RESEARCH ARTICLE

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The formation and management of virtual teams in T Telecom Company

Abstract   Virtual marketing teams have emerged in T Company, a regional branch of China Telecom, and led to tremendous success in recent years. It is beneficial to explore the reasons behind such a phenomenon and to identify the factors leading to high performance. Investigating these issues also helps deepen our understanding of managerial experience and some important organizational changes that Chinese state-owned enterprises are going through. In this case study, analysis of the characters of high performing virtual marketing teams in T Company concentrates on four main team processes, namely virtuality and communication, personnel selection, trust, and motivation. Key factors contributing to the team's high performance are analyzed, and the implications of the results for management and future research directions are also discussed.

Keywords   T Telecom Company, marketing, virtual team, VIP customer, high performance

摘要   T 电信公司作为中国电信的市级分公司，近些年出现了营销虚拟团队并取得了良好的业绩。考察这些现象有助于认识电信营销虚拟团队出现的原因，深入理解当前中国国有企业的一些重要组织变革及其可借鉴的管理经验。通过研究将 T 公司电信营销虚拟团队的高绩效特征聚焦于虚拟性与沟通、人员选择、信任、激励四个主要的团队过程，分析了 T 公司虚拟营销团队在实际运作中导致高绩效的关键因素，最后讨论了研究结果的管理蕴涵与未来研究方向。

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The emergence of virtual teams is due to the changing internal and external environment that an enterprise faces (Wang and Tang, 2006). Along with the deepening reform in domestic telecom operators, radical changes have taken place in the internal and external environment that China Telecom faces. Virtual marketing teams (VMTs), as a response to competition in the market, are now becoming more and more important for China Telecom Group (China Telecom). Based on VMTs, this new marketing mode, has demonstrated its strength as a powerful organization form in highly uncertain and complex VIP (very important person) customer marketing. Virtual teams, in which members use technology to interact with one another across geographical, organizational, and other boundaries (Gibson and Cohen, 2003), improve the speed of reaction, strengthen the adaptability and flexibility of organization, and has become an important method to develop the core competitiveness of organizations.

Although progress has been made in research on VMTs in China, little attention has been paid to the application and management method of VMTs in enterprises. Nor have there been such studies on large state-owned enterprises. The enterprise concerned in this case study is affiliated to China Telecom, a typical large state-owned enterprise in North China. The aim of this paper is to study the formation process and internal operation mode of VMTs in T Company so as to provide managerial references for other state-owned enterprises, which we believe, is of unique significance to China's ongoing enterprise reforms.

1　Background

Since the separation of government functions from enterprise management in 1995, China Telecom has undergone a number of adjustments and reforms. At the same time, corporate governance reform and technology renovation also promoted fundamental changes in China's telecommunication market. In 1995, China Telecom, for the first time, registered as an independent enterprise legal person, and gradually transformed from a former government department into a business entity. Since then, China Telecom has appeared formally as an enterprise in the legal sense. In 1998, China Telecom's postal services and telecommunication divisions were split into two independent companies and China Telecom began to focus solely on the operation of all telecommunication business. To further boost competitions in China's telecommunication market, in 1999, Chinese government declared that the paging, mobile and satellite services of China Telecom were separated and transferred respectively to Unicom, Mobile and Satcom, and all these enterprises were granted licensees to operate

their own telecommunication services all alone. In 2001, China Telecom was once again split into north China Company and south China Company (mainly with Changjiang River as a boundary), known as the new Telecom and Netcom, respectively.

Around 2003, both parties started to establish subsidiaries in each other's main operation regions. Meanwhile, accompanied by the reform of China Railcom (called Tietong in China) and the emergence of substitute products from other telecommunication operation enterprises, the competition faced by China Telecom became ever intensified. After years of reform, China Telecom has gradually become a telecommunication services provider mainly in the field of fixed-line telephone business, PHS, data and Internet business. For Chinese government's "separate operation" and "asymmetric regulation" regulatory policy in telecommunication market, as well as the ossification of interior management system, China Telecom in recent years faced severe situation of decrease in basic business and deficient in new business increment, including low growth rate of main business income, successive monthly decline of call minutes per single telephone, continuous rise of telephone withdrawal rate, etc. More seriously, due to the intense competition, China Telecom is losing its VIP services that are of decisive importance to its revenue stability and growth.

In order to change the rigidity of enterprise management system, China Telecom has carried out a number of reform measures top down, and has introduced a "market-oriented, customer-centered, and efficiency-targeted" enterprise tenet. However, strict bureaucratic administration system was seriously restricting its market competitiveness. Though China Telecom has set up some small sales and marketing teams, their roles are limited in the face of increased market uncertainty and complexity of customers' need. In 2003, in order to implement customer-oriented business philosophy, China Telecom divided its customers to three segmentations based on their importance and revenue, and constructed three corresponding marketing channels (i.e. VIP, business, and public customer channels) to use differentiation strategy to maintain the current customers and expand the increments from new market. The reform measures have achieved good results and created the organizational basis for cross-functional, cross-regional team coordination. Also, it fostered the formation of customer-oriented corporate culture.

While China Telecom is experiencing reform of interior and exterior system, modern communication and information technology has undergone rapid development. New types of virtual communication means have blurred the boundary with traditional face-to-face communication. In a new era of technology booming and visual reality, telecommunication products have become more complicated and diversified than ever, which requires composite

and integrated marketing strategies to utilize the advantages of network. In the same period, the customers' needs of communications and information begin to increase rapidly. But in face of these new changes, customers often can not really understand their communication and information needs so that it is difficult to predict the development of future technologies. The uncertainty and complexity of customer demand is rising drastically. Therefore, China Telecom not only contributes to the development of customers, but also brings new opportunities for itself by means of integrating its own network and human resource advantages and providing customers with comprehensive, long-term, high-quality solutions and deep support. This cooperative demand is hard to be met by any certain sector or regional team. As a result, a mode of marketing VT has emerged to meet this trend.

T Company is located in a western province of China. As a city-level branch of China Telecom Group, it holds more than 900 million Yuan of fixed assets and a total capacity of about 600 000 telephone exchanges. Its network covers nearly 3.6 million people in the whole city. By 2006, T Company has 500 000 network telephone users, 30 000 broadband users; the operational income is about 260 million Yuan. In T Company, under the background of telecommunication reform, technological development, and drastic change in interior and exterior market environment in the past 10 years, the number of potential customers has begun to drop and its interior network capacity has become surplus. The attention to new market and contest for customer resources in recent years made T Company begin to adopt the new mode of VT in VIP marketing activities. The results were quite satisfactory. Therefore, study on VT's formation, operation, and high-performance characteristics will definitely bring valuable insights into organizational reform of large state-owned enterprise. In addition, team mode as a necessary supplement to the rigid traditional bureaucratic management mode is able to help state-owned enterprises to improve their flexibility and to cope with the environmental uncertainty.

2 Theories on virtual teams

Since the 1990s, with the development of information technology, application of VT in the management practice has become increasingly popular. The inputs-progresses-outcomes (I-P-O) model, as a theoretical framework, is widely used in research on VMTs.

Virtual teams refer to a group with a common goal, who work coordinately by adopting the network information technology crossing obstacles of space, time and organizational boundaries (Lipnack et al., 1997). Gong and Wang (2004)

suggest that VT is a group of people with different capability or resources who work collaboratively, in order to complete a particular task or achieve a common goal, crossing obstacles of time and space or organizational boundaries with the assistance of electronic information technology. These definitions exclude the co-located VMTs, member geographical dispersion is not a requisite for VMTs. However, because co-located team members can communicate and coordinate in a highly virtual manner even though they are in close physical proximity. All teams have their virtuality (Kirkman and Mathieu, 2005).

2.1 Team virtuality

Some researchers are shifting away from defining VMTs as a type of team that contrasts with a "traditional" or "conventional" face-to-face team (Guzzo and Dickson, 1996; Kirkman and Mathieu, 2005), but are focusing instead on "virtuality" as the potential features of all teams (Martins et al., 2004). Team virtuality is the extent to which team members use virtual tools to coordinate and execute team process, the amount of informational value provided by such tools, and the synchronicity of team member virtual interaction (Kirkman and Mathieu, 2005). The amended team virtuality model is shown in Fig. 1.
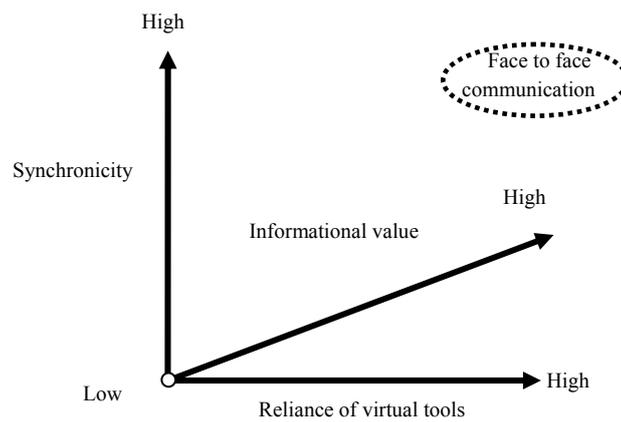

Fig. 1 Three-dimensional structure model of VMTs

The degrees of virtuality vary with different teams. Compared with face-to-face communication, the higher the dependence on virtual tools, the stronger the virtuality of a VT. Communications and information technology in VMTs include not only direct communication, but also valuable information transmission. The richer and more valuable the information exchange among

members, the lower the virtuality. The combination of virtual tools includes communication as well as data transmission. Synchronization refers to real-time exchange, while asynchronism has certain time lag. Although asynchronous communication has some shortcomings, members can have sufficient time to study the information and response, search for resources and reduce the time and space limitations. In short, compared with face-to-face communication, video conference, and instant information, asynchronous communication has higher virtuality than synchronous communication. Kirkman and Mathieu (2005) summarized a total of eight decisive factors of team virtuality from three aspects (Table 1).

Table 1   Team virtuality and antecedents

Contextual features	Numbers of boundaries crossed	Team virtuality increases as the increase of the number of boundaries(e.g., organizational, nations/cultural, time zones) crosses
	Proportion of co-located members	Team virtuality increases as the proportion of co-located team members decreases
	Team size	Team virtuality increases as the increase of team size
Task-media-member compatibility	Task complexity	Team virtuality increases as the increase of task complexity(intensive interdependence)
	Team member competencies	Team virtuality increases as the increase of KSAO (knowledge, skills, abilities, other) owned by team members
Temporal dynamics	Time available for task completion	the more efficiently and quickly the virtual tools are, the more likely team virtuality will increase
	Team evolution and maturity	Team virtuality rises as the increase of KSAO (knowledge, skills, abilities, other) owned by team members
	Rhythms of team process	Virtuality changes as the task attribute executed in different time. Virtuality is usually low at the upspring stage (mission analysis, targeting, strategy development), and high at the action phase (coordination, surveillance environment, execution of the backup plan)

Source: Kirkman and Mathieu (2005).

Shekhar (2006) clarified the directionality and granularity of virtuality under different contexts through the study of virtuality of virtual organization, and suggested that virtuality should be tested through the factors influencing it, the degree of virtuality, and the outcomes of virtuality. Under different circumstance, virtuality can promote team effectiveness, but also may impede it. Therefore, it is necessary to evaluate the outcomes of virtuality. Virtuality is virtuous only when

the business activity or process is being performed better or more effectively than non-virtual or low-virtual state (Shekhar, 2006). Virtual direction includes external customer (EC) direction, namely the virtuality of different types of customers; internal customers (IC) direction, namely the virtuality of working staff or other members within the organization; value chain (VC) partners direction, including virtual linkages with suppliers, alliance partners, affiliates, service providers, and other inter-organizational relationships. Research on the granularity of virtuality focusing on the analysis units includes individual, group, organizational units. Based on the identification of the direction and granularity of virtuality, it can conveniently describe different virtual outcomes. This comprehensive research makes it possible for the T Company assess whether the virtuality is indeed leveraged as a strategic tool or is a merely technical phenomenon. Under this framework, different virtual relations within VMTs can be discriminated (Fig. 2).
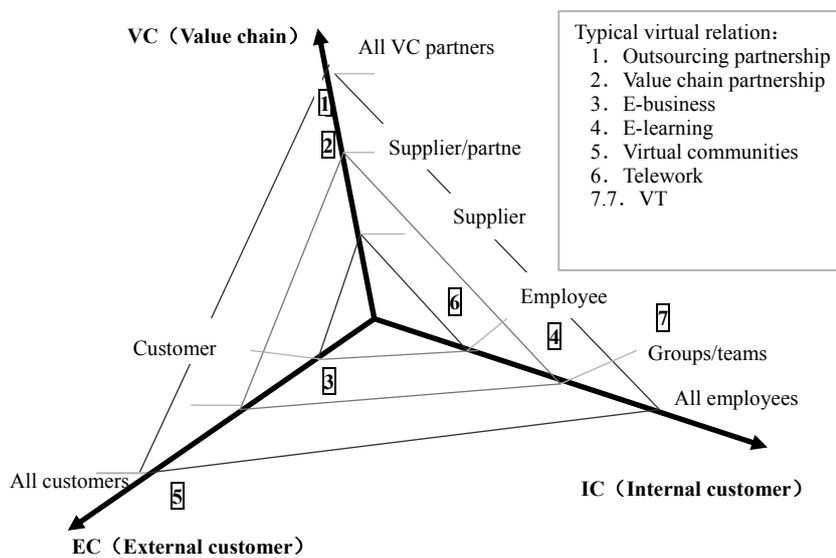

Fig. 2   Directionality and granularity of virtuality

2.2   The I-P-O mode of virtual teams

The inputs-processes-outcomes (I-P-O) model (Hackman and Morris, 1975) is the dominant framework used in studies of teams, and it also provides sound foundation for integrating the theory of VT (Martins et al., 2004). The input variable represents the design and compositional characteristics of a VT such as the member personalities, KSAs, group size, technology, task or experience that influence how team operates and performs (Hackman and Morris, 1975). Team

process means how VMTs achieve their outcomes, including planning process, action process and interpersonal process (Marks, Mathieu and Zaccaro, 2001). Planning process encompasses mission analysis, goal setting, strategy formulation and other processes related to focusing the team efforts. Action process includes the interaction among members when implementing team task, such as communication, participation, coordination, and supervision, etc. Interpersonal process refers to membership relation, including conflict, tone of interaction, trust, cohesion, affection and social integration and so on. Outcomes represent task and non-task consequences of performance outcomes (such as effectiveness, speed of decision, and decision quality) and affective outcomes (such as member development, satisfaction and so on). The I-P-O model is actually an open efficacy framework, from the study of different combination of input and process to achieve the intended performance within the company goal. The I-P-O model proposed by Martins et al. (2004) is shown in Fig. 3.

Moderators of VT performance
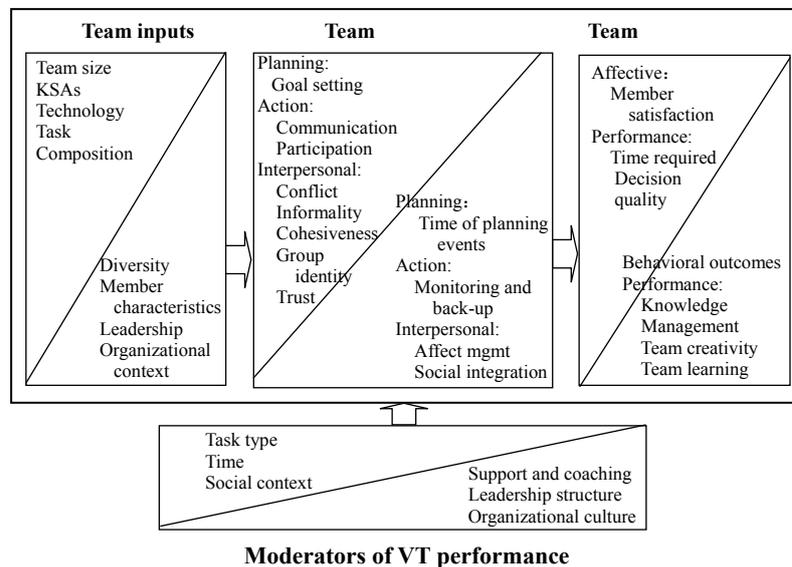
Note: Within each category of variables, those that have been examined in research on VMTs
      are listed above, and those in need of future research are listed below the diagonal.
Fig. 3   I-P-O model of virtual teams functioning

3   The changes of telecom marketing mode of T Company and the application of virtual teams

The marketing mode of telecom enterprises changes with the uncertainty of

the environment, especially the uncertainty of customer demand and the changes of the factors like the complexity of customer demand and internal business of enterprise. The marketing mode of T Company has experienced the traditional bureaucratic mode, small team mode and VT mode. Though the bureaucratic mode is still the main marketing mode in T Company, the VT marketing mode has developed rapidly in recent years and is mainly applied in VIP marketing.

3.1   The earlier bureaucratic style telecom marketing mode of T Company

The rapid development of telecom business of T Company started in 1994. In that year, this company opened ten thousand of computerized telephones and 900 MHZ analog mobile phones. The development process was in line with the overall background of China Telecom. During the south-north separation and reorganization of China Telecom in 2001, T Company was merged into China Telecom. The early stage of development was characterized by monopoly. Business was easy and simple, which was mainly composed of single business such as fixed and mobile phone or point-to-point data transmission and so on. There were few combinations or integration among different businesses. The consumers then were the scattered individual users with simple demands. During this typical period of demand exceeding supply, T Company's pace of construction of telecom network was far behind the market demand. Network construction and price adjustment were the main jobs of the "marketing department" in T Company. Services offered by the market department were passive and waiting-styled. Accordingly, the marketing mode had very strict bureaucratic organization attributes then.

   During this stage, network construction and maintenance played an important role. A large amount of technology and management staffs were concentrated on these two departments to deploy network planning, equipment procurement, construction, maintenance, and optimization work. More advanced telecommunication technology improved the service quality of the company fundamentally. When customers apply for phone installation, pay for phone bills, or do other business with the company, they did it through the business hall or other relevant departments in the company. There was nearly no need of marketing at all. The only expectation of customers at that time was to obtain standard services. The main responsibilities of marketing department included: price management (e.g. reduction of nonrecurring charges such as the initial installation fee) and accomplishment of new phone installation tasks. The standard of service was to reduce skip-level complaints as many as possible (Fig. 4).
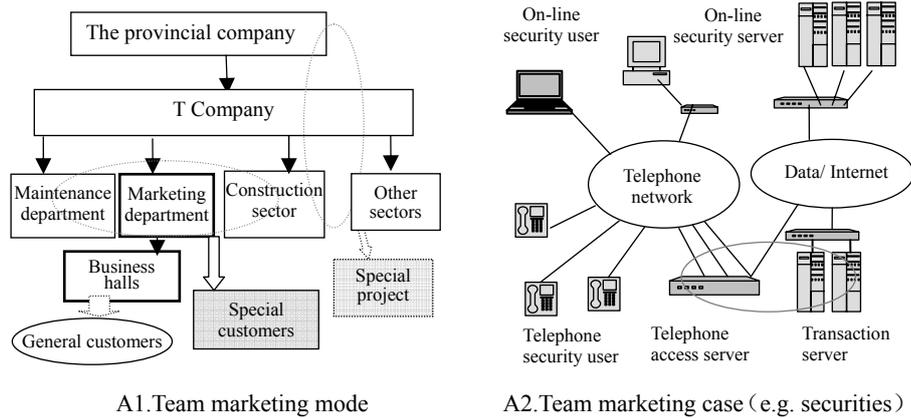
A1.Team marketing mode   A2.Team marketing case（e.g. securities）

Fig. 4   Team marketing and example

### 3.2   The marketing mode based on the cross-functional team in T Company

With the increase of customer demand, especially the increase in demand of computer and other data communication, the emergence of telephone private network and telephone service center, the complexity of customer demand increases greatly for telecommunication enterprises. Although there is still little competition among different telecom enterprises, it is necessary to integrate separate businesses together for sales promotion reasons. Hence links among different business divisions increase gradually. At this time, the interior sales department and other functional department cooperate with each other on the customer's project, which leads to the emergence of cross-functional teams. Such kind of team also appears in some important engineering project construction. Taken the example of a project in a certain securities company in City T (Fig. 5), in order to improve the service and expand telephone commissioned transaction and online transaction systems, the securities company wanted to satisfy its customers' demand of remote transaction by means of telephone network and internet access. To guarantee the quality of these remote transaction systems, the securities company required T Company to provide higher quality optical fiber access, double routing for backup and potential interfaces for future system upgrading. In addition, the securities company did not want to halt its business even during the process of network reconstruction. In this case, any single division in T Company was unable to complete such a complicated project on its own. To meet the customer's requirement, T Company built a cross-functional team based on division of labor in order to accomplish the task before the deadline

required by customers.

3.3   The formation and application of marketing virtual teams in T Company

The year of 2003 was a turning point in terms of competitive environment for T Company. Before that, it faced only limited competition from mobile phone service companies. In 2003, several events happened which lead to the intensification of competition in the telecommunication market. First, the reconstruction and integration of Railcom was officially completed in that year. Without support from the wealthy railway network, Railcom had to make a living on its own. Therefore Railcom eagerly entered the telecommunication market. Second, all the core members of Netcom were from the former China Telecom. Ever since the separation, NETcom had to start from scratch. It hence was desperate for juicy VIP customers. Third, although the CATV network was not yet an independent enterprise in 2003, its close relation with local governments at different levels (since a vast majority of the investment of the network construction was from these government) makes it a disquieting potential rivals for all telecommunication market participants. As a result, in the very year of 2003, market competition became more furious than ever before. At the same time, the information demand of various kinds of customers also increased rapidly. Customers from education sectors, governments, and enterprises generally require telecommunication service providers to integrate various existing networks and expand the function of these networks. Such factors made the complexity of customer demand increase. Problems faced by T Company included: network capacity became surplus; customer demand was getting more and more complex; new business emerged increasingly; talents and technicians were scattered in different department and regions; unable to meet customers' requirements on its own; can not meet specific requirements (such as certification of Cisco or Microsoft qualifications, etc.) in providing large scale comprehensive network construction. Under such circumstances, the traditional bureaucratic organizational structure or small team were not able to cope with these new market challenges. In order to adapt to environment, satisfy the demand of customer and to promote its own increasingly surplus network capacity, T Company began to try the marketing mode based on VT and made some achievement.

A typical VT marketing mode in T Company and a project provided by it are shown in Fig. 5. The team was established for the project of information, Construction of the education of city T. The gray boxes in Fig. 5. A1 represents the virtual composition of three directions that the VT concerned: internal customer (IC, such as VIP department, network maintenance department, customer response department, support departments, branch institutes and the VIP department of company of high level, engineering department), external customer (EC, such as the electrified education center of education department, staff of network center), partner (VC, value chain partner, such as integrator T, equipment supplier F, engineering company G and so on), the arrows of different color represent virtual tool existed and applied inside, namely OA (office automation) system, engineering MIS (management information system), PowerIBSS(integrated business support system), VIP system in all four computerized information systems. Meanwhile, each member of the VMTs has the convenient PHS (personal handy-phone system) or other mobile communication tools and broadband access to the internet.
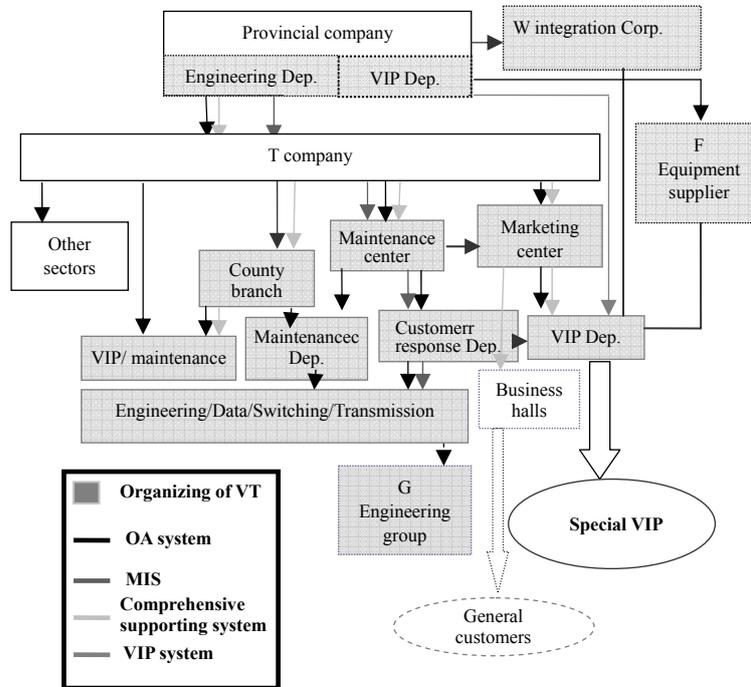
A1.Marketing mode of VT (VT)

Note: The grey area is the composition of VT of T Company.