

# Optimization of group decision making for superior SMES in China in the context of VUCA

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**Abstract:** *The VUCA era has provided a new impetus for China's superior SMES to show their advantages and contribute to the development of the economy, and the governance and development of superior SMES have attracted widespread attention from the academic community. From the perspective of group decision making, this paper will analyse the elements of group decision making of superior SMES, and make relevant suggestions on the optimisation of group decision making of superior SMES from both internal elements and processes, hoping to provide a perspective for further understanding of the development and decision making of superior SMES, and to provide ideas and theoretical guidance for superior SMES to adapt to the VUCA economic era, gain competitive advantages and achieve sustainable development. It also provides ideas and theoretical guidance for specialised enterprises to adapt to the VUCA economy, gain competitive advantage and achieve sustainable development.*

**Keywords:** *VUCA era; Superior SMES; Group decision making*

## 1. Introduction

With the promotion of the strategy of manufacturing power, China's economy is developing rapidly and the manufacturing industry is booming, but as time goes by, people are more concerned about the innovation ability of enterprises. By the end of 2022, the Ministry of Industry and Information Technology has certified four batches of "small giant" enterprises, totaling 9,279. In recent years, with policy support and their own efforts, private enterprises have played a huge role in promoting innovation, improving people's livelihood, increasing employment and expanding openness. The so-called "specialization, special new", that is, specialized, refined, special, novel enterprises, which is the evolution of the "invisible champion" from Germany. A series of support policies have been released and implemented one after another, which have cultivated many competitive and dynamic "Specialized, Specialized and New" enterprises, and "Specialized, Specialized and New Small Giants" are more specialized and innovative SMEs among Specialized and New enterprises. In the study of "Specialized, Specialized and New" enterprises, "Specialized, Specialized and New Small Giants" are more representative. Therefore, group decision optimization has become the key to improve the quality and efficiency of decision making, and how to achieve high quality in the context of VUCA era has become a hot topic of academic concern. In today's fast-changing business environment, companies are facing increasingly complex and changing challenges.

A group refers to two or more individuals who are grouped together to achieve a specific goal and form an interactive and interdependent relationship. Enterprises can be said to be a class of groups, where employees of enterprises combine together for corporate strategy, personal career development and other goals, abide by common rules and regulations, reward and punishment mechanisms, and form a reasonable division of labor and collaborative working relationships. Group behavior is inseparable from decision-making, which is a basic activity indispensable for people in work and life. Group decision making has its advantages and disadvantages, and it is not always better than individual decision making, or in all ways of use. The purpose of this study is to explore how to optimize group decision making in the context of the VUCA era in Chinese "specialization and innovation" enterprises. By taking into account factors such as diverse participation, information sharing and communication, intelligent decision support systems, scenario simulation and risk assessment, rapid iteration and agile decision making, and incentives and trust mechanisms, we will investigate how to build an effective group decision optimization framework to help companies make more informed decisions in complex and uncertain environments. Through this study, we expect to provide useful decision support and

management guidance for Chinese "specialised and new" enterprises to promote their sustainable development and competitiveness.

## 2. Theoretical foundation

### 2.1. Specialized and new related concepts

Early scholars interpreted the term "specialisation" separately. The term "specialisation" refers mainly to specialisation and specialised strategies. Adam Smith first proposed the division of labour and specialisation, encouraging firms to specialise in one area of work; Michael Porter proposed the strategy of specialization<sup>[1]</sup>, which means that enterprises focus on a specific region or customer group and provide products or services to them in order to achieve their core competitive advantage<sup>[2][3]</sup>. Garcia-Vega<sup>[4]</sup> suggests that technological specialisation facilitates the transfer of knowledge between products or businesses. The term "lean" refers mainly to lean production and refinement of management. The success of Toyota has led to the rapid spread of lean production worldwide, which has evolved into an integrated socio-technical system<sup>[5]</sup>. The widespread adoption of ISO 9000 shows that lean quality has become one of the central themes of European small businesses. In the 12th Five-Year Plan for the Growth of Small and Medium Enterprises issued by the Ministry of Industry and Information Technology in September 2011, it is proposed that "specialised, refined, special and new" means "specialised, finely managed, unique and innovative". This is the first time in a national policy document that the term "specialised and special new" is clearly defined. This is the first time that the connotation of "specialised, refined and special new" is clearly explained in a national policy document.

### 2.2. Concepts related to group decision-making

The study of group decision making began more than 200 years ago. In 1781 the French mathematician Borda proposed Borda's rule for group ranking of alternatives; in 1785 the French mathematician Condorcet, proposed Condorcet's rule and discovered the voting paradox. In 1951, the American economist Kenneth J. Arrow, who was awarded the Nobel Prize in Economics, published his book *Social Choice and Individual Values*, in which he formulated the famous impossibility theorem. This theorem states that, under a set of seemingly reasonable impossibility theorems, there is no social welfare function that is favoured by the members of the assembled society.<sup>[6]</sup> Arrow's impossibility theorem was a milestone in the study of group decision making, and became a classic conclusion in the study of group decision making. Subsequently, Fishburn investigated Arrow's theorem and proved that Arrow's impossibility theorem becomes a possibility theorem when the group has infinitely many individual members<sup>[7]</sup>. Different researchers have defined group decision making from different perspectives. According to Li Huaizu, a Chinese scholar, group decision making is the study of how a group of decision makers make a joint action choice. This definition focuses on how a decision group makes a joint action choice, usually this joint action is very complex, can be cooperative, can be competitive, or can be limited competition on the basis of cooperation. Hwang's definition actually portrays some of the characteristics of normative group decision making, i.e., the need to find a rule that is fair to the decision making group. Hwang's definition<sup>[8]</sup> actually characterizes normative group decision making more in terms of the need to find a rule that is fair to the decision making group to aggregate the preferences of individual decision makers. This definition emphasizes that group decision making is a process of finding a group utility function that each individual decision maker can agree on. Chen Scepter, a domestic scholar, defines group decision making as a variety of committees composed of representatives elected by the public, and group decision making is the pooling of the opinions of the members of the group to form the group's opinion. Luce and Raiffa argue that the problem of group decision making is to define a 'fair' way of pooling the choices of individuals to reach a social decision.

### 2.3. Concept related to VUCA era

VUCA is synonymous with Volatility, Uncertainty, Complexity and Ambiguity<sup>[9]</sup>. Sharifi(2001) believes that VUCA environment and customer opportunities change rapidly, which is difficult to predict, and organizations need to be agile<sup>[10]</sup>. Jain(2001) pointed out that enterprises need to respond quickly and effectively to the ever-changing and unpredictable customer-driven and competitive environment, which is the connotation of VUCA and the essence of agile<sup>[11]</sup>. Rosenbush(2007) proposed that VUCA means that customer demand, technology market and competitors are in dynamic

change<sup>[12]</sup>; Miller(2010) believes that VUCA will make enterprises face a series of fuzzy problems such as innovation rate and unpredictability of competitors<sup>[13]</sup>. Peter Drucker(2013) believes that the increasingly complex social environment presents both challenges and opportunities for enterprises<sup>[14]</sup>. Krupp(2014) sorted out four ways of thinking that enterprises need to cope with VUCA environment: global thinking, virtual thinking, innovative thinking and collaborative thinking<sup>[15]</sup>; Bartscht(2015) described VUCA as a sudden avalanche of information and technology overload in an enterprise<sup>[16]</sup>. CodreanuA(2016) believes that instability means that the change speed and direction of factors affecting the development of events are difficult to determine and cannot be repeated. Uncertainty refers to the difficulty in its changing trend; Complexity means that there are many kinds of factors, which are interrelated, and it is difficult to clearly sort out the causal relationship. Fuzziness refers to the ambiguity of its nature, state and structural characteristic<sup>[17]</sup>. Sushil(2017) proposes that in VUCA environments, flexibility is often seen as a mechanism to deal with risk, and in VUCA environments, the risk of failure seems to be higher when there is only one option, as it may not be able to meet unstable, uncertain and changing needs. Dynamic change mechanisms that support multiple options may help mitigate risk to some extent<sup>[18]</sup>; Complexity requires enterprises and all kinds of organizations to restructure the value chain. The fuzziness requires enterprises to verify the possible opportunities by relevant experiments. Yang Baiyin and Ouyangyang (2020) propose that instability is reflected in the fluctuation of the number of things, fuzziness makes the division of basic attributes of things unclear and causes the uncertainty of analysis and judgment<sup>[19]</sup>. Complexity refers to the complicated relationship between things, which makes it difficult to distinguish and understand. The three factors U, C and A all include uncertainty. Li Ping (2020) emphasizes that uncertainty means that the change speed of factors in the environment is greatly increased and the pace of development is accelerated instantaneously<sup>[20]</sup>. Uncertainty means that its change trend is difficult to predict and its evolution direction is difficult to grasp. Complexity means that its constituent elements and related relations are diversified; Ambiguity means that the information is neither complete nor accurate. The superposition of the four elements of VUCA will strengthen the frequency of black Swan events, and organizational resilience is the key to cope with it. He Guangyuan et al. (2020) analyzed the challenges faced by enterprise human resource strategic management in the VUCA environment, and built a four-element theoretical framework of human resource management based on the event system theory<sup>[21]</sup>.

#### **2.4. Review of the literature**

In summary, it is not difficult to find that the development of China's specialized SMES is faced with both opportunities and challenges, especially in the context of the VUCA era, the development of China's specialized SMES also needs to cope with the three major threats of uncertainty, ambiguity, and complexity, and since the goal of the development of the specialized SMES is to create a long-lasting and effective technological and product-service advantage, they need to be more rational and scientific when faced with decision-making with the goal of creating a long-lasting and effective technological advantage and product-service advantage. However, few scholars in China have discussed the relationship between the two, and without the discussion of this layer of relationship, China's superior SMES may fall into a decision-making error when faced with group decision-making choices. The paper also provides relevant suggestions on how to make better and more scientific and rational decisions in the context of the VUCA era.

### **3. Decision-making elements for superior SMES groups**

By relying on their expertise and innovation capabilities, superior SMESs have built a business ecosystem embedded with society, forming a relationship path of "individual enterprise - specialised and new business ecosystem - society". The study can focus on the special mechanisms of group decision-making in superior SMES, examining the collaboration mechanisms, information exchange and ways of negotiating decisions among the participating actors. By uncovering the mechanisms and influencing factors of group decision-making in superior SMES, it can provide useful guidance for their management and operation, thus promoting their development and success.

#### **3.1. Group decision-making objects of superior SMES**

The decision object is the decision object and the decision environment. The decision object determines the content and ease of the decision. The group decision objects of "Specialized" enterprises include products and services, the market and competitive environment, stakeholders, as well as

sustainability and social responsibility. The company offers a comprehensive range of products and services that span the entire product lifecycle, including design, development, production, distribution, service delivery, and operations. Group decision makers need to consider market demand for products and services, competition, technological innovation and other factors in order to make decisions that are in line with market demand and corporate strategy. The external market and competitive environment, which includes factors such as market size, growth trends, consumer demand and behaviour, and competitors' strategies, strengths and weaknesses. Group decision makers need to conduct a thorough analysis and assessment of the market and competitive environment in order to develop adaptive decision strategies. Stakeholder needs, including investors, partners, customers, employees, etc. The group decision maker needs to consider the needs, interests and expectations of each stakeholder in order to maximize benefits and achieve a win-win situation. This includes decisions on financial returns with investors, cooperation models with partners, product satisfaction with customers and the welfare and development of employees. Sustainable development and social responsibility, group decision makers need to consider environmental protection, social responsibility and ethics in order to make decisions that are consistent with the long-term development and social values of the company. This includes decisions to promote sustainable development strategies, focus on social impact, and promote public welfare.

### ***3.2. Group decision-making objectives for superior SMES***

The starting point for decision making is to avoid harm and maximise the benefits for all stakeholders. At present, superior SMES are under greater pressure to make adjustments and improvements in line with the development of the times, and group decision-making is more frequent. Therefore, the goal of group decision-making in superior SMESs should be achieved through the collective wisdom and collaboration of different stakeholders, in order to achieve the following goals:

Optimising resource allocation. The goal of group decision-making is to achieve the optimal allocation of resources. Through extensive participation and information sharing, group decision-making subjects can fully understand the internal and external resources of the enterprise, assess the benefits and risks of different resource allocation options, and make joint decisions on how to effectively allocate and utilise limited resources in order to maximise value and benefits.

Sustained growth and profitability. Group decision making is designed to drive sustainable growth and profitability. Through collective decision-making, clear strategic objectives and action plans can be developed with the participation and joint efforts of multiple parties, while reducing miscalculation and risk in decision-making. Group decision making helps to improve the accuracy and feasibility of decisions, ensuring that the business remains competitive and profitable in an ever-changing market environment.

Enhancing corporate image and social responsibility. One of the objectives of group decision-making is to enhance corporate image and fulfil social responsibility. By involving a wide range of stakeholders in the decision-making process, transparency and fairness can be ensured and the reputation and trust of the company can be enhanced. Group decision-making also helps to take full account of social and environmental factors, balancing economic, environmental and social interests in decision-making and achieving sustainable development and social values.

### ***3.3. Approaches to group decision-making in superior SMES***

The Delphi method is a technique that uses circular surveys and feedback to reach consensus and decisions. The method aggregates and gives feedback to team members' views through anonymous surveys and expert opinion collection, and then cycles through the collection of views again until consensus or agreement is reached. The Delphi method helps to reduce subjective bias and the pressure of collective decision-making. It also improves the accuracy and credibility of decisions; decision tree analysis is a decision model based on a tree structure that can be used to evaluate various decision options for potential outcomes and risks. Team members can work together to develop the branches and nodes of the decision tree, evaluate the likelihood and outcomes of each branch, and thus choose the best decision path. Decision tree analysis can help team members clarify the logic and potential impact of decisions and provide visualization and comparability of decisions; SWOT analysis is a common decision-making tool used to assess the strengths, weaknesses, opportunities, and threats of a company. Team members can work together to analyze factors related to the internal and external environment of the company and identify potential strengths and opportunities, as well as possible

weaknesses and threats. Through SWOT analysis, the team can better understand the positioning and development direction of the enterprise and provide comprehensive reference and guidance for decision-making; in the VUCA era, enterprises need to have the ability to adapt quickly and make flexible decisions. Agile decision-making methods emphasize the principles of iteration, trial and error, and rapid response, encouraging team members to actively participate and quickly adjust decisions. Team members can plan and execute decisions through short-term goals and iterative cycles to evaluate and adjust strategies in time to adapt to the rapidly changing market environment; stakeholder analysis is a method that helps teams understand the interests and impacts of different stakeholders in the decision-making process. Team members can identify and analyze the interests, power and concerns of each stakeholder and their potential impact on the decision outcome. Through stakeholder analysis, teams can better balance the interests and expectations of all parties, reduce conflict and resistance, and increase the acceptability and sustainability of decisions.

#### **4. Suggestions**

In the VUCA era, the changing economic environment requires companies to be more adaptable and resilient. Group decision making in specialised companies is a complex thinking process, and it is worth considering how to make effective group decisions according to the development needs of the company, so that specialised companies can gain a sustainable competitive advantage. In this paper, we present suggestions for optimising group decision making at both the internal and process levels.

##### ***4.1. Optimisation at the internal level***

###### ***4.1.1. Improve decision-making sensitivity.***

In the VUCA era, specialised companies are faced with rapidly changing market conditions and emerging opportunities. To optimise group decision-making, companies need to build agile decision-making capabilities. This means adopting flexible, rapid decision-making mechanisms to quickly adapt and respond to market changes. Specialised companies can use an iterative decision-making process, making decisions by taking small steps. This approach allows adaptation to rapidly changing business environments through rapid trial and error and learning. Companies can create agile teams, consisting of members from different functional and professional backgrounds, to be able to better collaborate and cooperate in the decision-making process. In addition, organisations can adopt agile methods and tools, such as agile project management and agile development methodologies, to support agile decision-making. With an emphasis on rapid iteration, timely feedback and continuous improvement, these methods can help organisations better cope with change and uncertainty. Agile decision-making also requires a culture and climate that encourages employees to proactively participate in the decision-making process and provide input and suggestions. Organisations can create incentives to reward employees for their initiative and innovative thinking to facilitate the practice and implementation of agile decision-making.

###### ***4.1.2. Build a diverse decision-making team.***

A diverse decision-making team includes members with different backgrounds, experience and expertise, and can bring a wealth of perspectives and ways of thinking that promote innovation and holistic decision-making. The formation of a diverse team should focus on the following aspects. Firstly, team members should have a broad diversity of backgrounds and areas of expertise, including people from different industries, functions and academic backgrounds. This will ensure that the decision-making process can be thought through and analysed from multiple perspectives and dimensions. Secondly, team members should have a diverse range of experience and expertise. Some members may have extensive industry experience and an understanding of market trends and business models, while others may have unique expertise in technology, science or innovation. Such a combination can lead to comprehensive decision analysis and insights. It is also important that team members collaborate and communicate with each other. Companies can provide collaboration tools and platforms that encourage team members to share information, exchange ideas, and leverage each individual's expertise and capabilities.

## ***4.2. Process optimisation***

### ***4.2.1. Suggestions for optimising the preparatory phase***

Before a group decision can be made, the decision maker needs to identify the problem, propose a decision topic and form a decision objective. In this process, problem identification requires a good understanding of the internal and external environment and a high level of insight and expertise; information gathering and filtering are also crucial for problem identification and decision topic definition. Clearly defined decision objectives ensure that team members have a clear understanding of the goals and objectives of the decision. This helps provide direction and guidelines and avoids confusion and deviation in the decision-making process. It is recommended that multiple sources of information be integrated. In addition to relying on internal data and information, it is also necessary to actively gather and integrate external information such as market research and industry trends. Diverse sources of information can provide a more comprehensive and objective basis to help make more informed decisions. It is advisable to define precise timelines and milestones for the decision-making process, in order to facilitate an efficient implementation. This helps to avoid delays and endless extensions and increases the swiftness and decisiveness of team decisions.

### ***4.2.2. Suggestions for optimising the discussion phase***

During the discussion stage, the decision maker should inform the members of the decision objectives and give them sufficient time to think before deciding on a solution through a discussion forum. During the discussion, all members should express their views, and the decision maker should combine the views of all members to form an alternative solution, which will be voted on by the members to determine the final solution. The first step is to establish a positive atmosphere of communication and cooperation, creating an open and respectful environment where team members are encouraged to actively participate in discussions and debates. It is imperative that each member is afforded the opportunity to express their views, present their ideas and respect and listen to the views of others. Furthermore, it is crucial to encourage innovation and diverse thinking. As specialized SMES emphasize the uniqueness and leadership of their technologies and services, there is a greater emphasis on innovation and team members are encouraged to come up with new insights, ideas and solutions. It would be beneficial for team members to be encouraged to consider problems from multiple perspectives and view them through different lenses, thus enabling them to make well-rounded and diverse choices. It is also important to utilize effective decision-making tools and techniques to help facilitate this. Appropriate decision making tools and techniques such as SWOT analysis, decision trees, brainstorming, and so forth, can help members of the team to analyse and evaluate. These tools can provide a structured approach and framework to assist in the effective decision-making process.

### ***4.2.3. Implementation of feedback phase optimization suggestions***

In the summary and feedback stage, specialised enterprises should set up special information officers in each department or at each level. After the implementation of the decision, the information officers should assist the decision maker in issuing tasks, recording the completion of tasks by group members on a daily basis or at each specific time period, and ensuring that the decision does not deviate from the target by monitoring the implementation status of each member of the group. If deviations occur, they should be reported to the decision maker so that solutions can be developed in time. Clear responsibilities and roles therefore need to be defined for each team member during the implementation feedback phase to ensure that the decision is implemented effectively. A clear allocation of responsibilities helps to avoid confusion and disruptions in the implementation of decisions. An effective monitoring and evaluation mechanism is also established, with key performance indicators and evaluation criteria to monitor the progress and effectiveness of decision implementation. Regular evaluations are conducted, and decision-making programmes are adjusted and amended in a timely manner to ensure that they meet actual needs and objectives. The promotion of learning and ongoing improvement should be encouraged among employees. The subsequent implementation of decisions should be regarded as a process of learning and ongoing improvement. The team should reflect on and summarise the successes and failures of decision making, learn from them and apply them to future decisions to continuously improve the team's decision making capabilities. The optimisation of the group decision making process is detailed in Figure 1.

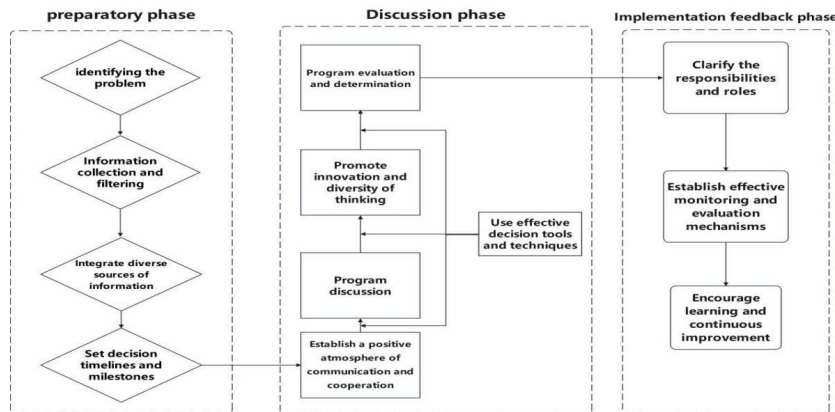


Figure 1: Group decision process optimization

## 5. Conclusions of study

In the context of the VUCA era, specialised enterprises are faced with the challenges of rapid change, uncertainty, complexity and ambiguity, so it becomes crucial to optimise the group decision-making process. From the perspective of group decision-making, this paper analyses the elements of group decision-making in superior SMES, including the subject, object, objectives and methods of group decision-making in superior SMES, and proposes suggestions for optimising group decision-making in superior SMES from both the internal level and the decision-making process. Firstly, at the internal level, specialised companies need to improve their decision-making sensitivity, form diverse decision-making teams, implement data-driven decision-making and establish communication and collaboration mechanisms. These recommendations are designed to help specialised companies make accurate, comprehensive and innovative decisions in a rapidly changing and uncertain environment in order to maintain a competitive advantage and sustain growth. At the same time, superior SMES should adopt and implement these recommendations in a targeted manner according to their own situation and characteristics, and continuously optimise and improve the process and effectiveness of group decision-making. The second is process optimisation. The preparatory phase of group decision optimisation in a specialised enterprise focuses on clarifying objectives and integrating diverse information; the discussion phase emphasises active communication and cooperation, encouraging innovation and diverse thinking; and the implementation phase requires clear responsibilities and roles, effective monitoring and evaluation mechanisms, and encourages learning and continuous improvement. Through these optimisation measures, specialised companies can improve the quality and effectiveness of group decision-making and enhance the decision-making capabilities of their teams to meet the challenges posed by the VUCA era.

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