

Research on economic policy system evaluation methods

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Abstract. Great progress has been made in construction of economic policy system in recent years. Nevertheless, there are also difficulties in accurate inquiry, efficient use and comparative analysis. In a bid to address critical problems of the existed system, this paper builds an intelligent policy system platform. By adopting the big data and artificial intelligence technologies, a number of functions such as accurate matching, system classification, and the analyses of relevance, life cycle, response level, time-effectiveness, self-consistency, maneuverability and so on are made available, so as to put in place a policy evaluation management system which is systematic, multi-dimensional and intelligent.

1 Significance and demand

The report of the 19th CPC National Congress^[1] pointed out that we will strengthen unified leadership, top-level design, reform, and innovation. We will speed up implementation of major projects, deepen reform of defense-related science, technology, and industry, and build integrated national strategies and strategic capabilities.

Progress has been made in construction of economic policy system in recent years. Nevertheless, the system is still underdeveloped, inadequate and incomplete. Some policies are either overlapping or conflicting, either over-supervised or under-supervised, and can hardly play the role of regulating, guiding and supporting. To address these problems, we must study the policy system of economic development in a comprehensive manner, put in place a supporting policy system which is systematic, completed, effective and stimulative, thus providing durable policy support for greater development of economic development^[2].

However, under the existing management model, there are great difficulties in accurate inquiry, efficient use and comparative analysis for the entities which research, make or use the policies and regulations. So far, there isn't a platform for the convergence and sharing of data resources in relation to the policy system of economic development. Therefore, building an intelligent policy platform is an important means to optimize the management of policy system, find its problems and improve its implementation result.

Based on the selection of a certain number of representative samples of policies and regulations, combined with the investigation and research results of existing policies and regulations at all levels and in various fields, in a bid to address critical problems of existed

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policies and regulations, the platform reviews the fundamental conditions of these policies and regulations by adopting such methods as expert discussion, data analysis and comprehensive comparison, and proposes the general review, specific performance and prominent characteristics. By analyzing the development demand, the platform discusses the critical problems of existed policies and regulations and their greater-rooted causes, thus proposes a policy evaluation management system which is systematic, multi-dimensional and intelligent.

2 Steps and methods

2.1 Data management and analysis

The platform collects and deals with policy documents in various fields, and makes preliminary classification and digital processing by the releasing authority, so as to provide the basis for database construction in the aspect of information resources. A number of sample policies are selected and compared with the prevailing policies released by varied authorities in varied fields. In line with the need of development, this platform analyzes the existing contradictions and problems, and puts forward measures and suggestions from such aspects as policy-making, release, implementation, dynamic supervision and effect evaluation.

2.2 Data platform construction

The platform gains access to accurate data related to the policy system adopting web crawlers and offline data collection. The basic databases are established by designing interfaces for data cleaning, processing and structured storage, depending on data structure and type. The database for policy data and interpretation as well as industrial databases are established by combining open-source distributed database and MySQL relational database, so as to realize the real-time or batch update on the data access layer.

2.3 Data modelling and analysis

Data models and training methods suitable for the policy system analysis are established through tremendous efforts on research and verification. For different analysis tasks, different models are selected for experiments. A large volume of data is trained or fitted to determine the model parameters. The efficiency of model analysis is quantitatively verified. The data model is optimized through theoretical analysis and iterative experiments. The paper a distributed data computing engine based on MapReduce and a streaming computing engine based on memory storage, which are constantly optimized, to solve the paradox between system real-time and complexity at low cost. Based on the mainstream analysis methods, the models of service are designed, combining with different data models.

2.4 Data visualization

A data retrieval method, which is convenient and free, is designed to provide configurable analysis dimensions. Depending on the results of different data retrieval, the results of statistical analysis and prediction of trend will be displayed in a visualized manner in the form of ample statistical charts by adopting 3D technology, so as to realize data management, duplication analysis and contradiction discussion.

3 Architecture and functions

3.1 General system framework

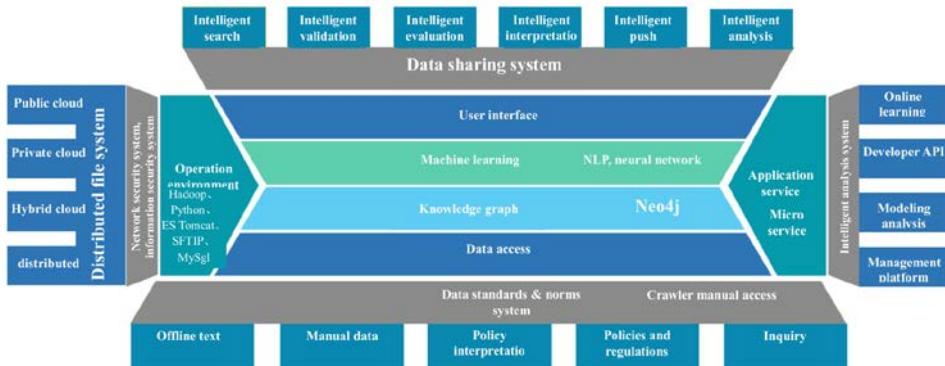


Fig. 1. General system framework.

Data access layer: integrating different data sources including the existed structured data such as offline text, manual data, policies and interpretations and consultations as well as external structured and unstructured data as input to the platform to follow through the idea of "data as service". At the same time, it provides the basis for data application, machine learning and knowledge graph.

Platform service layer: including machine learning, knowledge graph and application services. It relies on the hardware support of the computing service layer and manages two kinds of tools, including Python - knowledge graph modelling tool - and graph database, etc. It avails such functions as knowledge graph modelling, flexible analysis, intelligent monitoring and online learning, etc. As the core computing component of the knowledge graph product, it is constructed on the computing service layer as the core of the whole product. It also manages analysis tools to build a platform that covers product tools, development tools, mining tools, analysis and exploration tools.

Data application layer: namely, the user interface which adopts the micro-service structure and is characterized by high scalability and flexible deployment. It provides users with high-quality intelligent search, push, verification, analysis and evaluation among other things.

Computing service layer: the system adapts to the deployment of public cloud, private cloud, hybrid cloud or the Hadoop platform and other environments. The system also provides powerful data coordinated computing capabilities, serving as the support of the hardware computing power of the entire product.

3.2 System service structure

The system service structure has been built based on the flow of policy data and data services including web crawler service and manual data service with connection to data source; document service and model training service, ElasticSearch, tag configuration service, deconstruction storage, knowledge graph storage with respect to data storage; micro-services, data analysis, full-text retrieval when it comes to application service.

3.3 System operations structure

The platform not only provide basic functions such as digital processing, classified collection, centralized storage, comprehensive management, inquiry and search of policy data, but also provides policy evaluation analysis and event simulation analysis through data model analysis, so as to provide personalized and targeted policy-making service for users.

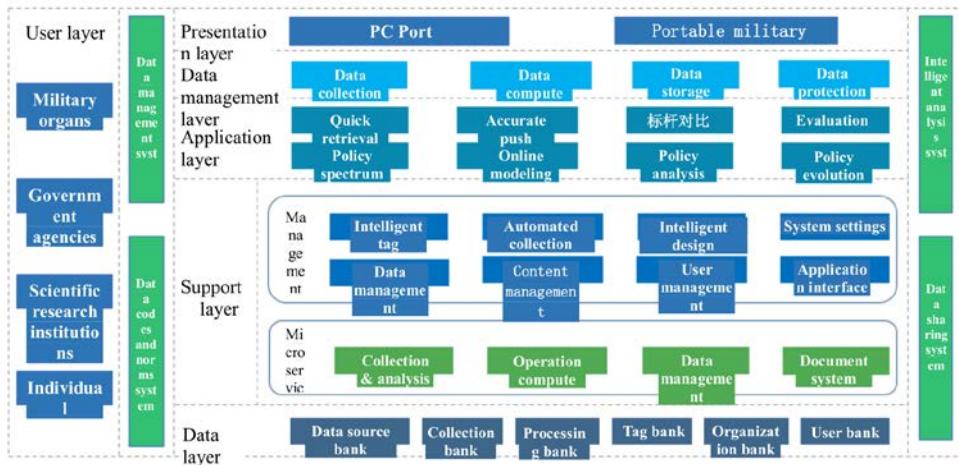


Fig. 2. System operations structure.

4 Innovation and development

From different dimensions such as specialty, field, task and content, all-round intelligent processing and function output is carried out for the integrated development policies and systems of economic development and national defense construction. These policies are collated, processed, deconstructed, reorganized, tagged and optimized in the system. In addition, a number of function modules such as accurate matching, system classification, multi-dimensional comparison, policy relevance analysis are made available by adopting the big data technology and artificial intelligence technology to put in place a policy management system which is systematic, multi-dimensional and intelligent.

4.1 Building a platform for policy system management

Intelligence analysis models are adopted to collate, process, deconstruct, reorganize, tag and optimize various policies which are then stored in the database to prepare for follow-up inquiry and analysis. The big data technology and artificial intelligence technology are adopted to provide a variety of functional modules, such as accurate matching of policies, system classification, policy correlation analysis, life cycle analysis, self-consistency, time-effectiveness and viability analysis, so as to put in place a policy and regulation management system which is structured, hierarchical and intelligent.

4.2 Improving the efficiency of policy system research

We could provide standardized policy analysis tools and evaluation indicators to avail multi-dimension and full-lifespan policy and regulation evaluation services (including time-effectiveness assessment, feasibility assessment, maneuverability assessment, text

evaluation, etc.). In future, a policy system evaluation process can also be established depending on specific working methods.

4.3 Making the policy system research intelligent

The database is established for the policy system based on open-source MySQL by means of data collection, machine learning and intelligent analysis. And text clustering, data cleaning and information mining is carried out on the basis of LDA model of latent semantic analysis, so as to realize data management, duplication analysis and contradiction discussion, making the political system research intelligent.

References

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