

Aria Juntunen

THE EMERGENCE OF A NEW BUSINESS
THROUGH COLLABORATIVE NETWORKS
A LONGITUDINAL STUDY
IN THE ICT SECTOR

HELSINKI SCHOOL OF ECONOMICS

ACTA UNIVERSITATIS OECONOMICAE HELSINGIENSIS

A-256

CONTENTS

| | |
|--|----|
| 1.1 BACKGROUND..... | 1 |
| 1.2 RESEARCH OBJECTIVES, PERSPECTIVE AND LIMITATIONS..... | 5 |
| 1.3 RESEARCH TRADITIONS AND KEY CONCEPTS..... | 8 |
| 1.4 RESEARCH STRATEGY, METHODOLOGY AND STRUCTURE OF THE CASE ANALYSIS..... | 21 |
| 1.4.1 Research approach and research design..... | 21 |
| 1.4.2 Evaluation of the quality and generalizability..... | 27 |
| 1.4.3 Structure of the case analysis..... | 28 |
| 1.5 OUTLINE OF THE STUDY..... | 33 |
| 2.1 A BRIEF HISTORICAL OVERVIEW OF THE CASE CORPORATION FROM 1880S TO 1990S..... | 36 |
| 2.2 THE TELECOMMUNICATIONS SECTOR IN EUROPE BEFORE 1998..... | 38 |
| 2.3 TECHNOLOGICAL DEVELOPMENT IN THE EARLY 1990s..... | 39 |
| 2.4 DEVELOPMENT AND CHANGES IN NATIONAL TELECOMMUNICATIONS MARKETS IN 1990-1997..... | 40 |
| 2.5 THE DEREGULATION IN 1998 AND CHANGE EFFECTS..... | 43 |
| 2.6 YEARS 1998-2000: GROWING COMPETITION, CHANGES IN THE INDUSTRY STRUCTURE..... | 47 |
| 2.7 YEARS 2001-2003..... | 49 |
| 2.8 SUMMARY OF THE CHANGES AND DEVELOPMENT DURING 1998-2003..... | 51 |
| 3.1 MAJOR DEVELOPMENT PROJECTS AND RESEARCH PROGRAMS..... | 60 |
| 3.2 DECENTRALIZED R&D AND R&D-NETWORK..... | 61 |
| 3.3 R&D-PROCESS..... | 64 |
| 3.4 CO-DEVELOPMENT OF R&D AND MARKETING..... | 67 |
| 3.5 BUSINESS IDEA AND PARTNERSHIP DEVELOPMENT..... | 69 |
| 3.6 SENIOR MANAGEMENT'S INFLUENCE..... | 71 |
| 3.7 OVERVIEW OF THE MAJOR DEVELOPMENT PROJECTS..... | 72 |
| 3.8 ANALYSIS OF ORGANIZATIONAL LEARNING,KNOWLEDGE AND CAPABILITIES UTILIZED IN THE DEVELOPMENT PROJECTS..... | 73 |
| 3.9 DISCUSSION OF THE EMPIRICAL FINDINGS OF HCB'S DEVELOPMENT DURING THE YEARS 1990-1997..... | 75 |
| 3.9.1 Driving forces..... | 75 |
| 3.9.2 Knowledge and technology transfer..... | 78 |
| 4.1 BACKGROUND INFORMATION: CHALLENGES IN R&D AND BUSINESS DEVELOPMENT..... | 80 |
| 4.2 DRIVING FORCES AND FORMATION OF HCB..... | 83 |
| 4.3 HCB'S DIFFERENT TYPES OF COLLABORATIVE FORMS..... | 84 |
| 4.3.1 Research and development on secure billing and payment solutions..... | 84 |
| 4.3.1.1 BIN and Palmu - researching billing and payment methods in the Internet..... | 84 |
| 4.3.1.2 Nettiplus - developing a self service platform and a security platform..... | 88 |
| 4.3.2 Arenanet (A-net) - the infocity multimedia platform..... | 91 |
| 4.3.2.1 Background information..... | 92 |
| 4.3.2.2 The business plan, strategy, vision and objectives..... | 92 |
| 4.3.2.3 The development of the platform and services..... | 93 |
| 4.3.2.4 Actors, their roles and the selection process..... | 94 |
| 4.3.2.5 Analysis of the project and its results..... | 95 |

| | |
|--|-----|
| 4.3.3 <i>Silicon Hill -alliances - developing dynamic organizational capabilities.....</i> | 97 |
| 4.3.4 <i>Mega-concept (Megahouse and Megahome) - developing the future home solutions and platform. 100</i> | |
| 4.3.4.1 Introduction of the Mega-concept..... | 100 |
| 4.3.4.2 Background information..... | 101 |
| 4.3.4.3 Purpose, goal and value constellation of the Mega-concept..... | 102 |
| 4.3.4.4 Description of Megahome..... | 103 |
| 4.3.4.5 Intelligent home -network solutions and description of the service delivery process..... | 105 |
| 4.3.4.6 Partner network and marketing of the Mega-concept..... | 107 |
| 4.3.4.7 KULTU-Consumer survey..... | 108 |
| 4.3.4.8 Partners and their selection process..... | 110 |
| 4.3.4.9 Analysis of the roles of actors and interaction in the Mega-concept..... | 116 |
| 4.3.4.10 Description and analysis of the development of the management and coordination of the technological infrastructure..... | 117 |
| 4.3.4.11 Analysis of the development of contract management..... | 123 |
| 4.3.4.12 Description of the marketing, communication, service delivery channel and product strategies..... | 124 |
| 4.3.4.13 Description and analysis of the business strategy..... | 126 |
| 4.4 ANALYSIS OF CHANGES IN R&D..... | 130 |
| 4.5 SUPPORTING NETWORKS..... | 135 |
| 4.6 DESCRIPTION OF THE PATTERNS OF INTERACTION AND THE HUMAN RESOURCE MANAGEMENT (HRM) . . . | 137 |
| 4.7 COMPETENCE LABORATORIES AND THE KNOWLEDGE MANAGEMENT-PLATFORM..... | 140 |
| 4.8 SUMMARY OF THE DIFFERENT COLLABORATIVE FORMS..... | 142 |
| 4.9 DESCRIPTION AND ANALYSIS OF THE COMPETITIVE MARKETS OF THE FUTURE HOME BUSINESS..... | 145 |
| 4.10 ANALYSIS OF THE EXOGENOUS AND ENDOGENOUS DRIVERS..... | 149 |
| 4.11 SUMMARY OF HCB'S CAPABILITY DEVELOPMENT IN 1998-2000..... | 151 |
| 4.12 DISCUSSION OF THE EMPIRICAL FINDINGS OF THE YEARS 1998-2000..... | 154 |
| 5.1 MEGA-CONCEPT'S NETS DURING 2001 TO 2003..... | 161 |
| 5.1.1 <i>Changes in the competitive environment of the future home -business.....</i> | 161 |
| 5.1.2 <i>HCB's key products and changes in competition in the broadband-network business.....</i> | 163 |
| 5.2 HCB'S DIFFERENT COLLABORATIVE FORMS FROM 2001 TO 2003..... | 166 |
| 5.2.1 <i>New business nets: Efodi and Emma.....</i> | 166 |
| 5.2.1.1 Efodi- the e-learning environment..... | 167 |
| 5.2.1.2 Emma-the online music business..... | 174 |
| 5.2.2 <i>Research and development on payment methods.....</i> | 180 |
| 5.2.2.1 Chinchilla -the e-payment platform..... | 180 |
| 5.2.2.2 Mobile payment-net..... | 183 |
| 5.2.2.2.1 Background information..... | 183 |
| 5.2.2.2.1.1 SEMOPS - European SafePay Secure Mobile Payment Service -project..... | 183 |
| 5.2.2.2.1.2 Metropolis-project..... | 184 |
| 5.2.2.2.2 Description of the actors in the Mobile Payment-net..... | 185 |
| 5.2.2.3 Payment Research -project..... | 189 |
| 5.3 HCB'S CAPABILITIES AND KNOWLEDGE DEVELOPED DURING 2001-2003..... | 190 |
| 5.4 THE EXOGENOUS AND ENDOGENOUS FACTORS DURING 2001-2003..... | 191 |
| 5.5 ANALYSIS OF THE CHARACTERISTICS OF COLLABORATIVE FORMS..... | 194 |
| 5.6 ANALYSIS OF HCB'S ROLES DURING 2001-2003..... | 196 |

| | |
|--|-----|
| 5.7 DISCUSSION OF THE EMPIRICAL FINDINGS FROM 2001 TO 2003..... | 197 |
| 6.1 THE CONSTRUCTION OF HCB DURING DIFFERENT DEVELOPMENT PHASES..... | 201 |
| 6.2 HCB'S DIFFERENT COLLABORATIVE FORMS FROM 1990 TO 2003..... | 204 |
| 6.3 CAPABILITY, KNOWLEDGE CREATION AND UTILIZATION..... | 211 |
| 6.4 PARTNERSHIPS..... | 216 |
| 6.4.1 Partner portfolio and roles in a business net..... | 220 |
| 6.4.2 Independency and interdependency in business nets..... | 223 |
| 6.4.3 A formation process of a value net..... | 227 |
| 6.4.4 Contracting..... | 229 |
| 6.5 HCB'S MANAGEMENT AND VIRTUAL PARTNERING TEAMS..... | 232 |
| 6.6 BUSINESS MODELS..... | 237 |
| 6.7 STRATEGIES..... | 241 |
| 7.1 SUMMARY OF THE STUDY..... | 250 |
| 7.2 THEORETICAL CONTRIBUTION..... | 252 |
| 7.3 SUMMARY OF MANAGERIAL IMPLICATIONS..... | 255 |
| 7.4 LIMITATIONS AND SUGGESTIONS ON FUTURE RESEARCH..... | 257 |

LIST OF FIGURES

| | |
|--|----|
| Figure 1.1. The levels of analysis in this study..... | 3 |
| Figure 1.2. The levels of analysis and the research traditions..... | 10 |
| Figure 1.3. A business network, its relationships and its horizon..... | 19 |
| Figure 1.4. Definition of the concepts resource, asset and capabilities..... | 20 |
| Figure 1.5. The data collection process..... | 25 |
| Figure 1.6. The overview of the levels of analysis..... | 31 |
| Figure 1.7. The overview of the case corporation's changes of name and corporate form in 1990-2003..... | 31 |
| Figure 1.8. The development of HCB in 1990-2003..... | 33 |
| Figure 1.9. Summary of research traditions, strategy and method..... | 33 |
| Figure 1.10. The structure of the dissertation..... | 35 |
| Figure 2.1. Picture 1: A telephone center in 1910s. Picture 2: A manually operated telephone center in Helsinki in the early 1900s..... | 37 |
| Figure 2.2. The competitive environment in Finland in 1990-1997..... | 43 |
| Figure 2.3. Drivers of change and stability in the telecommunications sector in the 1990s, (mod. McCartney, 1997, 132)..... | 44 |
| Figure 2.4. Changes in the competitive environment and in the industry structure..... | 46 |
| Figure 2.5. Changes in the competitive environment in 1998-2000..... | 47 |
| Figure 2.6. Major drivers of change and Elisa's competitive responses..... | 49 |
| Figure 2.7. An overview of development of the competitive environment in telecommunications industry in Finland from 1990-2002..... | 52 |
| Figure 2.8. The weighted driving forces in 1990-2003..... | 53 |
| Figure 2.9. The transformation of the case corporation during 1990-2003..... | 54 |

| | |
|--|-----|
| Figure 2.10. The overview of the case corporation organization, corporate strategies, the CEOs and changes in corporate name in 1990-2003..... | 56 |
| Figure 2.11. Elisa's number of employees and growth of turnover from 1990 to 2003..... | 57 |
| Figure 3.1. The R&D -network (an internal research group)..... | 63 |
| Figure 3.2. The product development process in the early and mid 1990s. (Source: Elisa's product development materials, Peltola)..... | 65 |
| Figure 3.3. An overview of the marketing development during 1990-1997..... | 68 |
| Figure 3.4. The strategic partnership between Elisa and CompTEL..... | 71 |
| Figure 3.5. Overview of the major development projects..... | 73 |
| Figure 3.6. The overview of the development and utilization of capabilities and knowledge during 1990-1997 | 74 |
| Figure 3.7. The overview of the driving forces from the viewpoint of the HCB's development during 1990-1997 | 77 |
| Figure 4.1. The Boston -matrix of some of the key products/product-groups in Elisa..... | 81 |
| Figure 4.2. BIN-project construction from 1997 to 1998..... | 85 |
| Figure 4.3. PALMU-project construction from 1998 to 1999..... | 86 |
| Figure 4.4. Nettiplus-project construction during 1999-2000..... | 89 |
| Figure 4.5. A-net project construction in 1999-2000..... | 91 |
| Figure 4.6. The actors of the two sequential Silicon Hill - alliances during 1999-2000..... | 97 |
| Figure 4.7. Silicon Hill projects during 1999-2000, the subprojects are described from the viewpoint of HCB.. | 99 |
| Figure 4.8. Change in R&D processes..... | 100 |
| Figure 4.9. The building-blocks of value constellation in the Mega-concept..... | 103 |
| Figure 4.10. Actors in a value network of the home portal services of HCB in 2000..... | 104 |
| Figure 4.11. The simplified structure of the service delivery process..... | 106 |
| Figure 4.12. Overview of the Home Commerce business..... | 111 |
| Figure 4.13. HCB's value net in 2000-2001 (mod. Partanen 2001, 65-67, Figures 8.2 and 8.3)..... | 112 |
| Figure 4.14. An assessment process of partners (mod. Figure 12, Kaasinen, 2001, 101 and Partanen, 2001, 118) | 115 |
| Figure 4.15. Architectural solution and control levels..... | 120 |
| Figure 4.16. Capabilities, tasks and processes in the integration of technologies to the existing infrastructure. | 122 |
| Figure 4.17. The product strategy (mod. Hakanen2000)..... | 126 |
| Figure 4.18. An overview of competitors in the year 2000 (mod. CAA-Consulting 2000, p.5)..... | 128 |
| Figure 4.19. Different levels of strategies..... | 129 |
| Figure 4.20. The corporate R&D -process in the late 1990s..... | 130 |
| Figure 4.21. HCB's R&D-process in the late 1990s..... | 131 |
| Figure 4.22. HCB's technical R&D -process and commercial product development process in the late 1990s (mod. source PCS 2001)..... | 132 |
| Figure 4.23. Supporting networks..... | 136 |
| Figure 4.24. The interactions between HCB's representative and other parties..... | 138 |
| Figure 4.25. The corporate level Knowledge Management -platform (CD Liisa Varjokallio, Elisa)..... | 141 |
| Figure 4.26. Overview of the most important projects, nets and alliances of HCB in 1998-2000..... | 143 |
| Figure 4.27. Changes in the competitive environment of the future home business in Finland..... | 146 |

| | |
|--|-----|
| Figure 4.28. Observations of differences..... | 148 |
| Figure 4.29. The endogenous and exogenous change drivers from 19*98 to 2000..... | 151 |
| Figure 4.30. The capabilities and knowledge developed during 1998-2000..... | 154 |
| Figure 5.1. Picture a: Megahouse with Nokia and its subcontractors as part of the net in 2000; Picture b: Megahouse-net after the terminated relationship with Nokia in 2002..... | 162 |
| Figure 5.2. The competitive environment of the future home and home commerce business in Finland in 2000- 2003..... | 163 |
| Figure 5.3. Potential subscribers of ADSL -line..... | 164 |
| Figure 5.4. Potential subscribers in a building..... | 164 |
| Figure 5.5. Changes in the competition of broadband-network markets in 1990-2003..... | 165 |
| Figure 5.6. The development path of Efodi and Emma..... | 166 |
| Figure 5.7. Efodi - business net in 2000..... | 168 |
| Figure 5.8. Efodi - business net in 2001..... | 169 |
| Figure 5.9. Efodi - business net in 2002..... | 171 |
| Figure 5.10. Efodi-life cycles in 1999-2003..... | 172 |
| Figure 5.11. Capabilities and knowledge developed in Efodi during the years 1999-2003..... | 173 |
| Figure 5.12. Emma-online business partners in January 2002..... | 176 |
| Figure 5.13. Capabilities and knowledge developed..... | 177 |
| Figure 5.14. Causes and effects in Emma's life-cycle..... | 178 |
| Figure 5.15. Chinchilla in 2001..... | 182 |
| Figure 5.16. The value net of the Mobile Payment net..... | 188 |
| Figure 5.17. The Payment Research -project in 2003..... | 189 |
| Figure 5.18. Capabilities and knowledge developed between 2001 and 2003..... | 190 |
| Figure 6.1. HCB's development-path (1990-2003)..... | 203 |
| Figure 6.2. An overview of HCB's different collaborative forms from 1990 to 2003..... | 205 |
| Figure 6.3. The focus of HCB's nets, projects and alliances from 1998 to 2003..... | 207 |
| Figure 6.4. An overview of HCB's development (1990-2003)..... | 210 |
| Figure 6.5. The partner portfolio..... | 221 |
| Figure 6.6. The dependency-matrix..... | 226 |
| Figure 6.7. The modified selection and assessment process of partners..... | 228 |
| Figure 6.8. HCB's virtual partnering teams..... | 236 |
| Figure 6.9. Multiple and single customer interfaces..... | 240 |
| Figure 6.10. The development of HCB in integration of technology and function..... | 241 |
| Figure 6.11. Different levels of strategies..... | 242 |
| Figure 6.12. Different strategies in abusiness net..... | 245 |
| Figure 6.13. The cluster strategy in a business net..... | 246 |
| Figure 6.14. Intra-net rivalry within industries in a business net: Picture 1: A-net and Picture 2: Megahouse .. | 248 |
| Figure A2.1. Internet users per 100 population (United nations statistics division millenium indicators. Http://millenniumindicators.un.org/unsd/)..... | 306 |
| Figure A2.2. Telephone line and cellular subscribers per 100 population(United nations statistics division millenium indicators. Http://millenniurnindicators.un.org/unsd/)..... | 306 |

| | |
|--|-----|
| Figure A2.3. Mobile and Fixed E-commerce users in 1999-2004 (source: ARC Group)..... | 307 |
| Figure A2.4. Home Networks and broadband access are more popular in multi-PC households (source: Forrester Research inc. 2003)..... | 307 |
| Figure A2.5. DSL subscription and penetration in Finland (Source: Gartner Group Market Analysis estimation 3/02)..... | 308 |
| Figure A2.6. The growth of ADSL subscriptions during 1999-2003..... | 308 |
| Figure A3.1: Efodi-presentation (Ahlstrand 11/2001)..... | 310 |
| Figure A3.2. Efodi's user interface in 2001..... | 310 |
| Emma..... | 311 |
| Figure A3.3. Emma- website (December 2001)..... | 311 |
| Figure A3.4. Habbo hotel Kultakala - the Hotel Goldfish images..... | 312 |
| Figure A3.5: Kotiportti website in 2003..... | 312 |
| Figure A3.6: Logical description of Kotiportti (home portal of Elisa Communications) and its service center. | 313 |
| Figure A3.7: Home networks and devices (Korppoo 2001, 23, Figure 6)..... | 314 |
| Figure A3.8 Framework for the analysis specific technology design requirements of smart housing -technology and activities (see Fig 2, in http://www.stakes.fi/cost219/smarthousing.htm)..... | 315 |
| Figure A4.1. Model of the expansive development cycle and its phases (Engstrom, 1987)..... | 316 |
| Figure A4.2. The layout of the competence laboratory space (Virkkunen and Ahonen, 2000)..... | 317 |
| Figure A4.3. Competence laboratory model in the case corporation..... | 318 |

LIST OF TABLES

| | |
|--|-----|
| Table 2.1. The number of the telephone companies/telecom operators in Finland from 1938 to 2003 (sources: Turpeinen, 1996a, www.ficora.fi , www.mintc.fi)..... | 38 |
| Table 4.1. SWOT-analysis of Elisa's delivery channels in HCB's business (mod. SWOT-analysis in NGS LTS001_v2,p. 6)..... | 125 |
| Table 4.2. SWOT-analysis of HCB's business (mod. SWOT-analysis in NGS LTS001_v2, p. 10)..... | 127 |
| Table 4.3. The characteristics of different collaborative forms from 1998 to 2000..... | 144 |
| Table 5.1. The characteristics of different collaborative forms from 2001 to 2003..... | 194 |
| Table 6.1. Development paths of the different collaborative forms..... | 208 |
| Table 6.2. The construction and types of HCB's collaborative forms..... | 218 |
| Table 6.3. The proximity and learning in HCB's collaborative forms..... | 219 |
| Table 6.4. Comptel's roles..... | 223 |
| Table 6.5. The business models..... | 238 |
| Table A2.1. The amount of fixed-line subscribers in 2001-2002 in Finland..... | 309 |