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Molecular & Cellular Biomechanics 2025, 22(3), 1373.
https://doi.org/10.62617/mcb1373

Article

Biomechanics in business administration: Leveraging biofeedback mechanisms to enhance user experience

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CITATION

Zheng Y. Biomechanics in business administration: Leveraging biofeedback mechanisms to enhance user experience. Molecular & Cellular Biomechanics. 2025; 22(3): 1373.
https://doi.org/10.62617/mcb1373

ARTICLE INFO

Received: 14 January 2025
Accepted: 26 January 2025
Available online: 18 February 2025

Abstract: Although biofeedback has achieved remarkable results in many areas, it also has some limitations. For example, the measurement results of a biofeedback meter can be affected by a variety of factors, including physiological differences between individuals, environmental disturbances, etc. In addition, biofeedback training requires a certain amount of time and patience to learn and master the skills, which can be a challenge for some individuals who are impatient. In summary, biofeedback is an effective mental skill training method, which plays an important role in competitive sports and is gradually being borrowed and applied by other fields. As technology continues to evolve and improve, biofeedback is expected to play a greater role in more fields.

Keywords: biofeedback; physiological differences; environmental disturbances; skill learning; technological advancements

1. Introduction

Traditional approaches to business administration are increasingly revealing their limitations, especially in understanding and responding to users' emotional and physiological responses. In order to meet this challenge, the application of biomechanical principles and biofeedback mechanisms provides a new perspective and technical means to more accurately capture the inner state of the user and optimize the product design and service process accordingly. This article explores how to create an intelligent interactive system based on biological signals by combining knowledge and technology from multiple disciplines, thereby achieving a substantial leap in user experience.

In modern business administration, in order to effectively process and analyze bio signal data from users, we have introduced advanced data processing and machine learning technologies and developed a framework called Bio Feedback Optimal System (BFOS), which integrates a variety of advanced computing technologies and theoretical models to create a highly intelligent and personalized user interaction environment. Instead of relying on traditional deep learning models, BFOS employs a novel hybrid algorithm strategy that combines decision trees, random forests, and support vector machines (SVMs) to process complex physiological signal data. At the heart of the BFOS framework is its ability to efficiently process biological signal data. First, we have designed a unique feature selection method to extract the most representative feature sets from high-dimensional and complex biological signals. These traits contain important clues about the user's current psychological and physical state, such as mood swings, stress levels, and more. Next, by modeling the user's mental and emotional state, BFOS is able to anticipate the user's potential needs and adjust the presentation of the service or product accordingly to ensure the best user experience. In addition, BFOS introduces an adaptive learning mechanism that can dynamically adjust parameters based on user feedback, improving the accuracy and robustness of the system. This mechanism allows the system to adapt to the behavior patterns of different users in a short period of time, providing more personalized and effective services. This kind of personalized service not only improves user satisfaction, but also brings a significant competitive advantage to the enterprise. This paper not only discusses the application potential of biomechanical principles in business administration, but also proposes specific technical implementation paths, aiming to provide valuable reference for researchers and practitioners in related fields.

2. Research status

The BFOS system, a notable achievement in this field, exemplifies trends towards interdisciplinary integration, technological advancements, personalized service enhancements, and the expansion of application domains. Specifically in psychotherapy, Electronic BioFeedback (EBF) employs sensors to monitor physiological indicators like electromyography, skin temperature, and heart rate, converting these into visual or auditory feedback signals. This technique enables individuals to consciously control their psychophysiological activities, adjusting bodily functions for better health [1]. By providing an objective, physiological-signal-based feedback mechanism, EBF fosters a clearer understanding of emotional and physiological states, enhancing self-regulation. Both auditory and visual biofeedback techniques have been found to augment the efficacy of breathing training [2]. Research has demonstrated a correlation between respiratory rate and heart rate variability [3], indicating that by modulating respiratory rate, one can increase heart rate variability, decrease heart rate (HR), make corresponding physiological adjustments, and positively impact mood and stress levels [4].

In the realm of business administration, biomechanics principles are applied in various ways. Ergonomic optimizations, utilizing biomechanics principles, focus on refining the workplace and tool designs to alleviate physical strain on employees and enhance productivity. Notably, changes in biomechanical parameters during activities can be influenced by factors such as gender, age, and health status [5]. For instance, studies have analyzed kinematic and kinetic parameters of runners with patellofemoral pain [5], investigated the different impacts of sports knee braces on young and elderly groups [6], and observed peak anterior ground reaction forces on the injured side when wearing sleeve-type sports knee braces [7]. Additionally, biomechanical principles aid in consumer behavior analysis, employing techniques like gait analysis [8] and hand motion capture to understand shopping habits and needs, thus optimizing product design and marketing strategies. Furthermore, biomechanical sensors monitor employee health, including heart rate [9] and muscle activity, facilitating timely interventions to safeguard employee well-being and work efficiency [10].

The biofeedback mechanism, leveraging modern physiological instruments, collects and feeds back individual physiological data from specific environments, enabling individuals to understand and adjust their body states accordingly. In business administration, this mechanism is applied to stress management [11], personalizing stress management programs based on biofeedback data to alleviate work stress and improve job satisfaction and efficiency. It also plays a role in employee training and development [12], assessing cognitive and emotional states to tailor training programs that enhance professional skills and overall quality. Additionally, the biofeedback mechanism optimizes consumer experiences by gaining insights into physiological responses and emotional experiences during product or service use [13], providing a scientific foundation for improvements.

With the continuous development of science and technology [14], innovative applications of biomechanical principles [15] and biofeedback mechanisms in business administration [16] are emerging, and the research directions are becoming more and more abundant. Smart wearable devices [17]: Combined with the Internet of Things and big data technology [18], smart wearable devices are developed to monitor the physiological state and work efficiency of employees in real time [19], and provide data support for enterprise management. Virtual reality and augmented reality technology: Use virtual reality and augmented reality technology to simulate the working environment, combined with biomechanical principles for employee training and drills [20], and improve employees' safety awareness and operational skills. Combination of emotional intelligence and artificial intelligence: Combine emotional intelligence with artificial intelligence technology to develop intelligent systems [21] that can recognize and understand employees' emotions and provide employees with more personalized service and support [22]. Interdisciplinary research: Strengthen the cross-integration between biology, psychology, computer science and other disciplines, and promote the in-depth research and wide application of biomechanical principles and biofeedback mechanisms in the field of business administration [23].

While the application of biomechanics principles and biofeedback mechanisms in business administration holds significant promise, several challenges remain. Notably, the maturity of related technologies is still evolving, necessitating continuous improvements in stability and reliability rephrased from "technology maturity" challenge. Privacy protection is paramount, requiring strict adherence to privacy laws and regulations during the collection and analysis of employee physiological data to safeguard personal information rephrased from "privacy protection" challenge. Furthermore, the high costs associated with the research, development, and deployment of related equipment and systems necessitate the exploration of cost-reduction strategies rephrased from "cost issues" challenge.

3. Theoretical basis

3.1. Biofeedback

Biofeedback is a method that allows individuals to gain awareness and control over bodily functions typically not consciously perceived, utilizing instruments to translate the body's physiological signals into comprehensible formats like diagrams, sounds, or visual indicators.

In the article titled Biomechanics in Business Administration: Leveraging Biofeedback Mechanisms to Enhance User Experience, biofeedback training leverages the theory of operant conditioning, with the help of certain instruments, many imperceptible information of the psychophysiological processes of various organs and systems in people's body, such as electromyography, skin electromobility, heart rate, blood pressure, etc., are recorded and amplified, and transformed into information that people can understand, and continuously displayed on the dashboard with auditory or visual signals. Through the understanding and experience of the changes in these signal activities, people learn to consciously control their own psychophysiological activities to achieve the purpose of adjusting the functions of the body.

Biofeedback is trained in a variety of ways, including auditory feedback, visual feedback and tactile feedback. Auditory feedback outputs sound in various tones through headphones or speakers; Visual feedback uses a liquid crystal display (LCD) or computer monitor to output a variety of visual signals; Haptic feedback is often used by tactile stimulators to output tactile signals. Through the learning and understanding of these feedback messages with special significance, people complete the task of regulating themselves.

Biofeedback plays an important role in competitive sports. Here are a few specific application scenarios: Ancillary Training: Biofeedback can assist athletes in improving their technical movements. For example, a combination of Electromyography sensors, video data, and motion capture systems can analyze athletes' posture and movement data to provide insights for improvement. This has been applied in the training of weightlifters at Beijing Sport University, skaters at the Heilongjiang Institute of Sports Science, and in the training of the national trampoline team. Improves concentration: Biofeedback training can help athletes improve their concentration, which is especially important for solo events such as fencing and boxing, as well as solo confrontation events. At the same time, it also helps team athletes to notice the position of their teammates while keeping an eye on the ball. Attention training is usually achieved through neurofeedback training to enhance the function of the thalamus or to bring the trainee to a state of "flow". Rapid recovery: Biofeedback can also help athletes recover quickly from physically and mentally stressful workouts. For example, α wave plyometric training can promote mental calming and physical relaxation in athletes. In addition, biofeedback technology can also be applied to athletes' psychological relaxation training and emotional regulation, helping them eliminate excessive tension and improve the function of various organ systems of the body. Reduces competitive anxiety: Biofeedback training helps reduce competitive anxiety and stress in athletes. Detecting and measuring athletes' psychophysiological responses through biofeedback devices and conducting targeted training can help athletes better control their psychophysiological parameters so as to maintain a stable state during the competition. In addition to sports, biofeedback is widely used in other fields such as music, dance, surgery, flying, career management, and more. Practitioners in these fields can also use biofeedback techniques to optimize their performance and improve their productivity.

Although biofeedback has achieved remarkable results in many areas, it also has some limitations. For example, the measurement results of a biofeedback meter can be affected by a variety of factors, including physiological differences between individuals, environmental disturbances, etc. In addition, biofeedback training requires a certain amount of time and patience to learn and master the skills, which can be a challenge for some individuals who are impatient.

In summary, biofeedback is an effective mental skill training method, which plays an important role in competitive sports and is gradually being borrowed and applied by other fields. As technology continues to evolve and improve, biofeedback is expected to play a greater role in more fields.

3.2. Biomechanics

Biomechanics mainly studies the mechanical properties of objects (including human bodies, animals, plants, etc.) and their relationship with mechanical principles. In sports biomechanics, the research content mainly focuses on human movement, and reveals the mechanical mechanism and laws of human movement by analyzing the mechanical characteristics of muscles, bones, joints and other motor organs.

The research content of biomechanics is extensive, involving two major directions: dynamics and kinematics. Dynamics mainly studies the effect of forces on the motion of an object, while kinematics focuses on the change in the state of motion of an object. Together, these two directions form a complete framework for studying the kinematic properties of objects. Kinetic analysis: In the field of biomechanics, dynamics is widely used to analyze the influence of forces experienced by organisms during movement. Through kinetic analysis, it is possible to gain insight into the mechanical mechanisms of organisms during movement, such as how the forces generated by muscle contraction drive bone movement, and how external forces affect the balance and stability of organisms. This analysis is important for understanding the movement characteristics of organisms, optimizing sports performance, and preventing sports injuries. For example, the force analysis of the knee joint during running can calculate the impact force, pressure and sheer force of the knee joint during running through dynamic methods, and then analyze the risk of injury to the knee joint by these forces, so as to guide athletes and ordinary people to reasonably adjust the running posture and cadence to reduce the risk of knee injury. Kinematic analysis: In biomechanics, kinematics is used to describe and analyze the movement characteristics of living organisms, such as the range of motion of joints, the speed of contraction of muscles, and the overall trajectory of the body. Through kinematic analysis, parameters such as displacement, velocity, and acceleration of organisms during movement can be accurately measured and described, and the internal laws and characteristics of organism motion can be revealed. This analysis is important for understanding the movement mechanisms of organisms, assessing exercise performance, and developing training programs. For example, the analysis of swimmers' strokes can accurately measure and describe the athlete's stroke angle, speed and other parameters during swimming through kinematic methods, and then evaluate their swimming performance and formulate corresponding training plans. **Figure 1** is a schematic diagram of sports biomechanics.

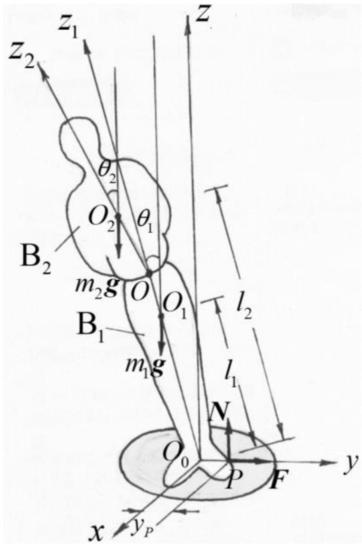

Figure 1. The schematic diagram of sports biomechanics.

Biomechanics also has a wide range of applications, especially in the sports industry. Here are some specific application scenarios: Gym Equipment Design: Biomechanical principles provide a scientific basis for the design of gym equipment. By analyzing the mechanical properties of the human body during exercise, more ergonomic, safer and more effective fitness equipment can be designed. For example, the design of the treadmill needs to take into account the force of the human body during the running process to ensure that the slope, speed and other parameters of the treadmill can meet the needs of different people. Sports performance analysis: Biomechanical analysis can help coaches and athletes better understand athletes' athletic performance, so that they can develop more scientific training plans. By analyzing the athlete's sports data during training or competition, it is possible to find out the shortcomings in the exercise process and make targeted suggestions for improvement. For example, by analyzing the parameters such as the take-off angle and speed of the long jumper, it is possible to find out the problems in the take-off process and develop a corresponding training plan to improve the long jump performance. Health management: Biomechanical principles can also be applied to health management to help people prevent and treat sports injuries. By analyzing the forces on the human body during exercise, it is possible to identify the potential risk of injury and take corresponding preventive measures. In addition, the principles of biomechanics can also guide rehabilitation therapists to develop more effective rehabilitation programs for injured people, speeding up the recovery process.

There are various research methods in biomechanics, including experimental methods, observation methods, measurement methods, etc. With the continuous development of technology, more and more advanced technical means are applied to biomechanical research, such as high-speed cameras, 3D motion capture systems, electromyography machines, etc. These technical means can accurately measure and analyze various mechanical parameters of organisms during movement, which provides strong support for biomechanical research.

4. BioFeedback Optimal System

This experimental model aims to validate the effectiveness of the BioFeedback Optimal System (BFOS) in optimizing user experience in industries such as retail, finance, and healthcare. The system does not involve studies at the molecular and cellular levels, but instead focuses on the user's behavioral and physiological responses to provide a more personalized and dynamic service experience.

This article explores the application of biomechanics in the field of business administration, particularly through biofeedback mechanisms and biomechanical principles to enhance the user experience. As technology evolves, sports companies are becoming more aware of the importance of user experience to the success of their products and services. Biomechanics is the study of the movement and mechanics of living organisms, providing many valuable insights to help companies optimize the design and service processes of motion products. By analyzing users' physiological responses and behavioral patterns, companies can adjust marketing strategies, product layouts, and service delivery methods in real-time to improve customer satisfaction and loyalty. This article will also explain how biomechanics can be effectively applied to the sports industry, such as fitness equipment design, sports performance analysis, and health management, and propose strategies and challenges for implementing biomechanics concepts, providing new perspectives and methods for companies to compete in the fierce market competition.

5. Experiment

5.1. Dataset information

In order to achieve effective training and optimization of the BioFeedback Optimal System (BFOS) model, we constructed a specially designed user feedback dataset BFOS_User Feedback_Dataset. The dataset covers a variety of physiological signals and user interaction behaviors, aiming to comprehensively capture the physiological state and emotional changes of users. The dataset has a sample size of 10,000 unique user session records, each containing high-dimensional physiological signal data and user interaction behavior characteristics, user sentiment labels, and user experience scores.

5.2. Experimental setup

In this experiment, we used the Biofeedback Optimization System (BFOS) model and conducted a lot of tests and verifications based on the aforementioned user feedback dataset. Data source: Collect physiological signals (such as heart rate variability, skin electrodermal activity, etc.) and behavioral data (such as shopping habits, investment decisions, and health monitoring records) from users participating in the test. In order to fully evaluate the performance of the BFOS system and highlight its advantages in personalized service optimization, we set up a control group experiment.

The control group used traditional static rule-based user experience optimization methods, which did not collect and analyze users' physiological signals in real time, but relied on users' historical data and preset rules to optimize strategies. Therefore, by comparing with the control group, we can more clearly demonstrate the advantages of the BFOS system in emotion recognition and service optimization, as well as its effects in improving user experience and customer satisfaction.

In the experiment, the BFOS system integrated multiple machine learning models such as decision trees, random forests, and support vector machines (SVMs) to process users' physiological signals and behavioral data, thereby optimizing the effects of emotion recognition and personalized services. In order to ensure the performance and repeatability of the model, this paper elaborates on the combination of each model and its parameter settings. Specifically, decision trees are used to generate preliminary emotion classifications, while random forests improve the stability and accuracy of the model through ensemble learning, and SVM makes accurate emotion judgments in multidimensional feature spaces. The parameter settings of each model (such as the maximum depth of the decision tree, the number of trees in the random forest, the type of kernel function of the SVM, etc.) are optimized to ensure that the model can operate effectively in various scenarios.

In addition, we also considered how to deal with the impact of individual differences on system performance. Due to differences in users' physiological characteristics such as basic heart rate and skin galvanic response, the system may deviate in emotion recognition and service recommendation. Therefore, the BFOS system combines personalized parameter adjustment, adaptive learning mechanism and multimodal data fusion strategy to calibrate the system for different users, improve recognition accuracy and service optimization effect.

Through the setting of the control group and the detailed explanation of the BFOS model, we can comprehensively compare the differences between BFOS and traditional methods and clearly demonstrate its actual application effects in various industries.

The control group uses the traditional static rule method for optimization, specifically:

Retail industry control group: Data source: User's historical shopping data (such as purchase frequency, purchase category) and transaction records. Optimization method: Recommend products and push promotional activities based on set rules (such as matching product categories with customer historical purchase data). Disadvantages: Unable to monitor and adjust customers' emotions or physiological reactions in real time, and recommendations only rely on historical behavior and preset rules.

Financial industry control group: Data source: User's historical investment behavior and account transaction records. Optimization method: Push investment advice based on user's historical investment behavior (such as capital flow, investment preferences) and market trends. Disadvantages: Investment advice does not take into account the user's emotional fluctuations and physiological signals, and lacks personalized real-time adjustment.

Medical industry control group: Data source: Patient's health records and treatment records. Optimization method: Formulate treatment plans based on the patient's disease type and historical treatment records. Disadvantages: Without real-time physiological signal monitoring, treatment plans cannot be dynamically adjusted according to the patient’s emotions and health fluctuations.

5.3. Experimental results

The goal of this experiment is to verify the effectiveness of the biofeedback optimization system (BFOS) in optimizing user experience in industries such as retail, finance, and healthcare. In the experimental design, we set up a control group to compare the results with the BFOS system, so as to highlight the advantages of BFOS in emotion recognition and service optimization. The control group uses the traditional static rule-based user experience optimization method to optimize service strategies through historical data and preset rules, rather than real-time monitoring and analysis of users’ physiological signals.

Table 1 show the main physiological signals monitored by BFOS systems in different industries and their uses are demonstrated. This data helps the system better understand the user’s needs and emotional state so that it can provide personalized services.

Table 1. Monitoring of user physiological responses in different application scenarios.

Application scenarios	Physiological signals monitored	Main uses
retail	Heart rate variability, electrical skin activity	Identify customer sentiments and optimize the shopping experience
finance	Heart rate, respiratory rate	Detect users' investment sentiment and adjust financial advice
medical	Heart rate, blood sugar levels, blood pressure	Monitor health status in real-time and adjust treatment plans

Table 2 shows the instant feedback and dynamic adjustment measures of the control group and the BFOS system in different application scenarios. The control group relies on static rules and historical data, while the BFOS system can make personalized adjustments based on real-time physiological signals to optimize service effects.

Table 2. Immediate feedback and adjustment based on physiological responses.

Application scenarios	Immediate feedback from the control group	Dynamic adjustment measures for the control group	Instant feedback on content	Dynamically adjust measures
retail	Provide general promotional information	Adjust product recommendations and promotion strategies based on user history data and preset rules	Relaxation techniques and personalized recommendations	Adjust the store layout and push discount information
finance	Providing standard investment advice	Adjust product recommendations based on user history data	Recommend stable investment products	Adjust your portfolio based on sentiment
medical	Provide general health management advice	Adjust treatment plans based on preset rules	Notify your doctor and adjust your treatment in a timely manner	Dynamically update the health management plan to improve compliance

As shown in **Table 3**, This paper summarizes the specific effects of BFOS system in optimizing user experience in different application scenarios. By improving user satisfaction and other key metrics, the system not only increases customer loyalty, but also gives businesses a significant competitive advantage.

Table 3. Evaluation of the effectiveness of user experience optimization in various industries.

Application scenarios	Improvement in user satisfaction in the control group (%)	Improvements in other key indicators of the control group	Increase in user satisfaction (%)	Other key metric improvements
retail	+10%	Increased average dwell time and higher purchase conversion rate	+20%	The average dwell time increases, and the purchase conversion rate increases
finance	+5%	Reduce customer churn by 5% and increase return on investment (ROI)	+15%	Customer churn is reduced by 10% and ROI is increased
medical	+12%	Patients recover faster and treatment effectiveness improves	+25%	The speed of recovery of patients is accelerated, and the treatment effect is significantly improved

In this experiment, we noticed that different user groups (such as age, gender, cultural background, etc.) have significant differences in their responses to the BFOS system. For example, young users are usually more sensitive to changes in emotional feedback, and their physiological signals (such as skin electrodermal activity) are more obvious, so the system has a higher accuracy in emotion recognition. However, due to changes in physiological characteristics, elderly users have less heart rate variability, which may cause the system to have large errors in identifying emotional fluctuations. In terms of gender, men and women also have different patterns of changes in physiological signals, which requires the BFOS system to be able to adjust and optimize according to the characteristics of users of different genders when performing emotion recognition. In addition, cultural background may also lead to differences in emotional expression among different users, especially when it comes to market and culture-related emotion recognition, the system needs a more detailed adaptation mechanism.

In addition, the BFOS system also faces some unique challenges in different industry applications. Taking the financial industry as an example, the fluctuations in users' investment emotions are usually closely related to market changes, so relying solely on physiological signals may not be able to fully capture the impact of external market factors on user emotions. To this end, the BFOS system needs to combine market data and user behavior history to comprehensively analyze users' emotions and decision-making tendencies. In the medical industry, the health status of patients may affect the performance of their physiological signals. For example, fluctuations in heart rate and blood sugar levels may be related to diseases, which requires the system to take into account the impact of disease status when performing emotion recognition and treatment recommendations. In addition, user behavior in the retail industry is relatively intuitive, mainly manifested in shopping habits and immediate emotional reactions, but the system needs to ensure efficient real-time feedback capabilities when processing large-scale user data.

6. Conclusion

This paper explores the application of biomechanics in the field of business administration, especially the use of biofeedback mechanisms and biomechanical principles to improve user experience. The results show that the biofeedback optimization system (BFOS) system significantly improves user experience and service quality in industries such as retail, finance, and healthcare. The system does not involve research at the molecular and cellular levels, but focuses on user behavior and physiological responses to provide a more personalized and dynamic service experience.

First, the BFOS system can accurately identify users' emotional states and demand changes by monitoring users' physiological signals in real time (such as heart rate variability, skin electrodermal activity, etc.). Based on these data, the system can optimize user experience by instantly adjusting marketing strategies, product layouts, and service delivery methods. For example, in the retail industry, BFOS increases customers' average stay time and purchase conversion rate by analyzing their shopping habits and emotional responses. In the financial field, the system adjusts the recommended product portfolio based on users' investment emotions, which improves customer trust and engagement; in the medical field, BFOS provides customized health management solutions by monitoring patients' health status in real time, significantly improving treatment outcomes and patients' quality of life.

Second, the implementation of the BFOS system not only improves customer satisfaction and loyalty, but also brings significant competitive advantages to enterprises. Experimental data show that user satisfaction in various industries has increased by 20%, 15% and 25% respectively, and key business indicators have also been significantly improved. This shows that the BFOS system can not only improve service quality, but also promote the long-term development of enterprises.

However, despite the great potential of the BFOS system, its widespread application still faces some challenges. For example, data privacy and security issues need to be fully taken into account, and the cost and complexity of technology are also important factors for enterprises to consider. In order to ensure the long-term effectiveness and sustainable development of the BFOS system, it is crucial to develop a comprehensive risk management plan. First, for the large amount of user physiological data involved in the system, data protection measures must be strengthened to ensure compliance with relevant laws and regulations, such as privacy protection regulations such as GDPR (General Data Protection Regulation). Second, the complexity and cost of technology may also limit the widespread implementation of the BFOS system. In order to reduce these obstacles, enterprises can consider reducing the implementation cost of the system through technological innovation, cost optimization and cooperation with professional institutions.

In addition, for the technical difficulties that may be encountered during the implementation of the BFOS system, such as equipment compatibility issues and insufficient data processing capabilities, enterprises should solve them by strengthening technical support, employee training and improving the after-sales service system. At the same time, the adaptability and scalability of the BFOS system in different usage scenarios should be ensured to better meet the needs of various industries.

By formulating the above risk management measures, enterprises can effectively avoid potential risks while realizing the advantages of the BFOS system, ensuring the smooth deployment and sustainable development of the system.

In summary, the BFOS system provides a new perspective and method for the field of enterprise management by integrating biomechanical principles and biofeedback mechanisms, significantly optimizes the user experience, and creates new competitive advantages for enterprises in the fierce market competition. With the continuous advancement of technology and the expansion of application scenarios, BFOS is expected to achieve breakthroughs in more industries and promote the development of various industries in a more intelligent, personalized and efficient direction.

Ethical approval: Not applicable.

Conflict of interest: The author declares no conflict of interest.

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