kim & Kim (2014), further illustrates that pharmaceutical companies are increasingly spreading their R&D operations across culturally diverse regions. As a result, R&D sites may reflect the cultural characteristics of their host countries or regions, influencing their R&D performance.

At a national level, companies are more likely to innovate in societies with a long-term orientation, less power distance, less uncertainty avoidance, and lower masculinity (Boubakri et al., 2021). Additionally, culture influences innovation by shaping individuals' attitudes and beliefs regarding novelty, risk, and personal initiatives.

While national culture shapes societal values and behaviors within which organizations operate, it also influences organizational culture and its impact on innovation (Zhang et al., 2023). Organizational culture is defined as a set of shared meanings that allow members of a group to interpret and act on their environment.

Naranjo-Valencia et al. (2016) found that organizational culture affects both firm performance and innovation, influencing them positively and negatively. Among various cultures, an adhocracy culture has the highest positive impact on firm innovation and performance. This culture is characterized by its external orientation and emphasis on flexibility and change. It values creativity, entrepreneurship, and risk-taking, making it particularly effective in companies that operate in a dynamic environment. In contrast, centralized decision-making and a higher level of formalization tend to hinder innovation.

Although the link between organizational culture, innovation, and performance has been extensively researched, limited research has explored this topic at the site level, especially for MNCs with global R&D networks spanning culturally diverse regions. Zhang et al. (2023) demonstrate that innovation, influenced by organizational culture, is a fundamental aspect of

organizational competitiveness and needs to be properly managed to promote firm performance. However, this connection between organizational culture and innovation at the site level, especially regarding competitiveness, remains underexplored.

2.3 External Factors Shaping the Context of R&D Sites

As pharmaceutical firms increasingly globalize their R&D operations, site-level competitiveness cannot be understood in isolation from external environments in which these sites are embedded. While internal capabilities are important, external factors beyond the site walls, such as global investment trends, political circumstances, and innovation ecosystems, play a growing role in shaping where and how R&D sites thrive. This section examines the broader context that influences R&D siting decisions and site performance, beginning with global investment trends and multinational site selection and moving toward the strategic importance of ecosystems and the evolving role of keystone organizations. Understanding these factors is important for evaluating how sites maintain relevance.

2.3.1 Global Pharmaceutical Investment Trends

Understanding global biopharmaceutical investment trends and their geographical distribution is vital for context and understanding why certain regions emerge as prominent hubs for R&D activities. Over the past two decades, there has been a shift in global biopharmaceutical investments, with the United States and China outpacing Europe (Wilsdon et al., 2022). The decline in European R&D investments, alongside increasing investments in China, underscores the shifting dynamics of pharmaceutical R&D and the need to understand the factors influencing these decisions. This understanding is increasingly important at the site level to maintain relevance and strategic importance, particularly at a time when pharmaceutical firms are reassessing their R&D footprint (Schuhmacher et al., 2016).

Around the year 2000, the investment gap between the United States and Europe was approximately EUR 2 billion (Wilsdon et al., 2022). However, by 2020, this gap has widened to EUR 25 billion. At the same time, China is emerging as a competitive hub for biopharmaceutical activities. Overall, several key indicators demonstrate that Europe has underperformed compared to the United States and China. These indicators include the proportion of global new treatments from Europe, the continent's share of global R&D investment, funding for early-stage product development, patent filings, and levels of R&D employment.

Wilsdon et al. (2022) shows that R&D expenditure among pharmaceutical companies is also increasing at a slower rate in Europe compared to the United States and China, as shown in Figure 1 below. Additionally, Europe's share of biopharmaceutical R&D investments is declining relative to that of China and the US, as illustrated in Figure 2 below.

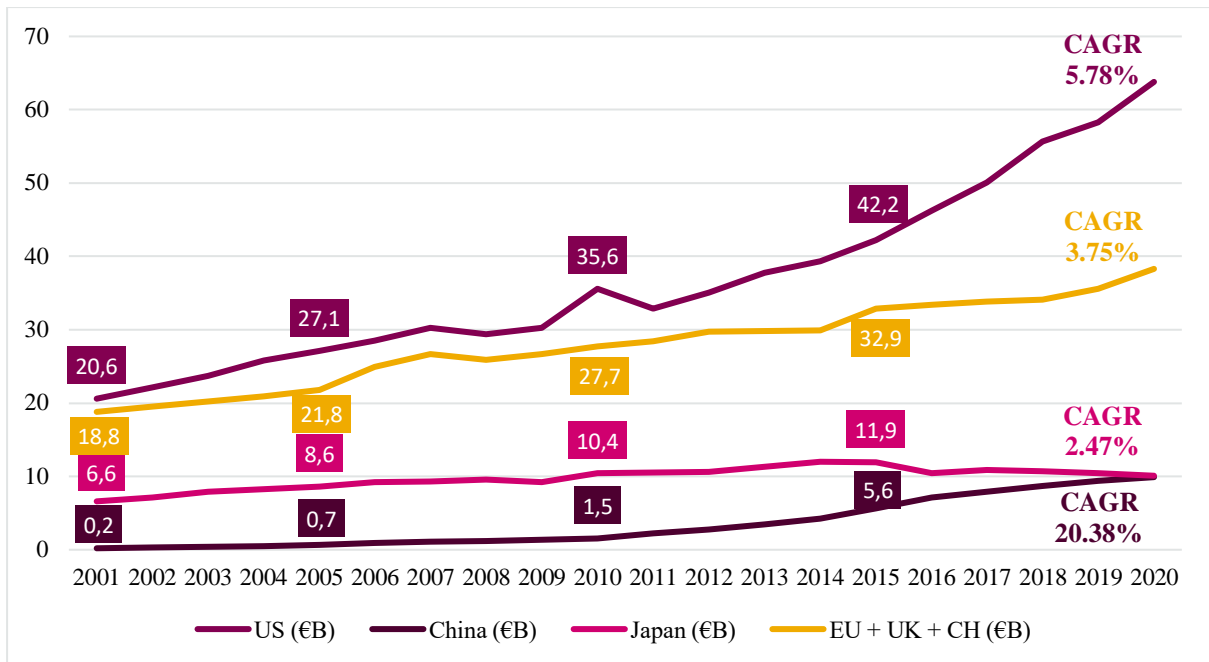


Figure 1: R&D Expenditure of Pharmaceutical Companies



Figure 2: Share of Biopharmaceutical R&D Investments in Major Markets

These global shifts provide essential context for understanding how companies make strategic decisions about R&D site locations (Wilsdon et al., 2022). To fully interpret investment trends in the biopharmaceutical sector, examining the underlying factors that influence where R&D activities are placed is necessary.

2.3.2 Global R&D Site Selection: The Increasing Ecosystem Focus

Julian and Keller (1991) provides a more general view of how researching MNCs grounds their decisions to establish or maintain an R&D site. They argue that such decisions are complex and highly strategic, influenced by a mix of strategic, political, market-oriented, and competitive considerations.

In recent years, decisions regarding R&D site location within the pharmaceutical industry have become increasingly influenced by the quality of regional scientific ecosystems and the presence of innovation clusters (Wilsdon et al., 2022; Schuhmacher et al., 2016). These clusters typically offer proximity to top academic institutions, access to leading research scientists, and a highly skilled workforce, which collectively enhance a region's attractiveness, particularly for establishing an R&D site.

Innovation clusters are known to foster knowledge spillover and a places-to-be-effect, making it an appealing location for foreign investments (Wilsdon et al., 2022). Firms that integrate into such scientific clusters can more effectively access new sources of knowledge (Kuemmerle, 1997). This knowledge can be acquired by leveraging talent from competing organizations or contracting research services from regional suppliers.

Consequently, several local considerations emerge as strategically crucial in R&D site selection (Julian & Keller, 1991). These include proximity to research infrastructure, access to international transportation, and quality-of-life factors that support the recruitment and retention of talent, such as housing, schools, and livability.

In parallel, governments offer targeted incentives, such as tax benefits and funding, to attract R&D investments, acquire technological expertise, and drive domestic innovation (Julian & Keller, 1991). While such incentives can promote R&D input and output for a particular firm, they may also harm its regional bargaining power if it becomes overly invested in a specific region or nation.

The pharmaceutical industry's current offshoring trends further demonstrate how R&D site selection is becoming increasingly important (Kim & Kim, 2014). Pharmaceutical companies in the United States are increasing their offshoring strategies by acquiring global firms and establishing R&D sites abroad. This approach has led to enhanced drug discovery processes, advancements in approval rates for NMEs, and an increase in annual patent filings. By decentralizing their operations, firms in the United States assess issues related to excessive centralization and bureaucratic inefficiencies. Additionally, these firms are experiencing shorter development cycles and accelerated innovation.

2.3.3 Innovation Ecosystems and the Role of Keystone Organizations

An ecosystem is composed of various interconnected elements that often lack distinct boundaries (Iansiti & Levien, 2004). In business ecosystems, companies interact with outsourcing partners, financial institutions, technology providers, competitors, and customers, all of whom influence product development and operations. In addition to business ecosystems, companies may also be part of regional innovation ecosystems, which merge

innovation ecosystems with regional economics within the context of open innovation (Robaczewska et al., 2019). Some motives behind ecosystem efforts are to stay ahead of technological advancements and ensure that strategic knowledge is accessible when needed. However, a firm's ability to benefit from its ecosystem may depend on its role within it.

A keystone organization serves as a central hub for an ecosystem that exerts influence extending beyond its immediate borders (Iansiti & Levien, 2006). Instead of concentrating solely on accumulating assets, a keystone organization emphasizes flexibility by accessing and integrating resources within a healthy and dynamic ecosystem. This approach encourages keystone organizations to actively nurture and sustain the ecosystem, promoting collaboration and long-term growth rather than seeking dominance over all assets. As a result, they play a crucial role in shaping the structure and success of the surrounding innovation ecosystem.

Remneland Wikhamn and Styhre (2022) also highlight the concept of keystone organizations as orchestrators within innovation ecosystems. They note that there is limited literature examining the structure and governance of these ecosystems. In their case study of AZG, the authors show how a pharmaceutical firm can play a keystone role by providing infrastructure and scientific expertise to nearby life science firms. AZG allows external companies to rent office and laboratory space within its facilities without requiring any equity or ownership. This strategy encourages value creation through beneficial spillover effects. The study suggests that although open innovation initiatives must balance value creation and value capture, these two elements are not inherently in conflict. Instead, one may temporarily take a more dominant role over the other, depending on the developmental stage of the ecosystem.

As previously noted, pharmaceutical companies increasingly establish R&D sites within innovation ecosystems to leverage existing networks, knowledge spillovers, and infrastructure (Wilsdon et al., 2022). These geographic and institutional advantages provide access to top-tier academic institutions, leading researchers, and a highly skilled workforce, which are factors that have long been recognized as essential for driving pharmaceutical innovation. However, while co-locating in an innovation-rich environment offers clear benefits, it represents a passive form of ecosystem participation, where companies rely on pre-existing structures rather than actively shaping the ecosystem themselves.

In contrast, some firms take a more proactive keystone approach to building, structuring, and fostering their innovation ecosystems (Iansiti & Levien, 2006), like AZG (Remneland Wikhamn & Styhre, 2022). An established innovation ecosystem may enhance the strategic relevance of an individual R&D site. However, the extent to which an R&D site's competitiveness is linked to its innovation ecosystem is not fully understood and is complex to quantify.

2.4 Theoretical Synthesis

To answer the research question, the theoretical framework integrates insights from three dimensions: pharmaceutical firm-level definitions of success, site-level enablers of R&D performance, and the external context in which R&D sites operate. While the literature in

each area offers valuable contributions, none sufficiently addresses how competitiveness is shaped and sustained at the individual R&D site level within a pharmaceutical MNC.

The first dimension focuses on how success is defined and measured at the firm level in pharmaceutical R&D. The literature emphasizes productivity metrics such as pipeline delivery, NPV, and LoA, and the balance between exploration and discipline (Shaywitz, 2024; Schuhmacher et al., 2025). These insights clarify what R&D sites are ultimately expected to contribute. However, this literature remains primarily focused on centralized firm-level outcomes and provides limited insight into how individual sites contribute to or are evaluated against, these broader strategic goals.

The second dimension turns inward to examine factors that enable R&D sites to meet these expectations. The literature highlights the strategic role of R&D sites (Wang & Zhou, 2013; Kyle, 2004a), internal R&D capabilities (Spithoven & Teirlinck, 2015; Poteralska & Mazurkiewicz, 2019), and organizational culture (Naranjo-Valencia et al., 2016); Zhang et al., 2023). These perspectives conceptualize site-level performance as a product of internal resources, structures, and cultural dynamics. Still, the literature lacks insight into how these internal elements contribute to broader organizational visibility and strategic relevance or how top management interprets them in the context of site-level competitiveness.

Lastly, the external environment is theorized using insights from research on global site selection (Julian & Keller, 1991), global investment trends (Wilsdon et al., 2022), innovation ecosystems (Kim & Kim, 2014; Kuemmerle, 1997; Robaczewska et al., 2019), and keystone organizations (Iansiti & Levien, 2006; Remneland Wikhamn & Styhre, 2022). These perspectives emphasize that proximity to knowledge clusters, political stability, and societal conditions, such as tax policies, housing, and family life, shape site attractiveness, even though they often lie beyond the direct control of the site. However, they offer limited guidance on how site managers should navigate these evolving external demands, particularly in regions with less established ecosystems, or how top management incorporates such “soft” factors into performance assessments of R&D sites.

Collectively, the literature frames R&D site competitiveness as a product of internal capability, external context, and alignment with corporate-level expectations. However, there is a lack of conceptual and empirical research on how these dimensions intersect in practice at the level of a single site. This thesis addresses that gap by examining the experiences of respondents at AZG, which contributes a site-level perspective that complements existing literature and supports the research purpose: to conceptualize how the competitiveness of a pharmaceutical R&D site is shaped and sustained within a multinational corporation (MNC).

Theoretical Concepts

Insights

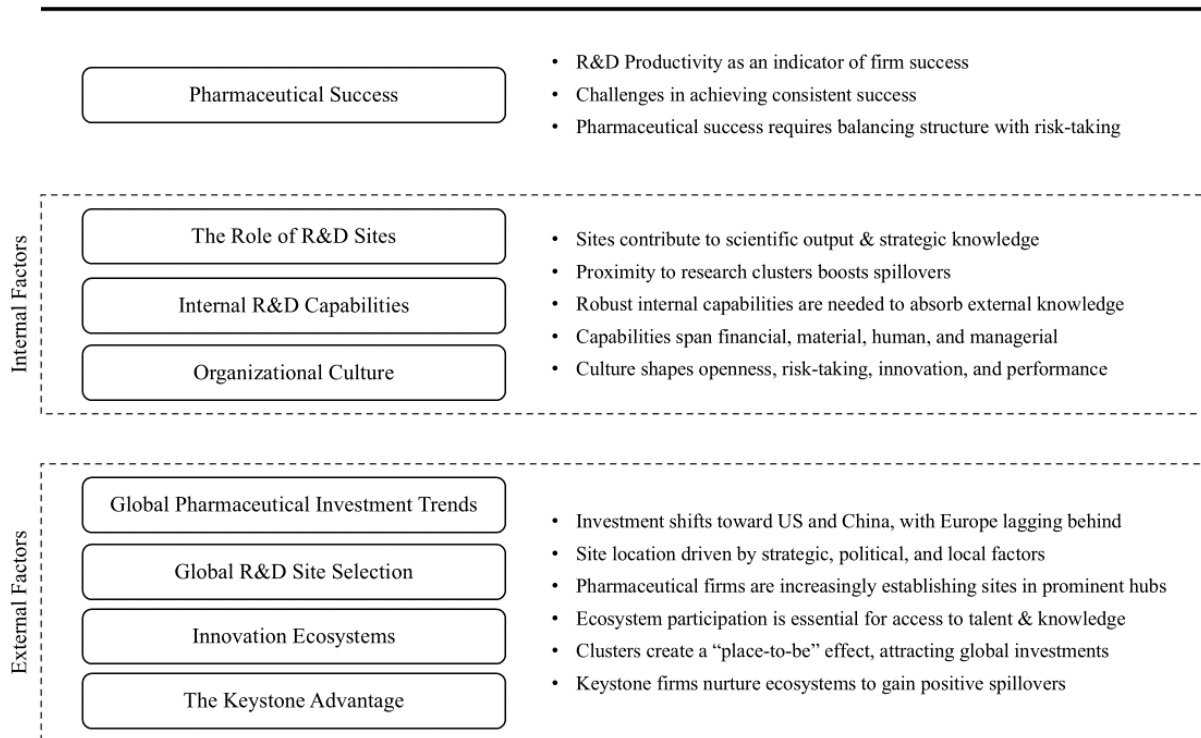


Figure 3: *Overview of the Theoretical Synthesis*

3 Methodology

This chapter outlines the methodological choices made to investigate how the competitiveness of a pharmaceutical R&D site is shaped and sustained within an MNC. Each methodological decision is justified with relevant literature to align with the research aim.

3.1 Selection of Methodology Approach

This study adopted a qualitative research approach, which is well-suited for exploring complex, real-world organizational phenomena (Yin, 2018). A qualitative research design allowed an in-depth examination of the key internal and external factors contributing to pharmaceutical success and the understanding of the competitiveness of a pharmaceutical R&D site, making it an appropriate method for studying AZG's competitiveness (Eisenhardt & Graebner, 2007). As the study is based on qualitative data and case material, the findings reflect the perceptions and experiences of stakeholders rather than quantitative comparisons or formal performance metrics.

A single-case study design was selected because it enabled a deep exploration of AZG's activities within its specific industry context (Yin, 2018). Case studies are particularly effective in addressing "how" and "why" research questions, making them suitable for examining organizational processes (Eisenhardt & Graebner, 2007). Given the limited prior research on R&D site competitiveness, a single case was appropriate for generating new insights. As Eisenhardt and Graebner (2007) emphasize that theoretical sampling is especially valuable when the goal is to build theory from cases that explain the phenomenon of interest. As Julian and Keller (1991) defines R&D sites as distinct organizational entities within global innovation networks, AZG could be selected as a relevant case. The focus on AZG provided a unique opportunity to analyze site-level competitiveness within a pharmaceutical MNC.

An abductive approach allowed the study to move between theoretical concepts and empirical observations iteratively (Dubois & Gadde, 2002). Rather than testing predefined hypotheses, this approach enabled the refinement and extension of existing theories based on insights emerging from the data. Abductive reasoning is especially suited to case study research in complex organizational settings, where theory may only partially explain observed phenomena and empirical insights help shape theoretical understanding. This approach supported a flexible yet systematic analysis of AZG's competitiveness, ensuring empirical relevance and theoretical contribution.

3.2 Capturing Stakeholder Perspectives

This study conducted two types of interviews: exploratory unstructured interviews and semi-structured interviews. The unstructured interviews served as an initial phase to explore the research context, refine the research questions, and support the development of the semi-structured interview guide and sampling strategy. The exploratory interviews were valuable because of the abductive research design, as they provided early insights to inform and iteratively refine the theoretical framing and research focus (Dubois & Gadde, 2002).

Semi-structured interviews were the primary method for data collection, providing detailed insights into AZG's perceptions. This method was chosen because it balanced structured exploration and flexibility, letting respondents elaborate on essential themes while ensuring consistency in data collection (Brinkmann & Kvale, 2015).

The interview guide was designed to capture R&D site competitiveness, factors influencing it, and ecosystem engagement. Although the interview guide was structured around the thesis's central analytical theme, the questions were adapted to fit the interviewee's expertise. New questions were added dynamically where relevant, depending on the flow of the conversation. To enhance data reliability, interview questions were pre-tested, and responses were validated through respondent verification by summarizing key interpretations during the interviews and validating them with the respondents for accuracy. Triangulation was achieved by comparing interview insights with internal documents, industry reports, and other interviews to identify consistencies and ensure robust conclusions (Yin, 2018).

3.2.1 The Selection of Respondents

The interview participants were selected through theoretical and snowball sampling (Bell et al., 2022). Theoretical sampling was used to identify the initial participants based on their involvement in AZG or its surrounding innovation ecosystem. Snowball sampling was used for subsequent respondents, who were identified through recommendations from earlier participants, ensuring access to individuals with relevant insight across domains (Bell et al., 2022). The interview sample included members of AZG's Site Leadership Team (SLT), AZG's Site Management Team (SMT), other stakeholders at AZ beyond AZG, external employees at entities within AZG's ecosystem, industry experts, and external academic experts, each contributing unique insights into the role of AZG's competitiveness.

A total of 21 interviews with different individuals were conducted throughout the data collection. The interviews were held either at AZG, at external sites, or online via secure video conferencing platforms. Most interviews lasted an hour, and all semi-structured interviews were recorded and transcribed for analysis with consent. Unstructured interviews were documented through detailed notetaking. All, except two interviews, were conducted by the complete research team. Table 2 shows the interview respondents, whether they work internally or externally, their general role, and the interview duration.

Table 2: Overview of Interview Respondents

Respondent	AZ GOT/AZ/External	SLT/SMT/Other AZ/External Role	Duration
R1	AZ GOT	SLT	1 h
R2	AZ GOT	SMT	1 h
R3	AZ GOT	Other AZ	1 h
R4	AZ GOT	SLT	1 h
RX5	External	University Professor	30 min
R6	AZ GOT	SLT	1 h
RX7	External	Pharma CEO	1 h
RX8	External	Pharma director	30 min
R9	AZ GOT	Other AZ	1 h
R10	AZ GOT	Other AZ	1 h
R11	AZ GOT	SLT	1 h
R12	AZ	Other AZ	30 min
R13	AZ GOT	Other AZ	1 h
R14	AZ GOT	SMT	1 h
R15	AZ GOT	SLT	30 min
R16	AZ GOT	SLT	1 h
R17	AZ	Other AZ	30 min
R18	AZ GOT	SLT	1 h
R19	AZ GOT	Other AZ	1 h
R20	AZ GOT	SLT	1 h
RX21	External	Pharma VP	1 h

3.3 Insights From Documents and Reports

To complement the primary data collection through interviews, the study employed written material analysis to validate and triangulate the findings (Yin, 2018). Triangulation involves systematically comparing data from different sources to identify themes, reinforce understandings, and minimize bias. It improved the credibility of the findings by ensuring that insights were supported across multiple forms of evidence. Rather than conducting a standalone systematic literature review, relevant academic research, industry reports, and documents were analyzed to support the study’s theoretical and empirical foundation. Written material analysis does not require predefined search terms or rigid selection criteria (Booth et al., 2021). Instead, sources are evaluated based on their relevance, credibility, and applicability to the research questions.

3.4 Data Processing and Analysis

The data analysis followed the Gioia methodology (Gioia et al., 2013). The methodology is designed to support concept development while maintaining a strong connection to the perspectives found in the data. This approach is suitable for research that aims to generate insights from qualitative data while ensuring transparency and theoretical relevance. An overview of the data structure that was created using the Gioia methodology can be found in Figure 4.

The process began with extracting first-order concepts, where interview transcripts were reviewed and coded using the terms and expressions of the interviewees themselves (Gioia et al., 2013). These first-order concepts reflected respondents’ words and experiences and helped maintain the essence of the data. In the second-order phase, these initial concepts were

compared, grouped, and abstracted into broader theoretical second-order themes that reflected underlying patterns of R&D site competitiveness. In this step, the written material analysis was applied, where relevant theoretical concepts were introduced to frame and make sense of emerging patterns. Finally, these themes were grouped into theoretical dimensions, forming the conceptual structure guiding the empirical findings and discussion chapters. Written material analysis was also used at this stage to validate the aggregated theoretical dimensions. An overview of the data structure can be seen later in Figure 4.

The Gioia methodology emphasizes a static data structure to maintain clarity and transparency (Gioia et al., 2013). However, the final step involved moving beyond this to show more dynamic relationships between the concepts. Following Gioia et al.'s (2013) methodology, the static data structure was transformed into a conceptual framework by identifying relations between dimensions, themes, and concepts. These connections were based on patterns observed across the interviews and triangulated through written material analysis.

3.5 Ensuring Validity and Reliability

This study aligns with ethical research principles by ensuring informed consent and data confidentiality (Brinkmann & Kvale, 2015). Participants were informed about the study's purpose and how their data would be handled.

Triangulation enhanced validity and reliability by comparing interview data with secondary sources, such as company reports and industry publications (Yin, 2018).

Reflexivity involves being aware of potential biases in data collection and analysis (Booth et al., 2021). Steps taken to minimize subjective influence included respondent validation, using multiple coders during the early phases of data categorization, and iterative comparison between empirical material and emerging themes. In addition, triangulation with written sources and a structured use of the Gioia methodology helped ensure transparency and consistency in the analytical process.

By implementing these measures, this study ensures ethical integrity, methodological rigor, and transparency, contributing to a reliable analysis of AZG's competitiveness.

4 Empirical Findings

This chapter presents the empirical findings from the interviews conducted with stakeholders at AZG and external experts. Applying the Gioia methodology, first-order concepts, second-order themes, and aggregate dimensions were identified, as shown in Figure 4.

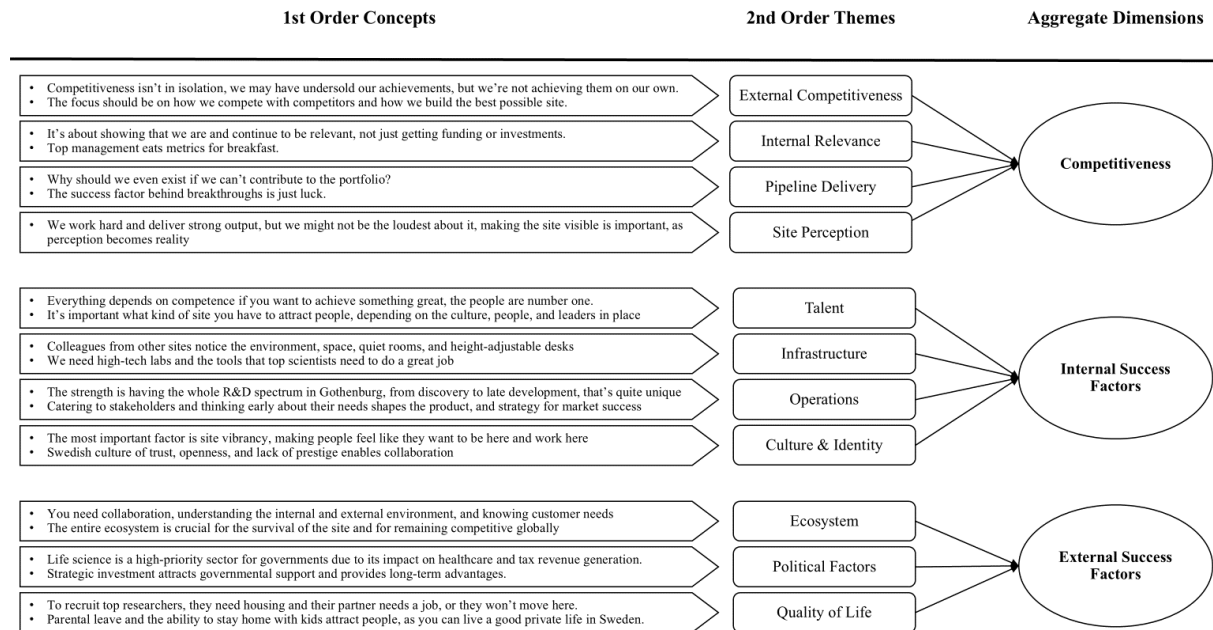


Figure 4: Data Structure of 1st-order Concepts, 2nd-order Themes, and Aggregate Dimensions

4.1 Framing an R&D Site's Competitiveness

An R&D site's competitiveness emerged from interviews as a multifaceted concept, capturing different dimensions through which stakeholders assess a site's success and strategic value. Respondents distinguished between external competitiveness, which was described as how the site is positioned relative to competitors in the global pharmaceutical industry, and internal relevance, which reflects the site's strategic importance within an MNC's global R&D network. The following section discusses what respondents have noted as the difference between external competitiveness and internal relevance.

4.1.1 External Competitiveness

When discussing the competitiveness of an R&D site, several respondents emphasized that a site's role should not be evaluated in isolation but rather in terms of the MNC's global competitiveness. A recurring theme was that the primary benchmark is not other internal R&D sites but rather external actors in the pharmaceutical industry:

The focus isn't on how we compete between sites, but rather on how we compete with our key external competitors and how we build the best possible site that stands strong in a global comparison. (R18, 2025)

This perspective was shared by others who expressed skepticism toward viewing site competitiveness as separate from that of the MNC. In their view, a site does not operate

independently but rather as part of a broader network, which can both enable and restrain its performance:

I don't believe in site competitiveness because I don't think one can potentially live without the other. It might be that we have undersold or not highlighted as much what we have achieved within Gothenburg. But it's not that we are achieving it purely on our own. (R19, 2025)

Another respondent advised against focusing too narrowly on individual sites in a context where global integration is increasingly central to innovation and competitiveness:

I also believe that in the context we live in today, where everything is so global, it's necessary to leverage global areas of expertise and leverage a global network. (RX21, 2025)

These perspectives highlight that while external competitiveness is relevant, it is closely tied to an R&D site's ability to contribute to the broader strategic goals of the MNC. Rather than focusing on internal comparisons between sites, competitiveness can be seen as the extent to which a site enhances the MNC's global position through internal relevance.

4.1.2 Internal Relevance

While external competitiveness relates to how an R&D site contributes to the MNC's position in the global pharmaceutical landscape, internal relevance refers to how the site is perceived and evaluated by top management within the MNC. Several respondents emphasized that internal relevance is not defined at the site level but is shaped by how corporate decision-makers view the site's role, performance, and long-term potential to remain prioritized in internal discussions around resource allocation, strategic planning, and investment.

Respondents explained that internal relevance is assessed through structured performance data. Decision-making is grounded in quantifiable indicators that align with the company's R&D and business strategy. As one respondent phrased it:

They eat metrics for breakfast. (R3, 2025)

Top management collaborates closely with analysts, focusing on metrics such as project milestones, pipeline progression, and commercial impact. This creates a system where sites are evaluated based on hard metrics:

We're very driven by our annual scorecards. They're tied to what analysts focus on, meaning results in the form of milestones, products, and sales. (R4, 2025)

While internal relevance is strongly shaped by current performance and measurable output, several respondents emphasized the importance of looking ahead. Sites are expected to deliver today and position themselves for the future by strategically aligning with where the company is heading. As one interviewee expressed:

I think it's really important that we don't just focus on the here and now, but also make time to work on the kind of innovation that's likely to become highly relevant tomorrow. (R4, 2025)

Internal relevance, therefore, involves whether a site is equipped with the right competencies, disease area focus, and research capabilities to contribute meaningfully to future therapeutic and scientific priorities. Forward-thinking capacity signals that a site is not only relevant now but will remain so as the pharmaceutical landscape evolves:

What the next way of thinking will be is not easy to predict. But as an individual, a team, a function, or a site, you can make sure that we deliver as well as we possibly can. We have some understanding of where we're heading as a company and do what we can to prepare for that. (R18, 2025)

Even if top management "doesn't make many romantic decisions" (R13, 2025), it leaves room for a few. Another respondent added nuance to this view, suggesting that although the process is highly analytical, there is still room for qualitative considerations:

Decisions are based on careful consideration and thorough analysis, but there is also an element of intuition, especially when deciding to build or close a site. (R18, 2025).

4.2 What Contributes to Competitiveness and Relevance?

The findings show that pipeline delivery and site perception are two primary contributors to an R&D site's external competitiveness and internal relevance. Pipeline delivery captures the site's scientific and commercial output, aligning with the performance metrics emphasized by top management. In parallel, site perception reflects how the site's activities and capabilities are internally recognized, influencing strategic prioritization beyond what formal metrics can capture. The following sections explore these two dimensions in greater detail.

4.2.1 Pipeline Delivery

When it comes down to it, pipeline delivery is the most fundamental contribution an R&D site can make. Across interviews, this was described as the most crucial factor determining a site's competitiveness and relevance. No matter how strong a site's other qualities may be, its continued existence relies on delivering tangible results into the pipeline. As several respondents put it:

Why should we even exist if we can't contribute to the portfolio? (R3, 2025)

Output, what comes out, what products we have, is the number one priority. (R11, 2025)

This delivery is not only critical for the MNC's innovation pipeline but also affects other important parts, such as talent acquisition:

If we want to attract those really hard-to-get names, the ones who can choose to work wherever they want, then we need to have an attractive pipeline. (R11, 2025)

This illustrates that pipeline delivery is not just about contributing to the actual pipeline, it also becomes a signal to the outside world, shaping how the site is positioned. Sites that can showcase successful projects, new modalities, or promising therapies gain a reputation that further strengthens their competitiveness.

While pipeline delivery is the most central for an MNC, respondents emphasized the uncertainty within pharmaceutical R&D. Even in a system built on scorecards, success rate, and productivity metrics; there is still an element of unpredictability that no amount of planning can fully control:

What is it that brings these breakthroughs forward? What's the success factor? And it's just luck. It's just luck. (RX8, 2025)

This quote reflects an industry-shared understanding that even the most successful sites operate within a space shaped by uncontrolled variables. In this context, R&D sites must focus on creating the conditions that increase their chances of receiving this luck. Doing so strengthens their external competitiveness and internal strategic relevance within the MNC.

Pipeline delivery and its connected dependence on luck in drug development is not only the scientific core of an organization but also the primary driver of business outcomes and, therefore, drives external competitiveness:

Our projects, our drug projects, that's our core business. They're what pay our salaries, our shareholders, everything. So, if we can't deliver strong outcomes from here, then we're in trouble. (R3, 2025)

Sites that consistently contribute valuable projects to the pipeline demonstrate that they are not just scientific hubs but also strategic assets that support the company's long-term financial performance and external competitiveness. As one respondent noted:

The most straightforward question is, do we fill our pipeline, do we impact our stock value by being here? (R18, 2025)

This highlights that pipeline delivery acts at the intersection of science and business. It links a site's scientific capability with its ability to create economic value for external competitiveness.

Beyond its commercial importance, pipeline delivery is also critical for securing internal relevance within the MNC. As several respondents emphasized, a site must be able to demonstrate clear and visible contributions to the portfolio to remain strategically prioritized.

If one site is to remain a relevant site, we need to be able to show what comes out of here, from the research, from the site. (R11, 2025)

In this way, pipeline delivery contributes to external competitiveness and the internal narrative of relevance. Sites that consistently bring forward successful or high-potential projects are more likely to be considered necessary within the R&D network.

As shown earlier, top management strongly emphasizes hard metrics when evaluating sites within the MNC's global R&D network. Respondents shared examples of what those metrics include, ranging from the number of new molecules entering the pipeline to productivity, portfolio ownership, and projected commercial value:

They look at how many new molecules are entering the pipeline. How do we ensure pipeline delivery? That's what counts. And specifically, new molecules. Are they coming out? (R20, 2025)

If you want to assess the value of the site, you'd look at the portfolio run here. What's led from here? And there are numbers on NPV (Net Present Value) for a project that's nearly finished. What do we think this will sell for? What is the commercial value of this product? (R16, 2025)

These examples show how pipeline delivery becomes a measurable and strategic value expression. It allows leadership to assess scientific performance and expected return on investment, linking R&D activity directly to future revenue and portfolio strength. This strengthens the site's internal positioning and justifies continued relevance at the firm level.

4.2.2 Site Perception

While pipeline delivery has been shown to influence both external competitiveness and internal relevance, the emerging theme of site perception primarily shapes the internal relevance of an R&D site. Based on insights, site perception relates less to measurable output and more to how the site is viewed within the organization by top management:

It's not only about getting funding or investments. It's about showing that we are, and continue to be, relevant. That we have these strengths and are actively striving to build on them. That's where we focus, rather than saying: 'Look how great we are, this is where you should invest. (R1, 2025)

This quote highlights that a site's perception is shaped not only by what it delivers but also by the image it gives internally. One respondent explained that what excites top management is not just results but the overall impression of the site's activity and ambition:

I think they want to see that an exciting portfolio is being created at the site. They want to see exciting collaborations as well. This goes back to in-licensing, that there are external contacts from the sites. And then they want to see exciting people. I think that's what they're looking for. (R16, 2025)

This illustrates that site perception is also influenced by how visible and present a site is within internal conversations. Several respondents reflected on this, particularly the tension between strong delivery and modest communication styles:

We work hard, deliver, and have strong output, but we might not be the loudest. You've probably heard that. So, when we say it's important that the site is visible, that's true. Because there's this saying: perception becomes reality. (R15, 2025)

This quote reflects that even sites with substantial pipeline delivery risk are overlooked if they do not actively communicate their contributions. In this context, site perception can be understood as a mechanism through which relevance is communicated, signaled, and maintained, particularly in situations where measurable output alone may not be sufficient to ensure strategic prioritization.

4.3 Internal Success Factors

The data show the importance of pipeline delivery and site perception, as well as a set of internal factors that contribute critically to an R&D site's competitiveness and relevance. These include the quality and development of talent, the strength of infrastructure, the effectiveness of operational structures, and the underlying culture and identity of the site. The following sections present these internal success factors.

4.3.1 Talent

Among the internal success factors identified, the quality of talent emerged as a fundamental one. Respondents emphasized that access to the right scientific competence affects other aspects of competitiveness, from innovation to delivery. Talent was described as individual expertise and how the site attracts, develops, and retains high-performing individuals. The following sections explore the key dimensions of talent competence, acquisition, leadership presence, and career development as critical enablers of site competitiveness.

Several respondents emphasized that the ability to attract, retain, and develop people with the right scientific competence determines whether a site can compete globally:

The people, that's everything. It's absolutely crucial to have the right competence, the right talents, to be able to attract them. If you don't, then you can forget about it. Everything ultimately depends on competence if you want to achieve something great. So, the people are definitely number one. (R3, 2025)

Respondents pointed out that the complexity of pharmaceutical R&D requires not only specialized knowledge but also an understanding of what they can achieve:

Since we're doing something that's incredibly difficult, you need to have many different talents around you. And you need that deep scientific knowledge to really understand deeply, what can we do? (R20, 2025)

Several respondents also stressed the importance of balancing experienced professionals with new perspectives and fostering an agile working culture without losing institutional knowledge:

I believe it's important to have a knowledge base. Looking at those who succeed, there's often a history behind them. Of course, breakthroughs will come up and new ideas will emerge. But there's a mix between experience and innovation, and what is brought in. I think that's also important. But you have to dare to be a bit agile, and not get stuck in old established processes. (RX21, 2025)

Attracting this level of talent, however, is not straightforward. While competence is a critical success factor, it is equally important to understand how an R&D site positions itself to attract and compete for top individuals.

Beyond the importance of competence, several respondents emphasized the role of talent acquisition as a strategic capability. Respondents noted that recruitment is shaped by more than just job roles; it depends on the overall identity and environment of the site:

That's why it's important what kind of site you have to attract these people. And it really depends on the kind of culture you already have, the people, and the kind of leaders in place. (R3, 2025)

Adding on this, reputation also plays a role. Interviewees highlighted that acquiring well-known talent could help to create momentum, where well-known names attract others:

And when we attract big names, they in turn attract others. (R11, 2025)

To support this, several respondents also highlighted the importance of actively communicating the site's achievements. Success stories and visibility were described as signals for attracting future talent:

Pointing out where something has come from at this site. Because I think it has to do with how people are inspired and how we attract people here. Everyone wants to work for a winning team. Everyone wants to be part of a winning team. And the fact that you can lead them to say, 'Here we've won, here we've done amazing things,' makes people believe it will continue. (R16, 2025)

These insights suggest that talent acquisition is both a practical and symbolic process. It reflects the site's attractiveness and position in the broader R&D network.

While attracting talent is essential, several respondents emphasized that retaining and developing talent requires strong leadership presence and visible development opportunities. Leadership was described as an operational necessity and a symbolic factor influencing motivation, decision-making speed, and internal relevance. Respondents noted that the absence of experienced senior leaders on a site can limit a site's ability to make decisions efficiently, manage complex projects, and maintain visibility within the organization:

I would say that our competitiveness can be limited by the lack of experienced senior leaders on site. We have an incredibly strong team of scientists, and in terms of productivity, I think we perform well. But we might not be able to contribute to AstraZeneca globally as much as we could if we had more leadership presence here, leaders who could maximize the value of what already exists at this site. (R1, 2025)

Leadership was not only viewed in terms of hierarchy but also in terms of operational capability. Respondents emphasized the importance of local leaders who understand project delivery and can create an environment that supports speed and efficiency:

We do have people who lead, but we also need those who are strong on the operational side, the ones who actually deliver all these projects. It's one thing to have

the expertise to do it, but also to have the experience and processes in place to run projects smoothly and quickly. (R6, 2025)

Strong and strategically placed leadership is viewed as both a signal and an enabler of competitiveness that supports internal relevance, operational success, and talent retention.

In addition to strong leadership, several respondents emphasized the importance of clear development opportunities for attracting and retaining high-performing talent. While competitive recruitment is essential, long-term commitment depends on whether employees feel they can grow professionally within the organization:

When we attract people, we also need to offer development opportunities once they've joined. That could mean new roles, new projects, or being involved in publications, whatever it may be. (R11, 2025)

Career development could then be argued to serve two purposes: it strengthens employee commitment while reinforcing the site's relevance as a place where global talent can thrive.

4.3.2 Infrastructure

Infrastructure was described as a key enabler of collaboration, scientific output, and employee engagement. Respondents emphasized that well-designed physical environments not only support productivity but also foster cross-functional collaboration:

It encourages movement between areas and creates opportunities to bump into people and spark conversations. That's what we want, to have people on-site and to foster cross-boundary collaboration and spontaneous interactions, not just formal meetings. I think the way the site is physically built is a major advantage. (R11, 2025)

The interviews revealed two kinds of infrastructure: workplace infrastructure and lab infrastructure.

When discussing what is best with the Gothenburg site, many respondents mentioned the site's office environment, highlighting its design that enables a collaborative and enjoyable workplace:

When you look at the environment and physical setting, this is one of the best places, in terms of the office environment and everything around it. (R6, 2025)

They also emphasized the "coziness factor" of specific gathering points, which enables informal conversations and cross-functional collaboration:

You could call it the coziness factor, these gathering points where people naturally come together to meet, exchange ideas, and create a good dynamic. (R2, 2025)

Interviewees also highlighted that seemingly fundamental aspects of infrastructure, such as accessibility and available parking, play an important role in making the site functional and appealing for daily work:

You need to be able to get here easily, without getting stuck in traffic. You need to find a parking spot. And you need to be able to find your colleagues, because if you can't, then there's no point in coming to the site. (R14, 2025)

Such comments reflect that workplace infrastructure is not only about fostering innovation, but also about removing friction in day-to-day operations, making the site a place where people want to be, and where work can happen smoothly.

While the general work environment was praised for supporting collaboration and employee experience, several respondents emphasized that high-quality laboratory infrastructure is essential for an R&D site to remain scientifically competitive.

In a highly specialized and innovation-driven field like pharmaceutical R&D, access to high-tech equipment was described as vital:

We need to make sure we have high-tech labs and the kinds of tools that top scientists need to do a great job. (R2, 2025)

The lab infrastructure was also linked to how teams are organized. Fit-for-purpose lab environments were described as a competitive edge due to their position as an enabler of collaboration, knowledge exchange, and efficient project execution:

When we have a way of working where people using the latest technologies are grouped into different hubs, it makes the expertise around the technology platform more accessible, so I can ask for help if I run into problems. That builds a community around the platform, which both supports others and raises the overall competence. (R13, 2025)

However, it is not only about making an initial investment and building the labs. Respondents explained that the ability to upgrade equipment and make sure lab spaces remain state-of-the-art continuously was critical for staying aligned with scientific and technological progress:

Making sure they have up-to-date equipment. That we have the lab infrastructure. (R20, 2025)

Lab infrastructure was pictured not only as a technical necessity but as a core strategic asset that reflects the company's commitment to long-term scientific leadership.

4.3.3 Operations

In addition to talent and infrastructure, several respondents highlighted operational excellence as a key internal success factor for R&D site competitiveness. While scientific output depends on people and resources, translating ideas into tangible results also requires efficient workflows, transparent governance, and the agility to adapt to changing priorities.

As previously highlighted, the site's physical design plays a key role in encouraging spontaneous interactions and enabling collaboration across departments. However, the operational structure and way of working are equally important in realizing the full potential of that infrastructure. Respondents repeatedly emphasized that what sets the Gothenburg site

apart is not only how it is built but how it organizes its operations, with the full value chain co-located and closely integrated across disciplines:

The strength, I think, is the fact that we have discovery, early research, early development, and late development, essentially the whole R&D spectrum in Gothenburg. That's quite unique. (R9, 2025)

This cross-functional integration was seen as a key advantage, particularly within the context of an MNC, where R&D activities are often geographically separated:

It's the integration, the integration between many global functions that can meet on site. We have everything from biologists identifying the next target, AI support, people producing materials, and those running clinical trials. That's a strength. (R15, 2025)

Having all core R&D functions co-located supports operational integration and the site's ability to think beyond the lab. Several respondents emphasized that modern drug development requires early consideration of external stakeholders, such as regulators, payers, healthcare providers, and patients. This perspective, described by some as a stakeholder-driven strategy, was seen as crucial for shaping relevant research, clinical endpoints, and long-term market success.

Thinking proactively about the expectations of regulators, payers, physicians, and patients was critical to ensuring that R&D projects are aligned with future market demands:

How we can cater to our stakeholders, how we can think earlier about what they need. Because then you shape your product, your indication, your entire strategy in a way that makes sense when it reaches the market. You can't just be R&D-focused. (R9, 2025)

This was described as essential for ensuring that the science is not only innovative but also clinically relevant, affordable, and positioned for adoption in the healthcare system:

Building commercial, payer, and patient insights into R&D thinking much earlier is crucial. It affects what endpoints we measure, not just the approved ones, but also those that may become important later through guidelines. Addressing payer needs is a major hurdle. We're so focused on regulatory submissions, but without payer endorsement, the drug may become unaffordable. (R9, 2025)

In particular, closeness to key stakeholders, such as regulatory agencies, physician networks, and payer agencies, was seen as a strategic asset that could be better leveraged:

It's about closeness to customers and key stakeholders, and customers can be regulatory agencies, prescribing physicians, or payer agencies. (R9, 2025)

4.3.4 Culture and Identity

As indicated in earlier findings, culture plays a significant role in shaping day-to-day operations and the site's position within the broader organization. The concept of identity is

closely connected to this, reflecting how the site perceives its role and how others perceive it. Culture and identity are an important part of the site's internal dynamics and relevance.

Many respondents highlighted a sense of pride and loyalty at the Gothenburg site. This emotional commitment was described as a key driver of motivation, with employees feeling personally invested in the success of the site and its work:

We also have loyalty, or rather this sense of responsibility. If there's a project that needs to be delivered, even though we don't get a lot of bonuses or extra rewards, people still want to do their best and deliver as well and as fast as they can. There's real strength in that. It's a kind of pride, maybe tied to the site or to Swedish values, that you want to do your best. (r6, 2025)

It's the most important factor of all, what my team likes to call site vibrancy. For me, it's about employee engagement. That we contribute to making people feel like they want to be here, that they want to work here. (R1, 2025)

This personal investment was closely tied to the idea of the site as a place people are proud to represent, both inside and outside the company:

All employees are ambassadors for AstraZeneca and help attract new colleagues. So I think it's a key part of building pride in your employer and showing that this is a great workplace. I believe it's really important that we can highlight the research that comes from here. (R11, 2025)

Several respondents emphasized the role of the site's historical delivery in shaping how it is perceived today. Prior achievements were seen as sources of credibility and influence in internal decisions:

An important factor is history, what has been delivered from here and how it connects to current discussions." An important factor in all this is history, right? What has been delivered from here, and how does that connect to what you're talking about now? (R4, 2025)

What has been done, and of course, what has been invested, matters. (R10, 2025)

However, some noted that this legacy can also foster tunnel vision, limiting innovation if past ways of working become too dominant:

But a potential pitfall is that you have too many people with tunnel vision, working in that tunnel vision because they've always done it a certain way. And if you've got new people coming in with expertise from other companies, it might be that this expertise is utilized more. (R19, 20205)

This tension highlights that personal investment and a long legacy are not only a strength but must be continuously refreshed to remain relevant.

The Gothenburg site was often described as benefiting from a uniquely collaborative and low-hierarchy Swedish culture, which enables open dialogue and teamwork:

It comes from being in Sweden, from the culture here, which is all about collaboration and trust. I think that's a competitive advantage for the Nordics in general, but especially here in Gothenburg. There's a lack of prestige and a real openness. I see that as a strength because it makes collaboration easier and more possible. (R1, 2025)

The Swedish culture as well, people like to share, they like to discuss. We have relatively low hierarchy. So yes, maybe a bit more happens here. (R15, 2025)

However, this cultural mindset was also seen as a barrier to visibility and internal recognition, particularly in how success is communicated:

But we have a potential that we're not fully living up to. We're bad at communicating what we're good at. Maybe it's a bit of a cultural thing. (R4, 2025)

Swedes tend to underplay their achievements. (R19, 2025)

Respondents suggested that while modesty can foster a strong internal culture, it may limit how the site is perceived externally within the MNC and across the industry.

4.4 External Success Factors

Although internal factors were believed to be a dominant part of a site's competitiveness, respondents continuously mentioned external factors as increasingly important for individual R&D sites' competitiveness.

4.4.1 Ecosystem

The ecosystem emerged as a recurring key factor amongst respondents when framing the competitiveness of an R&D site. Several respondents emphasized the importance of being part of an ecosystem, with one stating:

I believe the entire ecosystem is crucial for the survival of the site. In order for us to remain competitive globally, we need to have this ecosystem around us. (R11, 2025)

This quote highlights that the ecosystem is important for maintaining competitiveness and a key factor for the long-term survival of a specific R&D site, emphasizing it as a requirement.

Furthermore, the strategic placement of R&D sites is increasingly rooted in the benefits of a given ecosystem. One respondent highlighted this by stating:

Our internal storytelling has long been that we place our research sites where we can benefit from our surroundings. And with that kind of storytelling, we can't have a stagnant life science ecosystem where we are. (R18, 2025)

One respondent even indicated greater confidence in the site's future survival due to its local connections:

Back when they shut down in Lund, there was some fear that they'd shut down Gothenburg too, maybe move it to England or the U.S. But if you compare now to ten years ago, it's a much more favorable situation for AstraZeneca to keep its presence in

Gothenburg, because there are so many more connections around the site today. (RX5, 2025)

In contrast to ecosystems with intense competition, respondents described the distinct dynamics of their current ecosystem, which large pharmaceutical companies underrepresent. Most respondents identified themselves as ecosystem builders. When asked about their motivations for this role, one respondent noted:

That was our mantra, let's see how we can create opportunities for our employees to get an influx of ideas from outside. New people to collaborate with. New job opportunities as well, to create a healthier ecosystem. It's easier to recruit if there's somewhere else your spouse can also find a job. (R16, 2025)

One respondent highlighted the opportunities the ecosystem builder role has presented to them, emphasizing the following points:

You have a real opportunity to influence the content of the ecosystem. If you play your cards right, you can have significant advantages. You can influence the content, the type of organization you want to work with. You can influence the culture. (R20, 2025)

Compared to well-established ecosystems with multiple larger competing players, being a lone builder allows organizations to choose which participants can establish themselves while influencing the collaborations they wish to pursue. Another respondent illustrates the significant PR value the ecosystem-building role has presented them:

It has led to an enormous amount of PR for us, simply put. It has opened countless doors, and it's difficult to put a number on it. But it's probably worth hundreds of millions of SEK. (R16, 2025)

However, some respondents expressed skepticism about the long-term sustainability of maintaining such a role:

I say that it's not sustainably long-term for us to be the only one. We're a kind of ecosystem builder. We look at what's happening locally and regionally. And it's probably to our advantage that another big pharma would want to station itself here as well. Everyone benefits from that. It's difficult in the short term, but I think this is what they mean when they say success breeds success. (R20, 2025)

While the role of an ecosystem builder in an environment with minimal competing firms presents several unique advantages, most respondents believe that the benefits of having local competition outweigh those of being a standalone ecosystem builder. Furthermore, many respondents pointed out the challenges in validating both the role of the ecosystem builder and the outcomes it produces:

We cannot benefit from it until we demonstrate how it strengthens ourselves and our core operations, ultimately impacting patients and the cash flow. Or other tangible gains. So how we demonstrate the measurability of that, that's the next step. And how

we create things that generate publicity that counts as intent. That became very important. (R18, 2025)

One could wonder if we are evaluating what this has actually led to. I think it's a bit too early to say that, actually. (R16, 2025)

Multiple respondents illustrated the dynamics of having proximity to external competition. Most respondents emphasized the benefit of local competition. However, excessive competition instead becomes counterproductive and creates harmful talent mobility:

When you build something like Shanghai where everyone's located on the same street, it can become a bit too much. People switch jobs every six months between companies. Then it's no longer productive, it's all about money and climbing the ladder. (R6, 2025)

You also might not want too many or too large sites in areas where people constantly move around. You want mobility, but the right amount. You don't want people staying just two or three years and then leaving, because that drains a lot of energy. (R10, 2025)

Although these downsides were mentioned, most respondents highlighted the benefits of having proximity to competition:

I think that's really important to feed your pipeline. And then other pharmas, if there are other pharmas around, because that's really helpful when you're trying to get experienced people in pharma, is to have pharmas around." (R12, 2025)

This quote emphasizes the idea of local competition as cooperation, where competing firms benefit from being close to one another.

Apart from talent acquisition, one respondent discussed the benefits and future potential of having an additional big pharma near its current operations:

So I think it would be really much more beneficial if we had another big pharma company around the corner. Maybe Novo Nordisk is too far away in this case, because then you would create a much more interesting ecosystem for smaller innovative companies looking to work in pharma. (R18, 2025)

Local competition can foster cooperation from an ecosystem perspective, nurturing talent and well-being for smaller firms, enhancing the ecosystem's overall health. Conversely, excessive competition seems to lead to harmful mobility

External collaboration also emerged as an important aspect of an ecosystem. Developing new drugs often requires external knowledge beyond internal R&D capabilities, as respondents noted:

R&D alone is great, but it's not enough. You need to collaborate, understand both the internal and external environment, and understand customer needs. (R9, 2025)

Collaboration with external companies and universities, where research is ongoing and where you can also have trial collaborations, is super important. (R9, 2025)

Concerning external collaboration, several respondents highlighted academic presence as another crucial factor. This proximity can benefit innovation and attract early-stage research and scientific expertise, as noted by respondents:

It's usually about being close to academic clusters for early-stage research, that's how you attract that kind of scientific competence. (R6, 2025)

It's also an advantage if there is proximity to universities and the types of education that benefit innovation. (RX21, 2025)

4.4.2 Political factors

Domestic politics also emerged as an external success factor for the competitiveness of an R&D site. Respondents emphasized the importance of government support as a key success factor. Globally, governments are often motivated to back the life science sector due to its significance for both public health and tax revenue, as one respondent pointed out:

When you look at life science globally, it's a sector that all governments prioritize. It's important for the population to have good healthcare, but also because successful companies generate a lot of tax revenue. They make a lot of money. It's an important sector, which is why many countries offer benefits to life science. (R16, 2025)

However, respondents emphasized that the amount of government support an organization receives depends on its size and significance to a specific region or nation. AZG's role in the Gothenburg region as an active ecosystem builder has offered them many advantages, as noted by several respondents:

We have an advantage in being so large and important to Sweden as a country, which gives us access to decision-makers, an access I don't think we necessarily have in other countries. (R11, 2025)

And how easily we've gained access to governments and such over the years because they see that we're investing. And then they want to help us. And we've benefited from that in various ways. (R16, 2025)

These insights align with the ecosystem builder advantage, highlighting how AZG benefits from access to the local government due to their regional initiatives and investments.

One respondent exemplified the advantage they gained by being important to the region and having direct access to politicians, which played a crucial role in ensuring their firm's survival at one point:

When another company attempted a hostile takeover of our company some time ago, high-ranking Swedish politicians were very active behind the scenes, speaking with their American counterparts about the absurdity of a U.S. company buying a European firm and moving funds out of the U.S. to avoid corporate taxes. They led a public

campaign that generated domestic opinion in the U.S. around this issue. This was not something that was visible to the public here. (R18, 2025)

When choosing locations for R&D facilities, many respondents pointed out the importance of the local tax structure. It is generally understood that the domestic tax structure is a crucial factor influencing decisions about the R&D footprint at the senior management level. Furthermore, the domestic tax structure is believed to affect both national and site perceptions directly:

If the Swedish government is perceived as not strongly fighting for the competitiveness of the innovative pharmaceutical industry in Europe, it has a direct impact on the image of Sweden. If we have an unfavourable tax situation compared to other countries where we could also have made investments, it has a direct impact on the image of Sweden, and that's reasonable. (R18, 2025)

This quote highlights the connection between Sweden's governmental support and its global reputation, emphasizing that unfavorable policies, particularly tax disadvantages, may damage the country's image.

Another respondent further highlighted the challenges of the current tax incentives in Sweden:

You need to have supportive mechanisms in society to be able to establish an R&D site. And the current tax incentives in Sweden, it's not about political interference, but they do make it difficult to create more momentum. (R13, 2025)

Additionally, the tax structure extends beyond just the corporate tax rate. One respondent highlights the importance of tax incentives in attracting experts to AZG:

If we don't become more competitive as a country with tax incentives for experts relocating here, I think it will become difficult. (R16, 2025)

Evidently, the domestic tax structure plays an important role in determining the location of R&D sites, as it directly impacts costs, the perception of a country and site, as well as its ability to attract experts.

Societal stability was also mentioned as a success factor. Particularly when assessing investment and their long-term sustainment, as one respondent noted:

The next dimension that's also important is the hygiene factors. Is the regulatory framework clear and functional, and at least somewhat stable? Can we be sure that the investments we make will stand the test of time? To build research and development, or production for that matter, requires significant infrastructure investments, so they must be sustainable over time. (R18, 2025)

Therefore, a country's regulatory framework plays a crucial role in fostering long-term investment, which directly influences the internal relevance of a specific R&D site.

The current geopolitical situation, characterized by tariffs and uncertainty, also offers unique advantages to firms in certain regions, as noted by one respondent.:

We may also have a different kind of advantage now — some people might not want to live in the U.S. given the current situation. So there are certain political advantages right now, even if we don't talk openly about them. Global conditions, unrest, and stability in different places can have an impact. (R11, 2025)

Therefore, the stability of a given region or country directly influences the sustainability of both long-term investment and talent.

For MNCs, having R&D sites located in various markets and regions has proven to be an advantage for AZG, as it is the only strategic R&D site within the European Union, according to several respondents:

We can also brag about being the only R&D site in the EU after Brexit. Sometimes, that's actually an advantage. (R2, 2025)

Gothenburg has a unique position as it's the only site in the EU. (R16, 2025)

These insights underscore the importance of societal and geopolitical stability in shaping the competitiveness of individual R&D sites.

4.4.3 Quality of Life

Respondents pointed out that monetary compensation is important in securing and retaining top-tier individuals. However, in a global context where salary levels vary significantly, non-monetary benefits tied to the local context, and in this case, those offered by the Swedish welfare model, were consistently highlighted as important differentiators in talent attraction.

Sweden may not offer the most competitive salaries compared to other countries, but interviewees consistently pointed to the country's social welfare system and lifestyle advantages as supplements:

We do see that we're at a disadvantage when it comes to salaries, at least at these sites, compared to the rest of the world. But we've tried to emphasize work-life balance and the generous amount of vacation as a counterbalance. (R2, 2025)

Talent acquisition teams actively communicate these societal benefits to position the site as offering a strong private life alongside a scientific career:

But then you have the social aspects, like parental leave and being able to stay home with your kids, people think that's fantastic. That's also something that can attract people, the fact that you can live a good private life in Sweden. (R3, 2025)

While financial compensation remains important, Sweden's broader welfare provides a compelling quality-of-life offering that helps mitigate salary disadvantages.

Beyond individual benefits, respondents pointed out the importance of family-related factors in influencing relocation decisions. Talent retention depends not only on the professional opportunity offered but also on the broader environment provided for employees' families:

It also depends a bit on family situation. And that's something to consider for retention, it's not just about the individual performing well. The whole family needs to feel comfortable and do well. That's one of our advantages, we have good schools in the area and a strong community. (R6, 2025)

Particularly for senior employees, decisions to relocate are closely tied to the availability of housing, good schools, and employment opportunities for accompanying partners:

If you want to recruit top researchers, they also need to be able to find housing. Their partner needs to find a job, otherwise, they won't come here. (R14, 2025)

When you bring in a senior employee, they usually come with their partner or family. How can we offer the full package? Maybe through cross-industry collaboration and ecosystem support, it's not enough that just one person gets a job. If the kids don't have access to a good school, they won't want to move here. It's the overall offering that matters, how we support that. Housing is part of it too. It might be a bit easier for senior hires since their salaries allow them to buy property. (R6, 2025)

4.5 Synthesize: An Overview of Site Competitiveness

When moving beyond the static data Gioia structure shown in Figure 4, several meaningful connections emerged between the identified concepts, themes, and dimensions. Figure 5 presents a conceptual framework that illustrates these connections. Internal and external success factors influence both pipeline delivery and site perception. Pipeline delivery contributes to both external competitiveness and internal relevance, while site perception mainly affects internal relevance. Together, external competitiveness and internal relevance determine the overall competitiveness of a pharmaceutical R&D site.

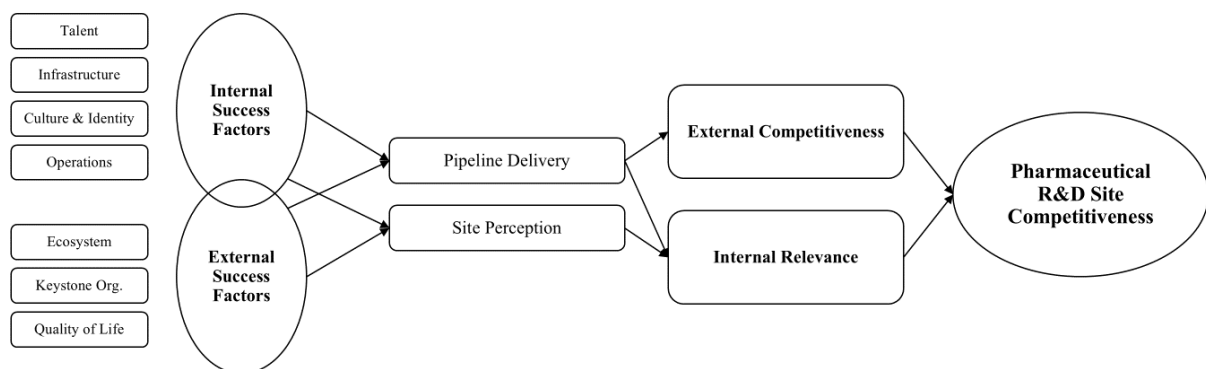


Figure 5: Overview of Influencing Factors and Their Relationships

5 Discussion

Existing literature on global pharmaceutical R&D has primarily focused on the firm level, examining how MNCs optimize their global R&D, enhance innovation performance, and navigate external ecosystems (e.g., Sommer & Bhandari, 2022; Wilsdon et al., 2022; Schuhmacher et al., 2025). While these studies provide valuable insights, they often rely on secondary data and overlook competitiveness at the site level. Consequently, there is limited understanding of how specific R&D sites maintain their competitiveness within an MNC.

This thesis aims to address this gap by exploring how the competitiveness of a pharmaceutical R&D site is shaped and sustained within an MNC. The goal is to understand an R&D site's competitiveness and how internal and external factors influence it.

The findings highlight several key dimensions of site-level competitiveness, which are elaborated upon in the following sections:

- The balance between internal relevance and external competitiveness, along with the tensions that arise when these aspects are not fully aligned.
- The paradox of pipeline delivery, where R&D performance must find a balance between structured management and openness to chance and exploration.
- The challenge of optimizing internal success factors, explored through tensions between competing priorities such as talent loyalty and mobility, and visibility and trust.
- The significance of external factors, such as innovation ecosystems and being an ecosystem builder.

5.1 The Fine Balance Between Competitiveness and Relevance

The findings indicate that an R&D site's competitiveness consists of both internal relevance and external competitiveness and that they are closely connected but not always aligned in practice. There is a variation in emphasizing the importance of contributing to AZ's global pipeline and the local visibility and performance of the individual site. This variation indicates that individuals across the organization may see competitiveness differently, depending on their role or level of seniority. These different perspectives can lead to misalignments in how value is created and communicated across the R&D network.

The literature on global R&D site management supports this idea. Wilsdon et al. (2022) show that the geographical distribution of R&D investments is shifting, with the United States and China attracting a growing share of global attention and capital. In this context, European sites may feel increasing pressure to prove their continued relevance. Similarly, Schuhmacher et al. (2016) argue that when firms reassess and restructure their global R&D footprints, individual sites should actively maintain their strategic importance. As a result, sites may feel forced to show their performance more, which can create rivalry between internal units. Competitiveness is not only an external concept but also shaped and negotiated internally.

This two-sided competitiveness gives an interesting insight into the balance between site-level relevance and corporate-level integration. The findings, supported by the theory, suggest that a focus on internal relevance that is too strong can create unintended competition

between sites. Performance metrics are then used to signal value and differentiate from other units instead of aligning with the strategy of the whole MNC. This threatens to shift attention away from collaboration and shared pipeline success. While internal scorecards and hard metrics are essential, they can only achieve their purpose if sites also have a broader understanding of their role in the MNC's strategy. Competitiveness should strengthen the firm's collective capacity, not outperforming other internal sites.

It may be necessary to reconsider how success is framed within the R&D network so that recognition and investment are tied to collaborative contributions rather than isolated achievements. External competitiveness and internal relevance can be considered shared concepts, where sites are expected to collaborate across geographies. This could reduce the risk of internal rivalry and encourage sites to support each other in strengthening the global portfolio.

One can argue that site managers should be aware that competitiveness at the site level is not just about showcasing local performance but about contributing to the MNC's global goals. Overemphasizing internal relevance can risk creating a rivalry between sites, reducing collaboration and then overall performance. To avoid this, site managers should promote a shared understanding of competitiveness that contributes to the global pipeline. Aligning performance metrics with collaborative goals, encouraging joint initiatives, and recognizing contributions that support other parts of the network can help ensure that internal relevance strengthens, rather than undermines, global competitiveness.

5.2 The Paradox of Pipeline Delivery

The findings show that pipeline delivery emerged as the most critical factor for an R&D site's competitiveness, both externally and internally. It was described as the site's core business, contributing to the MNC's commercial value and justifying the site's relevance in the MNC. Without delivering successful projects, the site risks losing attention and relevance. However, the findings also show an interesting tension. While pipeline delivery is treated as something that can be planned and measured, several respondents emphasized that success often depends on unpredictable factors. Breakthroughs can appear suddenly, and even well-managed projects can fail. One can see a paradox between planning and luck in pharmaceutical innovation.

This paradox also exists in the literature. Shaywitz (2024) explains that metrics NPV and LoA are commonly used to plan and support decision-making in pharmaceutical R&D. These tools help create structure in a complex environment. However, they also carry risks, such as overconfidence in prediction and a bias toward safer, more data-driven projects. Shaywitz (2024) further argues that firms with a high tolerance for failure often perform better over time because they are more likely to explore bold, early-stage ideas. This tension between planning and exploration matches the findings well. Even though metrics are essential for managing accountability, they do not fully capture the luck involved in scientific discovery.

These insights suggest that pipeline delivery is not just a question of managing performance but also about creating the right environment for luck. While hard metrics and planning are

necessary, they cannot replace the exploratory and often uncertain drug development process. This suggests that sites should deliver on expected outputs while fostering a culture that supports risk-taking and the possibility of luck. In that sense, luck is not something passive but something that can be prepared for.

It is also interesting how sites are evaluated. If internal scorecards only focus on short-term, measurable results, there is a risk that exploration and risk-taking are deprioritized. Over time, this could limit the site's ability to generate breakthrough innovations and blockbusters. Instead, performance evaluation might need to recognize both delivery and the conditions that make future luck possible. Creating room for planning and luck could be one way to navigate this paradox and support long-term competitiveness.

Site managers should recognize that while pipeline delivery remains the key factor of a pharmaceutical R&D site's competitiveness, it cannot be fully controlled or predicted. Over-relying on structured metrics can limit risk-taking and early-stage exploration. Instead, performance systems should reward delivery and efforts to create conditions where luck can occur. This means fostering a culture that tolerates failure and supports curiosity. Balancing planning with space for luck is essential for long-term R&D competitiveness.

5.3 Success From Within: How to Optimize Internal Success Factors

The findings indicate four key internal success factors are central to shaping a pharmaceutical R&D site's competitiveness: talent, infrastructure, operations, and culture and identity. These factors were described as essential for pipeline delivery and site perception.

These findings relate to the capability categories described by Poteralska and Mazurkiewicz (2019). Although initially developed for entire corporations, their framework helps explain site-level dynamics. Talent corresponds to human resource capabilities, including scientific competence, leadership, and recruitment. Infrastructure reflects material capabilities, such as laboratory equipment, physical layout, and supporting tools. Operations are tied to financial capabilities in terms of how efficiently time, resources, and cross-functional teams are managed. Lastly, culture and identity relate to information and management capabilities, which involve communication, organizational values, and how the site is perceived internally.

While each capability is described in the theory as supporting competitiveness independently, the findings suggest that the internal success factors are not isolated and are more complex than that. They can interact in ways that strengthen or weaken one another, and one can also question if it is possible to optimize all of them simultaneously. Managing internal capabilities involves more than aligning resources; it also requires navigating underlying tensions that affect pipeline delivery and site perception. These tensions reflect trade-offs R&D sites face when striving towards both external competitiveness and internal relevance.

The following subsections explore two such tensions that emerged as particularly relevant in the context of AZG: the trade-off between employee loyalty and talent mobility and the balance between communicating achievements and maintaining trust.

5.3.1 Retaining Loyalty While Enabling Mobility

The findings indicate that talent is one of the most important internal factors for an R&D site's competitiveness. Competence and leadership were essential for pipeline delivery and site perception. However, the findings also show that talent is not only about individual qualifications but also about how the site attracts and develops people and how it creates an environment that supports commitment and collaboration. The emotional commitment was reflected in the concept of "site vibrancy," where employees feel a strong sense of responsibility and loyalty. This creates a culture where people want to stay, contribute, and take pride in the site's achievements. This loyalty has supported knowledge retention over time. At the same time, the results highlight a risk. While loyalty contributes to secure competence, it can also lead to tunnel vision if not balanced with new perspectives. The findings suggest situations where loyal and long-serving employees may continue with established ways of working, making adopting new perspectives or methods harder.

This tension reflects what Spithoven and Teirlinck (2015) describe as the balance between maintaining institutional knowledge and absorbing new external insights. As defined by Poteralska and Mazurkiewicz (2019), human resource capabilities include existing experience, and the structures needed to refresh and develop it. High retention strengthens the knowledge base, but too little movement can hinder innovation and adaptability.

Considering the theory, the findings suggest that talent is dynamic and should not be managed as fixed assets. While long-term retention and deep institutional knowledge are strengths, they also introduce risks without openness to renewal. The findings highlight that loyalty can limit agility, especially when the same individuals continue leading key processes without exposure to alternative approaches or external insights. Moreover, as described in the findings, site vibrancy shows that cultural factors such as loyalty and emotional commitment can strengthen employee engagement yet may unintentionally reinforce existing norms and routines. This creates a subtle tension between continuity and adaptability. In the context of an R&D site's long-term competitiveness, talent must be viewed as an evolving capability, where retention and renewal are essential. Talent should enable continuity while also allowing new perspectives to challenge established practices.

For site managers, the critical insight is that loyalty and mobility are not isolated but rather interdependent and can drive success. Loyalty enables deep knowledge and can be cost-effective; however, it should be balanced with talent renewal. Instead of perceiving talent mobility as a potential threat, site leaders may find enhancing internal and external talent mobility beneficial. Possible strategies could include role rotation initiatives, external partnerships, or secondments.

5.3.2 Communicate Achievements Without Losing Trust

The findings indicate that internal relevance is shaped by what a site delivers and how the organization communicates those contributions. While delivery is essential, the findings suggest a pattern where achievements at AZG are often under-communicated. This tendency was linked to cultural modesty and a strong emphasis on collaboration rather than individual

recognition. Respondents expressed hesitation in highlighting successes too strongly, which may limit visibility to top management and the risk of being overlooked for future investment. Simultaneously, this humble culture was highlighted as something that built trust and improved AZG's credibility with top management.

Culture plays a central role in R&D site competitiveness, although it is difficult to measure or directly link to performance metrics (Knott, 2012). In global organizations, R&D sites often reflect the cultural characteristics of their host country (Kim & Kim, 2014). For instance, national cultures with less power distance and lower masculinity, features associated with Sweden, are more likely to innovate (Boubakri et al., 2021). Zhang et al. (2023) further emphasize that national culture influences organizational culture, affecting innovation.

Combining the findings and theory, one can observe a tension between maintaining an internally trusted and collaborative culture and, at the same time, without overcommunicating achievements to boost internal relevance within the MNC. On one hand, the site's collaborative and low-prestige culture fosters strong engagement and innovation. On the other hand, it may limit the visibility needed to secure future investment and prioritization. Being perceived as modest or underselling success might be misunderstood as underperformance. This becomes particularly problematic when decisions are made by top management somewhere else and when they are partially based on the perception of the site.

For site managers, the key takeaway is that communicating success is not about overstatements or undermining internal culture; it is about clarity and internal relevance. Modesty can coexist with visibility. Site managers can support employees in articulating achievements more proactively without shifting toward a culture of self-promotion that could lead to less trust. Structured storytelling, improved visibility of project outcomes, and strategic internal communication help ensure site contributions are acknowledged while preserving trust and openness. In distributed R&D networks, visibility is a resource that must be managed deliberately, just like scientific delivery.

5.4 Beyond the Walls: External Factors

While internal factors emerged as central to R&D performance, the findings revealed that external conditions play an important role in site competitiveness. Innovation ecosystems, the role one plays within them, and broader external enablers, such as political context and quality-of-life, all emerged as factors influencing internal relevance and external competitiveness. These insights indicate that R&D sites do not operate in isolation but are deeply embedded in their external context.

Much of the existing literature emphasizes the trend of offshoring among pharmaceutical companies (Kim & Kim, 2014), with firms seeking to establish R&D sites within innovation ecosystems (Wilsdon et al., 2022; Schuhmacher et al., 2016). Simultaneously, scholars like Julian and Keller (1991) have identified various strategic, political, and market-oriented factors that influence the decisions of MNCs regarding where to establish their R&D operations. However, limited research has linked external factors, such as ecosystems and political and social dynamics, to competitiveness at the site level.

It can be argued that external conditions are increasingly important in how pharmaceutical R&D sites achieve both internal relevance and external competitiveness, supported by the findings and theoretical insights.

The following subsections will explore the significance of innovation ecosystems, keystone advantage paradoxes, and additional external factors that extend beyond the innovation ecosystem.

5.4.1 The Increasing Importance of Ecosystems

The results highlight the increasing importance of innovation ecosystems, which have become necessary for the survival of R&D sites in today's pharmaceutical industry. Findings indicate that R&D sites located in less prominent ecosystems and not contributing to pipeline delivery are likely to lose their internal relevance. Consequently, as the findings and literature highlight, there is a growing focus on positioning R&D sites within hubs that provide access to academic institutions, skilled talent, and innovative companies.

The literature indicates that pharmaceutical companies are increasingly restructuring their R&D footprints and adopting offshoring strategies to access external know-how in prominent ecosystems (Kim & Kim, 2014; Schuhmacher et al., 2016). In line with the findings, most literature emphasizes the importance of ecosystems, with pharmaceutical firms opting to establish R&D sites near centers of excellence and academic institutions to gain access to new knowledge (Wilsdon et al., 2022; Schuhmacher et al., 2016). The increasing emphasis on ecosystems is also evident from an investment perspective, as innovation clusters tend to attract foreign investment (Wilsdon et al., 2022). Consequently, this shift has altered the global investment landscape, with Europe lagging behind the United States and China. Wilsdon et al. (2022) further exemplify this trend by stating that innovation clusters create a "place-to-be" effect, nudging companies to establish operations in regions that are emerging as prominent hubs.

Being embedded in innovation ecosystems emerges as crucial for both establishing new R&D sites and maintaining existing ones. Therefore, it can be argued that the ecosystem is not only beneficial for an R&D site's competitiveness but also a necessity for its survival. However, the increasing importance of ecosystems raises concerns for R&D sites located in less renowned regions. The "place-to-be" effect, as discussed by Wilsdon et al. (2022), pushes MNCs to establish sites in growing regions. As a result, regardless of their performance, it suggests that R&D sites in lesser-known areas or ecosystems may lose internal relevance simply because other regions are emerging as strategic locations and attracting increased foreign investment.

The changing focus on where to locate R&D operations appears to create a dilemma for site managers. On one side, sites must be embedded in ecosystems that provide external advantages such as access to talent, knowledge, and collaboration opportunities. On the other hand, it is vital to maintain strong internal capabilities that contribute to global research and the pipeline. While offshoring has been beneficial for some pharmaceutical companies (Kim & Kim, 2014), the challenge lies in assessing which ecosystems genuinely support internal

R&D and determining the best allocation of resources between leveraging external advantages and reinforcing internal capabilities. Successfully managing this balance is crucial for maintaining long-term relevance and competitiveness in an increasingly globalized and interconnected pharmaceutical industry.

For site managers, being embedded in ecosystems is no longer an option but rather vital to sustaining site competitiveness and relevance. This shift calls for a broader managerial focus that extends beyond internal capabilities and also includes proactive engagement with the surrounding ecosystem and the ability to demonstrate the benefits the site achieves through such engagements to top management. Such demonstrations could involve local collaborations, access to cutting-edge technology and talent, or potential cost savings.

Site managers must also remain updated on the "place-to-be" effect, where emerging regions increasingly attract attention and investment. For sites not located in globally leading ecosystems, like AZG's, this raises a critical strategic question: How can a site maintain competitiveness and relevance despite not being situated in a prominent ecosystem?

As the next section will explore, one pathway is to adopt a more active ecosystem builder role, differentiating the site by orchestrating the local ecosystem to tap unique benefits and ensure its continued strategic value within an MNC's global R&D network.

5.4.2 Building Alone? Opportunities and Limitations of a Keystone Role in Innovation Ecosystems

The findings indicate that AZG functions as an ecosystem builder within its regional innovation ecosystem. This role provides several advantages: it allows the company to influence the ecosystem's content, determine which actors may join, and derive significant public relations value. In addition to these advantages, the findings reveal that the initiatives undertaken by AZG within its ecosystem have emerged as beneficial and crucial for the site's future relevance and survival, as possessing a surrounding ecosystem has become a necessity in the pharmaceutical industry. Furthermore, being important for both its local region and Sweden has provided AZG with political benefits, such as access to politicians, which proved crucial in the event of a hostile takeover attempt.

While being an ecosystem builder offers several distinct advantages, being a lone builder within an ecosystem presents implications. The findings indicate that having other large pharmaceutical companies and external competition is crucial for sustaining a vibrant ecosystem, something that AZG's ecosystem currently lacks. On the other hand, too much competition can result in harmful levels of talent mobility, where individuals frequently switch companies in pursuit of better opportunities.

Additionally, the findings highlight the difficulties in demonstrating the benefits of possessing an ecosystem builder role to top management. Respondents emphasized that securing approval and recognition for the initiatives taken can be particularly challenging until it is clear that these initiatives lead to specific contributions to the internal R&D pipeline. This dilemma makes it difficult to justify investments in the ecosystem to top management over an extended period.

The role of an ecosystem builder shares many similarities with the concept of keystone organizations, as outlined by Iansiti and Levien (2006). A keystone organization is a leading actor within an ecosystem that benefits not by dominating all resources but by fostering the ecosystem's overall health and ensuring that resources are available when needed.

Previous research has examined AZG's role as an ecosystem builder (Remneland Wikhamn & Styhre, 2022), primarily from a governance and structure perspective, highlighting how AZG fosters value creation for other actors within its ecosystem. This thesis broadens the focus by emphasizing what the ecosystem does for the site and how it links to site competitiveness. Remneland Wikhamn and Styhre (2022) illustrate that value creation and value capture are not inherently in conflict for an ecosystem builder, although one may take precedence over the other at different stages of the ecosystem-building process. The findings also highlight the balance between value creation and value capture, emphasizing the unsustainability of being a sole builder and contributor to ecosystem value creation, as respondents consistently demonstrated the need for other "builders" or large players to establish operations within the ecosystem and contribute to value creation.

A challenging balance emerges from the findings: while the need for external competition and larger players is evident, it is unclear what the optimal level of competition should be. Having too few competitors may lead to unsustainable conditions for a lone ecosystem builder, while excessive competition can result in excessive and harmful talent mobility. Therefore, finding the right balance between these extremes is crucial for ecosystem builders who aim to create a healthy ecosystem.

Remneland Wikhamn and Styhre (2022) illustrate that value creation for other actors may temporarily take precedence over value capture for the ecosystem builder during certain periods. Simultaneously, the findings indicate that over time, the ecosystem builder must demonstrate the benefits and value it captures for top management, as relying solely on creation is not sustainable. This creates an interesting dilemma: while the ecosystem builder aims to foster a healthy ecosystem without monopolizing resources, the increasing need to demonstrate the value it captures may limit its ability to promote the well-being of the ecosystem.

As a result, one cannot definitively conclude that serving as a keystone organization or ecosystem builder enhances the competitiveness of an R&D site more than simply being part of a well-established ecosystem with optimal levels of competition. It could be argued that the ecosystem itself has proven to be a more critical factor in maintaining relevance and competitiveness than the specific role an R&D site plays within it. However, in a less prominent ecosystem, someone must ultimately take on the role of building the ecosystem to make it prominent.

For site managers at AZG and similar sites in less prominent ecosystems, ecosystem building is both a strategic opportunity and a demanding long-term investment. Before committing heavily to such initiatives, site managers must assess the long-term potential to attract other larger players or builders and how local expertise can differentiate the site from more well-known ecosystems.

Moreover, while AZG's current efforts may focus on creating value for other actors, site managers must also prepare to demonstrate the benefits the site captures for the ecosystem, especially to global leadership. Additionally, the value an ecosystem builder captures can often be hard to define. Ecosystem initiatives are complex to link to hard metrics such as revenues or profitability. Instead, they often emerge as a cost for the builder. However, value capture for the ecosystem builder often takes the form of more intangible or soft aspects that are not directly visible in an annual report but are still equally valuable. The political access or public relations value AZG receives through its ecosystem building is hard to measure but holds great value. Therefore, site managers must find an effective way of communicating these benefits and success stories to global management.

Finally, site managers must remain mindful of the balance between vibrancy and competition. While attracting additional large players is important to avoid overreliance, excessive competition could create harmful talent mobility. Managing this balance is important to sustain both the health of the ecosystem and the site's own competitiveness.

5.5 Synthesize: An Overview of Tensions and Paradoxes

To conclude the discussion chapter, Figure 6 synthesizes the empirical and theoretical insights into a conceptual framework. It highlights the core tensions and paradoxes that together shape and sustain the competitiveness of a pharmaceutical R&D site.

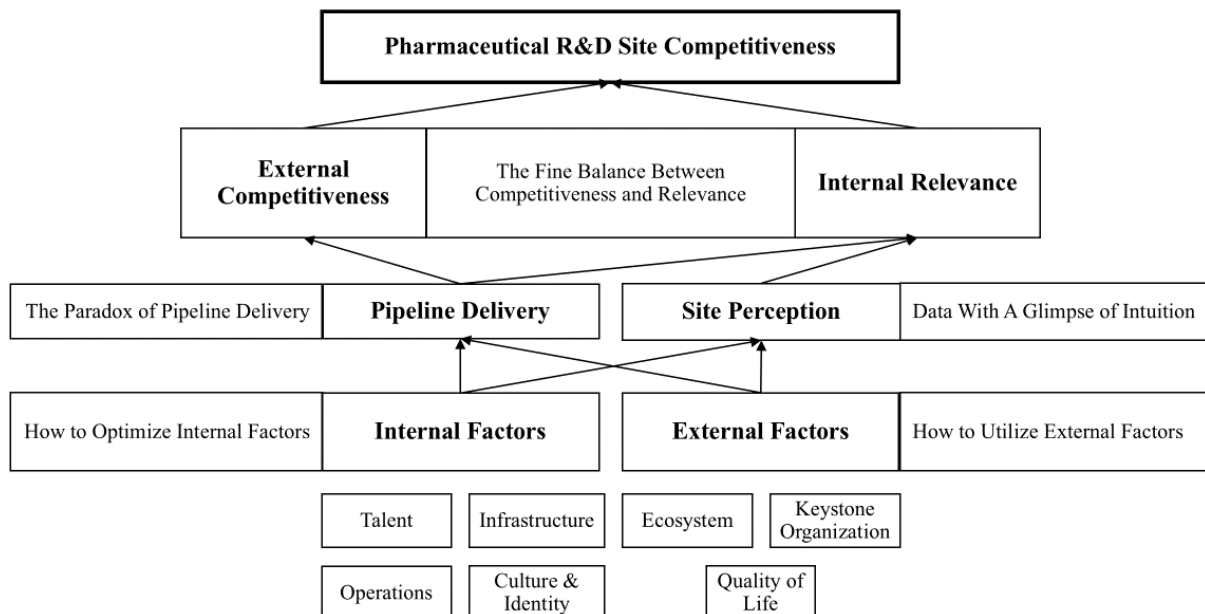


Figure 6: *Conceptual Framework of Pharmaceutical R&D Site Competitiveness*

6 Conclusion

This thesis aimed to conceptualize the competitiveness of a pharmaceutical R&D site is shaped and sustained within an MNC's R&D network. By studying AZG, the research explored how internal and external factors influence the site's competitiveness.

The study conceptualized site competitiveness as a combination of external competitiveness, defined by the site's ability to strengthen the MNC's global pipeline, and internal relevance, which refers to the site's visibility and value within the organization. These two aspects are connected but not always aligned in practice.

The findings highlight that two main aspects shape this competitiveness: pipeline delivery, the core contribution of an R&D site, which affects both external competitiveness and internal relevance, and site perception, which influences internal relevance and is shaped by how contributions are communicated and understood by top management.

The thesis identifies several internal success factors, talent, infrastructure, operations, culture, and identity, that support pipeline delivery and site perception. These factors are interdependent and cannot be optimized in isolation. In addition, the study shows that external success factors, such as being embedded in an innovation ecosystem and being an ecosystem builder, play a role in determining a site's competitiveness.

The thesis also highlights tensions that site managers need to navigate: the balance between competitiveness and relevance, the paradox of pipeline delivery, loyalty and renewal in talent strategies, modesty and visibility in communication. In less prominent ecosystems, sites may also face the challenge of ecosystem building while demonstrating value to global leadership.

This study contributes to the literature on global R&D and site-level innovation strategy by:

- Conceptualizing R&D site competitiveness in a global pharmaceutical context that complements the firm-level focus of most previous research and highlights how R&D site competitiveness is shaped and sustained.
- Identifying and explaining the success factors influencing pipeline delivery and site perception through empirical findings and theoretical frameworks.
- Highlighting key tensions that shape how pharmaceutical R&D sites could be managed to increase their competitiveness.

Future research could explore how the competitiveness of R&D sites can be measured, particularly when sites are integrated into an MNC's R&D network and when many success factors are based on soft values that are difficult to quantify. Comparing different measurement approaches could provide practical insights for both managers and researchers.

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