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QUALIFICATION WORK

Education Degree - Master

on: **Management of the competitiveness of the enterprise**

Completed: student of
073 «Management» (EP «Administrative Management»)

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Faculty Economics and Management
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Education degree «Master»
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TASK

on qualification work for student

Miao Xiaohu

1. Theme of Qualification work: **Management of the competitiveness of the enterprise**

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Learn the theoretical reseach of enterprise competetiveness, analyze the competetiveness of enterprises Zhontian Marine System Company LTD, develop ways of improving the competetiveness of the enterprise Zhontian Marine System Company LTD, improve the strategy and strategic goals Zhontian Marine System Company Ltd, analyze the effectiveness of the integrated financial management and control model with unified distribution.

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2	Selection and analysis of literary sources, the preparation of the first theoretical chapter	<i>December 2023</i>	done
3	Preparation and presentation of draft of the first chapter of the thesis	<i>January 2024</i>	done
4	Collection and processing of factual material, synthesis analysis of application issues in the enterprise	<i>February 2024</i>	done
5	Making the theoretical part of the thesis, summarizing the analytical part	<i>February 2024</i>	done
6	Design options improve the research problem	<i>March 2024</i>	done
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11	Defense of the thesis	<i>March ,22 2024</i>	done

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Thesis allowed to defense

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ABSTRACT

Miao Xiaohu. Management of the competitiveness of the enterprise

Master's thesis in the specialty 073 «Management», EP «Administrative Management» SNAU, Sumy-2024 - Manuscript.

In the era of globalization and internationalization of the economy, the only criterion for efficiency and effectiveness of economic entities is competitiveness. Ensuring the competitiveness of economic entities in the international market in a global pandemic has become especially important. Globalization is a defining feature of the world economy, and economies' dependence on foreign markets is growing. Thus, the development of global competition necessitates the development of economic strategies aimed at improving the efficiency and competitiveness of enterprises. The authors proposed organizational and financial principles of ensuring the competitiveness of the enterprise, information, and analytical tools for controlling the efficiency and competitiveness of enterprises, identified and demonstrated the logic of harmonizing business management goals using analytical tools for managing the efficiency of the enterprise and developed methods for integrated assessment of enterprise competitiveness. Techniques of statistical, economic, and financial analysis were used in the study; used research methods: grouping, analysis, synthesis, comparison, etc.

This study aims to enhance enterprise competitiveness. By conducting in-depth research on competitiveness theory, analyzing its influencing factors and development strategies, and evaluating existing competitiveness evaluation models, this study examines the current state of enterprise competitiveness through case analysis and proposes strategies for improving competitiveness. Additionally, it analyzes the impact of the business environment on enterprise competitiveness and suggests relevant response measures and strategic directions. This study adopts literature analysis and case study methods to review and analyze competitiveness theory, investigate the competitiveness status of case enterprises, and summarize the research findings. The research results provide theoretical support and practical guidance for enterprises to enhance competitiveness.

Keyword: enterprise, competitiveness; competitiveness theory, case analysis, business environment, strategic directions.

АНОТАЦІЯ

МЯО СЯОХУ. Управління конкурентоспроможністю підприємства.

Магістерська робота за спеціальністю 073 «Менеджмент», ОП «Адміністративний менеджмент» СНАУ, Суми-2024 - Рукопис.

В епоху глобалізації та інтернаціоналізації економіки єдиним критерієм ефективності та результативності суб'єктів господарювання є конкурентоспроможність. Забезпечення конкурентоспроможності суб'єктів господарювання на міжнародному ринку в умовах глобальної економіки набуло особливої актуальності. Глобалізація є визначальною рисою світової економіки, і залежність економіки від зовнішніх ринків зростає. Отже, розвиток глобальної конкуренції зумовлює необхідність розробки економічних стратегій, спрямованих на підвищення ефективності та конкурентоспроможності підприємств. Автором запропоновано організаційно-фінансові принципи забезпечення конкурентоспроможності підприємства, інформаційно-аналітичний інструментарій контролю ефективності та конкурентоспроможності підприємства, визначено та продемонстровано логіку узгодження цілей управління бізнесом за допомогою аналітичного інструментарію управління ефективністю підприємства та розроблено методику комплексної оцінки конкурентоспроможності підприємства.

Дане дослідження спрямоване на підвищення конкурентоспроможності підприємства. Проводячи глибокі дослідження теорії конкурентоспроможності, аналізуючи фактори її впливу та стратегії розвитку, а також оцінюючи існуючі моделі оцінки конкурентоспроможності, у цьому дослідженні розглядається сучасний стан конкурентоспроможності підприємства за допомогою аналізу кейсів та пропонуються стратегії підвищення конкурентоспроможності. Крім того, проаналізовано вплив бізнес-середовища на конкурентоспроможність підприємства та запропоновано відповідні заходи реагування та стратегічні напрямки. У цьому дослідженні використовується аналіз літератури та методи кейс-стаді для розгляду та аналізу теорії конкурентоспроможності, дослідження стану конкурентоспроможності підприємств-кейсів та узагальнення результатів дослідження. Також у дослідженні використовувалися методи статистичного, економічного та фінансового аналізу та методи дослідження: групування, аналіз, синтез, порівняння тощо.

Результати дослідження забезпечують теоретичне обґрунтування та практичні рекомендації для підприємств щодо підвищення конкурентоспроможності.

Ключові слова: конкурентоспроможність підприємства; теорія конкурентоспроможності; аналіз кейсів; бізнес-середовище; стратегічні напрямки.

INTRODUCTION

Actuality of theme. Enterprise competitiveness is the ability of enterprises to obtain sustainable competitive advantages in market competition, which is of great significance to the survival and development of enterprises. With the increasingly fierce market competition, enterprises are facing more challenges and opportunities. In this context, how to improve the competitiveness of enterprises has become a key issue for enterprise development.

At present, the research on enterprise competitiveness by domestic and foreign scholars has achieved fruitful results. However, due to the differences in the industry and market environment of different enterprises, the strategies and methods of how to improve competitiveness are different for different enterprises. Therefore, this study aims to systematically study the theory and strategy of firm competitiveness, and explore effective ways and strategies to improve firm competitiveness through empirical case analysis.

Specifically, this study will first summarize and analyze the definition, sources and influencing factors of competitiveness. Secondly, the strategies for developing enterprise competitiveness will be summarized, including product strategy, market strategy and human resource strategy. At the same time, through the introduction, evaluation and revision of the existing competitiveness evaluation model, a competitiveness evaluation model suitable for this study is constructed. Then, select the appropriate case for analysis, analyze the product competitiveness, market competitiveness and organizational competitiveness of the case enterprise by collecting case data, and propose corresponding competitiveness improvement strategies. Finally, the impact of the business environment on the competitiveness of enterprises will be analyzed at a macro and industry level, and corresponding countermeasures and strategic directions will be proposed.

Through this research, it will provide in-depth theoretical support and practical guidance for enterprises to improve their competitiveness. For enterprises, it will help to better grasp market opportunities and enhance core competitiveness, so as to be

invincible in the fierce market competition. At the same time, this research will promote the further development of competitiveness theory and enrich the content and methods of competitiveness research.

The purpose and objectives of the master's work. The purpose of this study lies in in-depth study of enterprise competitiveness and proposing corresponding improvement strategies, which has important guiding significance for enterprises to improve their competitiveness.

The author's research mainly includes parts: First, studying the theory of enterprise competitiveness can help enterprises understand the concept, sources and influencing factors of competitiveness more comprehensively. Through a deep understanding of competitiveness, enterprises can make targeted strategic planning and decision-making to better respond to the challenges of market competition.

Secondly, this study will revise and empirically apply the firm competitiveness evaluation model. The existing competitiveness evaluation model mostly uses quantitative indicators to evaluate the competitiveness of enterprises, but this evaluation method may limit the competitiveness of enterprises to specific performance indicators, and cannot fully reflect the competitive potential and advantages of enterprises. Through the evaluation and revision of the existing model, this study will propose a more comprehensive and operable competitiveness assessment model, so as to provide enterprises with a more accurate and comprehensive competitiveness assessment tool.

In addition, this study will conduct in-depth research on the current situation of enterprise competitiveness through case studies and propose corresponding competitiveness improvement strategies. Through the analysis and evaluation of the product competitiveness, market competitiveness and organizational competitiveness of the case enterprise, it can help other enterprises understand their own competitiveness and learn from the successful experience of the case enterprise, so as to enhance their own competitiveness.

This study will also analyze the impact of the business environment on the competitiveness of enterprises, and propose corresponding countermeasures and

strategic directions. The business environment is a dynamic and complex system, and different macro environments and industry environments have an important impact on the competitiveness of enterprises. Through macro analysis and industry analysis of the business environment, this research will provide useful research enlightenment and application suggestions for enterprises to grasp environmental factors, formulate strategic positioning and enhance their competitiveness.

The object of the study is the management system of the enterprise's competitiveness

The subject of the study is the activity of the enterprise in the context of managing the competitiveness of the enterprise.

The practical significance of the work performed is that its results can be used in the activities of enterprises and serve as a basis for use in work and increase competitiveness.

The information base of the research is scientific works and leading foreign experts on the chosen subject, data from official reports of the enterprise, available statistical information.

The significance of this research is to deeply study the competitiveness of enterprises and put forward corresponding improvement strategies, so as to provide theoretical support and practical guidance for enterprises to improve their competitiveness. Through the study of competitiveness theory, the revision of competitiveness evaluation model, case analysis and business environment analysis, this research will provide comprehensive ideas and directions for enterprises to improve their competitiveness.

List of publication:

1. Miao Xiaohu Increasing the level of competitiveness of the enterprise (take an example of zhongtian marine system Co., Ltd). *Стратегічні пріоритети розвитку бухгалтерського обліку, аудиту та оподаткування в умовах глобалізації : матеріали II Міжнародної науковопрактичної конференції* (м. Суми, 16 листопада 2023 р.) / за ред. проф. Назаренка О.В. Суми: СНАУ, 2023. С.275-277.

2. Miao Xiaohu Increasing the level of competitiveness of the enterprise (take an example of Zhongtian Marine System Co., Ltd). *Матеріали науково-практичної конференції викладачів, аспірантів та студентів Сумського НАУ (25-28 квітня 2023 р.)*. Суми, 2023. Р.381.

Thesis consists of an introduction, three chapters, list of references that includes 29 publications, applications, 12 tables, 1 figures. Full volume of 69 pages, of which the main text - 60 p.

CONTENT

INTRODUCTION	6
CHAPTER 1. THEORETICAL RESEARCH ON ENTERPRISE COMPETITIVENESS.....	9
CHAPTER 2. ANALYSIS OF THE COMPETITIVENESS OF ENTERPRISES ZHONTIAN MARINE SYSTEM COMPANY LTD.....	20
2.1. The current status of the company's business Zhontian Marine System Company Ltd	20
2.2 Industry and market environment analysis Zhontian Marine System Company Ltd	26
2.3 Competitive status analysis Zhontian Marine System Company Ltd.....	31
CHAPTER 3. WAYS OF IMPROVING THE COMPETITIVENESS OF THE ENTERPRISE ZHONTIAN MARINE SYSTEM COMPANY LTD.....	40
3.1 Improvement of strategy and strategic goals Zhontian Marine System Company Ltd	40
3.2 Alibaba's internal control system	46
3.3 Financial management and control mode of unified division.....	52
3.4 Analysis of the effectiveness of the integrated financial management and control model with unified distribution...../.....	59
CONCLUSIONS.....	70
LIST OF USED SOURCES.....	73
APPLICATIONS	

CHAPTER 1

THEORETICAL RESEARCH ON ENTERPRISE COMPETITIVENESS

The definition of competitiveness relates to a firm's capabilities and advantages over other competitors in a market environment. Competitiveness can be described as the efficient use of resources and capabilities by a business to gain a sustained competitive advantage and succeed in the market. The definition of competitiveness is usually linked to a firm's market position and ability to create value.

Competitiveness is closely related to market position. A competitive enterprise usually gets a large share of the market and has a good brand reputation. By providing quality products and services, competitive businesses are able to attract more consumers and maintain their loyalty. Therefore, the definition of competitiveness can include the position and influence of the enterprise in the market.

Competitiveness is related to the ability to create value. Competitive companies are able to use their resources and capabilities efficiently to reduce costs, improve quality and create unique value. Through innovation and continuous improvement, competitive companies can provide differentiated products and services that meet consumer needs and gain a competitive advantage. Therefore, the definition of competitiveness also includes the value creation capacity of enterprises.

The definition of competitiveness is also related to the sustainable development and adaptability of enterprises. Competitive companies are able to maintain a competitive edge in a changing market environment and adjust their strategies and operations in a timely manner. Through flexibility and creative thinking, competitive companies are able to meet the challenges of the market and find new business opportunities. Therefore, the definition of competitiveness also includes the sustainable development and adaptability of the enterprise [18].

The definition of competitiveness is linked to a company's position and influence in the market, its ability to create value, and its ability to develop and adapt. By better understanding the definition of competitiveness, companies can more fully leverage their strengths and implement strategies to improve their competitiveness.

The source of competitiveness is the superior resources and capabilities that enterprises have in market competition. These resources and capabilities can be acquired and enhanced in a variety of ways. First of all, the production capacity and technical level of enterprises are an important source of competitiveness. By improving production efficiency and quality, enterprises can realize cost advantages in product development and production process, and provide competitive products and services. Secondly, the innovation ability of enterprises is also an important source of competitiveness. By continuously improving and innovating products and services, businesses can win the favor of consumers in the market and increase market share. In addition, the company's brand and reputation are also an important source of competitiveness. Having an excellent brand image and word of mouth can enhance consumer recognition and loyalty, thereby gaining competitive advantage in market competition. In addition, the human resources and organizational capabilities of enterprises are also important sources of competitiveness. Through effective talent recruitment, training and management, enterprises can improve the professional ability and teamwork ability of employees, and create core competitiveness for enterprises. Finally, companies can also gain a competitive advantage by building good partnerships and supply chain management. By working closely with suppliers, distributors and partners, companies can integrate resources, expand markets, and maximize cost advantages and benefits. In summary, the sources of competitiveness are many, and enterprises can improve their competitiveness by improving production capacity, innovation ability, brand image, human resources and cooperative relations [21].

The influencing factors of competitiveness are an important research direction in the study of enterprise competitiveness. The factors influencing competitiveness

include internal factors and external factors. Internal factors mainly refer to the company's own capabilities and resources, including the company's technological innovation ability, product quality, production efficiency, human resources, etc. External factors mainly refer to the market environment and industry environment in which the enterprise is located, including market demand, market competition situation, industry development trend, etc.

The technological innovation ability of enterprises is one of the important factors affecting the competitiveness of enterprises. With the continuous advancement of science and technology, technological innovation has become the key to improving the competitiveness of enterprises. Through continuous technological innovation, enterprises can strengthen the differentiation of products or services, improve product quality and function, and meet the needs of consumers. Technological innovation can also bring higher production efficiency and lower costs to enterprises, thereby enhancing the competitiveness of enterprises [3].

Product quality is one of the key factors affecting the competitiveness of enterprises. In the fierce market competition environment, consumers have higher and higher requirements for product quality. High-quality products can win the trust and satisfaction of consumers, thereby increasing market share and improving the competitiveness of enterprises. High-quality products can also reduce the cost of after-sales service and improve the operational efficiency of enterprises.

Human resources are one of the important factors affecting the competitiveness of enterprises. Excellent workforce is the cornerstone of enterprise competitiveness. Having a high-quality and efficient workforce can improve the innovation ability and production efficiency of enterprises, thereby enhancing the competitiveness of enterprises. Reasonable human resource strategies and employee training plans are also important means to improve employee satisfaction and cohesion, thereby enhancing the competitiveness of enterprises [5].

The influencing factors of competitiveness involve the internal capabilities and external environment of enterprises. Enterprises should improve their competitiveness by strengthening technological innovation, optimizing product

quality and rationally utilizing human resources to meet the challenges of market competition. Only in an environment of constant development and adaptation can companies stay ahead of the competition.

In the process of improving the competitiveness of enterprises, product strategy plays a crucial role. Excellent products can improve the market share, competitiveness and profitability of enterprises. This research aims to explore how to improve the competitiveness of enterprises through product strategies.

On the one hand, for the formulation of product strategy, enterprises should determine the positioning and characteristics of products according to market demand and competition. Through market research and analysis, businesses can understand consumer needs and preferences and use this information to develop and improve products to meet market needs. In addition, enterprises should also pay attention to competitors' products and market responses, and adjust product strategies in time to ensure that products have competitive advantages [6].

On the other hand, for product development and innovation, enterprises need to continuously invest and improve. By investing more in R&D, companies can develop more competitive products and continuously improve and optimize existing products. Product innovation and upgrading can improve the added value of products, thereby improving the market competitiveness of enterprises.

At the same time, enterprises should also consider the quality and quality management of products. High-quality products can win the trust and praise of customers in the market, thereby improving the brand image and market share of enterprises. Therefore, enterprises need to establish a sound quality management system, ensure the quality control of products in all aspects of the production process, and deal with customer feedback in a timely manner to improve product quality and customer satisfaction.

At the same time, in the process of formulating and implementing product strategies, enterprises also need to pay attention to the coordination and cooperation with other strategies. For example, in the marketing strategy, enterprises can enhance the competitiveness of products through market positioning and marketing means; In

the human resources strategy, enterprises should select and cultivate talents with relevant professional knowledge and skills to support product development and sales efforts.

In general, product strategy is an important means to improve the competitiveness of enterprises. Enterprises should formulate product strategies according to market demand and competition, and improve the competitiveness of products through continuous R&D and innovation, quality management and coordination with other strategies. Through these efforts, enterprises will increase market share and profitability, improve competitiveness and achieve sustainable development [8].

Market strategy is one of the important means for enterprises to improve their competitiveness. The development of a marketing strategy needs to take into account factors such as the market positioning of the product, the needs of the target market, and the situation of competitors. This chapter will explore the impact of market strategies on firm competitiveness on the basis of the previous theoretical research on competitiveness.

The formulation of market strategy needs to be determined according to the company's product characteristics and the needs of the target market. First of all, enterprises need to accurately position their products and determine the positioning strategy of the products. Product positioning refers to the characteristics and advantages that a company has over competitors in the target market. Through accurate positioning, enterprises can effectively meet the needs of the target market and occupy a favorable competitive position in the market.

The go-to-market strategy also needs to take into account the needs of the target market. The demand of the target market is an important basis for enterprises to formulate market strategies. Companies need to understand the demographics, consumer preferences, purchasing power and other information of the target market and incorporate it into related strategies such as product development, sales, pricing, and more. By meeting the needs of the target market, enterprises can improve the market competitiveness of their products and gain more market share.

The marketing strategy also needs to take into account the situation of competitors. The existence of competitors has a direct impact on the competitiveness of enterprises. Enterprises need to understand the product characteristics, market share, brand influence and other information of competitors, and develop their own strategies by studying the market strategies of competitors. By analyzing competitors, companies can find their competitive advantages and develop corresponding market strategies.

In the process of developing a market strategy, companies also need to take into account the impact of the market environment. The market environment refers to the external environment including political, economic, social, technological and other factors. Enterprises need to analyze the market environment, understand the changing trend of the market, the intensity of competition and other factors, and incorporate it into the formulation of market strategies. Through the analysis of the market environment, enterprises can adjust their market strategies in time to improve their competitiveness.

Market strategy is one of the important means for enterprises to improve their competitiveness. By accurately positioning products, meeting the needs of target markets, analyzing competitors, and considering the impact of the market environment, companies can develop effective market strategies, improve competitiveness, and succeed in the market. Therefore, in the process of improving the competitiveness of enterprises, the formulation of market strategies is very important and necessary [16].

This research will focus on the impact of firms' HR strategies on competitiveness. In the face of fierce market competition, having excellent human resources will become an important factor for enterprises to gain competitive advantage. The human resources strategy aims to enhance the competitiveness of the enterprise by optimizing and improving the quality and ability of its employees.

Companies should focus on employee recruitment and selection to ensure that talent with relevant skills and qualifications is selected from the start. With the right recruitment channels, screening methods and interview techniques, companies can

attract and select employees who are in line with their growth strategy. These employees will have a high degree of recognition of the company's goal and mission, and contribute to the development of the enterprise.

Enterprises should pay attention to the training and development of employees. Through continuous training programs and development opportunities, employees are not only able to improve their professionalism and skills, but also to continuously adapt and respond to changes in the market. The content of training can include technical training, management training, communication skills training, etc., to improve the comprehensive ability and competitiveness of employees [21].

Companies should also pay attention to employee incentives and reward mechanisms. Through a reasonable salary system, incentives and reward mechanisms, it can improve employees' job satisfaction and enthusiasm, and stimulate their innovation and creativity. Enterprises should establish a sound performance evaluation system to promote employees' self-awareness and improvement through the evaluation and feedback of employee performance.

Enterprises should also pay attention to employee development and career planning. By providing a good growth environment and development platform, employees are provided with opportunities for promotion and promotion, and stimulate their motivation to pursue excellence and personal development. Enterprises should also pay attention to the work-life balance of employees, provide employees with flexible working hours and welfare packages, and improve employees' job satisfaction and loyalty.

This research will study and analyze the impact of human resource strategies on the competitiveness of enterprises. Optimizing and developing the human resources of enterprises will provide strong support for enterprises and the basis for striving for competitive advantage. Through appropriate recruitment and selection, training and development, incentives and career planning strategies, enterprises can attract and retain excellent talents, enhance the comprehensive ability and competitiveness of employees, and thus promote the sustainable development and competitiveness of enterprises.

The current state of the competitiveness assessment model is presented in section of this study. At present, there are a variety of competitiveness assessment models, some of which have been widely used and have achieved good evaluation results. Some of the main existing models are described below [8].

The first is the McKinsey competitiveness model. The model assesses the competitiveness of firms by analyzing their value chains. The model divides the value chain of the enterprise into two parts, internal and external, and evaluates the competitiveness level of the enterprise by analyzing the activities within the enterprise and the correlation with the external environment. The advantage of this model is that it can take into account the internal and external factors of the enterprise, and comprehensively evaluate the competitiveness of the enterprise.

The second is Porter's competitive diamond model. This model was proposed by Porter in 1990 to assess the competitiveness of enterprises by analyzing the industry environment in which enterprises operate and their own resources and capabilities. The model takes into account factors such as industry factors, demand factors, supporting industries and corporate strategies to comprehensively assess the competitiveness level of enterprises. The advantage of this model is that it can comprehensively evaluate the competitiveness of enterprises by taking into account the industry environment in which the enterprise is located and the company's own resources and capabilities.

There are also other competitiveness assessment models, such as the Dufrest Five Forces model, the SWOT analysis model, and so on. These models have their own characteristics and advantages, and they can be evaluated by selecting appropriate models under different research objects and research objectives.

In general, the existing competitiveness assessment models provide important theoretical and methodological support for the evaluation of enterprise competitiveness. This study will comprehensively analyze the characteristics and advantages of these existing models, and select the appropriate model for competitiveness assessment based on the specific conditions of selected case

enterprises, so as to provide a scientific and effective reference for improving the competitiveness of enterprises [6].

In this study, the existing competitiveness evaluation model is evaluated and revised in the section Model Evaluation and Amendment. First, the existing models were collected and organized, including the definition, application areas and evaluation methods of each model. Second, by comparing and analyzing these models, it is found that they have some shortcomings and limitations in assessing competitiveness. For example, some models are too subjective and lack objectivity; Some models consider only certain aspects and ignore other important factors. Therefore, these deficiencies have been corrected in this study to provide a more accurate and comprehensive assessment of competitiveness.

The method of correction consists of two aspects. First, this study introduces objective indicators and quantitative methods to improve the objectivity of assessment. Through the collection and analysis of enterprise data, combined with relevant economic, market and social factors, a set of quantifiable competitiveness evaluation index system has been established. These indicators include but are not limited to market share, sales, brand influence, product quality, R&D investment, etc., which can comprehensively evaluate the competitiveness of enterprises in products, markets and organizations.

This study further improves the evaluation methods and weight allocation of existing models. Through the analysis of the existing models, it is found that there are some problems in their weight allocation, resulting in inaccurate and reliable evaluation results. Therefore, the analytic hierarchy method (AHP) and principal component analysis (PCA) method were used to modify and improve the model. The AHP methodology can help determine the weighting of indicators to reflect the importance of each indicator to competitiveness; The PCA method can reduce the dimension of the index, reduce the redundant information, and improve the explanatory ability of the model [7].

In this study, the revised model was empirically applied. By selecting several enterprises as a sample, collecting their relevant data, and using the revised

evaluation model for competitiveness assessment. Through the analysis of the evaluation results, it is found that the revised model can more accurately assess the competitiveness of enterprises and provide more targeted guidance and suggestions for enterprises.

In this study, the existing competitiveness evaluation model is evaluated and revised in the section Model Evaluation and Amendment. By introducing objective indicators and quantitative methods, improving evaluation methods and weight allocation, and empirical application, it provides a more accurate, comprehensive and reliable competitiveness assessment model, which provides better theoretical and practical support for enterprises to improve their competitiveness.

In this study, the competitiveness evaluation and analysis of selected firm competitiveness evaluation models are empirically applied. First of all, in terms of product competitiveness, the product competitiveness score and ranking are obtained by evaluating the characteristics, quality, innovation and differentiation of the product. Secondly, in terms of market competitiveness, through the analysis of market share, market share growth rate, market penetration rate and other indicators, the score and ranking of market competitiveness are obtained. Finally, in terms of organizational competitiveness, through the evaluation of organizational structure, management ability, human resource allocation and other factors, the score and ranking of organizational competitiveness are obtained.

Based on the empirical application results of the model, this study evaluates and summarizes the competitiveness of the case enterprises. In terms of product competitiveness, the product scores of the case enterprises are high and ranked high, indicating that their products have strong competitiveness in the market. In terms of market competitiveness, the market share of the case enterprise is large, and the market share growth rate is relatively high, indicating that it has strong competitiveness in the market. However, in terms of organizational competitiveness, the case enterprises still need to be optimized in terms of organizational structure and management capabilities, and there are also certain problems in their human resource allocation, resulting in relatively weak organizational competitiveness [5].

Based on the above analysis results, this study proposes a strategy for improving the competitiveness of case enterprises. First of all, in terms of products, it is recommended that case enterprises increase product research and development and innovation to further improve product differentiation and quality to increase the market competitiveness of products. Secondly, in terms of market, it is recommended that case enterprises increase their efforts to expand the market, explore new market areas, increase market share and market penetration, and enhance market competitiveness. Finally, in terms of organization, it is recommended that case enterprises optimize organizational structure, strengthen management capabilities and human resource allocation, and improve the competitiveness of the organization.

The empirical application results of the model in this study provide an important basis and guidance for the improvement of the competitiveness of case enterprises. Through the competitiveness assessment and strategy analysis of different aspects, the competitiveness level of enterprises can be effectively improved, and then obtain greater competitive advantages in the market. The research results also have certain reference significance, which can provide reference and enlightenment for the competitiveness improvement of other enterprises.

CHAPTER 2

ANALYSIS OF THE COMPETITIVENESS OF ENTERPRISES ZHONTIAN MARINE SYSTEM COMPANY LTD

2.1 The current status of the company's business Zhontian Marine System Company Ltd

Driven by the needs of the country's major strategy of building a maritime power, Zhongtian Marine Systems Co., Ltd. is striving to seize the rare opportunity, adhere to the road of product specialization, excellent quality and service differentiation, and provide more and better system-level products and services for the construction of marine monitoring capacity and water environmental protection.

It has developed the first set of online water quality monitoring and early warning system of "Tongtianhe" based on the form of underwater observation network in China, passed the provincial new product appraisal, reached the domestic leading level, filled the technical gap of in-situ, three-dimensional and rapid acquisition of water quality data, and provided a revolutionary new means for water quality monitoring and real-time early warning of rivers, rivers, lakes and reservoirs.

The company also independently develops and produces dry (wet) plugging, optical (electrical) watertight connectors and components, establishes a complete design, manufacturing and testing platform, and forms a standardized, modular and serialized product system, covering marine general series, marine special series, underwater plug-in type, land and air general series, etc., the products have made major breakthroughs in reliability and safety, and have formed a batch of stable supply.

Relying on the strong support of submarine cable companies, the high-quality submarine cable accessories developed and produced are widely used in offshore oil and gas, wind power, communications and power transmission and other fields, and the products cover low-voltage to high-voltage (500KV) submarine cables,

submarine photoelectric composite cables, submarine optical cables, dynamic cables and umbilical cable related accessories, providing integrated solutions from design, production, testing to installation, and the products are exported to many countries and regions around the world. In 2019, Ocean Systems achieved sales revenue of 100 million yuan and profit of 8 million yuan. The completion of the 13th Five-Year Plan of Ocean Systems is shown in the table below.

Tabele 2.1 - Marine Systems' sales during the 13th Five-Year Plan (100 million)

Product items	Sales performance in 2016~2019	Sales target for 2020	Sales in 2020
Submarine cable accessories	3,62	0,96	0,99
Subsea Feeder Box	0,00	2,00	0,27
Watertight connectors	0,09	0,50	0,09
Observing systems	0,42	3,00	0,27

Source: own research

During the "13th Five-Year Plan" period, the company completed the industrialization of product technology, and further developed the technology based on the former Zhejiang University. In terms of longitudinal development, the research and development of 15kV/40kW energy routers, 10Gbp large-bandwidth long-distance communication systems, and 4500m underwater sealing structures have been completed to improve the observation coverage of the submarine observation network and meet the technical requirements of large science and engineering. In terms of horizontal development, the product expansion is carried out on the basis of submarine observation network technology, and a series of products represented by offshore small observation stations, self-contained observation stations, buoy seabed-based three-dimensional observation stations, etc., are widely used in marine science, marine ranching, underwater security and other market fields.

Based on the technology of submarine observation network, it has been successfully extended to the underwater security system to realize continuous, online and underwater visual monitoring and early warning of water quality and characteristic intrusions in key waters. It's becoming a standard form of security. It

has been successfully used in the 3rd World Internet Conference in Wuzhen in 2016, the 2017 Xiamen BRICS Summit, and the 2018 Boao Forum for Asia.

In terms of watertight connectors, in 2016, the independent research and development of dry-pluggable metal shell underwater connectors, only one year to complete the development of 2000m underwater electrical connectors, optical connectors and photoelectric mixed connectors, through the Jiangsu Provincial Oceanic and Fishery Bureau hosted the appraisal meeting, underwater electrical connectors are at the leading level in China, and underwater optical connectors have reached the international advanced level. Through continuous research and development, the current metal optical and electrical connectors can be applied to 4500m water depth. This type of product is used in Ocean University of China, Harbin Engineering University, 702 Institute of China Shipbuilding Industry Co., Ltd., Zhejiang University University, 719 Institute of China Shipbuilding Industry Co., Ltd., and the Ministry of Natural Resources of the People's Republic of China.

In 2017, it reached an agreement with the Shenyang Institute of Automation of the Chinese Academy of Sciences to fully transform its rubber underwater connector technology and industrialize it, and completed the identification of new products of 7000m water depth rubber connector at the end of 2018, and the appraisal conclusion of Jiangsu Provincial Department of Industry and Information Technology is at the leading level in China. On this basis, the development of a series of products has been completed, which can fully replace foreign imported products, and the products have been applied to the Naval University of Engineering, the National Marine Environmental Technology Center, the Changsha Mining Research Institute, the Deep-sea Institute of the Chinese Academy of Sciences and other units.

In 2018, the company independently established the project for the development of underwater plugging and unplugging electrical connectors, cooperated with the Shenyang Institute of Automation, Chinese Academy of Sciences, and developed 4-core underwater electrical connector products on the basis of foreign product research, which passed the third-party test and completed the underwater plugging and unplugging test verification in Nantong Yunhu Underwater

Observation Network, Yangtze River Observation Network, and Dongshan Observation Station of Xiamen University. At the end of 2019, Zhongtian Technology completed the appraisal of new products of 2000-meter-level underwater plug-in electrical connectors, and the appraisal conclusion of Jiangsu Provincial Department of Industry and Information Technology was at the leading level in China. At present, the product has passed the joint debugging test in 702 Institute, and has established cooperation intentions with 704 Institute, China National University of Offshore Engineering, CNOOC, etc.

Analysis of the macro environment of the company's development:

1) Political Environment:

Opportunities: The international order is facing major changes, the strategic economic position of the ocean is becoming increasingly prominent, due to the relationship between China and the United States trade war, affecting the export of cutting-edge technology and products to China by most Western countries, and strengthening the country's determination to research and develop marine equipment; The Ministry of Natural Resources has formulated the strategy of "maritime power", and the development of marine equipment has a strong demand, and the Ministry of Natural Resources clearly points out that in-situ online ecological early warning and monitoring must be included in the marine observation network system. Localization substitution is imminent, and the localization substitution rate is included in the important indicators of national scientific research project acceptance.

Challenges: Affected by the epidemic and international unilateralism, some voices of "deglobalization" have begun to emerge in the world, and the export blockade of domestic technologies and products from foreign countries has increased the difficulty of research and development. In the future, the country will gradually adopt the method of comparison and measurement for screening in the field of marine procurement, pay attention to performance cases, and the phenomenon of "Evergrande of the Greatest" will inevitably appear in the field of marine observation.

2) Economic environment

Opportunities: All coastal provinces and cities have increased their support for the marine economic industry, and the research and commercialization of emerging marine energy such as offshore wind power, wave energy, and natural gas hydrate have become increasingly mature, gradually forming a set of industrial ecological chains integrating platform construction, energy exploitation, and ecological environment monitoring.

Challenges: Due to the overall international economic situation and the impact of trade protection, the domestic economy is facing downward pressure, and since 2020, the government's budget for scientific research projects has shown a trend of tightening and contracting, which has a greater impact on products such as marine equipment with government investment as the main sales model; The global market economy will stagnate or regress, and cost-effective and high-quality services will be the mainstream model in the next two years.

3) Social environment

Opportunities: Observation and early warning of natural disasters such as marine earthquakes and tsunamis are becoming increasingly important; The public and the media have paid more and more attention to the protection of marine ecological environment and offshore fishery resources. The demand of customers for localization is becoming more and more urgent and supportive.

Challenges: Due to the impact of the epidemic, the promotion and implementation of projects in the field of ocean observation have been generally delayed; Customer requirements have not been reduced because of domestic substitution, our company's benchmark products are foreign mature products, and it takes time for customers to recognize domestic products.

4) Technical environment

Opportunity: In terms of observation network, domestic connectors, controllers, semiconductor devices and other supporting technologies have developed rapidly, and sample trials and technical support can accelerate the upgrading of product technology. The development of 5G technology empowers the submarine observation network and expands the application scenarios of the submarine

observation network. The international technology blockade tends to be normalized, and some technologies or key equipment need to consider localized alternatives; The development of submarine observation network is moving to a multi-node form, and key technologies such as fault diagnosis and reliability design are the main constraints to the development of technology.

In terms of connectors, our company's technology industrialization is from the project of Shenzi, and the technology is independent and controllable, and it can be traced; With the support of the national key R&D plan, it provides a good R&D technology platform. The basic materials are inferior to those in foreign countries, the product application is less, and the reliability needs to be verified;

In terms of submarine cable accessories, the demand for ultra-high voltage submarine cables and accessories is jointly promoted by the whole industry; The rise of dynamic cable system integration technology for floating wind turbines has attracted the attention of the entire submarine cable industry; The demand for applications such as reloaded towing cables, zero-buoyancy cables, and non-metallic armored cables has increased, and the technology of special cable accessories is gradually maturing. The conventional static submarine cable accessories technology has become mature, the technical form is similar, and the peers have improved the technical level through acquisitions and other means, and our company has no obvious advantages.

Challenge: In terms of observation networks, international technology blockades tend to be normalized, and some technologies or key equipment need to consider localized alternatives. The development of submarine observation network is moving to a multi-node form, and key technologies such as fault diagnosis and reliability design are the main constraints to the development of technology.

In terms of connectors; The basic materials are inferior to those in foreign countries, the product application is less, and the reliability needs to be verified;

In terms of submarine cable accessories, the technology of conventional static submarine cable accessories has become mature, and the technical form is similar.

2.2. Industry and market environment analysis Zhontian Marine System Company Ltd

The development of marine science and technology and marine economy and the construction of a maritime power are major strategic tasks of the country. On the afternoon of July 30, the Political Bureau of the Central Committee of the Communist Party of China held the eighth collective study on the study of building a maritime power. President Xi stressed that building a maritime power is an important part of the cause of socialism with Chinese characteristics; It is necessary to improve the ability to develop marine resources, strengthen the planning and guidance of marine industry, optimize the structure of marine industry, improve the quality of marine economic growth, cultivate and expand marine strategic emerging industries, protect the marine ecological environment, incorporate the construction of marine ecological civilization into the overall layout of marine development, effectively control the discharge of land-based pollutants into the sea from the source, develop marine science and technology, and strive to promote the transformation of marine science and technology to innovation-led, relying on scientific and technological progress and innovation. Efforts should be made to break through the scientific and technological bottlenecks that restrict the development of the marine economy and the protection of marine ecology. It is necessary to do a good job in the overall planning of marine science and technology innovation, persist in doing some things and leaving others undone, and focus on making breakthroughs in the field of deep-water, green, and safe marine high technology. In particular, it is necessary to promote the research and development of core technologies and key common technologies urgently needed in the process of marine economic transformation.

This is the general direction of development in the marine field determined by the state, and it is also the fundamental principle for us to develop the marine equipment industry.

The following focuses on ocean observation, watertight connectors, submarine cable accessories, water environment monitoring, etc.

1) Ocean observation: The level of marine monitoring technology is an important embodiment of the level of marine science and technology in a country. At present, the world's maritime powers implement three-dimensional monitoring of the ocean, especially for key sea areas, through the establishment of satellite remote sensing monitoring network, high-frequency ground-wave radar monitoring network, coast-based monitoring network, submersible and buoy monitoring network, ship-based monitoring network and seabed monitoring network to automatically obtain real-time, long-term continuous monitoring data, improve the level of ocean observation and management. The United States, Europe, Japan and other maritime powers have developed a variety of seabed observation network technologies and equipment, and have invested heavily in the establishment of seabed observation networks.

The research on China's seabed observation network started relatively late. In 2005, Zhejiang University began to carry out the preliminary exploration of a multidisciplinary cable-based submarine observation network, and established a prototype system in a laboratory environment. Since 2007, Zhejiang University and Tongji University have jointly developed China's first generation of single-node submarine observation network. In 2009, with the support of major scientific and technological research projects in Shanghai, Tongji University established the first cable system observation system test station in Xiaoqushan, East China Sea. In 2013, the Institute of Deep Sea of the Chinese Academy of Sciences established a single-node experimental seabed observation network in Luhuitou, Sanya. In 2014, Zhejiang University built the Zhoushan Pick-up Mountain Island Observation and Test System; Since 2012, the Institute of Acoustics of the Chinese Academy of Sciences, together with Zhejiang University, Zhongtian Technology and other units, has built the first large-scale seabed observation network in China in 2016. In February 2018, Tongji University and Zhongtian Marine Systems Co., Ltd. jointly established the East China Sea Seabed Observation Network.

The development of the domestic submarine observation network has also led to the R&D and equipment industrialization of a number of enterprises, universities

and research institutes, such as Zhejiang University, Tongji University, the Institute of Deep-sea Research of the Chinese Academy of Sciences, the Institute of Acoustics of the Chinese Academy of Sciences, the Shenyang Institute of Automation of the Chinese Academy of Sciences, Zhongtian Marine System Co., Ltd., Shanghai Hengtong Marine Installation Co., Ltd., Hailanxin, China Shipbuilding Industry Research Institute, Tianjin Marine Technology Center of the State Oceanic Administration, etc.

In general, the analysis of domestic and foreign gaps is as follows:

- insufficient understanding of the ocean, limited observation range and poor timeliness;
- the support capacity of marine information transmission and processing is insufficient, and the timeliness of information acquisition and information response is poor;
- the support capacity of the marine equipment industry is poor, and many core components (such as marine sensors, watertight connectors, etc.) rely on imports, and there is a risk that major projects may be stuck in the neck.

2) Watertight connectors: well-known foreign watertight connector manufacturers are mainly concentrated in developed countries such as Europe and the United States, among which all deep-sea watertight connectors are monopolized by foreign countries, such as SEACON series products of TE company in the United States, IMPULSE series products of TELEDYNE company in the United States, SUBCONN series products of MacArtney company in Denmark and JOWO series products in Germany. These foreign companies have perfect product design, production, testing and maintenance capabilities. Among them, it has great advantages in special rubber materials, performance testing technology and application, and most of the watertight connectors in China's 10,000-meter-level abyss scientific research institute use the products of the above companies.

China started late in the field of watertight connectors. Since the beginning of the 80s of the last century, Shenzi Institute has started the development and production of watertight connectors, and currently has dozens of watertight connector

products; During the "Twelfth Five-Year Plan" period, it undertook the project of "Engineering Technology of Deep-sea Sealtight Cable Connectors" of the National 863 Program, and developed a series of watertight connectors with a working water depth of 7,000 meters. CETC 23 is one of the earliest units engaged in the development and production of watertight connectors in China, and has completed the project of "M series deep-sea watertight cable connector development" of the National 863 Program, and has the development capacity of 7,000 meters of watertight connectors and supporting cables. Zhongtian Technology successfully transformed the 7000-meter series watertight connector product technology of Shenzi Institute, and jointly undertook the project of "deep-sea photoelectric composite cable and wet-plug interface technology" of the National 863 Program with the 23rd Institute of China Electronics Technology Co., Ltd., and established the production and research and development conditions of watertight connectors with metal shells. Sichuan Marine Special Technology Research Institute, AVIC No. 117 and No. 158 factories and other units are also involved in the development and production of watertight connectors.

Since 2018, when the underwater connector was listed as a stuck neck technology, relevant sea-related research, industry and user units have paid great attention to it, and there is a basic consensus on the reasons for the stuck neck condition, namely:

- the overall investment in research and development is small, and the technology accumulation time is short;
- the research on the characteristics of basic materials is not deep enough, the quality control of materials is not fine, and the research on sealing process under extreme conditions is insufficient;
- it has never been possible to jump out of such a circle: unreliable product quality leads to insufficient user confidence in application, and insufficient application can not effectively improve quality and reliability;
- most importantly, industry has not become a real dominant force due to weak technical capabilities and lack of attractiveness in the market.

3) Submarine cable accessories: foreign excellent submarine cable accessories manufacturers are mainly concentrated in developed countries such as Europe and the United States, such as Sweden's Trelleborg oil and gas submarine cable protection series, the UK's Tekma perforated submarine cable protection device series, the UK's PEFLEX offshore submarine cable accessories, etc. These foreign companies have perfect product design, production, testing and maintenance capabilities. Among them, it has great advantages in special marine-grade polyurethane materials, performance testing technology and the application of larger water depth and higher voltage.

China's submarine cable accessories manufacturers are divided into the first echelon, the second echelon, the first echelon includes Zhongtian Technology, Ningbo Oriental, Jiangsu Hengtong and Qingdao Han Cable and other manufacturers with submarine cable manufacturing capabilities, self-development and production, according to their own submarine cable technical capabilities for submarine cable accessories matching, the second echelon includes Xibeiyou, Jiusheng and other manufacturers without submarine cable production capacity, relying on their own industrial characteristics for the production of some submarine cable accessories, from the perspective of market share, the first echelon occupies almost all the domestic market share.

On the whole, at present, our submarine cable accessories products are in a leading position in China, but there is still a big gap in terms of process stability, quality reliability and fatigue life compared with international counterparts. With the development of marine exploration and development in a deeper and broader direction, the requirements for submarine cable accessories are getting higher and higher. In particular, for dynamic submarine cable accessory products, it is necessary to carry out key technical research on accessory design to solve key technical problems such as anchoring underwater dynamic sealing, buoyancy block material performance improvement, and bending reinforcement fatigue resistance. Carry out research on accessory processing technology to solve key technical problems such as

mold design, regulation of different raw materials, and effective bonding of metal parts and polyurethane in the production of accessories

2.3. Competitive status analysis Zhontian Marine System Company Ltd

Competitor & Benchmarking Analysis:

1) Observation system: The current competitors include Hengtong Haizhuang, Hailanxin, China Shipbuilding Exploration Institute and the Great Wall of Zhongke. Based on the connection technology of the seabed observation network of Tongji University, Hengtong Haizhuang has natural advantages in the seabed observation network of the East China Sea of major scientific projects. HAILANXIN is transformed by the OCEANWORKS submarine observation network connection technology in the united states, which is relatively mature and has a great threat of competition in the later stage; Enterprises with national team backgrounds such as China Shipbuilding Exploration Institute and China Academy of Sciences Great Wall Ocean have participated in the early design of the National Ocean Observation Network project, and have huge advantages in terms of technical strength and credibility. In terms of ocean observation, there are research institutes with technology accumulation, sea-related state-owned enterprises gradually join the ranks of competitors, these competitors in the industry of technical capabilities and contacts are more extensive, such as the Institute of Acoustics, CLP Eighth Institute and other scientific research units intend to support or their own into the research and development and production of seabed observation and connection equipment, although the product technology and reliability can not be compared with our products, but will inevitably lower the price of products, compress profit margins.

2) Connectors: foreign brands Subconn and Seacon have high reliability and large market share; Most of the domestic counterparts are in the stage of product exploration and market development, and the enterprises that enter the market application earlier will have an advantage in the later stage. The entry threshold of watertight connectors is not high, especially in shallow water environment, and the

future will still be dominated by shallow sea applications, which is easy to attract a large number of new entrants.

3) Submarine cable accessories: Hengtong and Dongfang can provide almost the same products and services, the user conversion cost is very low, and the advantages of Dongfang's umbilical cable increase the difficulty of our company to enter this field; International submarine cable accessories manufacturers have leading technology and occupy the high-end market. In terms of submarine cable wind power accessories, with the lowering of the entry threshold, small and medium-sized enterprises continue to join the ranks of competition and fully enter the stage of price competition; At the same time, foreign capital with technical advantages such as Terkmar participates in the competition, which increases the difficulty of bidding, and can only continuously improve their own technology to avoid technical barriers.

Analysis of key disadvantages:

1) Perfect product system and rich application cases: With the help of Zhongtian Science and Technology platform, it has formed a perfect product system of submarine cables, accessories, connectors, and connection boxes, with a variety of technical products, and participated in the construction of all domestic submarine observation systems, with rich performance and rich project experience.

2) Strong R&D strength: The company attaches great importance to product R&D investment, has a strong technical team, undertakes a number of national and provincial major projects, and has strong innovation ability in marine equipment with the help of R&D strength of Zhejiang University.

3) Good market brand: Relying on the cable brand of Zhongtian Technology and the famous school benefits of Zhejiang University, the product brand benefits are obvious. The sales channels are extensive, the response is fast, and the customer recognition is high.

Analysis of key advantages:

1) Lack of deep-sea construction capacity: there is no support platform in deep-sea construction equipment, the experience in construction is weak, and the product design cannot effectively fit the actual construction.

2) Product reliability needs to be improved: the technology industrialization time is short, product development and application are synchronized, there is a lack of long-term reliability verification, and there are potential quality hazards.

3) Weak product cost control: there are many customized products, small batches, and key components are subject to a single supplier, large cost amortization, and high product production costs.

SWOT analysis (3 main products)

Tabele 2.2 - Observation Network Products

Strengths(S)	Weaknesses(W)
S1:Rich application cases and performance advantages S2:The product system is complete and the system solution ability is strong S3:With the support of the technical team of Zhejiang University, the R&D capability is guaranteed	W1:The construction experience and ability are average, and there is no deep-sea construction ability W2:The relationship between the top leaders of state-owned enterprises involved in the sea is weak W3:There are few personnel in sea-related scientific research

Source: own research

Opportunity(O):

O1: The international order is facing major changes, and the strategic economic position of the ocean is becoming increasingly prominent

O2: The national strategy of "maritime power" has added in-situ monitoring requirements to the marine observation network system

O3: The research and commercialization of emerging marine energy such as offshore wind power, wave energy, and natural gas hydrate are becoming more and more mature, and a set of industrial ecological chains integrating platform construction, energy exploitation, and ecological environment monitoring has gradually been formed

O4: The public is increasingly concerned about the protection of marine ecological environment and coastal fishery resources; Observation and early warning of natural disasters such as marine earthquakes and tsunamis are becoming increasingly important.

SO strategy:

SO1: Continue to increase R&D investment (S2/S3/O2/O3/O4)

SO2: Diversify Marine Monitoring Capabilities and Expand and Strengthen Product Lines (S1/S2/S3/O3/O4)

SO3: Ensuring the accuracy, stability and reliability of monitoring systems (S2/O3/O4).

WO strategy:

WO1: Strengthening the capacity of marine monitoring projects (W1/O2/O3)

WO2: Introduction and Strengthening of Marine Scientific Research Technical Team (W3/O3/O4)

WO3: Intensify marketing efforts, take the lead in organizing industry activities, and strengthen the depth of communication with relevant management departments (W2/O1/O2/O3).

Threat (T):

T1: Affected by the epidemic and international unilateralism, some voices of "deglobalization" have begun to emerge in the world

T2: In the future, the country will gradually adopt the method of comparative measurement and screening in the field of marine procurement, pay attention to performance cases, and the phenomenon of Evergrande will inevitably appear in the field of marine observation

T3: Due to the overall international economic situation and the impact of trade protection, the domestic economy is facing downward pressure. Since 2020, the government's budget for scientific research projects has shown a trend of tightening and shrinking, and the construction of projects such as submarine observation networks has a large investment and long cycle, and products with government investment as the main sales model have a greater impact. The promotion and implementation of projects in the field of ocean observation have been generally delayed

T4: International technology blockade, some technologies or key equipment need to consider localized alternatives, and the stability needs to be verified; The development of submarine observation network is developing in the form of multi-

node, and key technologies such as fault diagnosis and reliability design are the main constraints to the development of technology

T5: Many research institutes and sea-related state-owned enterprises with technical accumulation in ocean observation have a wide range of technical capabilities and contacts in the industry; The increase in manufacturers will inevitably lower the price of products and reduce profit margins

T6: The construction of marine observation projects tends to be a general contractor, forcing enterprises to increase their own investment in software and hardware, and operating costs will increase significantly.

ST strategy

ST1: Strengthening our own product capabilities (S1/S2/T2/T4)

ST2: Enhancing Ongoing Follow-up of Long-Term Projects (S2/T3)

ST3: Optimization of product technology, modular production, cost reduction (S2/S3/T3/T4)

WT strategy

WT1: Increase personnel investment and build general contracting capacity; Or bind to other businesses and operate as a consortium. (W1/W3/T1/T3/T6)

WT2: Strengthening the depth of communication with relevant management departments (W2/T2/T5)

WT3: Introduction and Strengthening of Marine Scientific Research Technical Team (W3/T1/T4).

Opportunity(O):

O1: The marine industry has developed rapidly and the market demand is broad

O2: The trade war affects imports, and the state has increased the localization rate of projects of various scientific research units

O3: The state has special fund support

O4: Digital and information transformation

O5: The demand for localization in the oil and gas industry and the defense industry

Tabele 2.2 - SWOT analysis of watertight connectors

Strengths(S)	Weaknesses(W)
S1: Relying on the special support of the Group and the National Development and Reform Commission, the funds are abundant S2: The technical team is comprehensive and complementary in multiple fields S5: Master the key technology of the whole sea deep watertight connector S6: It has the ability to test the performance of watertight connectors	W1: Personnel have been in the industry for a short time and have insufficient knowledge W2: The basic materials have not been mastered, and the key parts and processes have not been overcome W3: The cost of machined products is high, and the management expenses are high, resulting in low profitability, and the quotation is not advantageous compared with the opponent W4: productivity tools are inadequate and complex, affecting efficiency and efficiency W5: At present, there are few applications of connector products, and there is no data support for reliability

Source: own research

O6: Wind power in the South China Sea is more inclined to barbed structural protection pipes

SO strategy:

SO1: Increase investment and develop products according to market demand

SO2: Introduce industry professionals and expand the product line

SO3: Actively promote market promotion and tap potential customers

SO4: Use the existing technology to have the advantage of detection, improve the quality of the existing products, and create several competitive products to win customers

WO strategy:

WO1: Increase personnel learning and training opportunities and establish a learning organization

WO2: Introduce material professionals to master key parts processes

WO3: Optimize parts design, develop new suppliers, optimize internal management level, and continue to reduce costs

WO4: Develop more customers, provide sample trials, and get customer trial reports as much as possible as a data for reliability

WO5: Further reduce product manufacturing costs and improve competitiveness from the aspects of design, manufacturing and supplier bargaining

Threat (T):

T1: There is still a gap compared with foreign products, and the acceptance of some customers is not high

T2: There are many competitors in the domestic industry, and our products do not have obvious advantages in quality and price

T3: At present, the industry has a low entry threshold, and there is a possibility of new entrants disrupting the situation

ST strategy:

ST1: Actively promote the formulation of industry standards for watertight connectors and raise the entry threshold

ST2: For large customers, we can provide negotiated prices, monopolize customer resources, and slowly squeeze out opponents

ST3: Provide products to customers for free to use, enhance customer confidence

ST4: Cooperate with influential customers in the industry, which can be used as promotional materials for other customers to increase product recognition

ST5: Actively interact with customers, solve existing problems, and improve knowledge accumulation

ST6: Design cost reduction, reasonable development of new products

WT strategy:

WT1: Do not accept orders for projects with large risk analysis

WT2: Strengthen the research of basic materials and key processes, and open up the quality difference with peer products

Opportunity(O):

O1: The marine industry has developed rapidly and the market demand is broad

O2: The trade war affects imports, and the state has increased the localization rate of projects of various scientific research units

O3: The state has special fund support

O4: Digital and information transformation

Tabele 2.2 - SWOT analysis of submarine cable accessories

Strengths(S)	Weaknesses(W)
S1: Relying on the special support of the Group and the National Development and Reform Commission, the funds are abundant S2: The technical team is comprehensive and complementary in multiple fields S5: Master the key technology of the whole sea deep watertight connector S6: It has the ability to test the performance of watertight connectors	W1: Personnel have been in the industry for a short time and have insufficient knowledge W2: The basic materials have not been mastered, and the key parts and processes have not been overcome W3: The cost of machined products is high, and the management expenses are high, resulting in low profitability, and the quotation is not advantageous compared with the opponent W4 productivity tools are inadequate and complex, affecting efficiency and efficiency W5: At present, there are few applications of connector products, and there is no data support for reliability products, and there is no data support for reliability

Source: own research

O5: The demand for localization in the oil and gas industry and the defense industry

O6: Wind power in the South China Sea is more inclined to barbed structural protection pipes

SO strategy:

SO1: Continue to increase R&D investment (S2/S3/O2/O3/O4)

SO2: Diversify Marine Monitoring Capabilities and Expand and Strengthen Product Lines (S1/S2/S3/O3/O4)

SO3: Ensuring the accuracy, stability and reliability of monitoring systems (S2/O3/O4)

WO strategy:

WO1: Strengthening the capacity of marine monitoring projects (W1/O2/O3)

WO2: Introduction and Strengthening of Marine Scientific Research Technical Team (W3/O3/O4)

WO3: Intensify marketing efforts, take the lead in organizing industry activities, and strengthen the depth of communication with relevant management departments (W2/01/02/O3)

Threat(T):

T1: There is still a gap compared with foreign products, and the acceptance of some customers is not high

T2: There are many competitors in the domestic industry, and our products do not have obvious advantages in quality and price

T3: At present, the industry has a low entry threshold, and there is a possibility of new entrants disrupting the situation

ST strategy:

ST1: Actively promote the formulation of industry standards for watertight connectors and raise the entry threshold

ST2: For large customers, we can provide negotiated prices, monopolize customer resources, and slowly squeeze out opponents

ST3: Provide products to customers for free to use, enhance customer confidence

ST4: Cooperate with influential customers in the industry, which can be used as promotional materials for other customers to increase product recognition

ST5: Actively interact with customers, solve existing problems, and improve knowledge accumulation

ST6: Design cost reduction, reasonable development of new products

WT strategy:

WT1: Do not accept orders for projects with large risk analysis

WT2: Strengthen the research of basic materials and key processes, and open up the quality difference with peer products

WT3: Develop new products, try to avoid price wars, and take high-tech products as the direction of profit

CHAPTER 3

WAYS OF IMPROVING THE COMPETITIVENESS OF THE ENTERPRISE ZHONTIAN MARINE SYSTEM COMPANY LTD

3.1. Improvement of strategy and strategic goals Zhontian Marine System Company Ltd

Zhongtian Marine System Co., Ltd. is a world-class and domestic leading marine energy and information transmission system high-tech enterprise under the leadership of Zhongtian Technology Group. The company will focus on the strategy of "land and sea co-ordination and building a maritime power", based on and deeply cultivate the regional advantages of the Yangtze River Delta, radiate the areas along the "Maritime Silk Road", face the national and local marine development and development needs, through system and mechanism innovation, relying on the scientific research advantages of Zhejiang University, Xiamen University and Ocean University, backed by the advantages of Zhongtian science and technology industry resources, operating in an asset-light mode, focusing on the application of marine energy and information transmission, and focusing on the development of deep-sea long-distance transmission and connection technology. Marine intelligent perception technology, marine three-dimensional mobile observation technology, and marine resource development technology provide corresponding marine equipment, technology and services for the development of the national marine industry, and become an important window and "vanguard" to show the strength of Zhongtian's marine science and technology industry.

Strategic Initiatives:

1) Accelerate the independent development of seabed observation and connection equipment, and become a "leader" in the field of subdivision

Due to its unique military-civilian integration attributes, the submarine observation network must rely on independent technology and equipment to achieve

independent construction. This is where our company can give full play to its advantages.

The focus of the "14th Five-Year Plan" is to build a submarine network, three-dimensional, mobile and sensing observation product ecosystem based on the submarine observation network, and promote the technology and capacity expansion of offshore accessories, watertight connectors, special cables and other products in the form of system solutions to drive products, form a production capacity of hundreds of millions, and occupy a leading position in the domestic marine equipment market. First, on the basis of the existing connection equipment technology, we should focus on the reliability, standardization and engineering design of the submarine connection box, create a series of submarine connection equipment products, and establish the design and construction capacity of the system-level submarine observation network. Second, based on the technical form of seabed observation connection equipment, expand the field of combined three-dimensional monitoring, and form a combined three-dimensional observation product cluster represented by buoys, submersibles, and buoy seabed bases. Thirdly, we will cooperate with Zhejiang University to carry out the industrialization transformation of underwater robot docking dock (DOCK) technology, carry out application verification, and expand the product field of underwater robots and high-speed towing systems through industry-university-research cooperation or mergers and acquisitions in the future, so as to create a product cluster with fixed and motorized combinations; Fourth, through industry-university-research cooperation, we should seek breakthroughs in marine monitoring sensors, create conditions for the future development of points and areas, establish comprehensive and systematic production, testing, calibration and application capabilities of marine sensors, and make up for the shortcomings of ocean observation systems.

2) Solve the problem of mass production of dry-plug watertight connectors and productized application of wet-plug connectors, and build a first-class transmission system integration platform on this basis, form a production capacity of

tens of millions, and make every effort to develop domestic and foreign application markets and become an invisible champion in the industry.

In terms of mass production: relying on camellia and national key R&D projects, the per capita production capacity is increased by more than 2 times through automation transformation, and the product qualification rate is improved to more than 98% through structural optimization design and process curing, and a production platform with an annual output of 50,000 sets of dry-plug watertight connectors is established from the aspects of preparation process, quality control, and standardized testing technology.

Tabel 3.1 - Key indicators for the improvement of the qualification rate of connector products

Control measures	2021	2022	2023	2024	2025
Total production capacity (10,000 sets)	2	3	5	5	5
Per capita production capacity (pcs/day)	5	7	10	10	10
Production staff	13	15	17	17	17
One-time failure rate	95	96	97	97.5	98

Source: own research

In terms of research and development: first, through the cooperation of experts such as Shen Oak, we will establish a production platform for key raw materials such as rubber and epoxy, form self-production capabilities, and solve the problem of stuck necks of key materials such as rubber; Second, through working with universities and research institutes to tackle key problems, based on the major engineering applications of the Deep-Sea Institute, we will establish the productization capability of full-sea deep-water watertight optical and electrical connectors and 4500m underwater plug-in connectors. The full-sea deep-water hermetic photoelectric connector is mainly for landers, UUVs, HOVs and other deep-sea exploration equipment, and the application scale is expected to be 10 million yuan/year. The 4500m underwater plug-in connector is mainly for oil and gas and seabed observation networking equipment, and the application scale is expected to be 40 million yuan/year;

3) Take the initiative to continue to innovate in the field of offshore accessories and become a "leader" in the field of subdivision

Offshore accessories should be oriented to the key areas of marine resource development, such as offshore wind power, offshore oil and gas, island and reef power supply and communication, etc., with supporting submarine cables, and develop new products and technologies in the direction of high water pressure, high voltage and dynamic transmission.

Tabele 3.2 - Strategic Goal Breakdown (Strategic Level, Supply chain Level)

Level	Indicator category		Unit	2023	2024	2025	Authorities-in-charge
Strategic level	Digitalization in manufacturing	Information technology application coverage	%	6	8	10	Chief Engineer's Office
	Servitization of manufacturing	Sales revenue	10,000 yuan	18	220	525	Marketing Department
		Net profit	10,000 yuan	9	60	113	Marketing Department
	Proportion of new product sales		%	28	29	30	Marketing Department
Supply chain level	Customer satisfaction	Overall satisfaction	%	98.1	98.2	98.4	Marketing Department
		Observation Network Products		98.1	98.4	98.7	Marketing Department
		Watertight connectors		98	98.1	98.3	Marketing Department
		Offshore attachments		98	98.1	98.3	Marketing Department
	Market share	Observation Network Products	%	56	58	60	Marketing Department
		Watertight connectors		20	25	30	Marketing Department
		Offshore attachments		28	29	30	Marketing Department

Source: own research

The focus of the "14th Five-Year Plan": conventional static cable accessories should be detailed and practical in structural design, material quality control, and cost optimization, so as to form a technical and cost advantage suitable for the share of submarine cables. Dynamic cable and umbilical cable accessories should be developed and popularized, and new serialized products should be formed such as dynamic anchoring, dynamic bending limiter, and dynamic traction head. At the

same time, aiming at the development of offshore oil and gas or natural gas hydrate, we will break through 1-2 high value-added offshore attachment technologies and form applications.

Tabele 3.3 - Strategic Goal Breakdown (Internal operational level, Employee learning and growth level)

Internal operational level	Brand value		100 million yuan	4	4.5	5	Branding Panel
	The first pass rate of the product	Observation Network Products	%	100	100	100	Production Department
		Watertight connectors		97	97.5	98	Production Department
		Bend limiter		98.2	98.7	99	Production Department
	Critical Process CPK	Pouring	/	1.33	1.4	1.5	Production Department
	Unit manufacturing cost	Observation Network Products	10,000 yuan/set	27	26	25	Finance Department
		Rubber watertight connectors	Yuan/set	90	88	85	Finance Department
		Bend limiter	Yuan/set	14500	14300	14000	Finance Department
	On-time product delivery		%	94	94.5	95	Production Department
	Comprehensive energy consumption of 10,000 yuan output value		Tons of standard coal (10,000 yuan)	0.0064	0.0061	0.006	Department of Safety and Environmental Protection
	Number of Patents Granted (Inventions)		pcs	11(2)	12(3)	12(3)	Chief Engineer's Office
	International patents		pcs	1	1	1	Chief Engineer's Office
	Number of Science and Technology Progress Awards		pcs	0	0	1	Chief Engineer's Office
	R&D success rate		%	90	90	90	Chief Engineer's Office
	Proportion of R&D expenditure		%	13	12	10	Chief Engineer's Office
	Equipment downtime rate		%	0.93	0.92	0.9	Equipment Department
	Overall Equipment Effectiveness (OEE)		%	23	24	25	Equipment Department

Continuation of Table 3.3

Employee learning and growth level	Employee satisfaction	%	86.5	87	87.5	HR
	Proportion of core talents	%	20	20	20	HR
	Key attrition rates	%	1	1		HR
	Proportion of highly skilled talents	%	9.5	10	10.5	HR
	Labor productivity per capita	10,000 yuan/person. year	128	144	147	HR
	Corporate culture identity	%	90	92	94	HR
	Training per capita from time to time	Hour	50	55	55	HR

Source: own research

4) Continue to introduce first-class talents, cooperate closely with domestic first-class sea-related units, and tap the intellectual source of sustainable development.

The marine industry is developing to the high-end, and talent and intellectual resources are the first elements. Relying on independent training and independent development is a conventional way, and through the introduction of first-class talents, and domestic first-class sea-related units to carry out industry-university-research cooperation, it is a shortcut.

"14th Five-Year Plan" focus: on the basis of industry-university-research cooperation with Zhejiang University, Shenzhi and other universities, focus on the needs of industrial innovation and development, deepen the cooperation with the technology center and four research institutes affiliated to the State Oceanic Administration, the research institute affiliated to China Shipbuilding Group, the relevant sea-related institutes of the Chinese Academy of Sciences, Xiamen University, China Haida and other sea-related universities, and at the same time rely on cooperation to introduce high-end talents. Establish contacts with local colleges and universities in Hangzhou, Xiamen and Qingdao, select and introduce professional talents, and appropriately favor local personnel to better retain talents.

3.2. Ways of improving the competitiveness of the enterprise Zhontian Marine System Company Ltd

Human resource allocation:

1) In the case of increasing orders and deliveries, through optimization and adjustment, the optimal combination of technology, quality, production and service forces will be realized, and the potential will be tapped. Compared with 2021, the total number of front-line employees in the company will increase by 25, an increase of 37.3%, the number of technical personnel will increase by 39, an increase of 45.3%, and the number of employees in functional functions other than technical will increase by 11, an increase of 35.2%. As a technology-intensive enterprise, Marine Systems will have 60.6% of managers by 2025.

2) Training of reserve middle and senior management personnel and technical personnel:

Building a high-end equipment industry for marine energy and information transmission is an important model for our company to gather top talents related to the sea. Based on this, our company creates a benign talent "ecosystem" of "career retention and career education", avoids the loss of high-level talents, provides an important channel for the convergence of top talents related to the sea, and provides an efficient mechanism for the construction of high-end teams.

3) "Brand Manager" Cultivation:

The brand manager is not only the centralized management of the market and development of a product, but also the spokesperson of the technical ability and strength of the product; Consider cultivating "brand managers" from the perspective of system from the perspective of application, construction and technical solutions for observation networks and special cable systems, cultivate and create 3-5 speakers who can connect with customers in depth technology and solutions, and work together with the business department to focus on the head (door) and tail (business) to develop the market; The "brand manager" of the product company should strengthen the ability to refine and summarize its own advantages, so as to shock and

trust customers within 15-30 minutes. At the company level, 7 existing department managers or mature technical supervisors are the first echelon, focusing on strengthening training in multi-discipline and cross-discipline; With the technical supervisor who has initially emerged as the second echelon, multi-faceted training and experience; The above first echelon and second echelon will be used as the brand manager's future sub-product positioning and alternate direction.

4) Build flexible and diverse talent acquisition channels to achieve dynamic talent matching. Take advantage of industry-university-research cooperation to continue to introduce high-end talents.

5) All-round and multi-type, cultivate and transport employees with different knowledge and skills, increase training in skills and practical operations, improve the skill level of front-line employees, and cultivate high-end skilled talents.

6) Divide the boundaries of power and responsibility, and clarify the positioning, functions and responsibilities of the department. Emphasize the internal promotion and rotation mechanism, select appropriate echelon talents for key positions, carry out job rotation exercises, cultivate reserve talent teams, and use the catfish effect to stimulate the work vitality of employees. By formulating an effective talent training and development plan, we will reasonably excavate, develop and cultivate the company's reserve talent team for key positions, establish a talent echelon, and provide intellectual support for the company's sustainable development.

7) Establish a sound performance management system, set performance goals based on the company's strategy, and design customized salary incentive mechanisms for positions with different attributes. Through measures such as salary increase at the end of the year, virtual equity, and project execution incentives, the company's outstanding employees are stabilized. About 80% of the company's functional employees will be included in the shareholding partnership system, and the original employment relationship will be changed to a partnership relationship, so as to mobilize the enthusiasm of employees, improve the sense of belonging to the company, and make employees regard themselves as the real masters of the company.

8) During the "14th Five-Year Plan" period, the total annual remuneration payable to employees of Ocean Systems Company accounted for about 15% of sales revenue, and the average salary increase per capita reached 84%, which can ensure that the annual salary of employees will increase by 8%-10%.

Financial resource allocation:

1) The company's 14th Five-Year Plan will be used as the guiding goal to do a good job in matching capital planning to ensure the safety of cash flow;

(1) Calculate the long-term and short-term operating cash flow according to the growth rate of sales scale, and check the funding gap;

(2) According to the equipment allocation plan, do a good job of investment feasibility analysis, and forecast and plan the investment cash flow of long-term assets;

(3) Combined with the operating and investment cash flow budget, prepare the company's capital demand plan, and reasonably allocate financing channels to ensure the optimization of capital structure.

2) Improve the construction of the talent echelon of the finance department, and plan to recruit or train a cost accountant with data statistical analysis ability and solid financial expertise to cope with the rapid growth of production scale;

3) Establish a standardized cost control mechanism, carry out detailed cost analysis, summary and feedback by product and project to ensure the accuracy of cost data to guide production cost reduction and improvement;

4) Set reasonable accounts receivable, inventory, accounts payable turnover indicators, early warning risks, feedback operating efficiency

5) Ensure the accuracy of various financial information to support the business decisions of the company's management.

Quality system assurance:

1) Organizational safeguards

Quality is one of the main contents of our business strategy, and its basic requirement is that marketing, design, production, logistics, sales and other departments must ensure product quality and business processes. Establish a leading

group for the implementation of the quality strategy, which is responsible for the full implementation of the implementation outline of the quality management development strategy. Clarify the rights and obligations of each department, and establish a comprehensive quality management organization and quality management network.

Tabele 3.4 - Manufacturing automation investment plan

Category	Project	Completion Time	Implementation Effects	Investment Budget (Yuan)
automation	The first stage of the automatic production line of connectors	May 2024	Production efficiency increased by 1.3 times	200,000
	The second stage of the automatic production line of connectors	May 2024	Production efficiency increased by 2times	250000
	Pouring shop automation	May 2024	Production efficiency increased by 1.5times	450000
	Dimensional inspection automation	May 2024	The detection efficiency increased by 1.3 times	300000

Source: own research

2) Institutional guarantees

Formulate code of conduct and assessment standards for all aspects of the quality business process, establish a market-oriented quality reward and punishment incentive and restraint mechanism, and motivate and restrain the quality management department, personnel and team.

3) Cultural environment protection

Create a soft environment in which all employees attach importance to quality and participate in quality. According to the implementation requirements of the quality management development outline, the company's planning and assessment departments are associated with the annual business plan and annual performance target assessment to ensure the implementation of the objectives at each stage.

Drawing on Huawei's "Small Improvements, Big Rewards" policy, the Quality Strategy Implementation Leading Group provides monthly, quarterly, and annual special awards for quality management, promoting the company's quality culture of "the company's top management attaches importance to quality and everyone actively participates in quality".

Tabele 3.5 - Manufacturing informatization investment plan

Category	Project	Completion Time	Implementation Effects	Investment Budget (Yuan)
informati zation	CRM	Oct 2024	Establish customer relationship management	100,000
	ERP	Oct 2024	Realize the whole process of resource control	300000
	PLM	Oct 2024	Establish product lifecycle management	250000
	MES	Oct 2024	Establish manufacturing process management	300000
	SRM	Oct 2024	Establish supplier management	100000
	Data fusion	Oct 2024	Establish data throughout the entire process	500000
	Device cloud platform	Oct 2024	Establish device lifecycle management	200000
	Ocean observation cloud big data platform	Oct 2024	Data analytics and data services	500000

Source: own research

4) Supply chain assurance

The supplier evaluation system is divided into several aspects: supplier entry evaluation, operation evaluation, supplier problem counseling, improvement evaluation and supplier strategic partnership evaluation. Transform supplier selection into a continuous, cumulative, selection process.

(1) Optimize the supplier entry evaluation management system

Drawing on the qualified supplier evaluation methods of Huawei and other outstanding enterprises, we have completed the optimization and implementation of the shortlisted supplier management system. Conduct on-site review and comprehensive analysis and scoring in seven aspects, including supplier management system, resource management and procurement, product realization, design and development, production operation, measurement control and analysis improvement, and enter the company's qualified supplier list only after passing the score.

For some suppliers who cannot meet the requirements temporarily, the information is also collected, and the suppliers are divided into candidate suppliers, intended suppliers, potential suppliers, temporarily ignored suppliers and other categories for management, so as to facilitate timely contact when temporary production tasks are needed.

(2) Supplier problem counseling

Through the method of special group counseling and result tracking, the supplier is provided with problem counseling and improvement. The purchasing department and the company's supplier quality management engineer will coach and follow up the supplier according to the products and materials in charge, track the improvement effect of the supplier, and implement the supplier management improvement evaluation.

(3) Evaluation of supplier strategic relationship

Through the entry and process management of suppliers, the cooperation strategy of suppliers is managed by classification. The purchasing department analyzes and discusses the collected information, determines the relationship evaluation related to the establishment of long-term partners, and submits it to the company's general manager's office for analysis and approval. Conduct a comprehensive risk analysis and cost analysis to determine whether and when to implement a strategic relationship.

Take advantage of the Internet:

(1) Form a network army

Table 3.6 - Quality one-time failure rate control target

Product type	2023	2024	2025
Bend limiter	3%	2.5%	2%
Watertight connectors	10%	5%	3%

Source: own research

Zhongtian marine system products are divided into the following three categories: underwater observation network products, connectors and submarine cable accessory products, which are characterized by narrow professional fields and confidential problems in some products. Among them, underwater observation network products and connector products are secret, and submarine cable accessory products do not exist.

Therefore, from the perspective of product classification, marine ranching products and wireless water quality testing products in the underwater observation network products can be promoted through the network; Products such as rubber and plastic connectors and metal connectors in the conventional form of connector products are cautiously publicized through the network under the condition of strict declassification, and the submarine cable accessories have a low degree of confidentiality and can be publicized through the network.

In terms of implementation, marine ranch products and wireless water quality testing products in the underwater observation network products belong to system integration products, which generally need to be released to the outside world in the form of online bidding, so the online sales of such products should be mainly based on network publicity. Connector products belong to confidential products, and the implementation of the "camellia" model is used for sales, and cannot be sold through the network, and this kind of product should be cautiously promoted on the network to avoid people with ulterior motives. Submarine cable accessories products are subordinate to submarine cable products, generally for submarine cable procurement projects, network sales channels are mainly through network promotion, the target

customer group is a small and medium-sized construction team, with low price and high-quality service to attract them to buy our sea (optical) cable maintenance joint products, the project work can be communicated with the submarine cable operation and maintenance department.

Combined with the actual situation, the plan is carried out according to the following strategies:

1) By enriching and updating the information of our existing company portal, our products will be streamlined and declassified, and the product information will be uploaded to our website, and at the same time, other products and our development concepts will always be displayed and promoted to interested customers;

2) Leave the contact information of the product manager on the webpage, because our product is narrow in professional fields and the intention of the customer group is easy to identify, a suitable target group can be selected;

3) In the guidance of customer information retrieval results, with the help of search engines and other technical measures, customers will be directed to our company's display page;

4) select the core customer group, this type of customer generally has a dedicated procurement platform, combined with the early customer visit and promotion, register qualified suppliers on the procurement platform, use the procurement platform to regularly push the function of procurement information, timely or regular understanding of the procurement needs of such customers. It avoids the net-type promotion model and promotes it in a targeted manner.

(2) Online Blue Army

1) Set up a "sprint" team composed of fresh college students, and use their spare time to freely study and discuss new marine problems, new things, and new ideas. It aims to keep fresh blood, discover talent cultivation talents, and find new directions and new business opportunities. Adopt an individual or group leadership system to conduct independent research and thinking; Adopt a rotation system of self-elected leaders to temper individual organization and coordination skills; Adopt

an incentive system to eliminate those who lack innovative initiative and reward individuals or groups who put forward valuable proposals.

2) In the same technical department, two teams (red and blue teams) are formed to carry out the research and development tasks of similar products at the same time. From the collection of R&D background to the formulation of R&D plans, centralized review is carried out, and the design scheme is optimized or one scheme is used to absorb the other, so as to improve the rationality of the scheme. Combined with the Iron Triangle system, the winning team is motivated

Branding:

In addition to submarine cable accessories, marine systems' products involve sensitive areas such as observation networks and watertight connectors. The users of sensitive products are also relatively limited, and the promotion of products is mainly based on one-to-one publicity of core customers, so as to establish word of mouth among customers and build brand awareness. At present, the publicity of the conventional form of submarine cable accessories is packaged in the submarine cable publicity, and the publicity report is carried out with the image of the submarine cable as a whole. For our company's offshore system integration product solution, we generally use special submarine cable as the photoelectric transmission medium, and at the same time, through our system integration product solution, we can promote the marine industry chain such as observation network, watertight connector, submarine cable accessories, special submarine cable and installation and construction, so as to achieve the effect of $1+1>2$.

1) By creating a "customer experience" through products, a brand product experience place can be established, similar to Xiaomi, Apple experience place, so that users can contact and understand our products more intuitively.

2) Advertisements, albums, and videos:

The brand positioning should be clear and make brand differentiation, such as visual image, brand culture, service mode, brand appearance channel, price segmentation, etc. Through the brand embodiment of the market segmentation, the brand is aimed at the target market, and the docking of the brand and the target

consumer is realized. In the process of brand use, the problem that tends to occur is that the brand covers too many products and is too wide, losing the role of the brand in market segmentation, and the final consumer's image of "Zhongtian Technology" is also vague. This can be solved in two ways:(1) For different fields, each focuses on one product, for example, the marine industry group mainly promotes a certain submarine cable, and the marine accessories mainly promoted by the marine system are used as a supplementary category.

(2) Adopt the idea of "brand management", locate and distinguish through a unified naming method, so that customers have a deep impression of naming, such as connector products, which can be named as Hai No. 1 - 3 core socket and Hai No. 1 - 4 core plug.

3) Internal measures:

It is necessary to establish a systematic brand architecture of "brand value (to help the national marine power plan) - brand proposition - brand image - brand positioning (as mentioned above, clear brand positioning) - brand structure (subject to submarine cable, supplemented by offshore engineering accessories) - brand endorsement (invite industry professionals to endorse) - brand naming (as mentioned above, unified naming method)" A systematic brand architecture, pay attention to the implementation of work content one by one.

4) Exhibition part:

The selection of the exhibition needs to be excellent, not every exhibition has to participate, with the sales strategy of the year "docking box, watertight connector, observation network" of the main sales area customers to carry out, through the exhibition to expand the market, expand sales.

5) Market cooperation:

Marine system products are data system integration products in their own products, but they are also a part of the large system in terms of their applications, and it is necessary to strengthen cooperation with other manufacturers in the large system, make full use of the sharing of market channels and information by other manufacturers, and expand our marketing work; In terms of technical standardization

and generalization, the supporting system integrates product communication and sales, and achieves the effect of 1+1>2.

Table 3.7 - Manufacturing servitization implementation plan

Serial Number	Service Mode	Project	Investment (million)	The project phased in objectives
1	System integration services	Buoy seabed foundation system for three-dimensional monitoring of deep and far seas	1500	Form sales data for potential customers from 2021 to 2025.
2	Upstream and downstream extensions	Customized submarine cable repair joint products	500	In 2023-2025, supporting sales will be formed.

Source: own research

Accelerate the research and development planning of new technologies and new products:

1) Long-distance transmission and connection technology in the deep sea

With the in-depth implementation of the national marine development strategy, the country has begun to advance into the strategic deployment of the deep sea on the basis of deepening the shallow sea. At present, underwater communication transmission technology plays an increasing role in marine environmental monitoring and marine engineering, but there are still many limitations. Driven by the huge application demand, the research of information transmission technology for the deep sea is imminent.

(1) Deep-sea plug-in connectors for oil and gas and observation network applications : Product introduction: For the needs of deep-sea observation and oil and gas exploitation, we have developed high-voltage, high-current, photoelectric composite deep-sea wet-plug connectors.

(2) Underwater robot docking technology : In view of the energy and information transmission needs of underwater robots, the development of underwater robot connection technology, the product is attached to the submarine observation

network, connecting the submarine observation network and underwater drone equipment, and improving the endurance of underwater drones.

(3) Miniaturization of energy routers : For high-voltage and low-power occasions, we adopt the requirements of highly integrated miniaturized circuit boards to develop energy routers with wide input range (1-15kV) and low power (no more than 2kW).

(4) Deep-sea optical cable branch joint: cooperate with major projects such as deep-sea optical cable of submarine cable company, develop deep-sea branch products, and realize the branch connection of submarine optical cable. The main customer of this kind of product is the communication group, with the continuous change of the structure of the observation system, from the near sea to the far sea, the original ordinary branch can no longer meet the basic requirements of high voltage and large water depth. Limited by the influence of mechanical seals on polyethylene materials, the end seal in the form of injection molding seal is developed to ensure that the sealing performance and insulation performance of polyethylene meet the requirements of use. This product is mainly used with the observation system, which can be used as a strong guarantee for the sales of submarine optical cable systems.

(5) Non-contact underwater wet-plug connectors: Facing the needs of deep-sea stereoscopic observation, multi-core non-contact underwater wet-plug connectors are developed through industry-university-research cooperation and transformation. The independent packaging structure is adopted, and the problems of deep-sea high-pressure sealing and underwater plugging and unplugging life are effectively solved through non-contact connection, and the product is mainly for underwater autonomous vehicles, submarine observation networks and other fields.

2) Marine intelligent perception technology

Marine intelligent sensing technology mainly uses marine sensing devices, uses marine remote sensing and underwater telemetry to obtain and process three-dimensional marine information, and transmits marine information through the sea-air three-dimensional communication network, which is an important link in

understanding the ocean, and is the premise and foundation for the research and development of the ocean.

(1) Sensors for deep-sea detection : Product introduction: Facing the needs of rapid detection of marine environment and high integration of instruments, through industry-university-research cooperation and transformation, we have mastered the integrated manufacturing and data fusion calibration technology of multi-parameter sensors such as CTD and PH, and realized the localization and replacement of key equipment of marine sensors and systems.

(2) Engineering application of underwater robots for deep-sea development: According to the needs of future marine development, a series of observation-based, operational-type and sightseeing-type underwater robots have been formed.

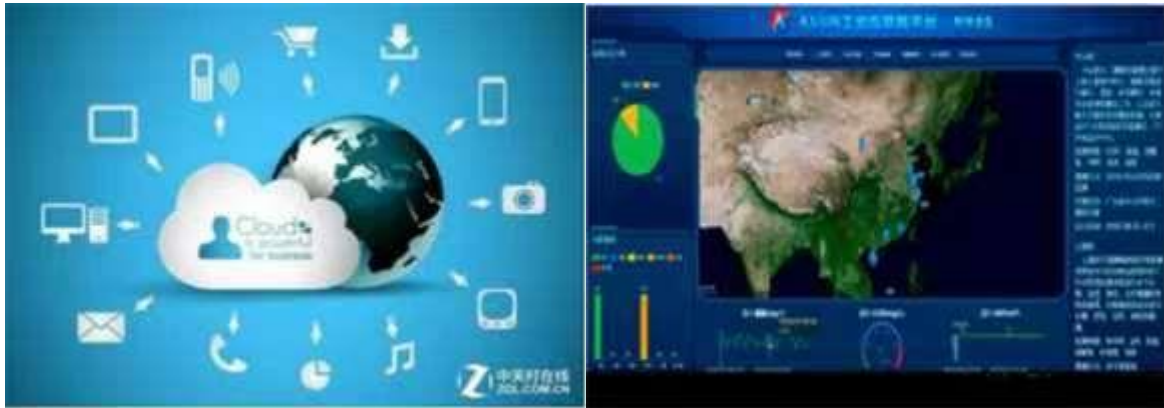
3) Ocean stereo maneuver observation technology

The marine three-dimensional mobile observation technology is mainly through the ocean sensing devices, through the observation platforms such as small intelligent mobile observation and full-profile ocean observation, to build real-time and quasi-real-time anchor buoys, submersible observation and other systems of the ocean, integrating observation, detection, monitoring and vigilance, and comprehensively understanding the ocean.

(1) Buoy seabed foundation system required for deep-sea stereoscopic monitoring : In view of the three-dimensional monitoring needs of the marine dynamic environment in the deep sea or special observation areas, the three-dimensional observation covering the air-sea exchange interface, the cascade distribution interface of the seawater profile, and the source interface of the seabed area is realized, which provides core technical support for the construction of a mobile self-contained three-dimensional observation system in the whole sea area in the future.

(2) Data analysis of cloud big data platform: Based on the existing big data platform, underwater observation system and data resources, further develop functions such as image recognition, data mining, data association, and data analysis, and transform from a simple product manufacturer to a data service provider. Provide

data-based value-added services for existing customers; For potential customers, the promotion of the observation system is assisted from the level of data meaning. The potential customer is the Institute of Marine Science, Biology and Power, focusing on the promotion of marine ranching.



Picture 3.1 - Cloud-based big data platform

Source: own research

4) Marine resources development technology

The development and utilization of marine resources in China is generally extensive, and there is still a gap between the utilization efficiency and that of developed countries. Through the research of supporting technologies for the comprehensive utilization of marine tidal energy, wave energy, wind energy, and temperature difference energy, as well as supporting technologies for the exploitation of seabed mineral resources, we will help the exploration and exploitation of national marine resources.

(1) Dynamic cable attachments for floating wind power generation for deep-sea wind power and deep-sea oil and gas exploitation: Cooperate with the dynamic cable R&D plan of the submarine cable company to develop a dynamic cable attachment system for offshore floating wind turbines and oil and gas exploitation, and form a series of products. With the completion of the development of offshore resources, offshore wind power will inevitably develop to the deep sea, with better wind speed conditions in the deep sea and negligible environmental impact factors on

land. Compared with the offshore wind power form, the deep sea offshore wind power submarine cable form is mainly dynamic cable, the field cable is connected by 66kV medium voltage dynamic cable, and the output cable is converted into a high-voltage static cable using a high-voltage dynamic cable.

(2) Umbilical Attachment System for Offshore Oil and Gas: Cooperate with the umbilical cable R&D plan of the submarine cable company to develop traction devices, repair joints, terminal products, platform anchoring, bending reinforcements and other products supporting the umbilical cable to meet the application needs of umbilical cables. Market planning: the important customers of this type of products are CNOOC (domestic), Saudi Aramco (foreign) and other CNOOC customers, in the short term is expected to be CNOOC, according to CNOOC's annual construction of 5 offshore oil platforms and FPSO and other oil platforms are estimated, the annual market demand is about 30 sets of umbilical cable accessories products, the umbilical accessories have a high degree of customization, are high-end products, and have been monopolized by foreign AKER SOLUTIONS and other enterprises for a long time. Our company cooperates with the research and development of umbilical cables of submarine cable companies, replaces the products of foreign manufacturers, and completes a series of processes such as product development and trial production, product testing, product certification, and customer use, and will obtain the trust and recognition of customers, and form a complete solution for the power-oil and gas transmission of offshore oil underwater production system together with Zhongtian submarine cable and supporting accessory products.

Promote market development:

1) Submarine cable accessories:

(1) For the deep sea area, combined with the basic type, R & D and design matching accessories, layout and publicity in advance, seize market opportunities, enrich and expand the company's product line in the field of offshore accessories;

(2) Increase brand promotion efforts for unsold areas (Shanghai, Shandong, etc.) and strive for market share;

(3) Develop the CNOOC market and strive for market share.

2) Connector products:

(1) The wellhead replacement of CNOOC system connector cable components, CNOOC unit joint procurement batch, at present, there is no such high quality, high-qualification supplier in China, seeking to establish customer relationships, research and development of general products, through the early trial process, enter the supplier system, to achieve batch procurement.

(2) Actively participate in sea-related exhibitions related to joints, such as transducers, marine ranches, ocean observations, thrusters, underwater robots, oil and gas equipment and other exhibitions, and comprehensively develop customers

(3) This kind of products belong to the late entry into the industry, there is a lack of sales network of the current situation, can make full use of the domestic agents who entered the industry earlier, with the help of its mature sales network, to promote our products.

(4) The domestic market is expected to account for only 1/5 of the global market, and the overseas market space is larger.

3) Observation Network Products:

The main customers of the observation network:

(1) Natural Resources Bureau: natural resources authorities at all levels, the National Ocean Technology Center, three sub-bureaus and their subordinate institutions, four oceanographic institutes, Guangzhou Marine Geological Survey, Qingdao Haiti Institute, etc.

(2) Scientific research institutions: Institute of Ocean-related Research of the Chinese Academy of Sciences, sea-related universities under the Ministry of Education, local sea-related scientific research units, etc.

(3) Fishery departments: marine fishery authorities at all levels, marine fisheries research institutes at all levels, major marine fisheries companies in various places, etc. For the above three types of customers, in the next two years, each business group of the special equipment division will strengthen the key personnel business relationship of potential customers of large-scale projects of the observation network (natural resources bureau, uniform group, industrial central enterprises),

ensure the information and first-mover advantage in the competition of major projects, find new growth points for the observation network brand, and carry out differentiated competition in the market segment. During the 14th Five-Year Plan period, the new products and new fields that will focus on development and intervention are mainly in the mobile ocean observation platform in terms of hardware equipment and the smart ocean big data platform in terms of software systems, which are planned to achieve 30 million sales by 2025, accounting for 30% of the total sales of the observation network, which is the most important growth point in the future.

Table 3.8 - New product development planning list

Serial Number	Technical field	Project	Content	Investment Plan (Million)
1	Deep-sea long-distance transmission and connection technology	Deep-sea pluggable connectors for oil & gas and observation network applications	Development of high-voltage, high-current deep-sea wet-plug connectors	800
2		Underwater vehicle docking technology	The product is attached to the submarine observation network to improve the endurance of underwater drones	600
3		Miniaturized applications for energy routers	Highly integrated miniaturized circuit boards are required	150
4	Marine intelligent perception technology	Industrialization of marine micro-nano sensors	Realize domestic substitution	700
5		Underwater robots for deep-sea development	For future marine development needs	400
6	Three-dimensional maneuver observation technology of the ocean	Data analysis on cloud big data platform	Transform from a pure product manufacturer to a data service provider	56
7		Autonomous portable profile monitor	Develop repair joints and end products for umbilical cables to meet the needs of market applications	250

Source: own research

New Product Platform:

1. Mobile observation platform: 20 million sales target is planned in 2025. In the next 5~10 years, the demand in the field of marine observation must be transferred from the fixed platform of the sea surface or the bottom type to the mobile observation platform, and it is expected that around 2025, the scale demand will be formed in the military and civilian mouths. Based on this, the sales target of 20 million was initially set.

2. Smart marine big data platform: With the development of the marine economy, the future integration of marine information system must start from the top-level design of the marine big data platform and then expand to the integration of terminal hardware equipment. Taking into account our technology research and development progress and market demand, we have set a sales target of 10 million in 2025.

CONCLUSIONS

Through the study of firm competitiveness, this study deeply analyzes the theoretical basis of competitiveness, including the definition, sources and influencing factors of competitiveness. On the basis of a review of the concept of competitiveness, this study further explores the development strategies of enterprise competitiveness, including product strategy, market strategy and human resource strategy. In this study, the existing evaluation model is introduced, revised, and empirically applied to the evaluation of competitiveness.

In conducting the case analysis, the study selected appropriate cases, conducted case profiles, and adopted appropriate data collection methods. Through the analysis of the product competitiveness, market competitiveness and organizational competitiveness of the case enterprises, this study proposes corresponding competitiveness improvement strategies. In terms of competitiveness assessment, this study evaluates the competitiveness of the case companies, summarizes the results of the analysis, and predicts the effectiveness of the improvement strategy. In terms of the application and reflection of the strategy, this study evaluates the implementation effect of the strategy and analyzes the significance of other enterprises.

In terms of the impact of the business environment on the competitiveness of firms, this study analyzes the macro environment and the industry environment. In terms of the macro environment, this study focuses on the impact of the policy environment, economic environment and social environment on the competitiveness of firms. In terms of the industry environment, this study analyzes the impact of industry trends, industry competitiveness, and industry potential. For the control of environmental factors, this study proposes corresponding countermeasures and strategic positioning, and discusses the path of improving the competitiveness of enterprises.

In conclusion, this study puts forward relevant strategies and suggestions for improving the competitiveness of enterprises through in-depth study of the theory of

enterprise competitiveness, combined with case analysis and business environment analysis. The results of this study will provide theoretical support and practical guidance for enterprises to improve their competitiveness, and provide new perspectives and ideas for research in related fields. Future research can continue to deepen the research on enterprise competitiveness, and analyze the influencing factors and strategies of competitiveness from more dimensions, so as to promote the sustainable development of enterprise competitiveness.

This study analyzes the theory of competitiveness, studies the influencing factors and development strategies of enterprise competitiveness, and puts forward strategies and countermeasures to enhance enterprise competitiveness through case analysis and analysis of business environment. However, there are still some aspects that can be further studied and refined.

For the research of competitiveness evaluation models, this study evaluates and modifies the existing models, and applies them empirically. However, due to the complexity and diversity of competitiveness assessment models, there are still other models that can be further explored and applied. Therefore, future research can further compare and analyze the advantages and disadvantages of different models, and explore new models to evaluate the competitiveness of firms.

In the research on competitiveness improvement strategies, this study proposes product improvement strategies, market expansion strategies and organizational optimization strategies for case enterprises. There may be differences in competitiveness strategies for different industries and different companies. Therefore, future research can delve into the competitiveness improvement strategies of different industries and provide more specific and precise guidance to meet the needs of different enterprises.

The impact of business environment on firm competitiveness is also an important research direction. This study analyzes the macro environment and the industry environment, and puts forward relevant enlightenment and countermeasures. The business environment is a complex system that includes multiple dimensions such as the policy environment, the economic environment, and the social

environment. Future research can further expand the research on the business environment, and deeply analyze the influencing factors of different dimensions, as well as the degree and path of impact on the competitiveness of enterprises.

This study is only a theoretical study and case analysis of enterprise competitiveness, and more empirical research can be carried out in the future to verify the effectiveness of the theory and the implementation effect of the improvement strategy. In addition, new technologies such as big data and artificial intelligence can be combined to provide more support for competitive forecasting and decision-making.

This study puts forward some preliminary conclusions and suggestions for the study of enterprise competitiveness, but it still needs to be further deepened and improved. Future research can deeply explore the competitiveness assessment model, competitiveness enhancement strategy, and the impact of the business environment on competitiveness, so as to provide more comprehensive and effective theoretical and practical guidance and make greater contributions to improving the competitiveness of enterprises.

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