

## A Text Analytic on Dynamic Capability

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### ABSTRACT

Business strategy is a variable that affects the use of financial and non-financial performance metrics by firms. Companies use financial and non-financial performance measurements as a source of information to make continuous changes. This constant improvement encourages the development of dynamic capabilities so that the business may compete effectively in an environment of intense competition. Unique resources in the form of dynamic capabilities represent core competences. Companies have diverse dynamic capabilities. This distinction provides a corporation with a competitive advantage over its rivals. This study aims to identify the published development map and trend of Dynamic Capability from trustworthy sources. More than 873 Scopus-indexed research publications were reviewed. The R Biblioshiny program processed and analyzed the data to generate the development map for Dynamic Capability. The results showed an increase in publications on the study function's evolution. In addition, the study draws a number of important findings about Dynamic Capability and the direction of future research development.

**Keywords:** Dynamic Capability, Innovation, Text Mining, Firm Performance

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### INTRODUCTION

Companies employing cost-effectiveness initiatives typically employ financial performance indicators. Through product innovation, the differentiation approach is geared toward products with distinctive characteristics. Due to the long-term nature of innovation's efficacy, companies employing this strategy tend to prioritize non-financial performance metrics over financial ones. In the meanwhile, businesses with cost-effective strategies prioritize products with competitive selling prices. Because organizations must be able to attain cost efficiency, companies using this approach tend to utilize more financial performance indicators than nonfinancial ones (Nilsson and Rapp, 2005).

Financial and non-financial performance measurements provide companies with information. Operations can be studied and evaluated by businesses (Chenhall, 2003; Tuomela, 2005). Knowledge is a product of information. Businesses that are able to externalize their knowledge will improve their capabilities. Conversely, organizations unable to externalize it will diminish their capacities (Nonaka, 1994). Because the corporation faces a dynamic business environment, capabilities are not static but rather dynamic. Dynamic capabilities are obtained by the organization through its internal processes (Teece, Pisano, and Shuen, 1997).

Few studies have investigated the relationship between company strategy and performance measurements and dynamic capacities. Bisbe and Otley (2004), Henri (2006), and Widener (2005) were previous studies that developed research models based on the resources-based theory and dynamic capacity view. These studies investigate management control system

impact on an organization's effectiveness. The study's findings demonstrate that the deployment of management control systems can enhance organizational effectiveness.

## **LITERATURE REVIEW**

Teece, Pisano, and Shuen, (1997) argue that companies need dynamic capabilities to remain competitive in a constantly changing and dynamic environment. Businesses with dynamic capabilities can integrate, cultivate, and reorganize their resources and competencies. According to Teece et al. (1997), a company's capability should evolve in reaction to external changes.

Process capability includes (1) coordinating and integrating observation activities; (2) learning or collective social activities entailing experiments; and (3) reconfiguring and restructuring company resources appropriate to the technological and market environments.

Eisenhardt and Martin, (2000) argued that the dynamic capacities process is "specific and identifiable routines," which refers to the organization's distinctive, specific (idiosyncratic), and recognizable work routines. Eisenhardt and Martin, (2000) classify this process as follows: (1) the capability to integrate strategic decision making with operational routines; (2) the capability in configuring internal resources, such as resource allocation and worker collaboration; and (3) the capability to acquire and allocate company resources, such as forming alliances, releasing or transferring resources.

Based on the original notion proposed by Teece et al. (1997), three dimensions of dynamic capability include path dependence, positions, and process.

### **Path Dependence**

Dynamic capability is dependent on prior route dependence because it is shaped by earlier decisions and resources (Eisenhardt and Martin, 2000; Zollo and Winter, 2002). "Path dependency not only outlines the company's current alternatives, but also restricts its potential future repertory" Teece et al. (1997). A socially and collaboratively controlled learning process influences the development of path dependencies.

### **Positions**

An organization's strategic life is influenced not only by its history and the operations it conducts, but also by the holding of valuable and difficult-to-obtain assets. In addition to reputation and connection assets, complementary assets are equally crucial to the success of the firm Teece et al. (1997). Multiple assets that complement one another are vital to the organization Teece et al. (1997).

### **Process**

Coordination or integration (static concept), learning (dynamic concept), and reconfiguration or transformational concept are the three components of the process (Teece et al. 1997). Not only for internal organizations, but also for coordination or integration with external (outsourcing or strategic partnerships) and current technology, coordination or integration is of critical importance (Teece et al. 1997). Organizations consist of numerous subsystems (components) that are both interdependent and autonomous (Teece, 2007). Integration capability refers to organizational procedures for collecting and processing information, linking consumer experience with design decisions, and coordinating factories and suppliers that support them (Teece et al, 1997). In a fast changing environment, organizational units must have autonomy (to make decisions quickly) while maintaining contact with other unit activities to ensure they are well-coordinated, which is crucial as the cornerstone of dynamic capability (Teece, 2007)

## METHODS

The assessment was performed on January 15, 2022. Eligibility, screening, and inclusion are the three systematic review steps of research publications, as shown in Figure 1. This study will seek to answer the aforementioned research questions through the use of keywords. Several statistics derived from the data set provide a research overview on good governance. All items that meet the search criteria are subjected to textual analysis.

Data were examined by applying the biblioshiny software supported by the R-environment called the Comprehensive R Archive Network (CRAN), which is available at <https://cran.r-project.org/>. It has various quantitative tools in bibliometrics and scientometrics. Construction of bibliometric maps receives the most attention in the bibliometric literature. Several mapping strategies were used to assess the influence of differences on the measured similarity (Ahlgren et al., 2003),(Boyack et al., 2005). The results of "word"-related bibliometrics mapping will next be analyzed via text analysis.

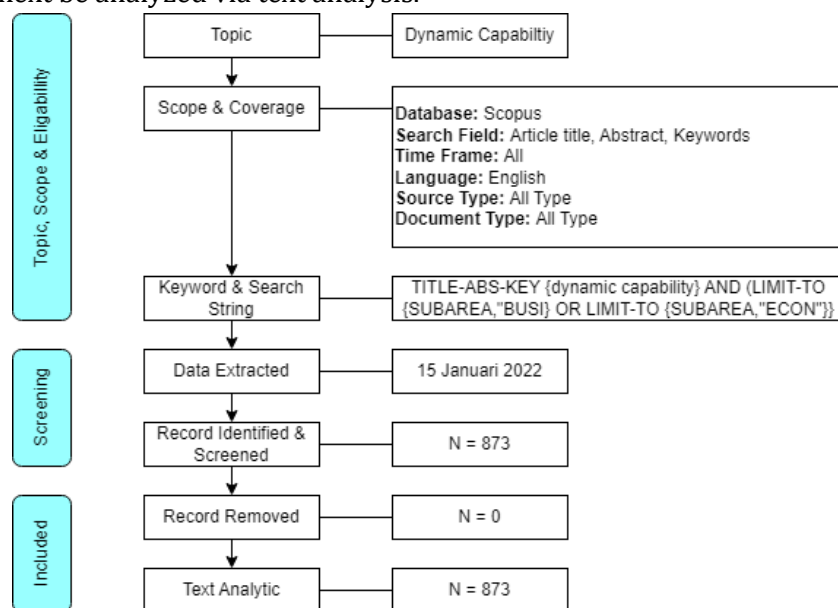


Figure 1. Flow diagram of the search strategy

## RESULTS

### Analysis Text

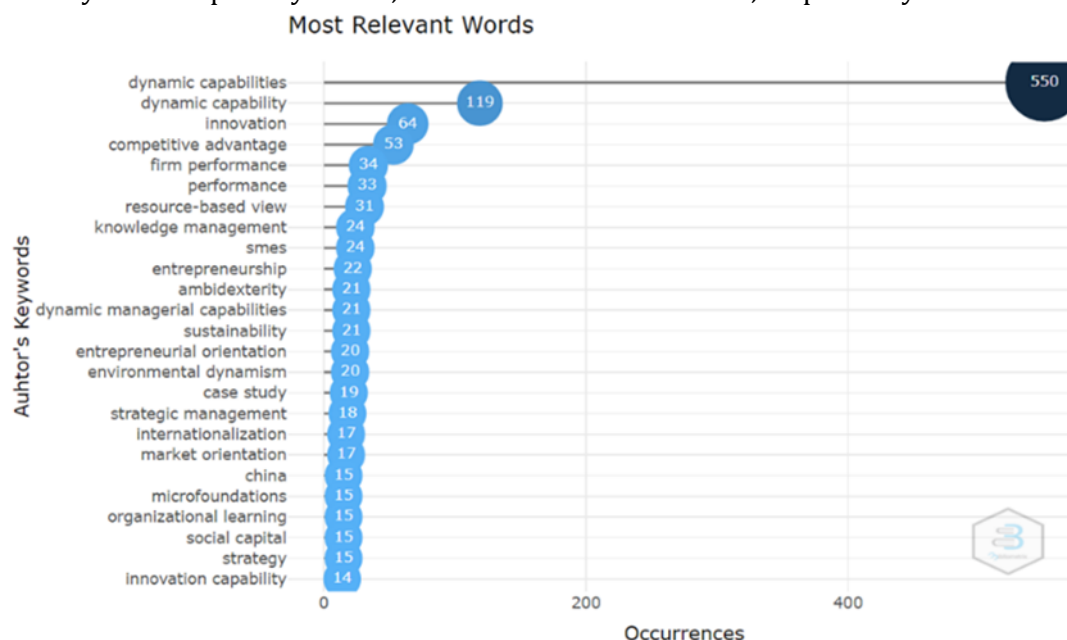
Text analysis used R-studio and biblioshiny software by Massimo Aria, Corrado Cuccurullo, and Luigi Vanvitelli of the University of Naples and the University of Campania, respectively (Italy). This involved searching for frequently occurring words associated with the theme of Dynamic Capability. This is designed to add references that the government can use to address economic issues, appropriate to current research from throughout the world.

In order to examine the meta-analysis, this section will show a visual mapping chart of 873 Dynamic Capability-related documents. The results help map the phrases significant or unique to particular publications. Mapping facilitates recognizing the configuration, dynamics, interdependencies, and interconnections of knowledge pieces.

### Most Relevant Words

The study performed the most relevant word analysis on each document's keyword with multiple terms occurring between 0 and 550 times. The graphic above displays the 25 most prevalent terms within the corpus associated with the phrase "Dynamic Capability."

The word Dynamic Capabilities, which appears 550 times, has the highest frequency and is most relevant to the keyword Dynamic Capability. The word Dynamic Capability appears 119 times, making it the second most frequent term associated with the subject of Dynamic Capability. Innovation and Competitive Advantage were the third and fourth most frequent terms associated with the Dynamic Capability theme, with 64 and 53 occurrences, respectively.



**Figure 2. Most Relevant Words**

Gao and Tian's (2014) research presents a new perspective for examining the performance mechanism of supply chain coordination capacity as a component of dynamic capability. Manufacturing capability plays a mediation function. In the meantime, Adam and Lindahl (2017) investigate the idea of dynamic capability and its application to construction enterprises. The study acknowledged the relevance of dynamic capabilities as an interpretive framework. However, the concept of dynamic capabilities alone cannot handle the operating environment of public client organizations. This pertains to the organizations' project-based nature and the difficulties defining "competitive advantage".

### Word Cloud

In addition, the Dynamic Capability-related keywords from the research will be shown as a word cloud on the title of the publication. Word cloud refers to the terms appearing frequently in data papers with the theme "Dynamic Capability"-related keywords. The word cloud presents a graphic of the words in varying sizes proportional to the frequency with which they occur. The location of words in word clouds tends to be arbitrary. However, the dominant words are positioned in the center, therefore more apparent and proportionally larger. The results of this study's word cloud were determined by analyzing the document's title.

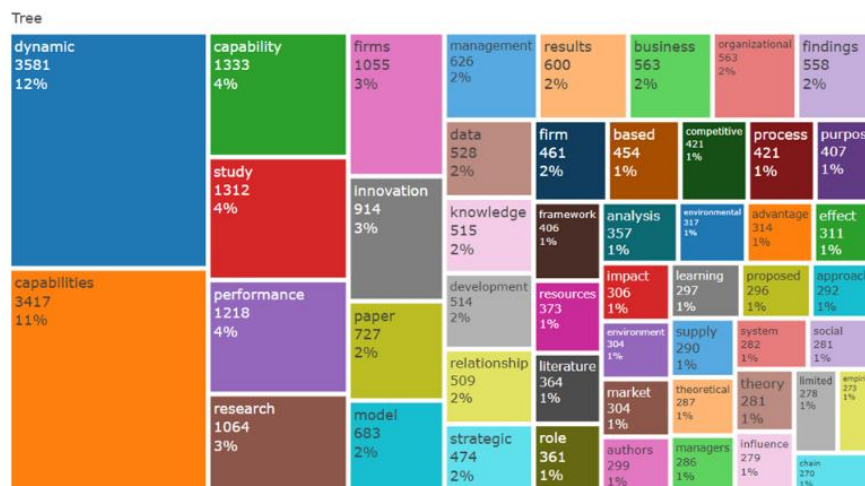
Dynamic, Capabilities, Capability, and Innovation are the most prevalent terms associated with Dynamic Capability, according to an analysis of the document's title's picture. The majority of contemporary research on Dynamic Capabilities focuses on "Dynamic Capabilities." Research conducted on Dynamic Capability is related to Organizational Search, Dynamic Capability, and Business Model Innovation (Zhao, et al., 2019), Motivating business towards innovation: A study using dynamic capability framework to analyze panel data (Hameed, et al., 2021), and Surviving an economic downturn: SMEs' dynamic capabilities (Hameed, et al., 2021). (Weaven, et al., 2021).



### Figure 3. Word Cloud

## WordTree Map

In addition, a word treemap will be used to illustrate the key research terms associated with the topic of Dynamic Capability in the abstract. Word TreeMap presents frequently occurring words in boxes resembling regions or areas on a map, where the greater the number of words, the larger the square area.



**Figure 4. Word Tree Map**

Dynamic, Capabilities, Capability, and Performance were identified to be the most frequently occurring terms in the research on the topic of Dynamic Capability, appropriate to the abstract's image analysis. The majority of current study on the subject of "Dynamic Capability" focuses on "Capabilities." Research on Dynamic Capability includes the title Balancing ambidextrous learning, dynamic capabilities, and business model design, a description of environmental dynamism's opposite moderating effects (Yuan, et al., 2021). This study aimed to investigate whether a balancing strategy for ambidextrous learning (BSAL) affects business model design (BMD) through dynamic capacities.

The study examined whether the relationship between dynamic capacity, novelty-centered, and efficiency-centered BMD is moderated by environmental dynamism in the opposite direction. It refers to a sample of 493 Chinese enterprises from various industries. Using OLS regression models and bootstrap techniques, the data were evaluated. The results demonstrate that dynamic ability mediates the BSAL positive effects on BMD centered on novelty and efficiency; environmental dynamism positively moderated capability dynamics – novelty-centered BMD relationships, whereas it negatively moderated capability dynamics – efficiency-centered BMD relationships. In addition, environmental dynamism attenuated in the opposite

direction the BSAL indirect effect on BMD that was based on novelty and efficiency via dynamic capacities. Theoretical and applied ramifications are examined.

### Word Dynamic

The Dynamic Capability study describes the often occurring words using a development curve with an annual occurrence value based on the document keyword analysis. The results show the annual average occurrence frequency of the keywords in the data analyzed for study on the topic of Dynamic Capability.

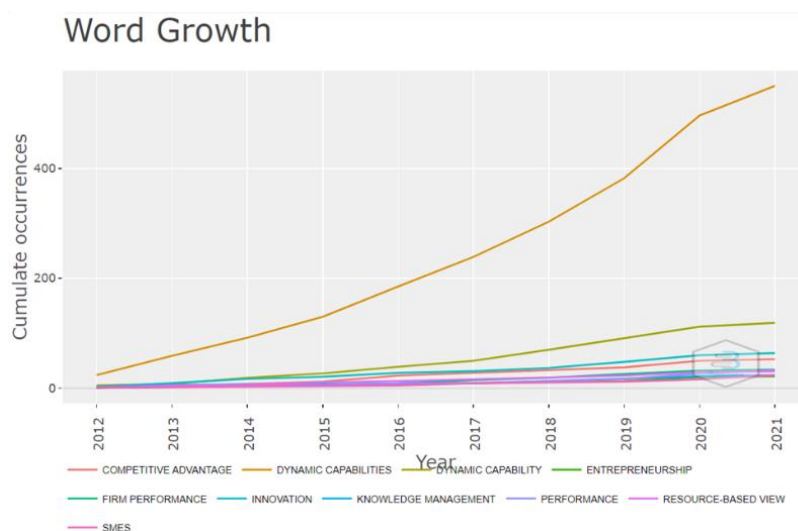


Figure 5. Word Dynamic

Figure 5 demonstrates that the majority of frequently occurring words have increased since 2012 and will continue to do so until 2021. From the image above, we can deduce that Dynamic Capabilities-related keywords show the greatest increase in frequency and have the greatest potential. significant enough to continue growing.

### Trend Topics

Based on the examination of the document's title on Dynamic Capability, the topic trend is equally essential. Figure 5 shows the yearly evolution of Dynamic Capability-related subjects. It shows the topics used for a long time and those utilized more recently. This topic's trend additionally takes into account the frequency value of each word as indicated by the log axis.

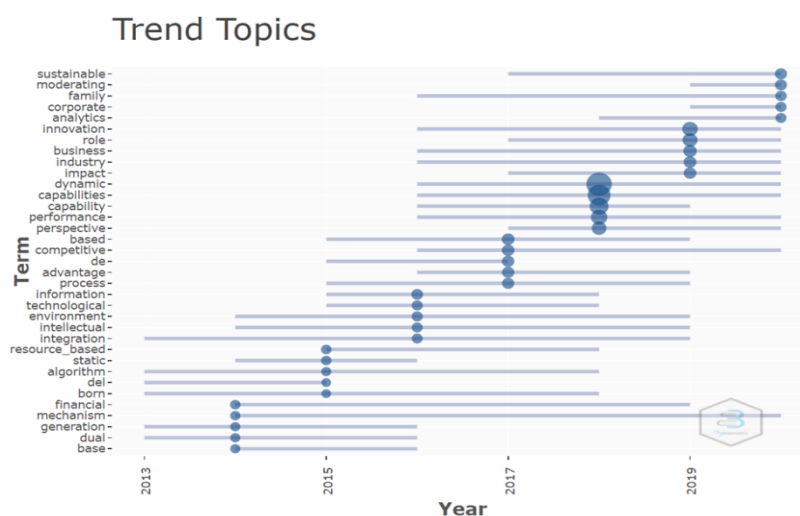


Figure 6. Trend Topics



In addition to analyzing annual trends, topic occurrences are also altered based on the frequency with which terms appear in Dynamic Capability-related study themes. A higher bar denotes the word applied frequently, and the distance to the right indicates the more recent use of the word. Since 2013, the development of the Dynamic Capability theme has increased significantly.

Sustainable, Moderating, Family, and Corporate are the newest and most popular subjects associated with the Dynamic Capability theme, appropriate to the data description provided above. The journal titled "Dynamic capacities for construction organizations in the era of the fourth industrial revolution" was written by Aghimien et al. (2021). A quantitative design with a questionnaire survey was used in this study. It also employed statistical methods such as percentages, the Mann-Whitney Test, and Partial Least Square Structural Equation Modeling (PLS-SEM). The results revealed that construction companies need transformational capabilities in knowledge management, technology governance, and the creation of new resources and processes to transform their service delivery and obtain a competitive advantage. The five senses and seven capturing capabilities highlighted in this study should also receive enough consideration, since they can have a substantial impact on the transformative capability of the construction organization. Theoretically, this study lays the groundwork for a more comprehensive examination of organizational competence development in future research.

### Co-occurrence Network

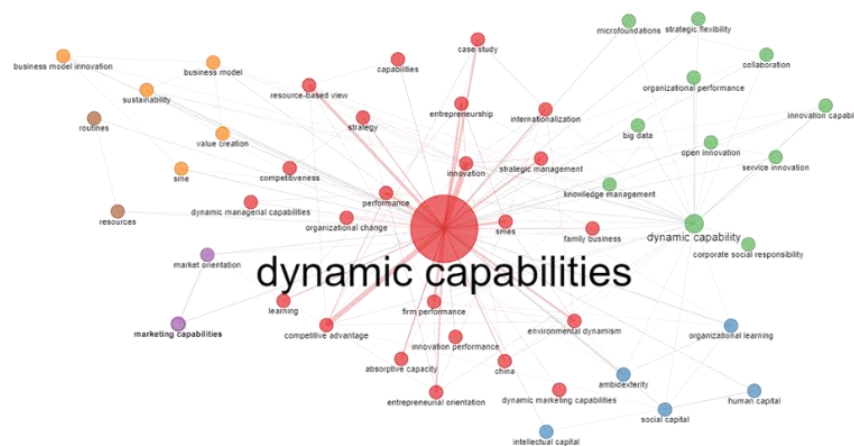


Figure 7. Co-occurrence Network

Co-occurrence network shows the words related to the Dynamic Capability theme. The words are shown in colored clusters based on their relationships. Several keywords often appearing under Dynamic Capability were divided into the following four clusters:

- Cluster 1 in red consists of keywords: Dynamic Capabilities, Learning, Competitive Advantage, Firm Performance, Absorptive Capacity, Entrepreneurship Orientation, Innovation Performance, Dynamic Marketing Capabilities, Environmental Dynamism, Dynamic Managerial Capabilities, Organizational Change, Performance, Competitiveness, Resource-Based View, Strategy, Capabilities, Case Study, Entrepreneurship, Innovation, Internationalization, Strategic Management, SMEs, Family Business.
- Cluster 2 in Green color consists of keywords: Microfoundations, Strategic Flexibility, Collaboration, Organizational Performance, Innovation Capability, Big Data, Open

Innovation, Services Innovation, Knowledge Management, Dynamic Capability, Corporate Social Responsibility.

- Cluster 3 purple color has keywords: Market Orientation, Marketing Capabilities.
- Cluster 4 in blue color has keywords: Organizational Learning, Human Capital, Social Capital, Ambidexterity, Intellectual Capital.
- Cluster 5 in orange color consists of keywords: Business Model Innovation, Sustainability, Business Model, Value Creation, SME.
- Cluster 6 in brown color consists of keywords: Resources, Routines.

### Thematic Map

This study analyzed the thematic map based on density and centrality by considering Dynamic Capability separated into four quadrants. The result was generated by a semi-automatic system examining all references to the study subject.

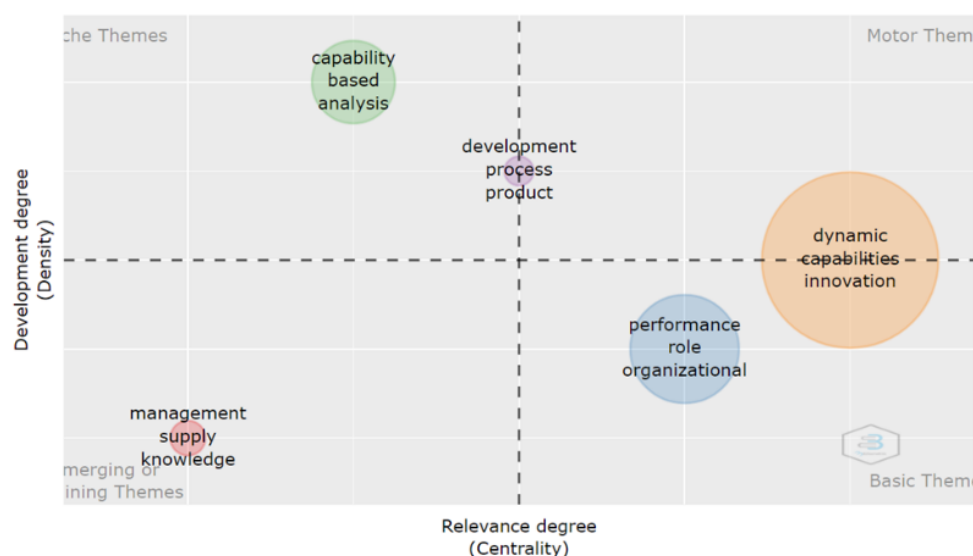


Figure 8. Thematic Map

The topic in the upper left quadrant is strongly progressive and distinct. Quadrants exhibit distinct themes and are infrequently researched, yet they are well developed, as demonstrated by their high density but low centrality. This quadrant's themes include Capability, Based, Analysis, Development, Process, and Product. While the lower left quadrant illustrates motifs that are developing or declining. This quadrant displays the topics applied for a long time but show a decreasing or increasing trend despite their low density and centrality. This quadrant's themes include Management, Supply, and Knowledge. The frequency of terms in this quadrant has increased as a result of recent advancements in the subtheme of Dynamic Capability.

As much as the top right quadrant contains a motor or driving theme illustrated by high density and centrality, it must be generated and is essential to continue investigation. This quadrant contains the themes Dynamic, Capabilities, and Innovation. Lastly, the lower right quadrant contains the fundamental and transversal themes, which have a high centrality but a low density. It is essential that these subjects be included in the research because they are widespread, generic concerns. This quadrant's recurring themes are Performance, Role, and Organizational.



## Thematic Evolution

The concept employed is that the research subject evolves, especially when comparing recently released studies to those published decades ago. The image above depicts the evolution that is analyzed by theme in Dynamic Capability-related research. The themes are depicted as rectangles whose size corresponds to their prevalence. Although the topic of this study is Dynamic Capability, the collected data reveals that other subthemes are also prevalent.

The Thematic Evolution consists of three sections. The left side of the graph displays a number of popular themes from 2012 to 2017, while the right side lists seven themes of varying sizes based on their frequency of use. The topic "Dynamic" ranks first, followed by the theme "Performance."

The second part lists the most commonly utilized themes between 2018 and 2019. Seven mentioned themes, three of which are a development of themes that developed in the preceding time, notably "Dynamic," "Capability," and "Performance," which is an extension of various themes illustrated through colorful narratives.

The final section on the right displays the most prevalent topics from 2020 to 2021. There are six themes, three of which evolved from the preceding period, notably "Dynamic," "Capability," and "Social," which is a continuation of various topics illustrated through colorful stories.

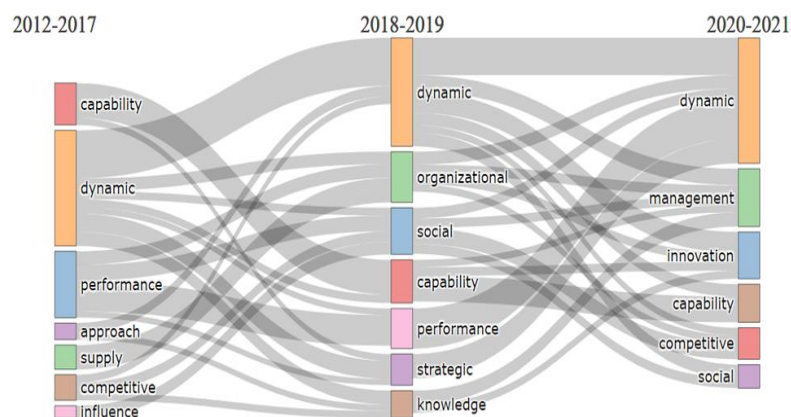


Figure 9. Thematic Evolution

## DISCUSSION

In a fast-moving corporation that deploys research and production resources geographically and organizationally, competitive advantage demands more than hard-to-copy assets (knowledge). It requires unique dynamic features and is unreplicable. These skills can be used to build, grow, protect, and sustain an organization's assets (Sunder M. et al., 2019).

Dynamic capabilities are hard to mimic and needed to react to changing consumers and technology (Carnahan et al., 2010). They recognize the company's ability to change ecosystems, create viable business models, and develop new commodities and processes. This 'orchestration' advantage enables the organization to innovate and capture enough value for superior long-term financial performance.

Market dynamics determine appropriate dynamic capacity pattern. Dynamic capacity' reliance on past knowledge varies. Moderately active markets fluctuate frequently but follow a linear pattern. They feature solid industry structures, well-defined market restrictions, and recognizable players (e.g., competitors, consumers, and complements). Effective dynamic skills in this industry require updated knowledge. Managers appraise the situation based on tacit

knowledge and heuristics, then plan and arrange their efforts (Teece, 2016). By following a linear approach from analysis through execution, they may create efficient, stable processes.

Dynamic capability requires situation-specific data. Action-based learning quickly produces new knowledge about the current environment, compensating for limited and irrelevant knowledge. Dynamic capabilities use prototypes and early testing to quickly gather fresh knowledge. Small losses and quick feedback accelerate behavior-based learning (Zahra et al., 2006). This market evolves dynamically. In less dynamic markets, managers recycle more by generating alternatives and executing linearly.

Dynamic capacities require real-time data, cross-functional interactions, and regular engagement. Process and market participation. Real-time information exposes people to the demand to adjust their behavior early since problems and opportunities are detected faster. Real-time data helps managers acquire market intuition, allowing them to adjust to shifting situations (Winter, 2003). In this industry, dynamic capabilities are defined by simultaneous assessment and partial execution (eg, prototyping) of many options.

The dynamic capabilities framework emphasizes organizational and (strategic) managerial qualities that allow organizations to develop competitive advantages and then modify semi-continuously to sustain them in an open market with rapid technological change. The framework blends principles from strategic management, business history, industrial ecology, law and economics, organizational science, and innovation studies. Dynamic capacities are generally managed by senior management, but they are influenced by past procedures, methods, and organizational structures.

## CONCLUSION

This study aimed to evaluate Dynamic Capability using text analysis for the 2012-2021 period with the main themes provided by the conceptual structure of R 'biblioshiny'. Co-occurrence networks were used to identify two networks in the Dynamic Capability literature. The two networks are "Dynamic" and "Capability", which could be combined to solve many environmental problems.

The study extended thematic maps to determine themes and subthemes on the graph and separated them into four clusters. The clusters include dropping, basic, highly developed, isolated, and motor themes. The theme of Capability, Based, Analysis, Development, Process, Product represented the highly developed and isolated themes quadrant. Then, the emerging or declining themes quadrant comprised Management, Supply, Knowledge. The motor themes quadrant consisted of Dynamic, Capabilities, Innovation. The Performance, Role, and Organizational themes also illustrated the basic and transverse themes.

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