The Comparing and Studying of Multinational Technology Learning and Technology Transferring for Engineering Projects of

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ABSTRACT

ABSTRACT In the latest few years, all the countries of the world concentrate on developing electricity and energy, and deregulating protecting laws. Influenced by the trend of internationalization and liberalization, impel the conjuncture changing from monopoly by Taipower to encroached by private power plants. So that how to set up a project management system for building Excellent public and private power plants, how to derive competitive advantages from the future energy market, and how to deal with the problems of increasing technology levels are the main ideas. To match up technology transferring, engineering projects of power plants depend on transferring external technologies and information to the internal organization through the dynamic, sequential learning process. After transferring all the information to its own, the Organization will store and expand them which are good for innovating. Therefore, the aims of this research include: 1. Realize the management methods of technology transferring process between public and private power plants. 2. Find out technology learning process after technology transferring, and analyze the learning systems inside their organizations. 3. Discuss how engineering projects of power plants successfully transfer from the outside of the organization to the inside, smoothly expand and innovate, and increase technological management capabilities of the organizations. 4. Analyze successful experiences, and hope these could become references what the other enterprises doing technology transferring and technology learning would take. In order to quickly increase the level of engineering technologies of power plants, to decrease the time of making mistakes, and to avoid the risks caused from R&D and investment, it has to cooperate with the other countries and to learn their technologies and transferring methods. Excellent technologies learn from advanced industrial countries can make original engineering technologies increased, and make limited resources used at the right place. The national designing and producing for main equipments of power plants is influenced by lack of original resources. Therefore, it has to take the multinational producing mode, and get opportunities of learning technologies transferred by international core enterprises. That would be good for increasing technologies of national public power plants' and private ones' engineering projects and it has direct influences on power plants' installing, operating, and maintaining. The following subjects are addressed after deeper researching and conferring: 1. The wider the range that technology learning of projects has, the better performance it gets. 2. The deeper how technology learning of projects is, the better performance it gets. 3. The performance of technology learning is distinctly influenced by the more wide of technology learning combined with the depth more deep of technology learning. Key words: technology transfer, technology learning, the width of technology learning, the depth of technology learning

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REFERENCES

一、中文部份 1.朱倍瑩(2000)「知識整合機制與創新策略配合類型對知識移轉績效影響之研究 高科技與服務業之比較」,中原大學企業管理研究所碩士論文。 2.李仁芳(1990)「管理心靈」。台北:商略印書館。 3.李庭毓(2000)「在不同的專案特性下控制機制對專案績效之影響」,靜宜大學企業管理學系碩士論文。 4.吳榮義、陳彥煌(1978)「美商投資的貿易及技術轉移效果」。中央研究院美國文化研究所。 5.林明杰(1982)「技術能力與技術引進績效相關之研究」,國立政治大學企管研究所博士論文。 6.林麗娟(1995)「國際技術合作策略與技術學習模式」,台北:中國生產力中心,產業科技研究發展管理研討會案例暨論文集,第三冊,頁46-60。 7.洪德芳(1983)「高科技企業技術策略與行銷策略配合對新產品發展績效關係影響之研究」,私立中原大學企業管理研究所碩士論文。 8.洪

```
儒瑤(2000)「台灣企業知識管理應用現況及其模式之研究」,台北大學企業管理學系碩士論文。 9.洪鏗評(1987)「知識技術跨國移
轉與組織學習電子資訊廠商赴大陸生產之個案研究」,國立臺灣大學國際企業管理研究所碩士論文。 10.姜占魁(1989)「組織行為與
行政管理」。作者自印。 11.封德台(2000)「技術學習與技術能力關係之研究 國內資訊軟體產業之實證」,政治大學企業管理學系
博士論文。 12.徐芳穎(1994)「百貨公司經營技術移轉之研究 以台北市為 例 」 , 政治大學企業管理研究所碩士論文。 13.唐鵬程
(2001)「學習型組織推動阻力之探索性研究-以學習歷史為方法」,義守大學管理研究所碩士論文。14.黃俊英(1994)「企業研究方
法」。台北:東華。 15.曾建勳(1985)「技術移轉對產品開發活動之影響 我國機械工業之研究」,國立政治大學企業管理研究所碩士
論文。 16.許士軍(1982)「管理學」。台北:東華書局。 17.莊銘國(2003)「經營管理實務」。台北:五南。 18.葉淑瑜(1993)「跨國
技術移轉與組織學習之研究台灣車廠之個案分析」,中央大學產業經濟研究所碩士論文。 19.葉惠青(1979)「當前國際技術移轉情勢分
析」。台灣經濟研究月刊,第十二卷第三期。 20.蔡忠育(1985)「技術接受者涉入與技術移轉績效之關係」,國立中央大學企管研究
所碩士論文。 21.楊君琦(2000)「技術移轉互動模式失靈及重塑之研究」以研究機構與中小企業技術合作為例」,台灣大學商學研究
所博士論文。 22.劉仁傑、范光瑩(1996)「台灣日系企業技術學習型態之探討」。管理科學學報,第十三卷第二期,頁250-270。 23.
榮泰生(1988)「組織學習論之探討 企業實施辦公室自動化之實證研究」,政治大學企業管理研究所博士論文。 24.盧偉斯(1987)
「組織學習理論之研究」行動理論觀點與行政組織應用的探討」,政治大學公共行政研究所碩士論文。 25.賴士堡(1982)「科技管理
論文集」。大葉文教基金會。 26.蕭亞男(1999)「零售業技術移轉績效影響因素之研究」以百貨公司為例」,國立成功大學頊士論文
。 27.嚴永晃(1987)「技術合作三十年的省思」。經濟雜誌。 28.許史金譯(2001)「知識管理推行實務」。勤業管理顧問公司著,台
北市,商周出版。29.蔡裕源(1994)「移轉技術類型、管理機制與移轉績效關係之研究」,國立政治大學企業管理研究所博士論文。
30.謝文凱(1983)「技術移轉過程互動程度與技術移轉績效關係之研究」以共同研發聯盟為例」,私立中原大學企業管理研究所碩士
論文。 二、英文部份 1. Anand, Vikas, Charles C Manz, and William H Glick.(1998), " An organizational memory approach to information
management ", Academy of Management Review, pp.796-809。 2. Aoki. (1990), "Toward an economic model of the Japanese firm",
Journal of Economic Literature, pp.1-27. 3. Archibald R.B. (1981), "The Implementation of Project Management: The Professional's
Handbook ", Massachusette: Addison-Wesley Publishing. 4. Argyris, C. & Schon, D. (1978), Organizational Learning: A Theory of Action
Perspective. 5. Baranson, J.B. (1970), "Technology Transfer Through the International Firm," American Economic Assciation, Vol. 60,
PP.435-440. 6. Bierly III, P.E. and Chakrabarti, A.K. (1996), "Technological Learning, Strategic Flexibility, and New Product Development in
the Pharmaceutical Industry", IEEE Transactions on Engineering Management. Vol.43, No.4. 7. Bierly, P. and Chakrabarti, A. (1996),
" Determinants of Technology Cycle Time in the U.S. Pharmaceutical Industry", R & D Management. 8. Bonora, E.A. and Revang, O. (1991
), "A Strategic Framework for Analyzing Professional Service Firm-Developing Strategices for Sustained Performance", Strategic
Management Society, Inter-organizational Conference, Toronto, Canada, 9, Brown, J.S., and Duquid, P. (1991), "Organizational Learning
and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation ", Organization Science, Vol.2, No.1, February,
pp.40-57. 10. Buckley, P.J. and Casson, M. (1976), "A Long-run Theory of MNE', In Jagdish N. Bhagwati (eds.) The International
Corporation, Cambridge MA:MIT Press. 11. Buckley, Peter J. and Casson, Mark C. (1988), "Models of the Multinational enterprise,"
Journal of International Business Studies, 1st Quarter, Vol.29, Issue 1, pp.21-45. 12. Burgelman, R.A. and Rosenbloom, R.S. (1989),
"Technology Stategy: An Evolutionary Process Perspective" in R.S., Rosenbloom and R.A., Burgelmam, ed., Research on Technological
Innovation, Management and Policy, Greenwich, Connenticut; JAIPRESS INC, Vol.4, pp.1-23, 13, Caravannis, Elias G & Kazuo Kurihara,
( 1998 ) . " Cooperative research and development agreements (CRADAs) as technology transfer mechanisms", R & D Management, Apr.
PP.79-88. 14. Christian N. Madu. (1989), "Transferring Technology to Developing Countries-Critical Factors for Success", Long Range
Planning, Vol. 22, pp.115-142. 15. Cleland, D.I. and W.R.King. (1983), "System Analysis and Project Management", New
York: McGraw-Hill Book Company. 16. Cohen, Wesley M. and Leventhal Daniel A. (1990), "Absorptive Capacity: A New Perspective on
Learning and Innovation", Administrative Science Quarterly, Vol.35, No.1, pp.128-152. 17. Cusumano, M.A. and Selby, R. W. (1995)
" Microsoft Secrets " N.Y.: The Free Press. 18. Daft, R.L. and Lengel, R. H. (1984), "Information Richness: Anew Approach to Managerial
Behavior and Organization Design ", Research in Organizational Behavior, 6:pp.191-233. 19. Daft, R. L. and Lengel, R. H. (1986),
"Organizational Information Requirements, Media Richness and Structural Design", Management Science, Vol.32, No.5, pp.554-571. 20.
Davenport, T. and Prusak, L. (1998), "Working Knowledge." Harvard Business School Press:Boston. 21. Davenport, T. and Prusak, L. (1998)
)," Working Knowledge:How Organizations Manage What They Know", Boston:Harvard Busuness School Press。胡瑋珊譯(1989)。知
識管理,台北:中國生產力中心。 22. Dodgson, M. ( 1991 )," Technology Learning, Technology Strategy and Competitive Pressures",
British Journal of Management, Vol. 2, pp.133-149. 23. Duffy, J. (2000), "The KM technology infrastructure", Information management
journal, 34 (2), pp.62-64. 24. Dussauge, P. Hart, S. and Ramanantsoa, B. (1992), Strategy Technology Management, West Sussex: JOHN
WILEY & SONS, pp.1-16. 25. Eres, B.K.(1981), "Transfer of IT to less developed countries: a systems approach," Journal of the American
Society of information Science, pp32.97-102. 26. Fahey, L. (1999), "Competitors - Outwitting, Outmaneuvering and Outperforming"
N.Y.:John Wiley and Sons, Inc. 27. Fiol, C.M. and Lyles, M.A. (1985), "Organizational Learning", Academy of Management Review,
Vol.10.No.4, pp.803-813. 28. Francois Chesnais. (1986), "Science, Technology, and Competitiveness", STI Review. 29. Garud, Raghu &
Praveen R. Nayyar. (1994), "Transformative Capacity: Continual Structure By Intertemporal Technology Transfer", Strategic Management
Journal, Vol.15, pp.365-385. 30. Gess. (1974), "The Role of Technology Transfer in Innovation", Re-Search Management, Nov. 31.
Gilbert, Myrna and Gordey-Hayes, Martyn. (1996), "understanding the Process of Knowledge Transfer to Achieve Successful Technological
```

```
Innovation ", Technovation, Vol.16. No.6,Jun, pp.301-312. 32. Grant, R.M. (1996), "Toward a knowledge-Based Theory of the Firm"
, Strategic Management Journal , 17 (NSI) , pp.109-122. 33. Grinyer, P. H. and Spender, J. C. (1979), "Recipes, crises, and adaptation
in mature businesses", International Studies in Management and Organizations, 9 (3), pp.113-133. 34. Gugler, p. (1992), "Building
transnational alliances to create competitive advantage", Long Range Planning, pp.90-99. 35. Hameri, Ari-Pekka. (1996), "Technology
transfer between basic research and Industry", Technovation, pp.51-57. 36. Hamilton, William F. (1992), "The Evolution of Corporate
Capabilities in Emerging Technologies ", Interfaces, Vol.22, No.4, pp.13-23. 37. Helleloid, Duane & Bernard Simonin. (1994),
"Organizational Learning and a Firm's Core Competenc", Hemel & Heene (ed.) Competence-Based Competition. 38. Hedberg, B.L.T.
(1981), How organizations learn and unlearn. In: Nystorm, P.C. and Starbuck, W.H. (Eds.), Handbook of Organization I Design, Vol.1, New
York: Oxford University Press. 39. Huber, G.P. (1991), "Organizational Learning: the Contributing Processes and the Literatures"
Organization Science. Vol., No1, pp.88-115. 40. Imai, K. Nonaka, I. and Takeuchi, H. (1985), Managing the new product development
process:how the Japanese companies learn and Unlearn. In: Clark, K. B., R.H. and Lorenz, C.(Eds.) The Uneasy Alliance, Cambridge,
MA: Harvard Business School Press. 41. Inkpen, A. C. and Dinur. A. (1998), "Knowledge Management Process and International Joint
Venture ", Organization Science, 19 (4), PP.454-468, 42, Jack Barranson, (1970), "Technology Transfer Through the International Firm
", American Economic Review 60, pp.435-440. 43. Johnson, H. (1970), "The efficiency and welfare implication of the multinational
corporation", In Kindleberge, Charles (ed.), The International Corporation, Cambridge, MA:MIT Press. 44. Kacker, M. (1988),
" International flow of retailing know-how: Bridging the key issues in undering and changing control." Journal of Technology Management, 17 (5
), pp.433-433. 45. Katz, D. and kahn, R.L. (1966), The Social Psychology of Organizations, New York: John Wiley and Sons. 46. Kerzner
Harold. (1997), "Project Management: A system Approach to Planning, Scheduling and controlling." NY: Van Nostrand Reinhold. 47.
Lawrence S. kleiman. (1998), "Human resource management:a tool for competitive advantage", 劉秀娟、湯志安譯(1999), 人力資源管
理 取得競爭優勢之利器,台北:揚智文化事業股份有限公司,pp.287-333. 48. Leonard-Barton, C. (1992), "Core Capabilities and Core
Rigidities:a Paradox in Managing New Product Development, "Strategic Management Journal, Vol.13, pp.111-125. 49. Leonard-Barton, D. and
Sinha, D.K. (1993), "Develop-user Interaction an User Satisfaction in Internal Technology Transfer", Academy of Management. 50.
Leonard-Barton, D. (1997), "Wellsprings of knowledge:Building and Sustaining the sources of innovation", Boston:Harvard Business School
Press。王美音譯(1988),知識創新之泉:智價企業的經營,台北:遠流出版社。51. Leroy, G.P. (1978), "Transfer of Technology within
the Multinational Enterprise ". 52. Leroy, G.P. (1978), "Transfer of Developing Economics within the Multination Enterprise.". 53. Leslie
W. Rue, Lloyd L. Byars. (1997), "Management:skills and application, 8thed." 賀力行、裴文及楊振隆等譯(2000), Rue & Byars合著
管理學:技巧與應用,台北:前程企業管理有限公司,pp.497-520. 54. Luthans,F.(1988),Successful effective real managers, The Academy of
management Executive,11 (2), pp127-132. 55. Lynn Godkin. (1988), "Problems and practicalities of technology transfer: a review of the
literature", Int. J. Technology Management, Vol.3, No.5, pp.587-603. 56. Madu, Christian N. (1989), "Transferring Technology To
Developing Countries Critical Factors For Success ", Long Range Planning, PP.115-124. 57. Maidique, M.A. (1980), "Entrepreneurs,
champions, and technological.innovation ", Sloan Management Review, pp.59-76. 58. Maidique & Robert A. (1988), "Strategic management
of technology and innovation", Homewood. 59. Mansfield, E. (1975), "International Technology Transfer: Forms, Resource, Requirements
and Policies", American Economics Association, 68-2; PP.372-376, 60, Mansfield, E., Romeo, A. Schwartz, M., Teece, D. Wagner, S. and Brach,
P. (1982), Technology Transfer, Productivity, and Economic Policy, New York: Norton. 61. March, J.G. & Olsen, J.P. (1975), "The
Uncertainty of the Past:Organizational Learning under Ambiguity ", European Journal of Political Research, Vol.3, pp.147-171. 62. Mansfield, E.
Romeo, A., Schwartz, M. Teece, D. Wagner, S. and Brach, P. (1982), Technology Transfer, Productivity, and Economic Policy, New
York:Norton. 63. Meredith, J.R, and Mantel. S. I. (1989), "Project Management", New York:John Wiley & Sons. 64. Mintzberg, H. (1973)
), The Nature of Managerial Work, New York: Harper & Row. 65. Mintzberg, H. (1990), Strategy formation: schools of thought.
In:Fredrickson, J.F. (Ed.), Perspectives on Strategic Management, Philadelphia, PA:Harper Business. 66. N.M. Reddy, L. Zhao. (1990),
"International technology transfer: A review", Research Policy 19, pp.285-307, 67, Nevis, E.C. Dibella, A.J. and Gould, J. M. (1995),
"Understanding Organization as Learning Systems," Sloan Management Review, Winter. 68. Noe, R.A., (1986), Trainees' attributes and
attitudes:Neglected Influences on training effectiveness. Academy of Management Review,11 (4), PP.736-749 69. Nonaka, I. & Takeuchi, H.
(1995), "The knowledge creating company," Oxford University Press, New York, NY. 70. Nonaka, I. (1944), "A Dynamic Theory of
Organization Knowledge Creation, "Organization Science, 5 (1), pp.14-37, 71, North, D. (1990), Institutions, Institutional Change and
Economic Performance, Cambridge: Cambridge University Press. 72. Pascal, R.T. (1984), "Perspectives on strategy: the real story behind
Honda 's success", California Management Review,pp.47-72. 73. Pierre Dussauge, Stuart Hart, Bernard Ramanantsoa. (1992), "Strategic
Technology Management, "Singapore, John Wiley & Sons, pp.5-14. 74. Polanyi, M. (1967), "The tacit dimension", New York: M.E. Sharp
Inc. 75. Porter, M.E. (1985), "Competitive Advantage," New York: Free Press. 28. 76. Porter, M.E. (1990), "Competitive advantage of
nations. Free press. " . 77. Reeser, C. (1973), "Management:Function and Modern Concepts", Foresman and Company, Scott, pp.200-250.
78. Roger, E.M. (1972), "Key concerts and models" Introducing Technology change for Economic Growth and Development, Michigan
State University Press, pp.85-101, 79. Sally Stewart. (1988), "The Transfer of High Technology to China: Problem and Option," Int. J.
Technology Management, Vol.3, Nos 1/2, pp.167-177. 80. Sasaki, N. (1990), Management and Industrial Structure in Japan,
Oxford: Pergamon Press. 81. Satikarn, M. (1981) Technology Transfer: A Case Study, Singapore: Singapore University Press. 82. Senge, P.M.
```

(1990), "The Fifth Discipline-The art and Practice of the Learning Organization", Doubleday Dell Publishing Group, Inc. 83. Sharif, M.N. (1988), "Basis for Techno-Economic Policy Analysis," Science and Public Policy, 15-4, pp.217-229. 84. Shiowattana, P. (1991), "Technology Transfer in Thailand, s Electronics Industry ", in Yamashita S. (ED). Transfer of Japanese Technology and Management to the ASEAN Countries, Tokyo:University of Tokyo Press. 85. Simonin, B.L. (1999), "Ambiguity and the process of knowledge transfer in strategic alliances. ", Strategic management journal, (20), PP.595-623. 86. Souder, W.E. (1987), "Managing New Product Innovation," Toronto: Lexington Books, PP.217-220. 87. Spender, J.C. (1989), Industry Recipes: The Nature and Sources of Managerial Judgement, Oxford:Blackwell. 88. Strassman, W.P. (1968), "Technological Change and Economic Development:The Manufacturing Experience of Mexico and Puerto Rico, "New York: Cornell University Press, pp.2-36. 89. Szulanski, G. (1996), "Exploring internal stickness: To the transfer of best practice within the Firm, "Strategic Management Journal,17:PP.27-43. 90. Tan, R.R. (1996), "Success Criteria and Success Factors for External Technology Transfer Projects, "Project Management Journal, pp.45-56. 91. Teece, D. (1992), "Competition, cooperation, and innovation", Journal of Economic Behavior and Organization, pp.1-25. 92. Teece, D.J. (1977), "Technology Transfer by Multinational Firms:the Resource Cost of Transferring Technological Know-How, "The Economic Journal, 87, PP.242-261. 93. Teece, D.J. (1976), "The Multination Corporation and The Resource Cost of International Technology Transfer, "Ballinger Cambridge, Mass. 94. Tushman, M.L. and Nadler, D.A. (1978), "Information processing as an integrating concept in organization design", Academy of Management Review, pp.613-624. 95. Washio, H. (1986), "The Provision of Manuals and Japanese Private Technology Transfer," The Developing Economies, XXIV, 4, pp.326-333. 96. Wilderman, L. (1998), "Allianac and networks: The next generation," International Journal of Technology Management, 15, pp.96-108. 97. Yin, J. Z. (1992) "Technological Capabilities as Determinants of the Success of Technology Transfer Project ", Technological forecasting and social change, Vol. 42,pp.17-29. 98. Yin, R.(1994), "Case Study Research: Design and Methods." Newburry Park., Sage Publications. 99. Zack, M.H. (1999), "Developing a knowledge strategy," California Management Review,41 (3):pp.125-145. 100.Zack, Michael H. (1999), "Managing Codified Knowledge," Sloam Management Review, summer, pp.45-58。張玉文譯(1990)「管 理顯性知識」,遠見雜誌164知識管理別冊第二期,台北:遠見雜誌,頁192-208。