



博士文丛·经管系列  
Economics and Management

◎ 疏礼兵 著

# 企业研发团队内部知识转移 的过程机制与影响因素研究

S

tudy on Process Mechanism  
and Influence Factor of Knowledge  
Transfer within R&D Unit



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## A 摘要 abstract

随着知识经济在全球范围内兴起,知识管理日益成为企业管理的主题,知识生产要素在企业成长中的地位和作用得到了广泛认可。作为知识管理活动过程的重要一环,知识转移正成为许多组织构筑竞争优势的关键基础。以往学者对于知识转移的研究总体上沿着组织内部知识转移和组织间的知识转移两条基本线索。虽然组织间知识转移是学者们长期关注的焦点,但是近年来却有越来越多的学者将研究目光转向组织内部,如何妥善开发和利用蕴藏在企业内部庞大的无形资产,促进知识在不同部门和人员之间转移将成为竞争致胜的关键。团队内部知识转移是组织内部知识转移的一个缩影,其绩效不仅具有基础地位,而且还会影响到组织或部门间的知识转移。然而,如何改善团队内部的知识转移仍是许多企业持续面临的困惑。本研究以企业研发团队为例,试图回答两个基本问题:第一,研发团队内部的技术知识是如何实现转移的?第二,哪些因素影响到研发团队内部技术知识转移绩效的提升?它们的相对影响程度如何?围绕上述两个问题,本书采用理论分析和实证研究相结合的研究方法,对上述两个基本问题进行了较为深入的研究。

本研究的主要工作包括以下四个方面:①在文献研究与实地访谈的基础上,揭示了企业研发团队内部知识转移的过程机理,归纳出知识转移的两类典型机制。②以知识转移过程观为背景,从知识转移基础结构视角构建了团队内部知识转移绩效影响因素模型,结合 20 家企业 35 人次的实地访谈修正了概念模型。③以信息产业、医药化工和传统制造企业研发团队为实证调查对象,在北京、上海、江苏、浙江和安徽五省(市)范围内选择了 11 个城市进行问卷调查,共计发放调查问卷 267 份,获取有效问卷 127 份。④利用 SPSS11.5 统计软件分析企业研发团队内部知识转移的实际状况,并检验实证资料对研究假设的支持

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程度。

经过上述研究工作,本研究的主要研究结论有:

(1)企业研发团队内部知识转移的核心是通过团队成员之间知识的传递和吸收促进知识的学习和新知识创造。企业研发团队内部知识转移是团队成员双方互动,并通过多种途径与方式实现的结果。知识转移过程并不仅仅是知识的简单流动和传递,更为重要的是知识接收者的知识吸收、整合,并重构其自身的知识基。企业研发团队在整体上可以视作一个知识的输入和输出转化系统,团队成员之间的密切联系和频繁互动构成了研发团队内部知识转移的主要通路,个人向团队贡献知识与从团队中获取知识则是个人知识与集体知识之间的转换过程。持续的知识学习贯穿于研发团队内部知识转移的全过程,新知识的创造作为研发团队内部知识转移过程的副产品,为知识循环过程提供了必要的新知识来源和补充。

(2)企业研发团队内部技术知识转移可以通过文档传递和人际互动两类典型机制来实现。在对研发团队内部显性知识与隐性知识、个人知识与集体知识转移方式系统总结的基础上,借鉴 Nonaka & Takeuchi(1995)的理论模型思想,设计了研发团队内部技术知识转移的途径框架,即研发团队成员技术知识的外部化与内部化、研发团队技术知识的外部/组合化与内部/社会化。文件资料、技术报告、数据库、参观学习、师徒制、沟通交流、在职培训等是研发团队内部知识有效转移的主要方式,而这些方式在总体上可以提炼为知识转移的文档传递机制和人际互动机制。在实践中更多的是以某一种知识转移机制为主,其他转移机制作为补充和支持。

(3)不同产业、不同研发强度、不同知识存量水平的研发团队知识转移存在部分显著性差异,不同年资个体对于研发团队知识转移认知也存在部分差异。单因素方差分析或独立样本 t 检验结果表明,不同产业研发团队的知识转移差异并不明显,仅在转移意愿、知识存量水平和团队成员之间的知识距离上存在显著性差异。不同研发强度和知识存量的团队知识转移差异明显。其中,不同研发强度团队的转移意愿、关系信任、吸收能力、被转移知识的系统性、团队知识存量水平、知识转移绩效都存在显著性差异;除被转移知识特性变量外,在其他所有变量上高知识存量团队的均值都显著大于低知识存量团队。不同年资个体对于研发团队内部知识转移认知差异仅存在于传授能力和知识距离上。

(4)知识特性、转移意愿、传授能力、关系信任、知识距离、吸收能力对研发团队内部知识转移绩效有直接影响,而知识转移机制则对上述影响关系具有部分调节作用。其中,关系信任、转移意愿、吸收能力、传授能力对研发团队内部成员



的满意度有重要影响;吸收能力、关系信任、转移意愿、知识系统性、知识距离是影响研发团队内部技术知识学习的重要变量;吸收能力、知识系统性、传授能力、知识内隐性对研发团队的技术创新有着相应的促进或阻碍作用。知识转移机制对知识转移绩效影响关系具有调节作用,特别是知识转移机制与被转移知识特性的匹配能够显著提升研发团队内部知识转移绩效。产业类别、研发强度和知识存量等团队属性变量也在一定程度上影响了研发团队内部知识转移绩效。

上述研究结论对于企业、团队和个人开展知识管理和组织学习可以提供一些有益的实践启示:第一,知识经济背景下企业应采取积极措施促进组织内部知识转移,实现企业内部知识的合理配置和高效利用,为组织竞争优势确立奠定基础。第二,企业可以依靠研发团队内部知识转移盘活和挖掘组织的知识资源,加速自主创新进程,具体措施有:搭建研发团队内部技术知识创新和学习网络、建设与维护研发团队内部技术知识库、鼓励员工组建并参与各种技术知识社群、适度加大企业研发强度等。第三,从知识转移绩效影响因素角度设计研发团队内部知识转移绩效提升对策,包括培养团队成员的知识吸收能力、团队成员的构成优化、基于关系信任的团队文化氛围建设、选择恰当的知识转移机制等。第四,企业研发团队成员的知识学习需要建立集体绩效观念,在研发团队内部主动当好老师和学生的双重角色,通过个人努力促进知识网络位置的中心化。

本研究的创新点主要集中在以下三个方面:

(1)以企业研发团队为分析对象,揭示团队内部知识转移的过程机理与内在机制。现有研究多是对知识转移四层次的综合分析,或以组织整体作为分析单位。本研究以团队为分析单位,并将研究触角深入至团队内部。在对研发团队内部知识转移一般过程刻画的基础上,从知识转移基础结构视角剖析了研发团队内部知识转移的过程机理。基于团队内部知识转移途径和方式的系统考察,提炼出研发团队内部知识转移的文档传递机制和人际互动机制,并进行了案例分析。

(2)从知识转移基础结构视角出发,设计研发团队内部知识转移绩效的影响因素概念模型。本研究从知识转移的主体、内容、情境和机制四个层面着手,选取了知识内隐性、复杂性、系统性、转移意愿、传授能力、关系信任、知识距离、吸收能力、转移机制九个主要变量,构建了团队内部知识转移绩效影响因素概念模型,使知识转移的理论研究更为深入和细化。

(3)基于三大产业五省(市)实地调查数据,实证分析企业研发团队内部知识转移绩效的影响因素及其相对影响程度。本研究选择组织内部技术知识和知识型员工双重密集的研发团队作为基本分析单位,这与以往大多数研究在分析层



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次和分析对象上存在较大差异。基于 127 个团队的问卷调查数据,运用回归分析技术识别出研发团队内部知识转移绩效的主要影响因素及其相对影响程度,与现有以定性分析为主的研究相比具有创新性。

知识转移问题的研究在国内尚未深入,本研究也仅仅是进行了一些初步的探索,未来的研究需要从多方面来完善知识转移理论体系;对企业内部不同团队之间知识转移的实证研究;以营销团队、生产团队为例进行更多的实证研究和对比分析;探索团队内部知识转移与知识创新以及组织竞争优势的关联关系等。

#### **关键词:**

知识转移,转移过程,转移机制,转移绩效,知识转移基础结构,研发团队



## ABSTRACT .....

Along with the rising of knowledge-based economy in the world, the knowledge management gradually became the theme of enterprise management. The status and function of knowledge in the process of firm growth has been widely realized. As an important link of knowledge management process, the knowledge transfer becomes the essential foundation of many organizations to construct the competitive advantage. The former researches of knowledge transfer went along two basic clues of intra-and inter-organizational units. Although inter-organizational knowledge transfer is the focal point heretofore, more and more scholars have moved their eyes to intra-organizational knowledge transfer recently. It's the key to obtain competitive advantage by properly developing the huge invisible knowledge property inside organization and promoting knowledge transfer between different departments and employees. The knowledge transfer within group is a miniature of intra-organizational transfer. And its achievements not only have the foundation, but also can affect the transfer performance among different organizations or departments. However, how to improve knowledge transfer within group is still faced with great confusion. This book attempts to answer two basic questions by taking the enterprise research and development unit as an example. Firstly, how does the technological knowledge within the R&D unit transfer? Secondly, which factors affect the promotion of knowledge transfer performance? And what is their relative influence? Two methods of theoretical analysis and empirical research has been adopted to answer the above two basic questions.



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The research work mainly included following four aspects. ① The knowledge transfer process within R&D unit has been revealed through literature review and field interview. And two kinds of typical transfer mechanisms were summed up. ② The model of influence factors of knowledge transfer performance was constructed from the perspective of knowledge transfer components by taking process concept as the background. And the conceptual model was revised based on large quantity of field interview with about 20 enterprises and 35 employees. ③ The R&D units of information technology industry, medicine chemical industry and traditional manufacturing industry were taken as investigation object. The questionnaire survey was carried out in Beijing, Shanghai, Jiangsu, Zhejiang and Anhui five provinces or cities. 267 questionnaires were distributed to different enterprises, and 127 effective questionnaires were received finally. ④ The SPSS11.5 statistics software was used to analyze the actual condition of knowledge transfer within R&D unit, and to examine the hypotheses been supported or not.

After the above research work, the main research conclusions are listed as following.

(1) The core of knowledge transfer within R&D unit was to promote knowledge learning and new knowledge creation through knowledge transmission and absorption between members. The knowledge transfer within R&D unit was the results of interaction in members through different ways and paths. The knowledge transfer process was certainly not merely to deliver knowledge, but more importantly to absorb, integrate, and reconstruct knowledge base. The enterprise's R&D unit can be regarded as a knowledge input and output transformation system in the whole. The close relation and frequent interaction constituted the main circuit of knowledge transfer within R&D unit. The knowledge acquisition and sharing was a conversing process between individual knowledge and collective knowledge. Continuous knowledge learning passed through the entire process of knowledge transfer within R&D unit. As the byproduct of knowledge transfer process, the creation of new knowledge has provided essential source and supplement of new knowledge for the knowledge cyclic process.

(2) The technological knowledge within R&D unit can be transferred by

two kinds of typical mechanisms, which were documents exchange and interpersonal interaction. On the foundation of systematical summarization of relative transfer styles, the path framework of knowledge transfer within R&D unit has been designed by drawing the theoretical model thought of Nonaka & Takeuchi (1995). That was externalization and internalization of technological knowledge of members and externalization/combination and internalization/socialization of R&D unit. The fundamental styles of effective knowledge transfer include document materials, technological reports, database, visit, mentorship, communication, on-the-job training and so on. And all these styles may be refined to documents exchange and interpersonal interaction in the overall. In the practice the R&D unit was primarily taken one kind of knowledge transfer mechanism, and the other as supplement and support.

(3) The differences of knowledge transfer among different industry, different R&D intensity, and different knowledge stock R&D units were partially significant. The cognition differences of different tenure were also partially existed. The examination results of ANOVA or independent sample t test indicated that the knowledge transfer differences of different industry were only significant on knowledge stock and distant. The significant differences of different R&D intensity were existed in transfer willingness, trust, absorptive capability, stock, systematic knowledge, and transfer performance. The R&D unit with high knowledge stock also has good condition of knowledge transfer expect attributes of knowledge transferred. The significant differences of knowledge transfer for different tenure individuals were only existed in transfer ability and knowledge distance.

(4) The direct influence of knowledge transfer performance within R&D unit was come from the knowledge attributes, transfer willingness, transfer ability, trust, knowledge distance, and absorptive capability. And the knowledge transfer mechanism moderated the above influence relations. Among them, the degree of satisfaction of members in R&D unit was influenced by trust, transfer willingness, absorptive capability, and transfer ability. The technological knowledge learning was affected by absorptive capability, trust, transfer willingness, systematic knowledge, and knowledge distance. The absorptive capability, tacitness and system of knowledge, and



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transfer ability have corresponding promotion or hindrance function. Specially, the transfer performance can be remarkably promoted by matching the knowledge attributes with transfer mechanisms. Other group variables, such as industrial category, R&D intensity and knowledge stock, have also affected the R&D unit's knowledge transfer performance in certain degree.

The above research conclusion may provide some beneficial practical implications for knowledge management and organizational learning. Firstly, some positive measures should be taken to drive the intra-organizational knowledge transfer. Secondly, the independent innovation capability can be cultivated by trapping and digging the organization's knowledge resources through knowledge transfer within R&D unit. And some concrete measures were provided, such as building the knowledge innovation network, constructing and maintaining the technological knowledge reservoir, encouraging to set up and to participate in communities of technical knowledge, moderately increasing the R&D expenditures and so on. Thirdly, some countermeasures to promote knowledge transfer performance can be designed from the perspective of knowledge transfer components, which include raising member's knowledge absorptive capability, optimizing R&D unit member's constitution, constructing trust atmosphere, and choosing appropriate knowledge transfer mechanism. Fourthly, the knowledge learning of members should establish the collective achievements concept. Everyone in the R&D unit initiatively works as dual roles of good teacher and student.

The innovation ideas mainly concentrated in following three aspects.

(1) The process mechanism of knowledge transfer has been revealed by taking the R&D unit as analysis object. Most existed researches are based on four levels or organizational level analysis. However, how to transfer knowledge within R&D unit was still not clear. The transfer process was analyzed from the perspective of knowledge transfer component. Two kinds of knowledge transfer mechanisms were refined based on systemetically inspecting on transfer styles within R&D unit.

(2) The conceptual model of influence factors of knowledge transfer performance was designed from the perspective of knowledge transfer component. It was different with other study on research object and level for



## ABSTRACT V

taking the R&D unit as the basic analysis unit. From four aspects of knowledge transfer main body, content, context and media, nine main variables were chosen to construct the conceptual model, which were tacitness, complexity, system, transfer willingness, transfer ability, trust, knowledge distance, absorptive capability, and transfer mechanism.

(3) The influence factors of knowledge transfer performance and their relative degree were analyzed by the empirical data from R&D units of three industries and five provinces or cities. The book took the group as analysis level to explore knowledge transfer question of members as knowledge main carrier. The major influence factors and their relative influence were identified by regression analysis of questionnaire survey data.

The research on knowledge transfer question in domestic is still very young. This book merely carried out some preliminary explorations, and the future research need to continually consummate the knowledge transfer theory system. Some valuable directions can go along inter-unit knowledge transfer, comparison analysis of different units within organization, relationship between intra-unit knowledge transfer and knowledge creation and organization competitive advantage, and so on.

**Key words:** Knowledge transfer, Transfer process, Transfer mechanism, Transfer performance, Knowledge transfer component, R&D unit



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# 01 绪 论

## 1.1 问题的提出

### 1.1.1 当代知识经济的发展呼唤知识管理

自 20 世纪后期开始,电子技术、信息技术、网络技术已成为经济发展的重要推动力量。1982 年美国经济学家奈斯比特在《大趋势》中提出了“高技术经济”,这可以看做知识经济的雏形。进入 20 世纪 90 年代,知识经济在发达国家得到了迅猛发展。技术的快速更新换代、产品生命周期的缩短、市场竞争的激化已改变了现今大多数公司的生存环境,组织愈来愈依赖通过知识的积累与创造来提升自己的竞争力(Reed & DeFillippi, 1990; Grant, 1996)。但直到 1996 年,经济合作与发展组织(OECD)首次在国际组织文件中使用“知识经济”这个概念。在其发表的一份题为《以知识为基础的经济》报告中,对知识经济作了这样的定义:知识经济是指建立在知识和信息的生产、分配和使用之上的经济,是以知识资源为基础的一种经济形态,一种“以知识为主导的经济”。根据 OECD 发表的报告,经合组织主要成员国国内生产总值的近 50%来自以知识为基础的产业,全球化和知识化是当前企业管理发展的必然趋势。在这个阶段,持续成长成为企业的管理目标,知识管理成为企业的管理主题。随着国内外纷纷掀起知识经济风潮,许多国内企业也开始建立起知识管理流程,并以知识管理作为企业核心经营策略的重要一环。近年来,知识经济在我国也得到了快速发展,根据国家统计局的资料,1996 年我国知识密集型产业附加值占全部企业增加值的比重为 6.6%,2001 年提高到 12.5%;知识密集型产业总从业人员占全部企业部门就业人数的比重,1996 年为 3.9%,2001 年上升为 7.4%。而传统产业企业的产品生产过程中也包含了越来越多的知识。