A Study on Service Portfolio Innovation of the Power Grid Enterprise
Against the Background of New Electricity Sector Reforms—
Based on an Analysis of Literature at CNKI (2008-2017)

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Keywords: New electricity sector reforms, Power grid enterprise, Service innovation.

Abstract. Against the background of a new round of electricity sector reforms, due to the
intensification of power sale market, service innovation has become an important way for the power
grid enterprise to gain new competitive advantage. Based on a keyword search at CNKI database,
this study selected 100 papers published between 2008 and 2017 on power grid service innovation.
An analysis of these papers finds that much of the literature focuses on service quality management
strategy, technology strategy, and product strategy of the power grid enterprise, little has
comprehensively and systematically explored its service innovation. Based on an internal and
external analysis of the power grid enterprise and a synthesis of 4P, 4C and 4R marketing theories,
this study puts forward a pathway for service innovation of the power grid enterprise, which
includes analyzing marketing situation, clarifying the strategic objectives of grid enterprises,
establishing the customer relationship management based on market segmentation, adopting a
customer-oriented marketing strategy, monitoring the data and controlling performance and so on.

Introduction
In March 2015, the CPC Central committee, the State Council issued “opinions on deepening the
reform of electric power system” (hereinafter referred to as the" new electricity system reforms),
which proposed that the power market needs to establish a market structure of " controlling the
middle and releasing the two ends". At the end of the same year, the National Development and
Reform Commission, the National Energy Board announced the supporting documents of electricity
system reform. Among them, “the implementation opinions about pushing forward the reform of
marketing electricity side”. The document pointed out that power generation companies and social
capital can invest in the establishment of the power sale company and allow the power users
matching market access conditions to choose independently to trade with power generation
companies and power sale companies. The purpose of opening the retail side is to introduce
competition, to restore power commodity attributes and to encourage more and more market players
participate in the power sale market. According to the North Star power grid, as of February 10,
2017, the number of power sale companies has increased to 6,389 within the scope of the business.

After the electricity system reform, external environment of power grid enterprises has changed
dramatically. In the meantime, the diversified, lean and customized requirements of customers urge
that its retail sector is confronted with stiff competition. How to make innovation in service
becomes the focus of the power grid enterprise against the background of new electricity sector
reforms. For this, the academic and industry have conducted continuous research on the topic of
“marketing strategy of power company” and the studies are published. Based on the analysis of
statistical data and the achievements of relevant papers in recent ten years (2008-2017) on Chinese
database CNKI and the pre-judging the power market environment after the implementation of the
new electricity system reform policy, this paper puts forward the three-dimensional path of the
service innovation of grid enterprise in the context of new electricity sector reforms in line with the
current situation of the power grid enterprises.
Descriptive Statistics and Review of the Service Innovation Literature of Power Grid Enterprise

According to the content coverage and relevance, this paper examined journal articles and dissertations based on Chinese database CNKI for three times, using “grid enterprise”, “service innovation”, “power marketing” and “power company marketing strategy” as the themes for retrieval. 100 papers which were published in the period from January 2008 to September 2017 and selected from all searched papers after excluding unrelated and repetitive papers constitute the samples of this literature analysis. Descriptive statistics are as follows:

Statistics Collection in Terms of Years

From 2008 to 2017, the number of papers published each year can reflect the trend of the research on the service innovation of grid enterprises before and after the proposition of the new electricity system reform, as shown in figure 1.

![Figure 1. The statistical results from the classification of the years of papers.](image)

From 2008 to 2014, the number of articles about service innovation of power grid enterprise is relatively small. In 2015, with the implementation of the new electricity sector reforms and other related documents, the research on this topic attached importance to the society. Therefore, many studies are conducted at this time. It continued this trend in 2016. Overall, there is a growth in the number of papers published between 2008 and 2017 (The number of papers in 2017 is an incomplete statistic, which is believed to exceed that in 2016).

Statistics Collection in Terms of the First Authors

According to the first author's occupation, professional title and work unit, this study has made a detailed statistical analysis of the papers. The results as table 1.

<table>
<thead>
<tr>
<th>Classification of Authors</th>
<th>Paper Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>occupation</td>
<td></td>
</tr>
<tr>
<td>grid technician</td>
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</tr>
<tr>
<td>engineer</td>
<td>2</td>
</tr>
<tr>
<td>university teacher</td>
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<tr>
<td>postgraduate</td>
<td>48</td>
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<td>electric power university</td>
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<td>Non-electric power university</td>
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<td>power grid enterprise</td>
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</tr>
<tr>
<td>non-power grid enterprise</td>
<td>7</td>
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</tbody>
</table>

Statistics Collection in Terms of Publications (Literature Sources)

Papers classified by publication include master's thesis, doctoral thesis, power core periodical, trade newspaper, classification statistics as shown in table 2.
Table 2. The statistical results from the classification of publications (literature sources).

<table>
<thead>
<tr>
<th>periodical sources</th>
<th>paper quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>master's thesis of electricity professional college</td>
<td>19</td>
</tr>
<tr>
<td>doctoral thesis of electricity professional college</td>
<td>0</td>
</tr>
<tr>
<td>master's thesis in management</td>
<td>34</td>
</tr>
<tr>
<td>doctoral thesis in management</td>
<td>1</td>
</tr>
<tr>
<td>core periodical of power and energy</td>
<td>7</td>
</tr>
<tr>
<td>non-key periodical of power and energy</td>
<td>16</td>
</tr>
<tr>
<td>non-electricity periodical</td>
<td>20</td>
</tr>
<tr>
<td>trade newspaper</td>
<td>3</td>
</tr>
</tbody>
</table>

Statistics Collection in Terms of Research Content

The papers can be classified in terms of scholars’ different opinions about service innovation strategy of power grid enterprise. According to the statistical results, improving the quality of service and the reliability of power supply occupy the first place. Other views are shown in figure 2.

![Figure 2. The statistical results from the classification of research content.](image)

The Literature Review

The above 100 articles mainly focus on the following three aspects: service, product and management.

**Firstly, service.** First of all, change the service perception. The company needs to adhere the principle of providing outstanding services, to strengthen the service consciousness of employees of power supply enterprises and to improve the service quality[1]. Only by establishing "customer-centric" marketing concept can the power grid enterprises seize the customer’s need which is the fundamental driving force of enterprise development[2]. Secondly, new technology is used to improve service quality. The introduction of robotics by power grid enterprises will change the existing traditional mode of the handle service and lead the future development direction of intelligent service of power grid enterprise, which has great exploring and innovative value[3]. The third is customer relationship management. The company can adopt the demand side guiding strategy. First, a wide range of customer data investigations should be conducted, and economy, technology and other means can be used to guide customers’ consumption after having established a large customer relationship management system[4].

**Secondly, product.** For clients who have special requirements on voltage quality, power grid enterprises should not only ensure the supply of power but also make an effort to satisfy their quality needs[5]. Furthermore, the “customer reception day”, quality improvement of the power product, and setting price based on customers’ needs with the help of internet technologies are also the research focus of scholars.
Thirdly, management. Enterprises need to change the old intensive management mode. Therefore, it is necessary for them to learn from the advanced management mode at home and abroad, to reflect on the internal problems and actively adjust the management strategy. Such adjustment includes the improvement of staff system, the standardization of management and the establishment of good image etc. Through the adjustment, a new market credibility order can be set[6]. What’s more, the innovative management mechanism will contribute to the form of efficient organizational structure and the establishment of optimal internal operation process. It can also improve the content and form of service innovation along with the development of the new era[6].

Brief comments: The above papers can be classified into two stages: one is before the release of new electricity reform policy(before 2015) and the other, after the release. At the former stage, proposed suggestions on service innovation of power grid enterprises are relatively general, with limited focus on the target enterprises. At the latter stage, relevant researches are rare and not systematic enough. Considering this, it is necessary for us to analyze the features of the operation environment and explore feasible service innovation pathway for the power grid enterprise.

Theoretical Analysis of Power Grid Enterprises’ Service Innovation Against the Background of New Electricity Reforms

The Business Environment Has Changed, Promoting Service Innovation of the Power Grid Enterprises

Firstly, power grid enterprises’ operation and competition environment have changed. Though the electricity transmission is still served exclusively after the reform, the administrative departments of the government, at the same time, strengthen their supervision, especially on the cost accounting. Secondly, competitors of power distribution and retail become diverse, so, users own more options. Now, with the open of the retail-side electricity market, electricity users, getting the market admittance, are allowed to deal directly with power plants and electricity retail companies. Propelled by the policy, more and more competitors covering independent retailers, companies which own the distribution and retail service as well as electric brokerage firms enter into the market, providing more alternatives for users.

Marketing Theory and the Integration

Typical marketing theories such as 4P, 4C and 4R will shed light on product marketing and service innovation. 4P refers to product, price, place and promotion, it is a marketing mix focusing on production. Emphasizing on customers’ need, mix 4C integrates elements including costumer, cost, convenience and communication. As for 4R, it is a mix of relevancy, relation, reaction and reward. The development of the above theories reflects clients' diverse demand on one hand, and it indicates on the other hand that due to the increasingly intense competition, government's supervision and public demand for enterprises are getting higher and higher. In order to apply the theories more effectively. We, considering the trendy issues like internet technologies, big data and online-sale, form an integration framework based on 4P theory and then incorporate 4C and 4R theory to it.
Innovation Path of Service Portfolio of Power Grid Enterprises under the Background of New Electric Power Reform: Taking the National Power Grid Corp as an Example

Firstly, analyze the current situation of enterprise marketing service. The information of power consumer’s demand, complaints can be gathered through analysis of historical data of enterprise marketing service, customer relationship, existing marketing tools and customer satisfaction. After fully considering the new competitive environment, the enterprise can make a basic judgment of the current situation of enterprise marketing services through comparing the above data with that of benchmarking enterprises. The conclusion is that analyzing the current situation of enterprise marketing service is the starting point of service innovation for enterprises.

Secondly, develop market-oriented marketing strategies. The strategic goal of state grid corporation is to build a modern company with powerful grid, superior asset, excellent service as well as performance and to provide crucial guarantee to serve the overall work of the Party and the country, to power customers, to power generation enterprises as well as to social economy development etc. Provincial power grid companies and its subsidiaries in city and county should formulate their own marketing strategies hinging around the social and economic development of the province (city, county) and market structure.

Thirdly, establish a customer relationship management system based on market segmentation. As electric power products belong to the most basic public products, the power grid enterprises must cover all markets, which means that the enterprises need to operate all market segments. But, more remarkable, different market has its own demand. Therefore, power market can be divided into different segments in terms of industry, such as agricultural electricity, industrial electricity, commercial electricity, constructional electricity, transportation communicational electricity, residential electricity and other electricity. The grid enterprise should always believe the in the conception of customer’s satisfaction, understand comprehensively the personalized and differentiated needs of all kinds of consumers. The marketing strategy choices should be based on market segment.

Fourthly, innovate on marketing mix, differentiation in service. Specifically, the plan covers the following four aspects. Product. Power grid enterprises need to strengthen the management of power quality, investing more on infrastructure of power supply, regulating the management of power plants, improving staff’s adaptive ability and gradually develop new business such as...
electricity substitution should also be taken into consideration. Price. Power grid enterprises should set reasonable price interval under the guidance of governmental management, implementing corresponding price strategy for users of different industries, power load and consumption amount and charging differently according to when the electricity is used (period and season). Place. Against the background of new electricity reform, users are provided with more options. This drives power grid enterprises to make adjustments, such as integrating traditional channels, cutting marketing procedures, forming an open, intelligent and interactive marketing system, providing service on computer and mobile phone, making micro-blog and We-chat as marketing place. Promotion. The promotion of electricity is different from that of other products. Power grid enterprises’ promotion has three purposes, namely, to retain the old clients, develop new clients and encourage more use of clean energy like electricity and less use of other energy.

Fifth, do supporting work for service innovation. Firstly, culture is the antecedence. In the operation of power grid enterprises, every action needs to be customer-oriented, everyone should bear customers’ requirements in their mind. Secondly, power grid enterprises should cherish talent. They can implement cultivation plan for chief expert and young experts, build team led by elites, promote competing activities in marketing service area. Thirdly, based on the “three intensification and five systems”, enterprises need to strengthen the information construction including the top-level design of operation mode and the construction of the unified platform for big data so as to support decision-making, optimize production and advance development of work mode. Fourthly, power grid enterprises need to guarantee the standard, detailed routine management of all aspects. They can improve their competitiveness through carrying out the service innovation.

Sixth, establishing mechanism of problem discovery and control based on the performance of service innovation. Firstly, enterprises can set standards of service marketing under the guidance of “The performance evaluation guidelines of National power grid enterprises” and “The performance evaluation outline of National power grid enterprises”. The enterprises should also make “The detailed performance evaluation rules of marketing service” to guarantee the evaluation is comprehensive, objective, quantitative, advanced integrated. In this way, with the consistent standard, power grid enterprises could evaluate the implementation of marketing service standards, the operation process, the system construction of the company and the use of professional strategies. Secondly, enterprises should make accurate measurement and refine service innovation. They can apply the theory “DMAIC”, namely, define, measure, analyze, improve and control to advance service innovation.

Conclusion

With further depth of electric system reform, the monopoly of power market was broken gradually. Therefore, the competition pattern is formed in the power sale market, which brings great challenges to the development of power grid enterprises. The key factor of sustainable development of power grid enterprises is the service innovation based on serving the overall work of the Party and the country. This paper discussed the establishment of innovation system of power grid enterprises with 4P, 4C and 4R. But each province, city and county electric power company have its own particularity, different customer structure. Finally, the power grid enterprise will establish a sound service innovation system which is geared to the electric power market system, so as to continuously improve the competitiveness.

References


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