Prototype System for Dynamic Elastic Protection and Monitoring

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Abstract. With the continuous development of science and technology, security becomes an important content, both from the personal safety and information security, the most basic protection and monitoring security system already cannot satisfy people demand for security, protection and monitoring technology is relatively simple, function is not fully diversified, so the protection and improvement of the monitoring system should be constantly, so the application of dynamic elastic protection and monitoring, protective monitor the implementation of the new type will help the large-scale application of the design process and the improvement of the system. Based on the above content, this paper proposes the construction of the prototype system of dynamic elastic protection and monitoring, and deeply analyzes the principle of its construction.

Keywords: Dynamic Elasticity, Prototype System, Protection and Monitoring

1. Introduction
Dynamic refers to the state in which the position of an object changes when it is in relative motion. Dynamic protection refers to the dynamic protection of objects moving relative to a reference frame. In the process of relative movement of an object to the protection system, it is highly likely that some uncertain damage, injury or even destruction will occur, so there will be certain security risks. Dynamic protection can reduce unnecessary damage or even damage to the object moving relative to a reference frame by physical means, so as to ensure the safety of this object and its surrounding objects.

Dynamic monitoring is the relative monitoring of various power facilities or constantly changing objects and a series of environmental variables [1-2]. A facilities complete set of comprehensive dynamic monitoring system can be very convenient for each equipment to monitor and collect relevant information, analysis and can be real-time monitoring, check facilities operation and for recording and processing the information material, still can real-time testing facilities damage and fault condition, and carries on the remote control when necessary, to control facilities and management; More convenient and reliable, and reduce the use of personnel, efficient and fast, improve the safety and
reliability of the equipment, for the dynamic protection monitoring management automation, high efficiency, feasible, scientific to provide ideas.

Dynamic elasticity refers to the process in which an object deforms and recovers its prototype under the action of a changing field. Dynamic elastic protection and monitoring refers to the protection and monitoring of a series of variables in a constantly changing environment, so as to achieve a certain security guarantee.

The dynamic elastic protection and monitoring system faces the continuous development of the future technology, the increasing number of network users, the deepening of information technology and the continuous reform of the application system. All kinds of data and information generated by the system will bring us a lot of security challenges. Therefore, we should integrate the constantly developing technology into the protection monitoring system. For the prototype system of dynamic elastic protection monitoring, we should learn the relevant knowledge system and grasp the key concept overview. If the dynamic elastic protection monitoring is a moving object, every time the data information is accessed, the system will provide dynamic feedback in time to realize real-time control and monitoring [3]. Dynamic elastic protection and monitoring system takes dynamic and real-time as the key basis. Different from traditional protection and monitoring system, dynamic system pays more attention to the concealment of information and has a more perfect protection system, which can effectively carry out protection and monitoring and strengthen dynamic protection and monitoring.

2. Analysis and research of prototype system

Prototype refers to the initial stage of the system to build a model, can run the simplest system model. Prototype system refers to the original model and form of the system. All kinds of systems have prototypes, including various facilities systems. As shown in Figure 1, the prototype system can be used in the construction of the dynamic elastic protection and monitoring system to make all the information and members related to the protection and monitoring system be the most basic construction of the system. Compared with the system with less required functions, the prototype system can be simply built directly to obtain the required model form. However, for the dynamic elastic protection and monitoring system, it is obviously necessary to reasonably construct the prototype system, and then carry out detailed design, and finally realize the implementation of the system. The construction process of the prototype system of dynamic elastic protection and monitoring is a process of analyzing and studying the content of the system requirements, establishing the system model, and then continuously optimizing and improving.

There are some methods and requirements to build a prototype system, rather than the step-by-step instructions you might expect. We need to recognize the importance of building prototyping systems correctly. We live in an era of information explosion. In the process of building a prototype system, we may collect all kinds of data to make ideas [4]. However, the huge amount of information may not be helpful to our system construction, and may even affect our thinking of building a prototype system. Therefore, when building the prototype system, we need to select the correct data and test the system in a timely manner, which is the correct construction process. Secondly, the construction starts from the thinking of the brain, rather than the direct system construction, which will lead to a large number of modifications and deletions in the process of testing, which may lead to the appearance of the prototype system constructed in the end is not quite the same as the original requirements. With the basic ideas in mind, we can quickly and effectively express the functions and requirements to be achieved through written design. Getting the basic ideas right saves us a lot of pain and trouble during the prototyping process. In the process of building a prototype system, we should not blindly invest time and energy. It is most appropriate to combine work and rest. In the case of knowing the goal of system construction, we should think while testing and modifying, so as to truly realize the correct construction of a prototype system. The most important thing is that in the design process, learn to build design with modules, the system requirements are divided into modules, which can facilitate debugging and modification in the design process, clear and convenient, conducive to the timely improvement of system requirements, and will not make the system look cumbersome.
In the process of designing the system we should also consider the cost and efficiency of the successful establishment of the system. Sometimes building a system to the requirements you want can result in a budget shortfall for a late implementation prototype [5-6]. We need to complete and modify the system within the cost range. To reduce the curiosity in the design process, we should build a prototype model that fits the required system, rather than focusing too much on a bright spot to build. Otherwise, it may contradict or even be wrong with the original conception goal. Finally, after the prototype system has been built, we should make some modifications to make sure that the system is correct when it is finally presented, and that it shows what is required to be accomplished in the initial goal.

As a method to construct the final molding system, the prototype system has certain application scope and limitation. For a large system, such as dynamic elastic protection monitoring system, the content and requirements to be built will be very complex and changeable. It is very difficult to simulate one by one directly through observation if we do not make a systematic analysis of the partition. But for a large number of operational and logical system models, the prototype system is difficult to construct an exact model. Because the required model is too complex, not so strong interactive, and not a few words can present the system clearly.

If the prototype system is poorly managed, or the information processing process is confused during construction, it will certainly cause problems and difficulties in its use. Firstly, it may be difficult to construct the prototype because of the unclear system process. Secondly, the basic management is not good, there is no scientific and reasonable construction method to rely on, the construction of the prototype system is easy to take some detours, can not be correctly constructed successfully.

![Figure 1. Construction of prototype system](image)

**3. Application construction of dynamic elastic protection and monitoring system**

The dynamic elastic protection and monitoring system is applied to all walks of life and even to individuals.

At present, the Internet still exists a lot of risk, the dynamic elastic protection and monitoring system in the Internet, scientific research, economic and trade, education, medical, communications, observation, and other fields are involved, from the original simple monitoring on protection extend to now can be perception, real-time dynamically and can realize more features. In the student information query system, for example, the dynamic elastic protection and monitoring system through the analysis of the difference of the research process of user's access, safe and reliable to determine whether the user, to determine whether can let its access, when its found not normal visit, will in time to intercept, effectively resist the malicious access, protect students when using the system running smoothly. In the future, information risks will continue to increase, which is both an opportunity and a challenge for the implementation of the dynamic elastic protection and monitoring system [7-8]. Therefore, we need to continuously improve the defense capability and provide new technologies and solutions on the basis of the protection and monitoring system.

Dynamic elastic protection and monitoring system can be used in alarm system (as shown in Figure
2), which is generally composed of a combination of surrounding protection, building space protection and equipment target protection, etc. When the system is implemented, the configuration of the alarm detection system should be able to dynamically detect, so that its detection range is large enough. The dynamic elastic video technology can be used to monitor, display and record the scene images in real time. By detecting, protecting and controlling multimedia technology equipment, the relevant targets are identified and their electronic systems and networks are controlled using customization and pattern recognition. The dynamic elastic protection and monitoring system can also check whether some luggage, cargo and personnel are carrying unsafe objects, weapons or other contraband in the alarm system. And the real-time monitoring and video of the scene images, so that the security personnel can effectively and directly grasp the scene, and can analyze and study through video playback [9-10]. The dynamic elastic protection and monitoring system can be organically combined with the anti-theft alarm system to form a more reliable monitoring system. And other systems with some functional requirements of the building or other special parts or facilities, need to design a unique function of the safety technology protection system, then can also use the dynamic elastic protection and monitoring system for design and construction.

![Figure 2. Application of dynamic elastic protection and monitoring system](image)

4. Conclusion
To sum up, through the dynamic elastic protection and monitoring of the construction of the prototype system, we can implement for the purpose of information security protection and security, so as to realize from the point of monitoring and protection to the surface monitoring and protection, minimize the situation of the lack of security, so as to improve the authenticity of protection and monitoring, ensure the automatic protection and monitoring data can effectively reflect the operation and practice of the facilities, provide powerful technical support for the future of information protection, the prototype system of dynamic elastic protection and monitoring will become the development trend of automatic monitoring management. The dynamic elastic protection and monitoring prototype system has become an important part of the security system, which is a kind of comprehensive integrated system with strong protection ability. The emergence of this system, to monitor the administrator to provide a great convenience, can quickly find the monitored object problems and errors. Based on the above content, this paper proposes the construction of the prototype system of dynamic elastic protection and monitoring, and deeply analyzes the principle of its construction.

References
[1] Chen Yidong. A large-scale cloud monitoring system [D]. supporting elastic expansion Zhejiang University, 2015.
[2] Dang Yindi, Song Ningning. A Study on Dynamic Adaptive Evolution Security Architecture [J]. Information Technology and Network Security, 2019, 038(010): P. 18-23.
[3] Gong Kang. The invention relates to a dynamic monitoring system and a monitoring method for the normal operation of IT equipment; CN111600778A [P]. 2020.
[4] Du Gongyou. [J]. Research and Implementation of Dynamic Monitoring System Information
and communications, 2012, 000(003):51-52.

[5] Zhuang Baiming, Zhang Minghua, Gu Jinfeng. A dynamic equipment monitoring and warning system: CN208298368U [P]. 2018.

[6] Xie Liangyu, Yan Yuxiu, Tao Jianwei, et al. A Study on the Protection Performance of Seamless Knee Protector Based on Three-Dimensional Dynamic Capture Technology [J]. Journal of Zhejiang University of Technology (Natural Science Edition), 2018.

[7] High, long pine. Design and Implementation of Dynamic Monitoring System for Sand Excavator [J]. of China Journal of Zhejiang Ocean University: natural Science Edition 2012(02):164-167.

[8] Xie Mingzhi. Dynamic Monitoring System and Methods: CN101087405 [P].

[9] Wu Xubo, XIE Hong, Wang Yanzhen, et al. Research on the Protective Performance of Sports Wristband Based on 3D Dynamic Capture System [J]. Shandong Textile Science and Technology, 2013.

[10] Wang Hao. Function of Dynamic Control [J]. of Automatic Monitoring System Construction Engineering Technology and Design, 2015, 000(030):1708-1708.