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Transforming the 'valley of death' to a 'horizon of hope': a network-driven approach to innovation resilience

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Abstract: The purpose of this study, which is in progress, is to explore the main network mechanisms that aid in transforming the Valley of Death' (VoD) into a 'Horizon of Hope' (HoH), which is rooted in strategic connections and resourcefulness. The study uses a systematic literature review to collect and synthesize knowledge on VoD-to-HoH transition networks, followed by semi-structured interviews with inventors, innovation managers and technology specialists to explore management strategies, critical factors and key challenges for VoD-to-HoH networks. Preliminary interview data analysis shows support for the user, research, and business networks captured by the literature, as well as the importance of governmental, institutional, investor, prototyping and communication networks. One main theme, concerning HoH validation accelerators that expedite innovation artefact approval processes, is emerging from the current data as well as codes surrounding trust focus and futuristic outlooks. Conceptual and methodological areas for feedback and development are also presented.

Keywords: Valley of death; innovation resilience; co-creation; technology commercialisation; innovation networks; technological innovation; interviews; user networks; business networks; Saudi Arabia.

1 Introduction

Technology developers face a major innovation challenge in moving forward with their discoveries, i.e., being able to push, pull, pump, and punt ideas across the 'Valley of Death' (VoD) – an ability that separates inventions from successful commercialization. The VoD refers to a gap between technical invention and value creation, and this gap

characterizes a complex and perilous innovation management phase between technology development and commercialization. Typically, this phase involves multiple actors with potentially conflicting motivations and may appear despite financial funding and management support. Lessons from technology development and commercialization strategies suggests that the VoD is a major barrier to successfully moving innovations to scale. New product development, from idea to market, requires strategic management of all stakeholders, particularly the supplier-manufacturer relationship, not only for the post-development phase of technologies but also for pre-development phases and during technology innovation processes (Sobrero *et al*., 2002). This approach lowers the risk of being stuck in the VoD and accelerates the deployment of novel solutions.

Notably, the VoD represents a struggle to achieve profitability, and this struggle is caused by insufficient funding, poor collaboration, lack of business knowledge and early technology marketing (Gbadegeshin *et al*., 2022). Accordingly, navigating these VoD challenges requires appropriate networks for effective connections and engagement between different technology development and commercialization stakeholders, e.g., scientists, industrialists, marketers, and innovation managers (Ellwood *et al*., 2022). Likewise, a VoD focus on innovation resilience (Fey & Kock, 2022) is pivotal for coping with times of adversity. This resilience capability enables firms recover from times of crisis, navigate conflicts, and deal with market fluctuations – conditions that are commensurate to managing the VoD context. On the strength of innovation resilience and networks, this study adopts a novel approach for tackling the VoD problem by arguing for focus on a 'Horizon of Hope' (HoH), which is rooted in strategic connections and resourcefulness. The HoH is an invented mnemonic in this study and used to characterise a more optimistic experience of development-to-commercialization phases when firms prioritize and tap into networks for innovation resilience.

This study, which is in progress, aims to explore the main network mechanisms that aid in transforming the VoD into an HoH. The study offers insights from inventors, innovation managers and technology specialists on how these network mechanisms contribute to innovation resilience. Accordingly, the research question for the study is:

"From the perspective of inventors, innovation managers and technology specialists, what forms of networks for innovation resilience contribute to crossing the VoD?"

Existing research (Gbadegeshin *et al*., 2022) indicates that most technology innovators face difficulties in grasping how a business operates, usually undermining external factors, driving market resistance whilst assuming an instant acceptance of the new technology or product. Such outlook underscores the importance of marketing and promotional activities at an early stage of technology development to gain useful visibility *via* collaborative mechanisms for team building, technology readiness, funding, clear business model, and early marketing. For collaboration management, a network-dominant logic (AlGhamdi & Durugbo, 2021) is key to co-creating value across cross-functional teams and value chains. Based on strategic insights concerning how inter-organizational cooperations cross the VoD in the biopharma industry (Calza *et al*., 2021), it is also suggested that reducing barriers within product development pipeline can be achieved through efficient engagement, the development of strategic relationships among technology stakeholders, and a general entrepreneurship culture within research centers.

This study contributes to the existing literature seeking to accelerate technology development and cross the VoD. Specifically, the study contributes to an innovation resilience and HoH framing of the VoD problem for innovation and technology

management. Current innovation management studies of the VoD (e.g., Ellwood *et al*., (2022) and Gbadegeshin *et al*. (2022)) tend to focus on financial funding and investment as main contributors to accelerating technology development and crossing the VoD. However, the complex nature of the VoD requires several actions throughout the process of research and development including the use of effective mechanisms for managing logical differences between science (research), industry (development) and market (commercialization). This implies that to accelerate technology development and rapidly navigate or overcome the VoD, firms could disseminate results to achieve corporate goals rather than scientific goals and address high-demand areas or emerging markets to further advance their technology development and commercialization strategies. In addition to shifting the attention beyond financial resources to networks capabilities and how these capabilities could contribute to transforming the VoD into an HoH, this study advances an innovation resilience ethos that promotes resourcefulness in harnessing innovation resources and potentials within networks.

For innovation and technology managers, this study will make recommendations to support the corporate plans of firms for technology development, deployment, and commercialization. Using insights from the case study, the study will propose guidelines on strategic innovation resilience and network priorities for transforming the VoD into a HoH. Additionally, the study will inform innovation and technology managers on the network orientations and mindsets needed for achieving an HoH for development-to-commercialization phases. Particularly, the study will shed light on the specific mechanisms that could aid in cultivating these orientations within firms' innovation cultures and reflect on the implications of an HoH mindset for broader technology development and commercialization strategies.

3 Research methodology

The study begins with a systematic literature review to collect and synthesize knowledge on VoD-to-HoH transition networks from existing academic studies. Systematic literature review aims to identify and analyze prior research studies seeking to answer a similar question; hence they are unbiased and deliver more objective results. The standard protocol in systematic literature review includes identifying research question, outlining inclusion and exclusion criteria, selecting resource databases, extracting and analysing data, and interpreting results.

Analysis of the existing literature found several types of networks related to crossing the technology VoD and they are presented in Table 1. These networks include user networks, innovation research networks, and business industrial networks.

Table 1 Networks for facilitating VoD-to-HoH transitions

Networks	*Source*
User networks:	
• Networks with lead user	Harrison & Waluszewski (2008)
• User-to-user interaction	
Innovation & Research networks:	
• Knowledge transfer	Calza *et al*. (2021)

• Funding and sales	Gbadegeshin *et al*. (2022)
Business & industrial networks:	
• Organizational heterogeneity	Sobrero *et al*. (2002)
• Business networks and partnerships	Palmer & Truong (2019)
• Industrial networks	Burström *et al*. (2024)

Next, the study proceeds with a qualitative approach based on multi-case studies and involving semi-structured interviews with inventors, innovation managers and technology specialists. This phase seeks to capture management strategies, critical factors and key challenges for HoH networks that aid in transitioning from technology development to commercialization phases and fostering innovation resilience.

Sample, setting and data collection

This research employs a purposive approach for sampling, in particular, expert sampling (Creswell & Poth, 2018). The interviewees are selected from universities and firms that are currently developing innovations, including experts who are involved in technology development, deployment, and commercialization.

The semi-structured interviews were organized and conducted via videoconferencing in April 2026 on the Zoom videoconferencing platform. Selection of the Zoom platform was to improve access to participants and to reduce limitations of location, hesitation, and subjectivity (McIntosh & Morse, 2015). All participants agreed to the recording of the interviews for transcription purposes. However, at the request of participants, all identities remain private, with names replaced by codes (INT_1 to INT_5) as summarized in Table 2. Open-ended questions of the interview protocol prepared beforehand focus on main network mechanisms that aid in transforming the VoD to an HoH, in line with the research focus and question.

Table 2 Overview of interview participants

Type	*Interviewee*	*Gender*	*Job role*	*Duration*
University	INT_1	Female	• Assistant Professor • Former Dean of Innovation and Entrepreneurship Centre	55 min
	INT_2	Female	• Dean of Deanship of Scientific Research • Full Professor and Inventor	45 min
	INT_3	Female	• Head of the Management Department, College of Business Administration	30 min
Venture Capital	INT_4	Male	• Co-founder, Managing Partner & Inventor	60 min
	INT_5	Female	• Co-founder & Managing Partner	35 min

Data analysis

Thematic analysis (Guest *et al*., 2012) aids in making sense of the transcribed interview data and ATLAS.ti provides software support for this analysis. The analysis began with a readthrough and review of transcripts before coding and subsequent clustering of codes to generate themes that reflect key and interesting insights into the data.

4 Findings

Figure 1 summarises some initial codes and themes from analysing the current interview data. This preliminary data analysis shows support for the user, research, and business networks captured by the literature. However, interviewees noted the importance of five additional networks for facilitating VoD-to-HoH transitions. To begin with, interviewees noted the importance of governmental and institutional networks that offer key support for establishing regional and sectoral connections, i.e.,

> "**Governmental network**, are very important, for example the Chamber of Commerce, they will tell you whom to talk, and other government entities, such as the RDIA (Research Development and Innovation Authority) are very important networks to a researcher/innovator" (INT_1)
>
> "It is critical, if a person comes with an idea that … there are **institutions behind them**, such as academia and venture capitalists" (INT_5)

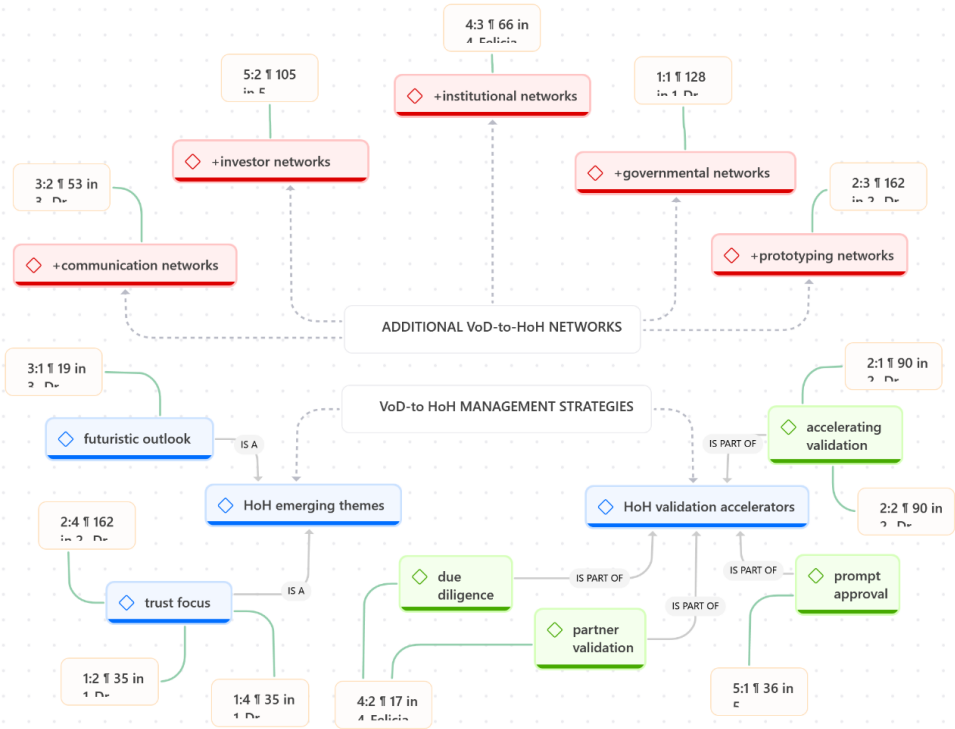

Figure 1 Network diagram from ATLAS.ti on additional networks and innovation management strategies for a VoD-to-HoD transition (white boxes in the middle represent thematic groupings, blue boxes are additional VoD-to-HoD transition networks captured from the data, green boxes are current management themes, green boxes are management codes, while outer boxes represent interview quotes from which codes are derived).

Closely related are the investor networks that support innovators and entrepreneurs with early-phase funds and the prototyping networks that aid in rapidly scaling up product designs. Examples of excerpts advocating for these networks from the interviews include:

"**Network of investors** that I introduce them (innovators and entrepreneurs) to. To connect them with other money sources, money supply." (INT_4)
"**Prototype networking** was very important. It helped us with the scaling up product design part of prototype knowledge and relationships with investors" (INT_2)

The interviews also noted the role of communication networks for enabling knowledge exchange and supporting resilience, i.e.,

"**communication** and networking, help a lot in advancing the resilience and making organizations really create value … Having the network itself is a factor, an important factor that can drive and thrive through resilience and innovation by exchanging knowledge, experience, providing support, technical support, financial support, marketing opportunities and so on" (INT_3)

On the basis of these different VoD-to-HoH transition networks, one main theme, **HOC validation accelerators,** is emerging from the current data. This theme is about strategic capabilities, routines and methodologies that expedite the authentication and approval of assets and artefacts for innovation. Currently, the theme is based on a clustering of four codes: prompt approvals, partner validation due diligence, and accelerating validation. For instance, interviewees noted that:

"I think it's important to do a **due diligence** on companies, we look, to know, what universities are they coming from, what networks have they built, in terms of, in space of academia, to understand, you know, the **validation of their technology**, and not just technology made in a lab" (INT_5)
"It takes **some time for approval** … sometimes it kills the technology, despite the technologies being good" (INT_4)

Additionally, the interview data currently contains HoH emerging themes around trust focus and futuristic outlooks as reflected in the following quotes:

"So, the strategy (for HoH) is definitely not to be a reactive or to take a reactive approach, but rather to be proactive and **futuristic in the practices** and try to be aligned with the latest technologies" (INT_3)
"**Maintain trust**. People are going to trust you if you show them that this thing is working" (INT_1)

5 Areas for feedback and development:

We have conducted a thorough literature review on technology VoD and how networks can accelerate VoD-to-HoH transitions for technological firms. Through this study, we aim to capture appropriate networks for effective connections and engagement between technology development and commercialization stakeholders for enhancing innovation resilience. However, we would appreciate any feedback and recommendation that would enrich our study and bridge any apparent conceptual gaps in our research topic and focus. Particularly we are interested in how networks accelerate transitioning to HoH or even, avoid it, and the distinct stages where different networks are best effective. Moreover, we welcome feedback from innovations experts, practitioners, and academics in favor or complementing our preliminary findings.

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