Design for Dynamic Stability

Investigating Dutch Startups' Strategic Reactions to Economic Deglobalization

Cai, Meng ; von Morgen, Wouter ; Yu , Xihan ; Kim, EuiYoung

Publication date
2024

Document Version
Final published version

Published in
DMI: ADMC 2024

24th DMI: Academic Design Management Conference
Design & Innovation at a Crossroad
Delft, Netherlands, 6-7 August 2024

Design for Dynamic Stability: Investigating Dutch Startups' Strategic Reactions to Economic Deglobalization

Meng CAI, Wouter VON MORGEN, Xihan YU and Euiyoung KIM
Delft University of Technology

Economic deglobalization, characterized by reduced global integration and interaction, presents significant challenges for startups with limited resources to adapt and innovate their resource management and business growth strategies. This paper investigates how innovative technical startups based in the tech incubator program at Delft in the Netherlands respond to economic deglobalization, focusing on their strategic management of competitive resources to achieve dynamic stability—-the ability of a business to return to steady or new status after an external disturbance. Findings are thematically concluded with six main resource management strategies: flexible supply chain, comprehensive talent planning, an optimized mix of investments, the value of time and money, diversified marketing strategies, and clear knowledge security. By designing a systematic framework for startups to navigate dynamic stability, our research identified the effectiveness of channel resilience, operational adaptability, and executive innovation in an economically deglobalized world as the strategic and designary reactions to economic deglobalization.

***Keywords**: economic deglobalization, startup, dynamic stability, competitive resources*

Introduction

Within this global business context, deglobalization has emerged as a strong phenomenon, especially after the 2007–2008 economic crisis and during the COVID-19 pandemic (Kornprobst & Paul, 2021; Kinnvall & Kisić, 2023). The complex phenomenon of deglobalization happens within its vast branches of political, economic, cultural, and societal interactions (Kinnvall & Kisić, 2023). Among the four aspects, the economic deglobalization (Bello, 2008) trend in recent years has enhanced global trade instability, which adds direct challenges and risks for businesses worldwide.

In response to economic deglobalization, firms are compelled to enhance agility and rapidly develop core capabilities to sustain their business models in changing environments (Seetharaman, 2020). The firm's dynamic management capability in the face of economic deglobalization becomes a key competitive performance for growing businesses (Teese et al., 1997; Zhang et al., 2024). Startups, being more vulnerable, especially lack competitive resources and relations compared to large corporations (Santi & Neves, 2020), necessitating dynamic service innovation capabilities (DSICs) for success (Teixeira et al., 2021). The impact of deglobalization factors on startups, evident in the COVID-19 pandemic, emphasizes the importance of navigating economic uncertainties (Cahyanto et al., 2021).

Current academic achievements state the importance of resilience, adaptability, and innovation in navigating complex and changing environments (Kim et al., 2022; Fiksel, 2015; ÇAKMAK, 2023). The frameworks and strategies in previous studies (Kim et al., 2022; Bennett et al., 2014; Teece et al., 1997) guide organizations to thrive in dynamic and uncertain conditions. Because startups play a key economic and social role around the globe, it is thought to be highly valuable to research within the startup scene (Teixeira et. al., 2021). However, few scholars provide design frameworks specifically for startups to build dynamic stability amid the economic uncertainty of deglobalization, and the new deglobalization situation has raised new wicked problems to be delved deeply into.

Therefore, a startup's success in facing economic uncertainties hinges on its package of capabilities and resources (Nath et al., 2010; Peteraf, 1993). To present startups' strategies for creating economic dynamic stability, this research addressed the question: *How do validated technical startups react to economic de-globalization in terms of competitive capability resources?*

Our purpose in this research is to develop a framework of competitive resources management combined with designerly thinking to create dynamic stability in the startup world facing economic deglobalization. This framework and strategies will help managers and experts in startups and large corporations stabilize deglobalization changes and maintain business growth.

Literature review

In line with the research scope delineated above, this study aims to examine strategic management of business and organizational resources to achieve dynamic stability and how designerly thinking mindset plays a part. This literature review provides insights of existing research in the scope of design management and innovation.

Deglobalization in the startup world

Deglobalization, the opposite of globalization, entails a reduction in integration, communication, trade, connections, and policies between countries and organizations (Bello, 2008). Economic globalization involves global economic relationships spanning policy, economy, society, and culture, with markets, finance, goods, services, and transnational corporations forming key manifestations (Kornprobst & Paul, 2021; Chase-Dunn, 1999). Yet, evidence from global economic crises, trade wars, and pandemics suggests simultaneous economic deglobalization (Bello, 2008; Postelnicu et al., 2015). Economic deglobalization involves diminishing economic interdependence and integration between states, leading to periods of decline in business efficiency and competitiveness (Postelnicu et al., 2015).

Prior research indicates various themes depicting the impact of deglobalization on businesses. Unlike the trend of increased market and production integration, economic deglobalization obstructs the global flow of values, trades, and capital, introducing risks like transportation, exchange rates, and cultural uncertainties (Kwak et al., 2018; Postelnicu et al., 2015). Businesses may experience disruptions in the supply chain, resulting in shortages and increased production costs (Postelnicu et al., 2015). In the realm of knowledge and talent, Farndale et al. (2021) found talent shortages in the high-tech industry due to deglobalization, suggesting solutions like attracting skilled migrants and building interdependencies for high-tech enterprises.

Starting a new business is recognized as a challenging and risky process (Cahyanto et al., 2021). In this paper, "startups" are specifically defined as ventures with the primary goal of discovering a viable business model that generates value for customers, captured by the startup itself (Bortolini et al., 2021). These startups create hypotheses in conditions of great uncertainty, validate them with minimum viable products, and rigorously refine concepts (Ries, 2011). Santi & Neves (2020) claim startups that surpass $50 million in revenue, have over 100 employees, or are worth more than $500 million are considered beyond the startup world.

This study is scoped around validated startups, those between the extremes, facing deglobalization challenges in marketing and operations (Sreenivasan et al., 2022) and requiring diverse skills to manage risks and pursue growth opportunities, while those still validating hypotheses are excluded from the study to focus on startups with a clear market vision. Despite these impacts on supply, knowledge, and talent, there is limited research on the specific risks posed to startup businesses by deglobalization.

Competitive Resources Management

Gyemang and Emeagwali (2020) state that a Resource-Based View (RBV) is a bundle of capabilities and resources enhancing competitive performance. According to RBV, tangible resources include finance, physical assets, technology, and organization, while intangible resources include human, knowledge, and reputation (Nath et al., 2010). Tangible resources enable a firm to behave and implement business strategies, while intangible resources empower innovation and increment business performance.

In an uncertain economic environment, however, innovation relies on new knowledge acquisition for sustainable business development (Koentjoro & Gunawan, 2020). Teece et al. (1997) emphasize that the internal management method is the source of differences in firms' competence; learning is sometimes more important than integration. Gyemang and Emeagwali's (2020) survey on Nigerian telecom firms concludes that knowledge and talent management positively impact surviving innovation competition, ensuring dynamic capability.

Physical assets for business growth rely on supply management, which is integral to the product cycle and another key resource for firms (Gold et al., 2010). Kwak et al. (2018) show the positive impact of supply innovation on risk management in South Korean companies, enhancing stability capabilities and competitive advantage amid uncertainties.

Extending RBV, scholars emphasize dynamic competitive capabilities (DCCs), which are crucial for a firm's business growth (Peteraf, 1993). Combining RBV insights, researchers identify valuable resources and develop DCCs for adaptability, learning, and innovation (Liu et al., 2020). In rapidly changing marketplaces, managers of firms need to develop capabilities embedded in the firm to achieve competitive growth (Teece et al., 1997; Nath et al., 2010).

Design for dynamic stability

In recent decades, designerly thinking has influenced every role of an organization in order to co-create a dynamically stable business environment (Kim et al., 2018; Braun et al., 2014). Many researchers have explored and justified the power of designing for dynamic stability. Boynton (1993) states that information management lies at the core of dynamic stability so companies should build comprehensive information systems in order to make rapid adaptations. In recent years, an increasing number of organizations have relied on agile teams and methodologies to reinforce dynamic stability as well as foster innovation (Grass et al., 2020). Kim et al. (2022) further redefined dynamic stability as the ability of a system to arrive at a steady (previous or new) state under an unstable business environment. According to their research, to achieve dynamic stability in an organization, managers must be capable of building long-term, flexible resource management for uncertain and fast-changing markets. To steer organizational members, Kim et al. (2022) generated strategic reactions by 6R—research, reframe, repurpose, redesign, reimagine, and resile—based on a case study on the aviation industry, which plays an exemplary role in designing for dynamic stability, confirmed in the cultural sector (van Alkemade et al., 2024). However, in the context of deglobalization and competitive capacity resources, the literature lacks specific research on the situations of startups and small and medium-sized companies.

Initially conceived as a method for the innovation process, designerly thinking has evolved to encompass broader organizational functions, often shaping the overall management approach of an organization (Gardien & Gilsing, 2013). Characterized by its exploratory, experimental, and future-oriented nature, designerly thinking typically requires the active involvement of diverse stakeholders (Hassi &

Laakso, 2011; Lockwood, 2010). In the uncertain business landscape, the theoretical structure of designerly thinking is applied across various domains, including strategy, organizational design, business model innovation, sales, marketing, engineering, and user experience (Laursen & Haase, 2019; Cousins, 2018; Kim et al., 2016).

Method

As depicted above, previous studies mainly revolve around mature large enterprises with relatively adequate resources to confront economic deglobalization. Our study addresses the gap of startup companies in facing the challenges of deglobalization and builds the framework of how technical startup businesses create dynamic stability with competitive resources. The research methods, data collection, and analysis processes are detailed in this section.

Research Method

To address the aim of the study, a phenomenological research strategy (Moustakas, 1994) is applied, and the qualitative interviews (e.g., Grass et al., 2020) are conducted with 8 participants. The sequence of the mixed research methods we undertook is depicted as follows (Figure 1).

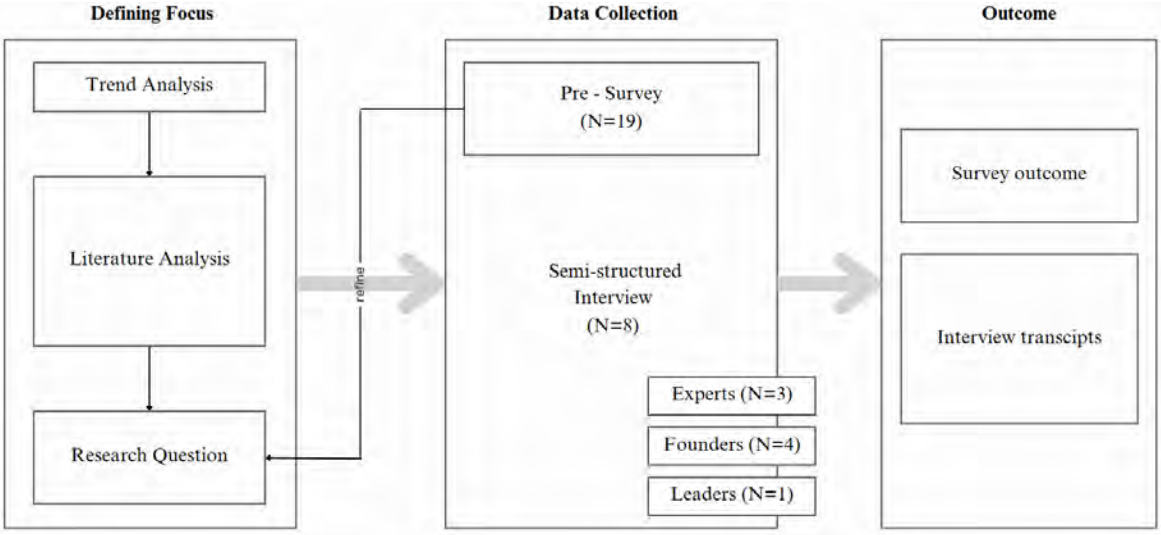

Figure 1. A sequence of the mixed research approach

Our research focuses on the intersection of organizational innovation and business growth within the context of economic deglobalization, aiming to establish dynamic stability. Initially, key factors were identified through a literature review and trend analysis to inform our research question. A presurvey (N=19) was conducted to understand key contributors in economic deglobalization, refining our questionnaires and formulating our interview guide/protocol. Semi-structured interviews were then conducted individually with invited participants (N=8), exploring challenges, actions taken, and lessons learned within technical startups. The context was given by a Dutch entrepreneurship support institution.

Data Collection

Participants consisted of key informants, information-rich practitioners who were purposefully selected. As shown in Appendix 1, our interviewees were in three different categories: business experts (N=3), startup founders (N=4), and department leaders (N=1). The participants we chose are all decision-makers of strategies and actions to tackle economic deglobalization issues. We didn't approach employees, as they have limited power to decide business countermeasures.

The perspectival triangulation in in-depth interviews with founders, leaders, and technical startup experts gathered diverse viewpoints on macro management, precise operation, and professional consulting, which validate data by preventing individual bias and ensuring a comprehensive understanding.

Data Analysis

Data was analyzed through a deductive thematic analysis approach. The interview transcripts were divided into two batches, based on the interview guide. One batch is the data on 1) challenges faced, and the other batch is the data on 2) actions taken and 3) results. Initially, three researchers collaborated online to code a portion of the dataset purposefully. 249 codes and 33 category groups were extracted as being of relevance. These subcategories were put into the data structures of situation/reaction and their specific deglobalization category. A further clustering of the codes leads to the generation of 6 themes. Survey analysis validated these themes, ensuring their high relevance. The finalized coding tree, emphasizing connections between batch 1 and batch 2, was visualized through structure diagrams. Figure 2 shows an overview of the interview data analysis approach.

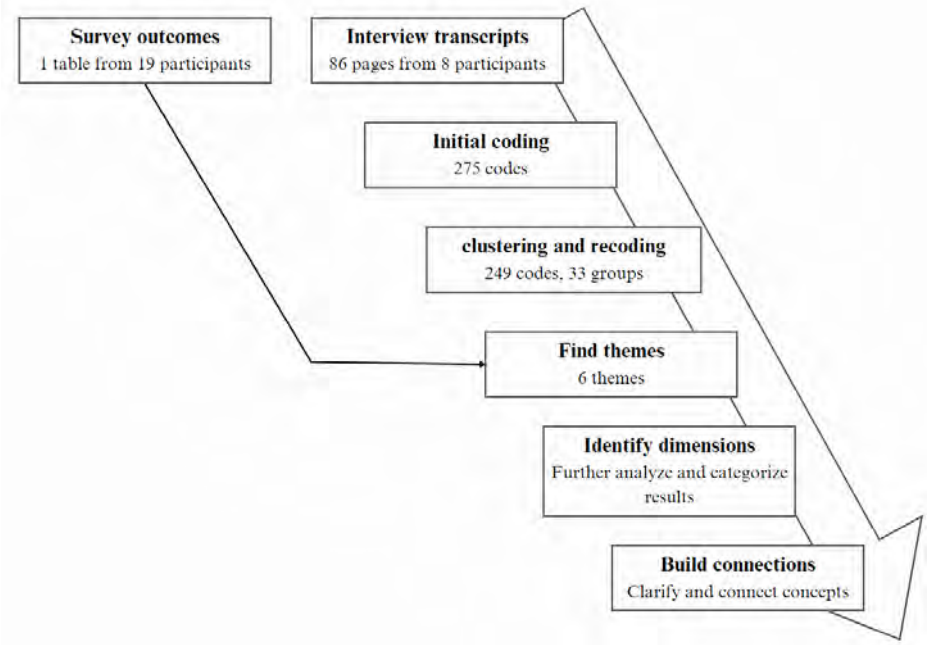

Figure 2. Overview of data analysis approach

For the first data batch, specific challenges startups have been facing in economic deglobalization are categorized into thematic situations based on relevance. Appendix 2 offers detailed accounts of representative cases on the left and summarizes thematic situations as 2nd order Themes on the right.

For the second data batch, our deductive thematic analysis process began with specific reactions to confront deglobalization issues, leading to thematic relations, ultimately culminating in overarching strategies adopted by startups to establish dynamic stabilities. For example, in terms of reaching international talents in an affordable way, 1st order codes mention reactions like Hiring talents with NL visas, finding university internships, hiring remote working employees, and collaborating with foreign labor companies. Those reactions, with the help of external resource support, can be concluded into building external access. Combining with the other 2nd Order codes on internal working culture and financial planning to attract talents, the aggregate strategies can be inferred as Comprehensive talent planning. Appendix 3 depicts the identified first-order concepts, second-order themes, and aggregate strategies that will be presented and discussed hereinafter.

Then, with all the research results generated, we further analyzed the contents by keyword extraction. Therefore, we identified the 3 key dimensions guiding all the strategic business reactions. For example, terms in the Result part like “execute new strategies,” “innovative technologies,” and “new approach” merged to innovative execution, and “bouncing back,” “recover,” and “secure the channel” were categorized into channel resilience.

In the last step, the connections between the situations, reactions, and the extended dimension analysis are elaborated logically. The Sankey diagram (Figure 3) in the Discussion part illustrated the clarified connection as the final response to the research question.

Results

This research aims to investigate the situations of economic deglobalization that technical startups experience or prepare for in their businesses and the reactions startups take to build dynamic stability in the uncertain business world. With qualitative research, the following results can be divided into two parts: the presurvey research results and the In-depth interview results.

Presurvey research results

Collected presurvey data from 19 startup founders shows the impact of economic deglobalization factors on their operations. Further categorization based on situational connections reveals a high entanglement of factors. Supply, cost, and talent emerge as the most pervasive challenges affecting the stability and growth of technical startup businesses. Investment and market demands pose partial challenges, while knowledge issues are prominent among startups engaged in significant digital innovation. Besides, a relevant result is that several startups have not experienced any deglobalization issues within their startup because they are still growing domestically and have no global business yet.

In-depth interview results

The main 2 categories: Supply and Talent complication were the most common deglobalization factors that nearly all startups in the interview experienced. Investment, Cost, Market Demand, and Knowledge also emerged as crucial themes for startups to achieve dynamic stability amid economic deglobalization.

Insight 1: the deglobalization situations experienced by technical startups

- Supply

Typically, technical startups procure components rather than raw materials, with product design, component manufacturing by suppliers, and assembly constituting their operational processes. Although many startups benefit from efficient global supply chains of manufacturing in Asia and Eastern Europe, the increasing complexity of the international landscape, marked by regional conflicts, trade disputes, and pandemics, introduces uncertainties into global supply chains. Some interviewees noted disruptions caused by customers expressing reluctance to purchase products containing components from certain regions under tension. The companies are encouraged to source components locally, but suppliers in the EU are more expensive than those in the far East, for instance. Besides, the bullwhip Effect amplifies market demand variability and further compounds supply chain challenges.

- Talents

Startups leverage foreign employees to enhance their talent pool in the Netherlands, fostering innovation through diverse skills and information. However, hiring international talents is both time and money-consuming. Complex recruitment processes, especially for small startups lacking full-time HR, and EU regulations governing employee markets contribute to the financial burden. An expert at startup operations explained the challenges:

I've seen that you need to pay somebody at least 35k yearly. (...) There are a lot of inefficiencies because people need to adapt to adjust and to adapt. People get homesick.

- Investment

In recent years, factors like the COVID-19 pandemic and the Russo-Ukrainian situation have contributed to a tightening of international investment. The EU's implementation of stricter rules and knowledge loss tensions between continents have further deterred foreign investments, prompting companies to retreat from investing outside their countries. A technical startup founder depicted that:

The foreign investments, (...) I really do not appreciate it as much as it did before. (...) It is now recognized that a lot of knowledge is flowing out of the Union.

In many cases, investments often lead to acquisitions, with strategic investors seeking innovative knowledge. The idea of rejecting cross-border acquisitions has gradually pushed international investment further away.

- Cost

In this unstable economic climate, costs related to raw materials, components, labor, and transportation fluctuate significantly. The unpredictability in component prices, influenced by international dynamics, is particularly impactful for startups. Additionally, global political factors introduce tax complexities for growing startups; import taxes have significantly raised the price of goods.

- Market Demand

Thriving in a local business environment is more straightforward but limited in market size. While venturing into international markets presents challenges due to heightened competition, the dominance of large companies, and the need for complex strategies, robust finances, and overseas offices. These factors pose obstacles for small-scale startups aiming for international expansion.

- Knowledge

In the Netherlands, a prevailing trend is to retain knowledge locally, discouraging its flow outside the EU. This preference for local manufacturing addresses technology leaks, which contributes to the partial aggregation of deglobalization. Besides, software-related startups are increasingly cautious about the nationality of employees and partners to mitigate concerns about technology leakage.

Insight 2: the reactions employed by startups to foster dynamic stability under economic deglobalization

- Flexible supply chain

Firstly, startups should meticulously design and source products, preparing for potential disruptions in the supply chain due to changes in the international situation. When key components are difficult to obtain, some startups choose to innovatively redesign electronic boards with other replaceable components to facilitate the traceability of available supplies. Besides, a combination of local supply, outsourcing, and self-production works well in bouncing back from rapid changes. Creating an inventory is a direct way to mitigate challenges. According to one interviewee, he listed 3 strategies in his mind to address supply issues:

> *Normally what they do is that they try to source the components elsewhere. That is one thing. The second thing is that they redesign their electronics so that they can use the available components.*

Secondly, maintaining effective communication with stakeholders is essential. Building strong relationships with domestic and international suppliers, industry peers, and investors helps recover from potential disruptions. Partnerships with big corporations can help startups get their supply when they lack channels to source products.

In the Dutch context, seeking assistance from governmental entities aligns with policies supporting localized production. Government projects and incentives promote procurement from the Netherlands or Europe, which will secure the supply channel. A glimpse can be found in the words of a startup founder in the shipbuilding industry:

> *The government pushes to make everything locally like the Made-in-Holland brand and there are also grants and subsidies for that. And it's encouraged by the government for companies to buy their products from a European company. In the future that will become more and more because after Covid everybody's like, "Hey, we need to keep the knowledge ourselves as well." (...)*

Lastly, implementing new technologies in production, such as 3D printing and robotic manufacturing, are crucial. These technologies enhance efficiency and reduce costs, facilitating local production for startups, especially those requiring frequent prototyping and custom production. As an interviewee explained:

> *You simply see that small electronics manufacturers are adapting right now. They do a lot of robotics so they can actually compete with China because they take out the human manufacturing factor from the electronic production. The whole thing is robotized. So you see some investments there actually to get local production lines where you can actually compete with China.*

- Comprehensive talent planning

Firstly, strategic financial planning is crucial for building a diverse international talent team. Seeking investment from investors is viable, emphasizing the value of high-salary personnel. If hiring international talents is time-consuming, startups should also calculate the time investment. In talent evaluation, startups can use Dutch RVO's suggestions and criteria. Researching global culture and policies is essential for staying resilient, considering investments in adaptation and knowledge sharing. Because of the complexity, collaboration with specialist organizations' directors can aid startups in embracing international talents.

Secondly, startups should extend external access for global talent acquisition, leveraging current policies and innovative technologies. Online platforms, particularly popular during and after the pandemic, are instrumental in global recruitment. Executing hybrid working models improves efficiency and expands access to talents beyond the Netherlands. A new approach implemented in startups involves initially employing individuals to work within the Netherlands, allowing them to familiarize themselves with their roles before transitioning to fully remote work from their home countries. A founder of a technical hardware startup described it like this:

> *We have now one person working fully abroad. So he worked in the Netherlands for some time and went back to his hometown. And that's a very good way of working for us. So I think for us it's something we want to explore more. It's also the strategy of Europe.*

Despite strict policies on recruiting international talents, startups can execute new strategies within their operation mode. Opting for international talents with existing NL visas or EU passports streamlines the hiring process. Some startups explore collaboration with foreign companies for talent acquisition, although communication gaps may arise. To reduce costs, hiring interns at a lower allowance is a viable option. In this case, collaborating with universities and situating near campuses, facilitates access to young international talents to be interns and future employees. Additionally, startups can adjust payment methods, offering shares to employees instead of high salaries. An interviewee introduced us to this option:

> *If you look into this highly skilled migrant visa, that's really expensive. It's not something that a startup can afford. Then there's this new startup visa, which is the essential personnel visa which you pay a little bit less, but give shares to the employee. Which is sometimes hard.*

Thirdly, startups should foster an internal working culture that attracts global talents. This involves adapting the working environment to be more open and inclusive, with English as the primary language. Additionally, flexibility in hiring criteria, a flat organizational structure, and a liberated atmosphere resonate with the expectations of young talents from international universities. To ensure stability, valuing long-serving employees and providing flexibility and meaningful responsibilities contribute to fostering business loyalty.

- Optimized mix of investment

Key methods include maintaining clear and unified communication with investors and channel partners, involving them in significant projects like technical product redesign. Experts advise startups to include first-round production investment in contracts for safe early-stage operations. Conducting business in English and establishing an office in target investment locations enhance international connections for investments outside the Netherlands. An expert from the entrepreneurship support institution claimed the strategy:

> *(...) If you want investment from Silicon Valley, you have to have an office in Silicon Valley.*

Secondly, startups are advised to diversify funding sources beyond international investments. Internally, cost reduction operations, such as adjusting lower salaries and switching to cost-effective suppliers, can contribute to financial stability, especially as the business scales. Externally, seeking government support, exploring crowdfunding, and securing bank loans provide stable alternatives for capital. A mixed-sources revenue model strengthens adaptability against global investment risks. Additionally, the EU offers profitable projects for startups to generate small and stable revenues. As an experienced founder, an interviewee has done this before:

> *The European Union is putting a lot of effort in this new horizon project, which is a way that we actually got funding.*

Moreover, becoming profitable with sales is more important than raising investment. It not only earns the trust of investors but also reduces reliance on external funding. The best way to keep on the go is bootstrapping, wherein startups use revenue from product sales to fund further growth. In this case, startups have to make sure their products penetrate the market soon and trade them into cash. This statement is also mentioned in the Cost part; timing is significant for a startup business. One interviewee has his professional point of view on that:

> *The first one, which is basically the best, is bootstrapping. And that means you buy some components, you make a product, you sell it and you get a profit from that. And from the money you get you can buy the new components. So as investors say, money from your customers is the best investment.*

The last reaction mentioned by interviewees, is to select multi-round investors for startup business, which stands for those investors who are able to do big ticketing. Because supportive and long-term accompanying investors are prominent in the process of growing a startup:

> *For some types of investors, they can only do a small ticket, for example, 100,000 euros. And then the next round you have to find new investors. And that's a time intensive process. Actually you want somebody who can do 100,000, but then also in the next round 500,000 and then 1 million. That's how you select them.*

- Balance time and money

In the context of rising technical resource costs, the value of time (VoT) becomes crucial for startups. During the startup phase, prioritizing shipping, production efficiency and time-to-market over cost becomes essential in operation, acknowledging that time is often more valuable than money. One interviewee explained it this way:

> *It's very important for startups to know that the time between you and the market is much more important than optimizing the price. This is why you get investors, because the cost of the first product that you sell doesn't really count. But you need to invest into that in a later phase so you can lower the costs.*

In the scale-up phase, cost control becomes crucial. Optimizing the selection of collaboration from seeking cost-effective options, favoring local production, avoiding production in tense countries, implementing automation, and securing reliable suppliers establishes an adaptable framework for sustaining capital, ensuring financial stability and growth.

- Diversified marketing strategies

Startups are suggested to initially concentrate on the domestic market to build a strong foundation and increase visibility. After gaining market knowledge and experience, they can gradually adapt to neighboring countries. In situations where high market volatility hindering access to certain countries, consider indirect collaborations when the potential profits outweigh the challenges.

- Clear knowledge security

Interviewees emphasize the importance of researching knowledge protection laws in target foreign countries, stating that patent and IP protection is a new implementation to secure innovation, especially for software-based startups. For hardware-focused startups, local production can safeguard manufacturing knowledge. When collaborating with clients for constantly available external knowledge, startups should clarify needs and adhere to local rules. The suggestion is given by an interviewee:

> *We tell the Americans the basic things that we need to know and then they choose to tell us or not. So, if they tell us more than what we should then it's on their side. Liability is on their end that they broke ITER.*

Discussion

This paper focuses on conceptualizing dynamic stability strategies for technical startups amid deglobalization. The research starts from the initial research question: How do Validated Technical

startups React to Economic Deglobalization in terms of competitive capability resources? Competitive resources, derived from the Resources-Based View (Nath et al., 2010; Peteraf, 1993), empower startups with robust capabilities for stable business growth with economic deglobalization uncertainties. A validated technical startup can react to economic deglobalization by implementing strategies such as a flexible supply chain, comprehensive talent planning, an optimized mix of investments, a balanced time and money, diversified marketing strategies, and clear knowledge security. Each strategy offers multiple methods to enhance the dynamic stability of a startup's competitive capability.

Sankey diagram - 3 dimensions of reactions to ensure dynamic stability in startup

The impacts of economic deglobalization on technical startups allow us to connect situations with reactions. The design further extracts the inner strategies of these coping reactions and encompasses a broader set of approaches. Integrated with previous dynamic stability research on the 6R design framework (Kim et al., 2022) and Agile methodologies for innovation (Grass et al., 2020), we analyzed the content of Results and identified 3 keywords as dimensions that show the underlying logic of applying these reactions to deglobalization issues: Channel Resilience, Operational Adaptability, and Executive Innovation.

Resilience, adaptability, and innovation represent core mindsets under the umbrella of designerly thinking, which has been supported by emerging design methodologies such as Resilience thinking in Design (Cowley et al., 2018) and Design for Adaptability (Kasarda et al., 2007). Those mindsets enable organizations to respond effectively to challenges, navigate uncertainty, and drive continuous innovation (Cousins, 2018).

Combined with designerly thinking in organization management, the contents (situation-reaction-dimensions) depicted in a Sankey diagram provide strategic insights, offering an actionable framework for startups to navigate future deglobalization challenges. Paths from economic deglobalization situations (2nd Order Theme from Appendix 2) to startup reactions (2nd Order Theme from Appendix 3) and dimensions (Associated keywords clustering from Results) are represented, with path thickness indicating the universality of methods among technical startups.

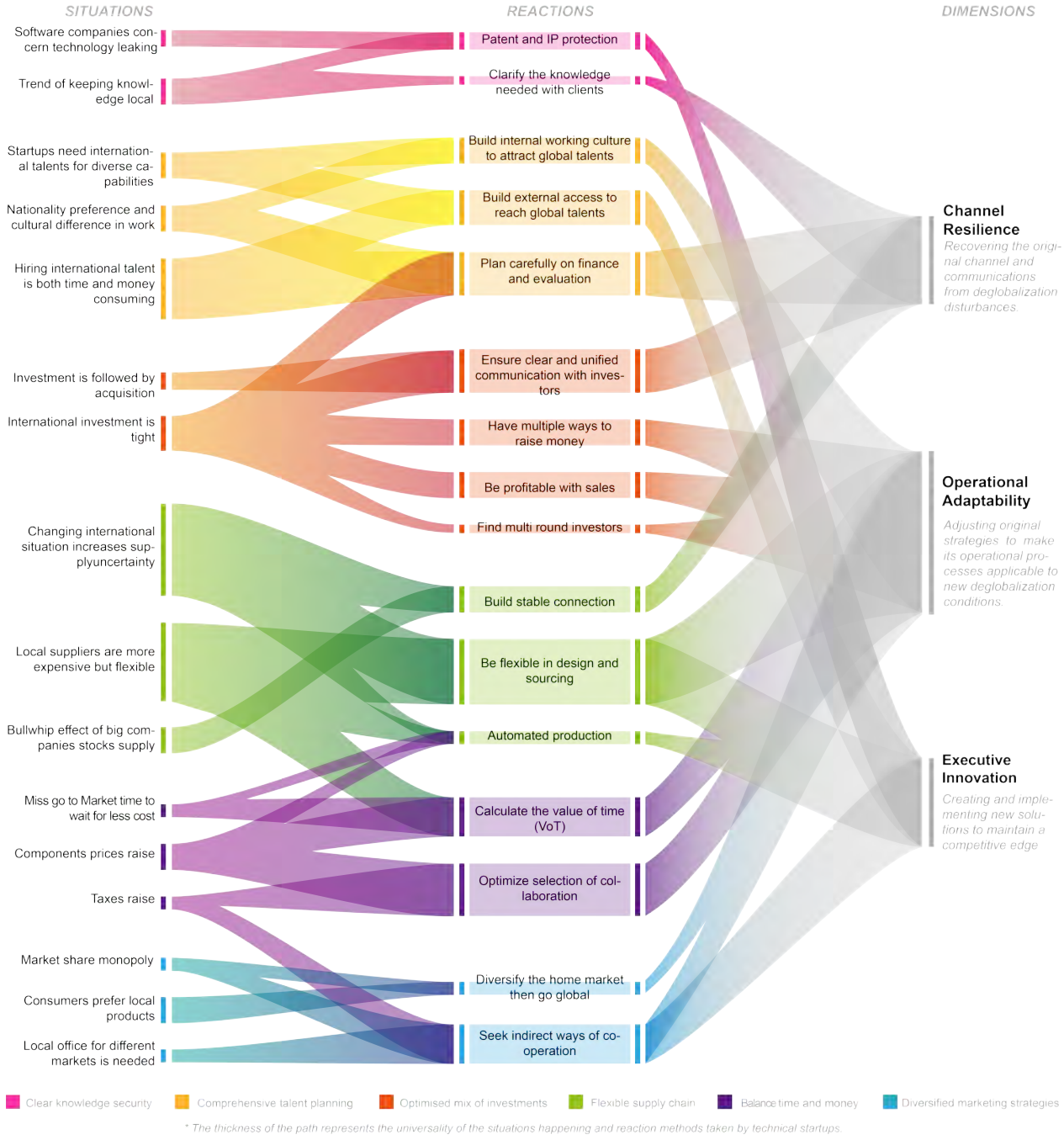

Figure 3. Situation-Reaction-Dimensions Sankey diagram for startups to react strategically to deglobalization challenges

Cross-correlations between different situations and reactions categories show the cross-influence of combinations of different issues and solutions. For instance, between the category of investment and talent, careful financial planning and evaluation alleviate the challenge of tight international investment. Technical startups can enhance investor confidence by strategically planning finances for acquiring the right talent. Between the category of cost and market demand, to mitigate the impact of increasing taxes, startups adopt market strategies like subcontracting business to foreign companies to expand their market, simultaneously saving on taxes for materials purchased from that country.

Correlations between different situations and reactions categories demonstrate the impact of resilience, adaptability and innovation in shaping business reactions towards dynamic stability, which are also frequently validated in Design and Business methodologies.

Channel Resilience means recovering the original channel and communications from deglobalization disturbances. Resilient by Design (Fiksel, 2015) states that managers are paying increasing attention to their organization's resilience to ensure growth in the changing economy. Kim et al. (2022) define being resilient as an action to return something to its original state after being disturbed, which has been identified as the core effort to cope with the recent COVID-19 challenges in their research. "Channel Resilience" is mentioned a lot in the Results section. Startups have tried different ways to recover their original channel from deglobalization, including flexibility in logistics management, clarification in communication and information sharing, and collaboration among channel partners. For example, negotiating more investment from investors or following instructions from talent acquisition institutions can help startups restore the channel to international talents despite the limitations of visas. Different from large organizations with strong risk management resources and capital chains, consultation and financial support from external experts and investors usually effectively contribute to the channel resilience of a startup.

Operational Adaptability means adjusting original strategies to make its operational processes applicable to new deglobalization conditions. Fiksel (2015) defines adaptability as the capacity to adjust or transform in response to changing conditions. Research has proved that adaptability has been incorporated in many existing enterprise architecture methods to design dynamically stable operations (Verhoeven, 2019; ÇAKMAK, 2023). Designerly thinking also proposes the adaptability of mindsets and methods as a basic requirement for design success (Cousins, 2018). "Operational Adaptability" in terms of making adjustments and modifications on an operational level is applied by many startups in the Results. This includes modifying workflows, restructuring resources and investments, and reallocating time and capital. For example a combination of local supply, outsourcing, self-production and collaborating with big corporations to get their supply are strategic plannings to confront uncertain supply disturbances. While traditional large corporations often have established processes, hierarchical decision-making systems, and bureaucratic layers that can hinder the agility and adaptability of operations (Aghina et al., 2015).

Executive Innovation means creating and implementing new solutions to maintain a competitive edge. Several studies indicate that innovation has a significant impact on the growth of startups (Teixeira et al., 2021; Grass et al., 2020). Dynamic stability has been linked to the innovation capacity of firms and their survival in turbulent environments (Kim et al., 2022; Teece, 2014). "Innovation" as a keyword is associated frequently with the results of reactions. When existing solutions are insufficient to address new deglobalization obstacles, startups can actively adopt innovative approaches in-house. For example, redesigning the technical board to source available components, and restructuring the combination of local supply, outsourcing, and self-production have proven to be effective in solving supply problems. In implementing innovative concepts and operations, startups can act quickly by re-design and re-structure. While innovations in large organizations often fall into the valley of death because of large efforts for aligning all the departments and commercialization process (Sandberg & Aarikka-Stenroos, 2014). Within large organizations, innovation is often insufficient to drive a project to receive a green light toward implementation through financial rigors (Klitsie et al., 2019). For example, Restructuring the combination of supply requires realignment of the supply chain partnership, reorganization of business structures, and upgrading of the technological infrastructure, are sometimes challenging for large enterprises to quickly coordinate among the stakeholders (Roh, 2011).

When compared with large corporations, startups are notoriously well known for acting quickly in terms of operational adaptations and executive innovations due to its fast-paced growth and flat organizational structure (Aghina et al., 2015). Those strategic methods and dimensions prove to have a positive impact to maintain the dynamic stability of their business growth. The Sankey diagram may function as a resource management navigation for both startups and big corporations in the deglobalization world. By identifying strategic reactions to specific situations, managers can not only proactively enhance their stability based on anticipated disruptions, but also promote a designerly thinking in channel resilience, operational adaptability, and executive innovation. Thus, the future will require managers and experts in the economic deglobalization environment to embrace the designerly thinking and have a deep understanding of cross relationships between situations, reactions, and dimensions.

Conclusive remark

Economic deglobalization poses challenges for global business development, especially for startups striving to achieve dynamic stability in sustaining their businesses. This research sheds light on understanding how technical startups respond to economic deglobalization. Pre-surveys and interviews with 19 founders in the entrepreneurship support institution provided valuable insights, yielding six main

categories: supply, talent, investment, cost, knowledge, and market demand. Six corresponding strategies were identified: flexible supply chain, comprehensive talent planning, an optimized mix of investments, balanced time and money, diversified marketing strategies, and clear knowledge security. From the results, we identified channel resilience, operational adaptability, and executive innovation as key elements in shaping startups' reactions. A Situation-Reaction-Dimension Sankey diagram is organized to claim startups' comprehensive understanding of economic deglobalization. Strategic planning in these categories enables startups and large corporations to navigate challenges, harness benefits, and foster dynamic stability amid economic uncertainties. For research development, future directions include expanding the scope to political and cultural deglobalization and exploring their interactions with startup businesses. Additionally, targeting software startups could offer insights into core knowledge protection, and validating reactions and dimensions in the Sankey diagram beyond deglobalization issues on a large scale is also necessary.

References

Aghina, W., De Smet, A., & Weerda, K. (2015). Agility: It rhymes with stability. McKinsey Quarterly, 51(4), 2-9.

Bello, W. (2008). Deglobalization: Ideas for a new world economy. Zed Books Ltd..

Bennett, N. & Lemoine, J.G. (2014). What a difference a word makes: Understanding threats to performance in a VUCA world. Business Horizons, 57(3), 311-317.

Bortolini, R. F., Cortimiglia, M. N., De Moura Ferreira Danilevicz, A., & Ghezzi, A. (2021). Lean Startup: a comprehensive historical review. Management Decision, 59(8), 1765–1783. https://doi.org/10.1108/md-07-2017-0663

Braun, E., Moreland, J., Sanders, E., & Gill, C. (2014). Designers in Design Thinking. In DS 78: Proceedings of the 16th International conference on Engineering and Product Design Education (E&PDE14), Design Education and Human Technology Relations, University of Twente, The Netherlands, 04-05.09. 2014 (pp. 302-307).

Cahyanto, T. D., Putri, I. S., Hamdani, M., (2021) The policy design to assistance tech startup for reducing the impact of covid-19 pandemic. EAI, retrieved from: https://eudl.eu/doi/10.4108/eai.14-9-2020.2304523

ÇAKMAK, Z. (2023). Adapting to Environmental Change: The Importance of Organizational Agility in the Business Landscape. Florya Chronicles of Political Economy, 9(1), 42-53.

Chase-Dunn, C. (1999). GLOBALIZATION: A WORLD-SYSTEMS PERSPECTIVE. Journal of World-Systems Research, 186–215. https://doi.org/10.5195/jwsr.1999.134

Cousins, B. (2018). Design thinking: Organizational learning in VUCA environments. Academy of Strategic Management Journal, 17(2), 1-18.

Cowley, R., Barnett, C., Katzschner, T., Tkacz, N., & De Boeck, F. (2018). resilience & design. Resilience, 6(1), 1-34.

Farndale, E., Thite, M., Budhwar, P., & Kwon, B. (2021). Deglobalization and talent sourcing: Cross‐national evidence from high‐tech firms. Human Resource Management, 60(2), 259–272. https://doi.org/10.1002/hrm.22038

Fiksel, J., & Fiksel, J. R. (2015). Resilient by design: Creating businesses that adapt and flourish in a changing world. Island Press.

Fiksel, J., & Fiksel, J. R. (2015). Resilient by design: Creating businesses that adapt and flourish in a changing world. Island Press.

Gardien, P. & Gilsing, F. (2013). Walking the walk: Putting design at the heart of business. Design Management Review, 54-66.

Gold, S., Seuring, S., & Beske, P. (2010). Sustainable supply chain management and inter‐organizational resources: a literature review. Corporate social responsibility and environmental management, 17(4), 230-245.

Grass, A., Backmann, J., & Hoegl, M. (2020). From empowerment dynamics to team adaptability: Exploring and conceptualizing the continuous agile team innovation process. Journal of Product Innovation Management, 37(4), 324-351.

Gyemang, M. D., & Emeagwali, O. L. (2020). The roles of dynamic capabilities, innovation, organizational agility and knowledge management on competitive performance in telecommunication industry. Management Science Letters, 1533–1542. https://doi.org/10.5267/j.msl.2019.12.013

Hassi, L. & Laakso, M. (2011). Design thinking in the management discourse: Defining the elements of the concept. 18th International Product Development Management Conference, Delft.

Kasarda, M. E., Terpenny, J. P., Inman, D., Precoda, K. R., Jelesko, J., Sahin, A., & Park, J. (2007). Design for adaptability (DFAD)—a new concept for achieving sustainable design. Robotics and Computer-Integrated Manufacturing, 23(6), 727-734.

Kim, E., Beckman, S., Kim, K., & Santema, S. (2022). Designing for dynamic stability in an uncertain world: A media content study of the aviation industry. Proceedings of DRS 2022

Kim, E., Beckman, S. L., & Agogino, A. (2018). Design roadmapping in an uncertain world: Implementing a customer-experience-focused strategy. *California Management Review*, *61*(1), 43-70.

Kim, E., Chung, J., Beckman, S., & Agogino, A. M. (2016). Design roadmapping: A framework and case study on planning development of high-tech products in Silicon Valley. *Journal of Mechanical Design*, *138*(10), 101106.

Kinnvall, C., & Kisić Merino, P. (2023). Deglobalization and the political psychology of white supremacy. Theory & Psychology, 33(2), 227-248.

Klitsie, J. B., Price, R. A., & De Lille, C. S. H. (2019). Overcoming the valley of death: A design innovation perspective. Design Management Journal, 14(1), 28-41.

Koentjoro, S., & Gunawan, S. (2020). Managing knowledge, dynamic capabilities, innovative performance, and creating sustainable competitive advantage in family companies: A case study of a family company in Indonesia. Journal of Open Innovation: Technology, Market, and Complexity, 6(3), 90.

Kornprobst, M., & Paul, T. V. (2021). Globalization, deglobalization and the liberal international order. International Affairs, 97(5), 1305-1316.

Kwak, D. W., Seo, Y. J., & Mason, R. (2018). Investigating the relationship between supply chain innovation, risk management capabilities and competitive advantage in global supply chains. International Journal of Operations & Production Management.

Laursen, L. N., & Haase, L. M. (2019). The shortcomings of design thinking when compared to designerly thinking. *The Design Journal*, *22*(6), 813-832.

Liu, C. H., & Mehandjiev, N. (2020). The effect of big data analytics capability on firm performance: A pilot study in China. In Information Systems: 16th European, Mediterranean, and Middle Eastern Conference, EMCIS 2019, Dubai, United Arab Emirates, December 9–10, 2019, Proceedings 16 (pp. 594-608). Springer International Publishing.

Lockwood, T. (2010). Design thinking in business: An interview with Gianfranco Zaccai. Design Management Review, 16-24.

Moustakas, C. (1994). Phenomenological research methods. Sage publications.

Postelnicu, C., Dinu, V., & Dabija, D. C. (2015). Economic deglobalization–from hypothesis to reality. Ekonomie a Management (E&M)/Economics and Management, 18(2), 4-14.

Ries, E. (2011), The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Business, Crown Business, New York, NY.

Roh, J. J., Min, H., & Hong, P. (2011). A co-ordination theory approach to restructuring the supply chain: An empirical study from the focal company perspective. International Journal of Production Research, 49(15), 4517-4541.

Sahakian, J., & BenMahmoud Jouini, S. (2023). Building design as a dynamic capability: A model for design integration. Journal of Product Innovation Management, 40(5), 733-758.

Sandberg, B., & Aarikka-Stenroos, L. (2014). What makes it so difficult? A systematic review on barriers to radical innovation. Industrial Marketing Management, 43(8), 1293-1305.

Santi, C., & Neves, G. T. (2020). Startups and prominent business. In New and Future Developments in Microbial Biotechnology and Bioengineering (pp. 209-223). Elsevier.

Seetharaman, P. (2020). Business model shifts: Impact of Covid-19. International Journal of Information Management, 54, 102173.

Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. Academy of management perspectives, 28(4), 328-352.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509-533.

Teixeira, E. G., Moura, G. L. D., Lopes, L. F. D., Marconatto, D. A. B., & Fischmann, A. A. (2021). The influence of dynamic capabilities on startup growth. RAUSP Management Journal, 56, 88-108.

van Alkemade, I., Fernandez, S. J., Kordian, P., Kyriakopoulos, N., Choi, Y., & Kim, E. (2024). How to respond to Change? Evidence of Cultural Organizations in Times of COVID-19.

Verhoeven, P. L. (2019). Adaptability by Design: Incorporating Adaptability Constructs in the Design of Digital Business Ecosystems (Master's thesis, University of Twente).from http://www.core77.com/blog/columns/why_design_education_must_change_17993.asp

Rust, C., Chamberlain, P., & Roddis, J. (2009). *A Practice-Centred Approach To Research In Industrial Design*. Paper presented at the Proceedings Of Design Plus Research Conference, Politecnico Di Milano.

Terry, N. (Ed.). (2012). *Managing by design – enacted through situated networks*. Boston, USA: Design Management Institute.

Tovey, M., Porter, S., & Newman, R. (2003). Sketching, concept development and automotive design. *Design Studies, 24*, 135–153. doi: 10.1016/S0142-694X(02)00035-2

Ulrich, K. T., & Eppinger, S. D. (2004). *Product Design and Development* (3rd ed.). New York, NY: McGraw-Hill/Irwin.

Zhang, H., Lili, M. I., Xuefeng, S. H. A. O., & Juan, B. U. (2024). Demystifying pathways of composition-based international strategies under the de-globalization world: A configurational approach. *Journal of International Management*, *30*(2), 101085.

Appendix

Appendix 1 Overview of the participants who were part of the interview study, their experiences, and business domains

ID	Role	Participant's experience, business domain
1	Founder	Founder of 8-Year-old high tech startup, developing a hardware device in wirelessly transferring energy to small Internet of Things devices.
2	Founder	Founder of 5-Year-old high tech startup, applying haptics to ship control ensuring the shipping industry to be safer and more efficient.
3	Founder	Founder of 4-Year-old high tech startup, developing a hardware device in improving stress resilience.
4	Expert	Leader of the funding department, ensuring expert lever overview in the funding area of startups.
5	Expert	Innovation expert, skilled in linking high tech applications to market opportunities in the startups.
6	Expert	Leader of the Talents department, ensuring expert level overview of talent recruitment within startup teams and international talent pool.
7	Founder	Founder of 8-Year-old high tech startup, developing validated sleep aids in the form of a hardware sleeping robot.
8	Leader	Leader within a 3-Year-old high tech startup, developing a hardware device to create Hydrogen Peroxide for the space industry.

Appendix 2：Data structure of Situations

Appendix 3: Data structure of Reactions