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Abstract

Lack of fully understandings and experiences on culture and problems coping of host countries, most Chinese enterprises would face some cross-cultural issues when they are carrying out the “go global” strategy. The cross-cultural information service, which is essentially a big data with multisource, isomerism and massive quantity, is needed for these “go global” Chinese enterprises. Traditional technology cannot solve these problems. And big data technology turns out to be a tool to solve them. Based on the situation, this article raises a conception on the big data cross-cultural platform system. The conception contains one mainline, two perspectives, three levels, four paths and five sub-projects and is looking forward to servicing on Chinese enterprises “go global” strategy.

Keywords: Cross-culture, Big Data, the "Go Global" Strategy of Chinese Enterprises

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Introduction

Currently, Chinese government promotes an national strategy named Chinese enterprises “going global”, which maintains the strategic conception “the Belt and Road” in an important role. Guided by this national strategy, Chinese enterprises accelerate their speed. Until the end of 2014, Chinese domestic investors have set up 61.28 million overseas factories and enterprises in all 156 countries and areas. Till now, China's non-financial overseas investment increased to 646.3 billion dollars. The amount of annually overseas investment becomes fifth in the world and first among developing countries.

However, Chinese enterprises “going global” strategy faces many difficulties. In the past 20 years, the amount of Chinese enterprises multinational merger and acquisition increased 17% annually. But the research shows that over 70% of the M&A transaction failed in three years and caused billions of losses. To this point, Yifu Lin(2015) pointed out that Chinese enterprises “going global ” included three steps: going global, going inside, going top. “Going global” means hard power which contains funds, technology and resources. “Going inside” means soft power which shows the success in cross-cultural communication and management. “Going top” means the combination of hard power and soft power which can earn the respect from the host government local companies and people. It is the final goal of the international enterprise that to gain worldwide reputations.

Most Chinese enterprises lack of experience in understanding and analyzing the culture about their host countries when they go global. For example, “the Belt and Road” strategy covers 25.9% of the areas in the world and 61 countries in total. The countries include Indonesia, Malaysia and other nine southeast Asian countries, Nepal, Bhutan and other eight south Asian countries, Kazakhstan, Turkmenistan and other eight central Asian countries, Iran, Iraq and other 16 southwest Asian countries, Albania, Bosnia Herzegovina and other 14 central and eastern European countries, Russian, Belarus, Ukraine, Moldova, Mongolia and Egypt. In the meanwhile, the strategy contains more than 40 different languages like Bahasa Indonesia, Malay, Tamil, Khmer, Tetum language, Urdu, Sinhalese, Maldivian language, Azerbaidzhan, Arabic, and Russian. These languages inflect multiple different cultures like Islamic culture, orthodox culture, Buddhist culture, Jewish culture and Sinic culture. Chinese enterprises “going global” have to understand and adapt to the host countries’ culture and make proper cross-cultural management strategy. Chinese enterprises are eager to solve the “cross-cultural problem”. The problems mainly about the following aspects: ① misunderstanding in multiple languages; ② differences in religionary beliefs; ③ values; ④ law and policy; ⑤ difference in races; ⑥ difference in thinking mode; ⑦ cultural conflicts. These failing cases, for example China Minmetals corporation merger and acquisition Noranda Inc. in Canada and CHALCO merger and acquisition Rio Tinto Group, show that the cross-cultural problems will appears in human resource policy, negotiation skills, management methods and other areas.
Therefore, Chinese enterprises which implement “going global” strategy need cross-cultural information service eagerly. Cross-cultural environment is about the cultures from different countries, different languages and difference races. It contains both the cultural differences of different races, nations and populations and also shows the interactions of people with the same cultural ownership. Cross-cultural information sources have many characteristics like plentiful data source, enormous quantities, quick growth, abundant topics, wide coverage, complex languages, difficult to understand, high-cost of usage, frequent changes and mixed qualities. The cross-cultural information source is enormous in quantity, multiple types, and quick to deal with and with low valuation. Essentially, cross-cultural information source are big data with several characteristic like multsource, heterogeneous, massive amounts. With these characteristics, it’s hard for traditional technology to deal with cross-cultural information sources while big data technology can provide some help. This article analyses the cause of cross-cultural management problems then construct the cross-cultural management theory of Chinese enterprises “going global” based on available cross-cultural theories. In the end, this research serves the enterprises by the cross-cultural big data platform construction theory and constructs the big data platform.

Figure 1. The Logic Diagram

The Big Data Cross-Cultural Platform for Chinese Enterprises

The big data cross-cultural platform for Chinese enterprises “going global” research focuses one thread, two aspects, three layers, four paths and five sub-projects.
Figure 2. The Research Frame

One Thread: Chinese Enterprises “Going Global”

Chinese enterprises “going global” have to understand and adapt to the host country culture. This research focuses on cultural confusion (research start point), and knowing the cultural demand of overseas management. The research choose the technology to satisfied the demands (research priority). They develop “the big data cross-cultural platform” and serves Chinese enterprises (research purpose) and embassy abroad, and government departments with foreign elements.

Two Aspects: Cross-cultural (Management) + Big Data (Technology)

Chinese enterprises overseas management faces multi-layer cross-cultural problems. Researchers use qualitative and quantitative ways to study “cross-cultural” problems. This has many problems, like data collection too small,
understand too hard and respond too slowly. The emergence of big data technology may solve these problems in many aspects, for example, Information integration, machine translation, intelligent active service. In a word, this research combines management and technology, and provides service to solve problems in cross-cultural management.

Three Layers: Regulative Layer, Normative Layer, Cultural-cognitive Layer

For these cross-cultural international enterprises, they face problems from companies and industries and nation. Comparatively speaking, Resource-based theory and industrial organization theory can help solve the problems from companies and industries. However, problems from national layer have to solve by new institutionalism. “Institutional theory” devoted to combining the institutional study and organization tightly. During the researches on institutionalization, many problems shows up like causes of differences between organizations, effects that institutional environment has on organizations, and how institutional environment can affect the organization’s structure and operation, and these are what cross-cultural management need to solve. This article studies generalized cultural problems in institutional layer for Chinese enterprises “going global”. One of the prevalent analytical frameworks for institutional theory studies is one proposed by Scott (Scott, 2001) in his book Institutions and Organizations, which includes the following three aspects: A. Regulative system, including laws, rules, sanctions and other coercive systems to restrain people’s behavior; B. Normative system, involving values and standards; C. Cultural cognitive system, involving shared social cognitions such as shared belief and share conduct logic.

Four Paths: Dynamic Integration, Machine Translation, Intelligence Service, Visual Application

This research starting from the national strategy about Chinese enterprises “going global” and “the belt one and road” and depending on big data platform, focuses on the study of dynamic integration of cross-cultural information and resources in the big data environment(path A); machine translation(path B); and intelligent service(path C). This research provides intelligent service for enterprises cross-cultural management by the three paths mentioned before. It helps to develop the frame of cross-cultural big data platform by designing and improve the cross-cultural big data demonstration platform. This supports Chinese enterprises “going global” by platform supporting and intelligent service.

Five Sub-projects

The research includes five sub-projects:
A. Demand Research on Chinese Enterprise “Going Global” Cross-cultural Theory and Big Data Platform

Centering on the cross-cultural management problems Chinese enterprises “going global” have to solve and the demands of the cross-cultural big data platform, we define the research category and study the basic theory of cross-cultural management based on the concept of the cross-cultural dimensions. Finally, we construct the framework and function design of the cross-cultural big data platform taking the demand of Chinese enterprises overseas management as main thread.

B. Research on Information Collection and Dynamic Integration of Cross-cultural Big Data Platform

This research is processed around the organization and application of cultural information resources. The database is the research of collection and filtration of multisource and isomerism of cultural information. The breakthrough is the research of semantic reveal methods of multisource and isomerism of cultural information. These two research aspects integrate information from the perspective of resource. The final goal is to research the dynamic integration of cross-cultural big data platform, which mainly integrates information based on the demand from the perspective of enterprises. The research of organization and visualization of cross-cultural information is the key and the belt for both them.

Research on Multi-language Corpus and Machine Translation System

This research is processed around the solution of machine translation in cross-cultural context. The sub-project will further construct the comparable corpus used for intelligent machine translation system, which is the important base for machine translation system. According to the conception translation problem with the cultural characteristics of host countries, this research is the base of machine translation system and also the language problem which should be handled carefully with in cross-cultural context. At the present, practical machine translation system translates sentence by sentence. The article base on this kind of translation is difficult to understand. So, this sub-project researches the framework design of machine translation system. Finally, the research can help evaluate system performance objectively, comprehensively, and automatically.

Research on Intelligent Initiative Service mode of Cross-cultural Big Data Platform

Centering on the demands of the cross-cultural information in the process of Chinese enterprises “going global”, the article studies the intelligent initiative service mode of cultural information. Chinese enterprises face multi-
layers cultural diversity when going global. Have to consider the different situation they face, basing on situational value and user value, definite intelligent initiative service demand of cross-cultural enterprise users. Through collective wisdom, the research dig out the information that cross-cultural enterprises create and establish the incentive mechanism of user creating information by researching the content iteration created by users of cross-cultural enterprises based on human dynamics and opinion dynamics. To improve the service of the platform of cross-cultural big data, the research constructs the introduced products set of cultural information service by the approach of user matching algorithm and cluster analysis, providing high efficiency and extensive introducing service of cross-cultural corporations. At the same time, the research establishes security and protection mechanism for cross-cultural big data platform to realize the intelligent auto service for Chinese enterprises “going global”.

Construction and Optimization of Chinese Enterprises “Going Global” Cross-cultural Big Data Platform

Based on the theoretical research above, this research develops the prototype system of cross-cultural big data platform, and makes the theory come true. This sub-project aims to realize the storage and processing optimization of cross-cultural big data based on the enterprise-level data platform of Cloud era. According to the theoretical research of sub-projects B, C and D, the research develops three different sub-systems. Then the research tries to visualize the cross-cultural information in big data platform. In the end, surrounding the question that how the cross-cultural big data apply to enterprises cross-cultural management, the research applies in SHANGTEX as demonstration application.

Key Issues and Researche Methods

This article attempts to explain the following five key issues: (1) What do the Chinese enterprises need in the aspects of cross-culture theory and big data platform when they are carrying out the “go global” strategy? (2) How does the big data platform gather and integrate intercultural information? (3) How can multilingual text be understood and translated quickly? (4) How can big data platform provide intelligent and active service of cross-cultural information? (5) How to construct and optimize the big data cross-cultural platform? Table 1 shows the key issues, specific methods, key points and difficult points of each sub-project. Picture 1 shows the technology roadmap. On the basis of related literature and existing research, this study combines with different research methods of management discipline, computer discipline and library intelligence discipline, adopts theory research, qualitative and quantitative research and experimental research method, adheres to the novelty of theory research and the practicability of applied research equally, which ensures the research results have primacy in academic level and extensity in application.
**Figure 3. Technical Route and Method**

**Research on theory and demands**
- **Sub-project1**: Demand research on Chinese enterprise “going global”

**Research on techniques and methods**
- **Sub-project2**: A research on information collection and dynamic integration of cross-cultural big data platform.
- **Sub-project3**: A research on multilingual corpus and machine translation system.
- **Sub-project4**: A research on information collection and dynamic integration of cross-cultural big data platform.

**Application**
- **Sub-project5**: Construction and optimization of Chinese enterprises “going global” cross-cultural big data platform.

**Methods**
- Expert interview;
- Questionnaire survey;
- Literature
- Natural language processing;
- **Artificial neural network**;
- Correlation/Clustering analysis;
- Natural language processing;
- Incremental search;
- Neural network;
- Pareto/NED model; Focus label; User matching; Data mining;
- Hadoop system; Information system;
- Cloudera Enterprises-level big data platform;
- Enterprises cooperation

**Big data**
- Cloudera
- Google enterprise cooperation
<table>
<thead>
<tr>
<th>Sub-project</th>
<th>Key Issues</th>
<th>Specific methods</th>
<th>Key and Difficult Points</th>
</tr>
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<tbody>
<tr>
<td>Sub-project 1</td>
<td>(1) Theory construction of Chinese enterprises “going global” cross-cultural management (2) Recognition of demand towards the big data cross-culture platform</td>
<td>(1) Interview (2) Enroot (ALTAS) (3) Structural equation model</td>
<td>To construct target system of cross-culture dimensions of Chinese enterprises going global.</td>
</tr>
<tr>
<td>Sub-project 2</td>
<td>(1) Research of semantic reveal methods of multiscource and isomerism of cultural information (2) Intelligent Semantic matching mechanism of information under the Cross-cultural environment</td>
<td>(1) Mathematical modeling (2) Correlation/Clustering analysis (3) Ontology integration (4) Information visualization</td>
<td>(1) Semantic correlation in the reveal of information; (2) Context analysis of semanteme</td>
</tr>
<tr>
<td>Sub-project 3</td>
<td>(1) Research on word aligning model basing on multi-language corpus; (2) The system design and automatic evaluation of machine passage translation</td>
<td>(1) System modeling (2) Arithmetic design of web dynamic update (3) Concept analysis</td>
<td>(1) How to construct word aligning model; (2) How to design machine passage translation system;</td>
</tr>
<tr>
<td>Sub-project 4</td>
<td>(1) Measurement model construct of customer value and situational value (2) Efficient, quick and rational systematized integration of giant UGC produced by multiple information resource.</td>
<td>(1) Information extraction (2) Behavior dynamic (3) Collaborative filtering (4) Survival analysis</td>
<td>(3) To construct new product family of going global enterprises with data mining (4) The evaluation method of giant UGC produced by multiple information resource</td>
</tr>
<tr>
<td>Sub-project 5</td>
<td>(1) The design and development of the big data cross-cultural platform (2) The application of the big data cross-cultural platform</td>
<td>(1) Interview (2) Enroot (ALTAS) (3) Prototype system development</td>
<td>The application of the big data cross-cultural platform</td>
</tr>
</tbody>
</table>
Features and Innovation of the Big Data Cross-cultural Platform

Three Features of the Big Data Cross-culture Platform

Firstly, responding to the demands of those “go global” Chinese enterprises, the platform can collect intercultural data with multisource, isomerism and massive quantity. For example, based on new institutionalism, it can collect cultural information in “control level”, “specification level” and “cultural cognition level”, specifically including laws, rules, sanctions, values, standards, beliefs, behavior logic, these seven aspects. Not only structured cultural information is included, like law, policy, speech standard, recordable religious canon, fairy tales, etc; also unstructured information is included, like related video and documents of sanctions, values language and logical thinking.

Secondly, the platform can cope with the understanding problems of multilingual information faced by Chinese enterprises in the process of “go global”. The data of one culture may be derived from different languages of different countries. “The Belt and Road” strategy involves many countries and more than forty different languages. Based on the situation, the big data cross-cultural platform plans to build corpus with various languages and provides machine translation of multilingual information collected before.

Thirdly, the platform can also provide initiative intelligent services for “go global” users and complete the service of big data platform according to the User Generated Content. Based on the needs of users and aimed at various different terminals, the platform tries to provide intelligent recommendation service. Meanwhile, it can also create contents with the reference of user’s feedback, so as to optimize the service quality and effect in the future and provide better intelligent service.

Three Innovations of the Big Data Cross-culture Platform

Theoretical Innovation: Establishing Chinese Enterprises “Go Global” Intercultural Theory System

Given the fact that intercultural management theory which can provide guidance for Chinese enterprises is lacking, this article intends to introduce the new institutionalism theory, attempts to integrate and improve the existing cross-cultural management theory. At the present, Chinese research results about cross-culture management is fewer, so culture measurements are mostly based on the research perspectives of western scholars, lacking in research perspectives of oriental scholars. Even the most authoritative theory - six dimensions framework (individualism and collectivism, power distance, uncertainty avoidance, softness, long-term and short-term, indulgence and constraints) put forward by Hofstede (1980; 1991; 1980) has also suffered from lots of questions. Also, management mode doesn’t only depend on cultural factors, so it’s not enough to attribute multinational management problems to
cultural dimension diversity. It’s really necessary to construct a cross-culture management model on the basis of existing research results, which is also the precondition of clarifying cross-cultural research service category. In conclusion, the establishments of Chinese enterprises “go global” intercultural theory system is one innovation of the article.

**Method Innovation: Glacier Model**

Based on the construction system of Scott (2011) and Fan Zheng (2007), this project constructs Glacier model, which can describe the civilization environment relied by management models and one kind of management model based on system civilization. Glacier model develops on the basis of “Onion Model” and “Iceberg Model”, and it surpasses “Shane mode”. ① Glacier model adopts the hierarchical thinking of “Onion Model” and “Iceberg Model”, and meanwhile it emphasizes the interaction relationship between all levels, and especially the frozen layer results from the interaction between the snow layer and water layer. ② External forces are added into Glacier model, which highlights the interactive relationship between different civilizations and fills new content into cultural hierarchy theory model. ③ Glacier model depends on concept of civilization system and concept of knowledge, rather than culture concept. ④ Glacier model is not only suitable to describe a kind of system environment or civilization environment condition (based on the three layers of system), or explain the civilization environment relied by management models, but also suitable to describe a monomer (based on the three layers of knowledge) and be used to express a kind of management mode. ⑤ External force imposed, seepage staggered and inaction, these three scenarios predict three cross-cultural function relation between two civilizations or between management modes.

**Application Innovation: Constructing the Big Data Cross-culture Platform System for Chinese Enterprises “Going Global”**

At the present, information tools serving for analyzing cross-culture problems about Chinese enterprises going global are seriously lacking. Responding to the uncertain and multiple-scenario problems faced by going global enterprises and based on the dynamic integration of cross-cultural information, the article attempts to build users’ cross-culture demand model with the help of the big data cross-culture platform. Through the iteration of cultural information generated by enterprises and employee users, and based on the positive feedback of user-generated content constructed by incentive mechanism, the article intends to realize personalized recommendation of cross-cultural information for going global enterprises, and intends to provide intelligent initiative service for enterprises and help Chinese enterprises go global successfully.
References


