



Construction of the Smart Training System Based on the Online Platform of *State Grid E-learning*

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Abstract. State Grid Technology College has constructed a smart training system based on the online training data platform of *State Grid E-learning* to enhance talent training efficiency. This paper introduces the background of the smart training system construction and discusses the specific measures to construct the smart training system in terms of extending the learning scenarios from intranet to mobile terminals, developing the “Internet +” smart training model combining training courses with live broadcasts, and building a large visual screen for smart operation, aiming to provide references for other power enterprises and state-owned enterprises on how to empower talent training based on online platform.

Keywords: Smart training system, Online platform, *State Grid E-learning*, International talent training, Visual large screen

1 Introduction

With the advent of the digital intelligence era, information technology and training have been further integrated, giving new impetus to training reform. Adapting to the new changes in training forms brought about by the development of information technology, State Grid Corporation of China (SGCC) is accelerating the digital transformation of enterprise training and nurturing a new smart training system based on the online platform of *State Grid E-learning* by extending the learning scenarios from intranet to mobile terminals, developing the “Internet +” wisdom training model and building a large visual screen of wisdom operation^[1]. This smart training system covers the entire cycle and all elements of power talent training while innovating to serve the national development strategies for power talent training. Using the operational practice from the online training platform of *State Grid E-learning* as an example, the paper presents the construction background and operational measures of the SGCC's smart training system and provides case support for the digital intelligence operation of the training of SOEs^[2].

2 Construction background of the smart training system based on *State Grid E-learning*

As a large state-owned key backbone enterprise linked to the lifeline of the national economy and national energy security, SGCC has built the smart training system based on *State Grid E-learning* to meet the new requirements of electricity talent training.

2.1 Supporting the national strategies for talent development

SGCC not only undertakes the task of providing stable and reliable power supply to society but also shoulders the important responsibility of implementing the national strategy for talent development. It needs to fully implement the work requirements of the central government to deepen the reform of talent development, thus gathering wisdom and strength for constructing an international leading energy internet enterprise with Chinese characteristics. Since the Belt and Road Initiative has opened a new chapter of Sino-foreign power cooperation, SGCC has actively carried out technical exchanges and cooperation in the field of power energy and promoted people-to-people exchanges among the Belt and Road countries and regions, aiming to promote mutually beneficial cooperation and win-win results. In such a scenario of Sino-foreign power cooperation brought about by the Belt and Road Initiative, a smart training system based on an online platform has been constructed to meet the demand for international talent training in the power industry.

2.2 Promoting the high-quality development of SGCC training

At the forefront of energy transformation, SGCC is building new power systems that bring profound changes in power supply structure, grid morphology, load characteristics, new energy sources, new loads, new businesses, new directions and new modes. This has led to new demands for talent training in areas such as technological research and development, management innovation and market development. With the deepening reform of the power system and the construction of the smart grid and the global energy network, the quality requirements of employees in power enterprises are becoming more and more demanding. In addition, the rapid iteration of high-tech in the Internet era and the smart chains of the Big Cloud have accelerated the digital transformation of enterprise training. In this context, the construction of digital training platforms is an inevitable measure for the digital transformation of corporate training. The digital training platform is expected to achieve panoramic coverage of digital training resources, efficient promotion of digital training management, improved training quality for all personnel, and precision empowerment and training management for enterprises^[3].

3 Measures for constructing the smart training system based on *State Grid E-learning*

SGCC constructs the smart training system based on the the intelligent education and training platform of *State Grid E-learning* through the overall use of "big cloud intelligent transfer" and other advanced technical means to expand and optimize the training functions.

3.1 Extending the learning scenario from Intranet to mobile terminals to support employee piecemeal learning

We have established the "dual portal" of *State Grid E-learning* on the Intranet PC and the mobile terminal of "i State Grid", as shown in Fig. 1. The Intranet PC terminal is integrated with the company's unified portal platform for single sign-on, and a link to *State Grid E-learning* has been added to each employee's personal workbench. This allows employees to easily switch between work and study scenarios, access classes, watch live broadcasts, and participate in exams at their convenience [4]. The mobile terminal of *State Grid E-learning* is integrated into the unified portal of the company's mobile terminal "i State Grid", which supports employees to access the learning platform for fragmented learning. Functions such as learning lessons, live streaming and training course management on Intranet PC are implemented on mobile terminals. Meanwhile, short videos of knowledge bloggers, Hima classes, personal growth trajectories and other unique mobile functions have been launched. Now *State Grid E-learning* has become a "Big training" platform based on the company's SG-UAP platform, integrating the human resources SG-ERP system teaching and training module, using high-quality network courseware of distance education system to realize the integration of two unified portals and single sign-on on the Intranet and mobile end. It can support up to 2 million registered users, 100,000 simultaneous online users and 10,000 concurrent users.

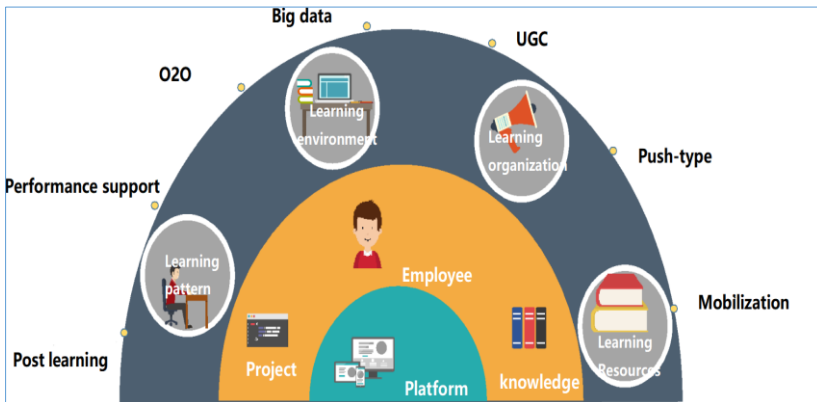


Fig. 1. The "dual portal" of *State Grid E-learning*

3.2 Developing the “Internet +” smart training model of “training courses + live broadcast” to serve the international talent training for the Belt and Road Initiative

First, we innovated to serve the clean energy cooperation of the Belt and Road Initiative. In recent years, SGCC has collaborated with Xi 'an Jiaotong University, Hong Kong Electric Company and Hong Kong Polytechnic University in jointly launching the Belt and Road Initiative Energy and Power Executive Talent Program. The program has trained more than 700 power and energy professionals across the country using live online classes and a multi-person online sharing approach to teaching, aiming to build a platform for exchange and sharing of executive talents in the power and energy industry in the Belt and Road Initiative countries and regions. In 2022, with the theme of "building smart sustainable power system and empowering green life", a seminar was held on executive talent development plan for the power and energy industry in Belt and Road countries and regions. Present at the seminar were 315 executives and personnel from universities and research institutions of 26 countries and regions, including Brazil, Chile, Portugal and Oman. Online live courses such as "UHV AC and DC Power Grid", "Intelligent Dispatching System", "Large-scale Clean Energy Grid Connection" and "Energy Storage Technology" were opened, which demonstrated the practice and achievements of SGCC in actively promoting energy and power transformation and serving the construction of new energy system, and won the praise of participants from all countries^[5].

Second, we have improved our international business support system. We have built a system of international business education and training resources by developing international training curriculum resources such as new power systems and electric vehicle charging networks, implementing international language application competency evaluation and training international teachers to further improve the support capabilities of international training services. On this basis, we actively serve the human resources development of the company's key overseas projects. For example, we have successfully completed the Saudi smart meter training program, training 68 local technical backbone employees and providing package solutions such as professional personnel training and training facility planning; we have had an exchange of anti-theft technology with Ceckunta, Chile; we have signed projects such as Pakistan Merah DC Line Operations and Maintenance Training, etc.

3.3 Building a large visual screen for intelligent operation to assist the company in training decision-making

Similar to the "operation cockpit" of *State Grid E-learning*, the smart large screen system summarizes, refines and processes all kinds of business systems and massive data from *State Grid E-learning*, as displayed in Fig. 2. This system accurately reflects the dynamic situation of training implementation, learning improvement, online examination, knowledge management, talent development, etc., to provide core operating indicators to better support the development of State Grid training.

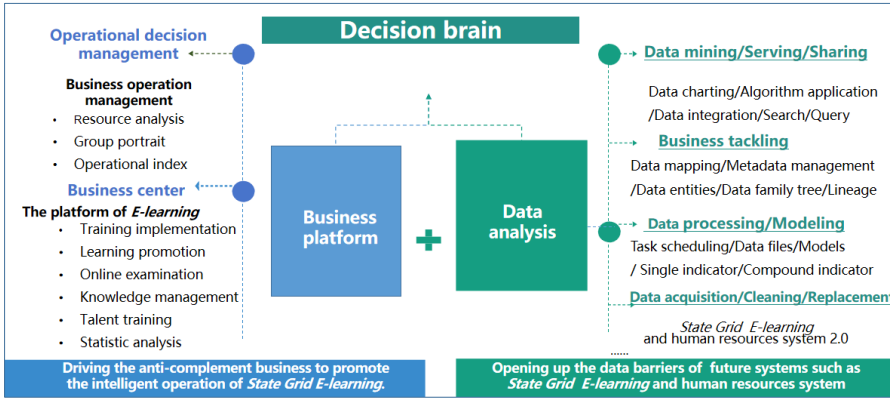


Fig. 2. Business systems and massive data of State Grid E-learning

First, the smart-screen system serves as the smart decision-making brain for State Grid E-learning. As the first State Grid training operation analysis platform, it harmonizes State Grid E-learning and human resources data, builds a comprehensive data warehouse, forms a unified data standard, and provides essential bottom-up support for the smart training of State Grid staff. Second, the system marks an innovation in big data algorithms for education, based on data cleaning, data analysis, and data mining of tens of billions of data from State Grid E-learning. With the operational analysis model created by the State Grid E-learning, various framework algorithms such as decision classification, clustering, link mining, association mining and pattern mining have been implemented. Third, this system is also the first group portrait of intelligent learning, representing the establishment of trainee group behavior portraits through the collection of "data labels" that contain information, learning, examination process, as shown in Fig. 3.

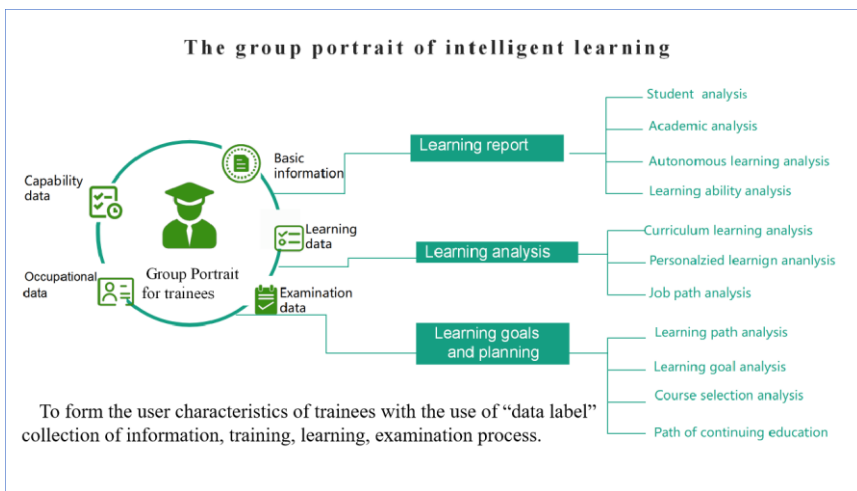


Fig. 3. The group portrait of intelligent learning

4 Conclusion

The smart training system developed by SGTC, based on an online training data intelligent platform, fully leverages the advantages of skilled talent training by improving the quality and efficiency of training [6]. At the same time, it promotes cooperation among countries and regions along the Silk Road in talent training and drives the landing of SGCC's international strategy to serve the country's Belt and Road construction. At present, with the smart learning system, the annual average number of off-job training personnel of SGTC has reached 3.6 million, the number of online training hours has reached 30 million +, and the number of online examination personnel has reached 5 million +, which has effectively promoted the company's talent strategy to a high level of landing. Overall, the system has played an active role in the implementation of the national talent development strategy and helped shape SGCC's good international and domestic brand image, serving as a reference for other power enterprises and SOEs on the digital transformation of their training businesses.

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