



HELSINKI UNIVERSITY OF TECHNOLOGY  
Software Business Laboratory  
Institute of Strategy and International Business



# **Finnish Software Product Business: Results of the National Software Industry Survey 2006**

Aki Lassila, Jani-Pekka Jokinen, Janne Nylund,  
Petru Huurinainen, Markku Maula, Jyrki Kontio



Centre of Expertise  
for Software Product Business



tietoalat

**Centre of Expertise for Software Product Business**

Ohjelmistotuoteliiketoiminnan osaamiskeskus

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## FOREWORD

Finland-based software business has been growing quite consistently over the past ten years – even during the times when the overall growth of the IT sector has been stagnant. Software companies – and software entrepreneurs – have demonstrated significant drive, flexibility, and agility in growing and maturing their businesses.

This year's survey shows the beginning of a very promising trend. The growth of international sales reached almost 25% - a substantial increase from previous years. In fact, growth of this magnitude or more is required for the industry to reach its growth target by the year 2015: annual revenues of software product-based businesses should reach 15 billion euros by the year 2015, with 40 international, leading companies in their segments. We believe that the industry's continuous effort and focus on growth, internationalization, and market orientation has begun to pay off.

While the data presented in this report shows a visible growth, we have also found several indications of substantial growth in software-based sales in traditional industries. Many traditional companies have begun to explore and sell software based products as add-ons to their existing product line. We believe that companies in other fields will also increase the software-based business revenue in the years to come.

Among the interesting new trends in the survey is software being sold as a service, as well as many services being more and more dependent on software-based solutions. The role of services as complements, source of additional revenue, and even as new business models has also been internationally identified as an important trend in software business and now we observe the same trend in Finland. Services may be a good growth strategy for companies that do not want to – or cannot rely on – external capital for growth.

The EU market is also expanding and it has shown to be a good, solid growth segment for many Finnish software companies. It is easier and less risky to increase international sales through gradual growth in the EU area. The U.S. market is still the largest homogenous market for software. However, as EU expands and its markets are harmonized, if not quite considered a home market, it may well become an excellent “neighborhood” market that supports solid growth for Finnish software companies.

The growth potential of the Finnish software industry is limited by the availability of entrepreneurs, competence, and capital. Availability of international business competence in the field has improved significantly over the last years, but the limited availability of funding and lack of motivation for entrepreneurship poses challenges for the industry. Finland is known as the country with the low number of “wanna-be-entrepreneurs”. Both of these issues have been recognized by the government as well, and they are often mentioned in dinner speeches given by top politicians. However, very few concrete actions have been taken, so far.

The OSKARI survey represents an exemplary, long-term study into software product-based business in Finland. To leverage this study further, international comparison data should be obtained by expanding this survey to cover other countries possibly by cooperating with other universities abroad e.g. in order to find out how the Finnish business is different from that of other similar countries. We need this information in order to support the good growth of the industry.

Risto Siilasmaa  
Chairman of the Board  
F-Secure Oyj

Jyrki Kontio  
Professor of Software Product Business  
Software Business Laboratory  
Helsinki University of Technology

# FOREWORDS OF THE COMMISSIONING ORGANIZATION

The National Software Industry Survey 2006 was carried out for the 9th time this year. In the survey, the internationalization trend of software business continues, with a satisfactory growth rate of 24 percent for international business turnover. However, to reach our cluster goal of 15 billion euros in annual turnover by 2015, we need continuing growth at the same rate, or even at a rate higher this. The domestic growth of software business turnover was 1.4%.

On the whole, the 2006 survey sends out a key message: the growth for our software product industry lies abroad, and our companies need global thinking and action to reach their potential markets. Support in the form of providing international know-how and contacts to our companies is essential.

Over the years, we have found that the national software industry survey serves in many functions: For our cluster companies, the survey provides data for benchmarking and information on the industry trends. Knowledge intensive business service companies look for information regarding the industry challenges and future needs, to support their product, service or operation content. For universities and other research organizations, the survey provides basic data for further research. Support organizations, such as public offices, use the survey results for public policy decisions and planning.

The Centre of Expertise for Software Product Business commissioned the 2006 survey together with the Federation of The Finnish Information Industries, in co-ordination with the Software Entrepreneurs Association, Ministry of Trade and Industry, and the Finnish Funding Agency for Technology and Innovation (Tekes); we wish to thank our partners and funding agencies for their continuing support. In addition, we wish to thank the researchers Aki Lassila, Jani-Pekka Jokinen, Janne Nylund and Petru Huurinainen, and professor Jyrki Kontio at the Software Business Laboratory, and professor Markku Maula at the Institute of Strategy and International Business, for their hard work and enthusiasm on the project.

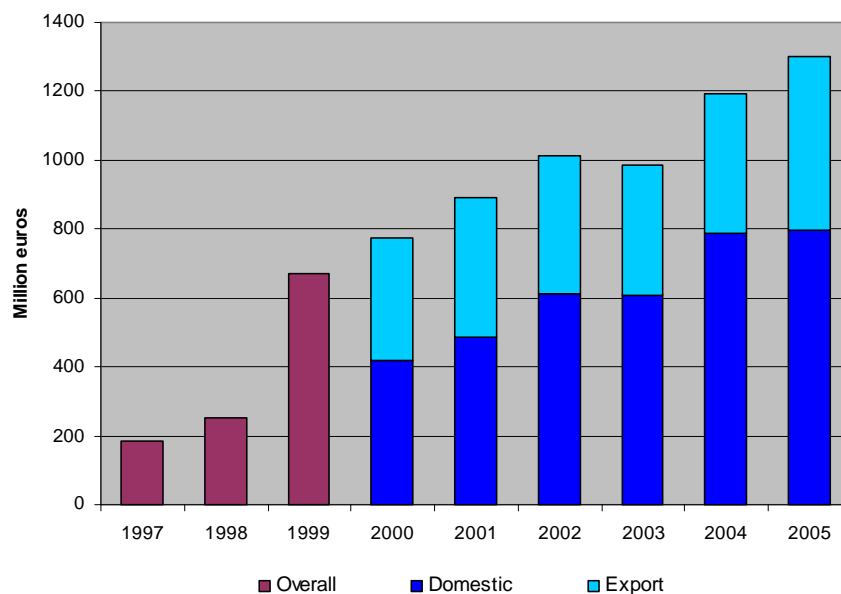
Espoo, October 18, 2006

Irmeli Lamberg  
Program Director  
Centre of Expertise for Software Product Business  
Technopolis Ventures Ltd

## ABSTRACT

The software product industry in Finland has continued to grow: in 2005 software product revenue grew by 9.2% (21% in 2004) reaching 1.3 (1.19) billion euros. Especially the international revenue increased by 24.2% (7%) amounting to 504 (406) million euros, see the figure below. Growth was evident especially in the larger companies, which usually have international operations. In addition, the profitability of the industry improved during 2005: profitability increased from previous year's 2.2% to 2.8%. Unfortunately, employment stayed on the last year's level: the amount of employees in the Finnish software product business was 12 340 (12 400) software professionals. Moreover, the average revenue per employee was low, only 109 000 euros (111 000).

However, the future expectations of the companies are optimistic, e.g. the companies are investing more into the development of new products 41% (33%), young firms' R&D investments have risen for the third consecutive year, and companies are planning to recruit more personnel in 2006. Furthermore, the companies have started to pay more attention to the scalability of their business models and are investing in the future as productization has gained more importance and offering software as a service has gained more popularity: 54% of the respondents offered Software as a Service compared to the last year's 37%.



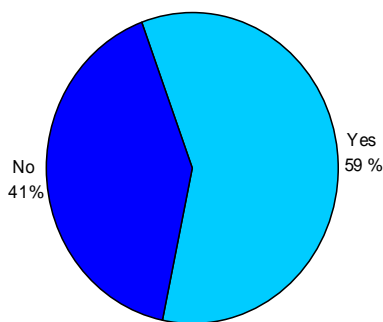
### Development of the Finnish Software Product Business Revenues 1997-2005

On average, founders and their family members owned 69% (73% in 2004) of the Finnish software product companies with only minor foreign (6.1% in 2005, 4.2% in 2004) and external ownership (6.1% in 2005, 3.7% in 2004). Lack of risk capital was again seen as a major barrier for the emergence of new companies, especially by the young companies with 67% (64%) of the 0-2 year-old companies indicating so. The current financing situation is also causing significant reduction in the internationalization attempts of the companies. 31% of the companies seeking external financing reported that they had to change their business plans due to problems with the availability of financing. In other words, it is important for the success of the Finnish software product industry that the most promising companies could find the financing they need.

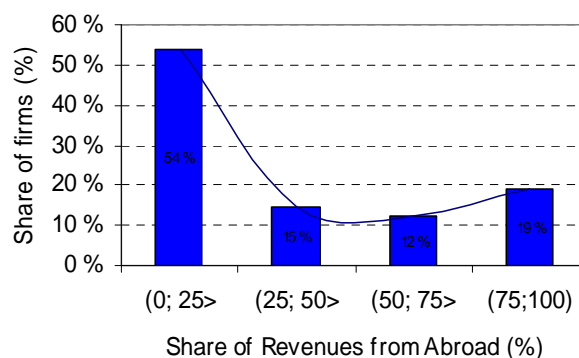
Of the respondents, 59% (46%) had international operations, see the figure below. The most important export countries were again Sweden, Germany, and USA (same as 2002-2004). Even though there are many internationalized companies in the sector, there is a gap between the initial foreign sales and full internationalization, as 54% (57%) of the internationalized companies received less than 25% of their revenues from abroad and as only 19% (15%) of the internationalized companies received more than 75% of revenues from abroad. For most of the companies, increasing the internationalization rate of the business is still a challenge. All in all, software product revenue especially from the international markets grew and the profitability of the companies increased slightly. However, the revenue per employee figure is still low compared to the most successful countries, such as USA and Israel.

This study brought up some areas that are critical to the development of the Finnish software product industry. These development areas include further improvement of the knowledge and skills related to internationalization particularly in case of the SMEs, improvement of the knowledge and skills needed in software productization and product management, and the strengthening and development of networks and supporting services for small companies is important in order to develop internationally capable and competitive companies.

**Revenues from Abroad**



**Foreign Revenues Share Histogram**



### **International Operations of the Software Product Companies**

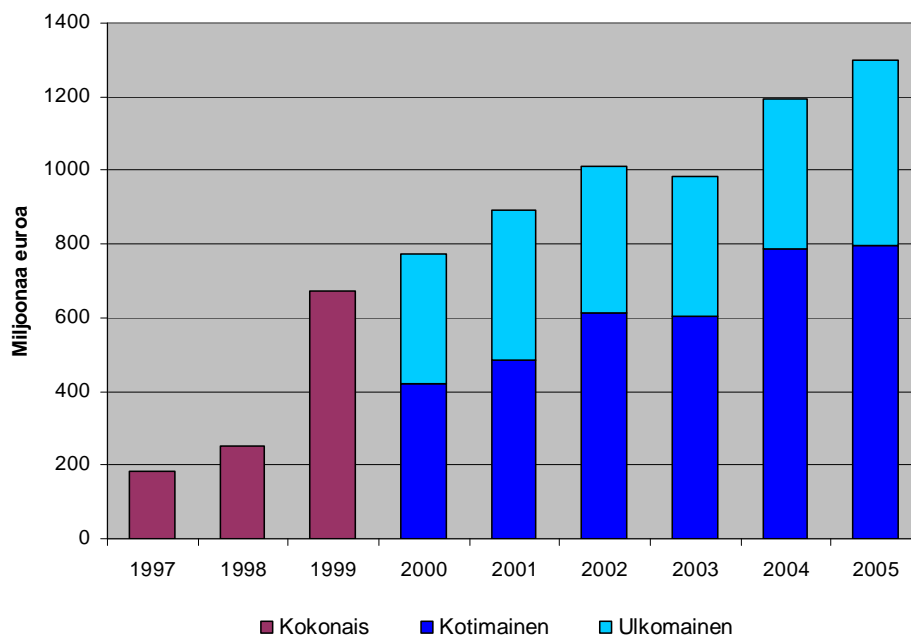
This report contains the findings of the 9th national software product industry survey, which was jointly performed by the Software Business Laboratory and the Institute of Strategy and International Business of the Helsinki University of Technology. The objective of this survey is to provide basic information about the current state of the Finnish software product business. The research was commissioned by the Centre of Expertise for Software Product Business and Federation of The Finnish Information Industries in co-ordination with Software Entrepreneurs Association, Ministry of Trade and Industry, and National Technology Agency.

The survey focused on the software product companies, i.e. companies that sell software products they themselves design, develop, and maintain. The survey was carried out in April-June 2006 using a web-questionnaire and it reached 184 (220) companies, which represents ca. 17% of the estimated 1 100 Finnish software product companies. The responding companies were estimated to generate over 68% of the whole industry's revenues and over 80% of the international revenues of the industry.

## TIIVISTELMÄ

Suomalainen ohjelmistoala on jatkanut kasvuaan: ohjelmistotuoteliiketoiminnan liikevaihto kasvoi 9,2% (21% v. 2004) ja saavutti 1,3 (1,19) miljardin euron tason vuonna 2005. Erityisesti ulkomainen liiketoiminta kasvoi 24,2% (7%) ollen 504 (406) miljoonaa euroa, ks. kuva alla. Kasvu oli selkeästi havaittavissa erityisesti suurten yritysten kohdalla, joilla on yleensä myös ulkomailla liiketoimintaa. Lisäksi ohjelmistotuoteliiketoimintaa harjoittavien yritysten kannattavuus parani vuonna 2005: kannattavuus nousi 2,2 prosentista 2,8 prosenttiin. Valitettavasti alan työllistävyys pysyi toissa vuoden tasolla: ohjelmistotuoteliiketoiminnan työntekijöiden määrä oli 12 340 (12 400) henkeä. Myös liikevaihto per työntekijä jäi matalaksi ollen keskimäärin vain 109 000 euroa (111 000).

Tulevaisuuden odotukset ovat kuitenkin positiiviset: yritykset esimerkiksi panostavat uusien tuotteiden kehitykseen enemmän kuin viime vuonna (41% 2005, 33% 2004), nuorten yritysten tuotekehitysinvestoinnit jatkoivat kasvuaan jo kolmatta vuotta ja yritykset suunnittelevat rekrytoivansa lisää henkilöstöä tänä vuonna. Lisäksi yritykset ovat alkaneet kiinnittää huomiota liiketoimintamallinsa monistettavuuteen ja panostavat tulevaisuuteen: mm. kehityskohteista tuotteistus on noussut ykkössijalle ja ohjelmistojen tarjoaminen palveluna on lisääntynyt: 54% vastaajista tarjosi ohjelmistojaan palveluna kun vuonna 2004 vain 37% teki niin.



### Ohjelmistoliiketoiminnan liikevaihdon kehittyminen 1997–2005

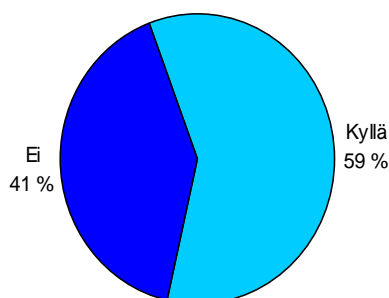
Yritysten perustajat sekä heidän perheenjäsenensä omistavat keskimäärin 69% (73%) suomalaisista ohjelmistotuoteyrityksistä ja yksityisten pääomasijoittajien (6,1% 2005 ja 4,2% 2004) sekä ulkomainen omistusosuus on edelleen hyvin alhainen (6,1% 2005 ja 4,2% 2004). Riskipääoman puute nähdään yhtenä syynä sille ettei uusia yrityksiä perusteta, erityisesti nuoret yritykset kokivat varhaisen vaiheen riskirahoituksen puutteen edelleen keskeiseksi esteeksi uusien ohjelmistotuoteyritysten synnylle (67% alle 2 vuotiaista yrityksistä, 64% 2004). Tämän hetkinen rahoitustilanne on myös vähentänyt yritysten kansainvälistymishankkeiden toteuttamista. Ulkoista rahoitusta hakevien yritysten määrään nähden melko suuri osa vastanneista yrityksistä (31%) ilmoitti joutuneensa muuttamaan liiketoimintasuunnitelmiaan rahoituksen saatavuuteen liittyvien

ongelmien vuoksi. Koko alan menestyksen kannalta olisi tärkeää että lupaavimmat suomalaiset yritykset pystyisivät hankkimaan tarvitsemansa rahoituksen.

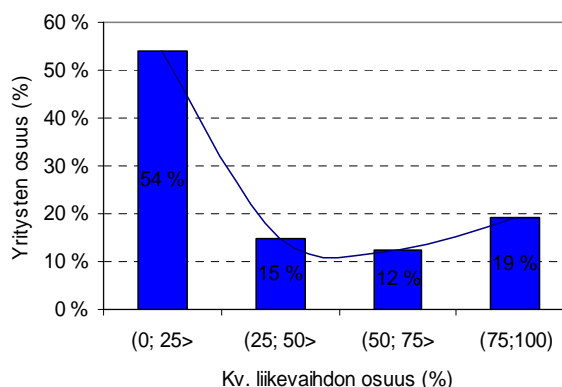
Vastanneista yrityksistä 59% (46%) oli kansainvälistä liiketoimintaa, ks. kuva alla. Tärkeimmät kohdemaat olivat Ruotsi, Saksa ja USA (samat kuin 2002–2004). Suuri osa yrityksistä on kansainvälistymisprosessin alussa, 53% (57%) yrityksistä saa alle 25% liikevaihdostaan ulkomailta, mutta osa yrityksistä on erittäin kansainvälisiä, 19% (15%) yrityksistä sai yli 75% liikevaihdostaan ulkomailta. Kansainvälisen liiketoiminnan aloittaminen ja kasvattaminen on haaste suurimmalle osalle yrityksistä. Kaiken kaikkiaan ohjelmistotuoteliiketoiminnan liikevaihto kasvoi merkittävästi eritoten ulkomailta ja yritysten kannattavuus parantui hieman. Tästä huolimatta liikevaihto per työntekijä on yhä alhainen verrattuna alan menestyksekkäimpiin maihin kuten USA ja Israel.

Tämä tutkimus toi esiin alan tulevaisuuden kehityksen kannalta muutamia kriittisiä kehittämiskohteita kuten kansainvälistymisosaamisen jatkokehittämisen erityisesti pienten ja keski suurten yritysten osalta, ohjelmistojen tuotteistukseen ja tuotehallintaan liittyvän osaamisen kehittämisen. Lisäksi erityisesti pienten yritysten verkostojen ja tukipalveluiden kehittäminen ja vahvistaminen on tärkeää, jotta Suomeen kehittyisi kansainvälisesti kilpailukykyisiä yrityksiä.

**Liiketomintaa ulkomailta**



**Kv. liikevaihdon osuuden histogrammi**



### Ohjelmistoyritysten kansainvälinen liiketoiminta

Tämä raportti pitää sisällään tulokset yhdeksättä kertaa järjestetyn suomalaisen ohjelmistotuoteliiketoiminnan kartoituksesta, joka suoritettiin Teknillisen korkeakoulun Ohjelmistoliiketoiminnan laboratorion ja Yritysstrategian ja kansainvälisen liiketoiminnan laboratorion toimesta. Raportin tavoitteena on luoda yleiskatsaus suomalaisen ohjelmistoliiketoiminnan nykytilaan ja rakenteisiin. Tutkimuksen toimeksiantajana olivat Ohjelmistotuoteliiketoiminnan osaamiskeskus ja Tietoalojen liitto, yhteistyössä olivat mukana Ohjelmistoyrittäjät ry., KTM ja Tekes.

Kartoituksen kohteena olivat ohjelmistotuoteliiketoimintaa harjoittavat yritykset eli ne yritykset, jotka myyvät ohjelmistotuotteita joita he itse kehittävät, toteuttavat ja ylläpitävät. Kysely toteutettiin verkkokyselynä huhti-kesäkuussa 2006 ja omaa ohjelmistotuoteliiketoimintaa harjoittavista yrityksistä tavoitettiin 184 (220) eli n. 17% alan 1 100 yrityksestä. Vastanneet yritykset vastaavat arviolta yli 68% koko toimialan liikevaihdosta ja yli 80% kansainvälisestä liiketoiminnasta.

# Table of Contents

<b>FOREWORD</b>	
<b>FOREWORDS OF THE COMMISSIONING ORGANIZATION</b>	
<b>ABSTRACT</b>	
<b>TIIVISTELMÄ</b>	
<b>1</b>	<b>INTRODUCTION..... 5</b>
1.1	BACKGROUND..... 5
1.2	SOFTWARE PRODUCTS AND SOFTWARE PRODUCT BUSINESS..... 6
1.2.1	<i>Object of Trade</i> ..... 6
1.2.2	<i>Degree of Productization</i> ..... 7
1.3	THE FOCUS OF THE SURVEY..... 9
<b>2</b>	<b>THE FINNISH SOFTWARE PRODUCT INDUSTRY: CURRENT STATE AND FUTURE PROSPECTS..... 10</b>
2.1	REVIEW OF THE RESEARCH ON THE FINNISH SOFTWARE PRODUCT INDUSTRY..... 10
2.2	IMPLEMENTATION OF THE SURVEY..... 10
2.3	REGIONAL DISTRIBUTION OF THE COMPANIES..... 11
2.4	AGE OF THE SOFTWARE PRODUCT COMPANIES..... 12
2.5	REVENUE..... 14
2.6	PERSONNEL..... 20
2.7	PROFITABILITY..... 23
2.8	IMPROVEMENT AREAS..... 24
<b>3</b>	<b>CHARACTERISTICS OF THE BUSINESS..... 27</b>
3.1	MAIN PRODUCT..... 27
3.1.1	<i>Composition of the Sales Revenue</i> ..... 27
3.1.2	<i>Sales Channels and Product Delivery Methods</i> ..... 28
3.1.3	<i>End-Users and Market Segments</i> ..... 29
3.1.4	<i>Releasing New Versions of the Software</i> ..... 30
3.2	RESEARCH AND DEVELOPMENT..... 31
3.3	PRODUCT DEVELOPMENT PROCESSES..... 34
<b>4</b>	<b>INTERNATIONAL OPERATIONS..... 38</b>
4.1	SCALE OF INTERNATIONAL OPERATIONS..... 38
4.2	PROFILE OF INTERNATIONALLY OPERATING FIRMS..... 39
4.3	IMPROVEMENT EMPHASIS..... 42
4.4	PRIMARY FOREIGN MARKETS..... 43
4.5	INTERNATIONAL OPERATION MODES..... 45
4.6	RESOURCE FIT FOR INTERNATIONALIZATION..... 47
4.6.1	<i>Internationalized firms</i> ..... 47
4.6.2	<i>Domestic firms</i> ..... 48
<b>5</b>	<b>FINANCING AND OWNERSHIP..... 50</b>
5.1	OWNERSHIP..... 50
5.2	ACCESS TO FINANCE..... 52
5.3	FINANCING PLANS..... 54
<b>6</b>	<b>BUSINESS MODELS OF THE COMPANIES..... 60</b>
6.1	CATEGORIZATION OF THE COMPANIES..... 60
6.1.1	<i>Categorization Variables</i> ..... 60
6.1.2	<i>Categorization Criteria</i> ..... 61
6.1.3	<i>Description of the Categories</i> ..... 61
6.2	KEY FIGURES..... 62
6.2.1	<i>Revenue and Profit</i> ..... 62
6.2.2	<i>Personnel and Ages of Product Businesses</i> ..... 63
6.3	ACTUAL AND ESTIMATED PROFIT MARGIN..... 63
6.4	ADDITIONAL DESCRIPTIVE FIGURES..... 64

6.4.1	Revenue.....	64
6.4.2	Personnel.....	65
6.4.3	Sales and Distribution.....	66
6.4.4	Customers.....	67
6.4.5	Financing.....	67
6.5	MAIN PRODUCT.....	68
6.5.1	Characteristics of the Main Product.....	68
6.5.2	Version Releases.....	69
6.5.3	Product Development Investments.....	69
6.6	INTERNATIONALIZATION FROM A BUSINESS MODEL VIEWPOINT.....	70
6.6.1	Number of Countries.....	70
6.6.2	Internationalization Strategy.....	70
6.7	CONCLUSIONS.....	71
<b>7</b>	<b>INDUSTRY CLUSTERS.....</b>	<b>72</b>
7.1	GENERAL.....	72
7.1.1	Software Classification.....	72
7.1.2	Target Market Classification.....	73
7.2	DISTRIBUTION OF THE COMPANIES.....	74
7.3	REVENUE.....	76
7.3.1	Total Revenue.....	76
7.3.2	Software Product Revenue.....	78
7.4	PROFITABILITY.....	79
7.5	INTERNATIONALIZATION.....	81
7.6	CONCLUSIONS FROM THE CLUSTER STUDY.....	82
<b>8</b>	<b>OFFERING SOFTWARE AS A SERVICE.....</b>	<b>84</b>
8.1	SERVICE-ORIENTED PERSPECTIVE.....	84
8.2	SAAS DEVELOPMENT STATISTICS.....	86
8.2.1	Revenue.....	86
8.2.2	Internationalization.....	89
8.2.3	Profitability.....	90
<b>9</b>	<b>CONCLUSIONS.....</b>	<b>92</b>
9.1	THE CURRENT STATE OF THE FINNISH SOFTWARE PRODUCT INDUSTRY.....	92
9.2	IMPLICATIONS OF THE FINDINGS AND POINTS FOR CONSIDERATION.....	93
9.2.1	Financing and Ownership.....	93
9.2.2	Productization and Product Development.....	94
9.2.3	International Operations.....	95
9.3	CONCLUDING REMARKS.....	96
<b>10</b>	<b>REFERENCES.....</b>	<b>98</b>

## **APPENDIX I: RESEARCH METHODOLOGY**

## **APPENDIX II: RESEARCH PROJECTS RELATED TO THE FINNISH SOFTWARE PRODUCT INDUSTRY AND OTHER INTERNET LINKS**

## **APPENDIX III: FINNISH SOFTWARE PRODUCT INDUSTRY STATISTICS**

# List of Tables

Table 1. Comparing Product and Service Companies on Five Key Issues (Nambisan 2001) .....	8
Table 2. Location of the Software Product Companies and Their Revenue Distribution (n=183).....	11
Table 3. Location of the Companies by City and Software Business Revenue .....	12
Table 4. Expected Annual Growth of Software Product Business for the Year 2005 (n=96).....	20
Table 5. Expected and Actual Growth in Software Product Business in 2005 (n=63).....	20
Table 6. Companies' Average Profits .....	23
Table 7. Companies' Profits in 2005.....	23
Table 8. End-Users in Different Market Segments.....	30
Table 9. Basis of Releasing a New Version of the Main Product.....	30
Table 10. Version Release Interval of the Main Product.....	31
Table 11. Product Development Investments in 2005 (% of Total Revenue).....	32
Table 12. Product Development Investments in 2005 in Relation to the Age of Software Product Business .....	32
Table 13. Indicators of International Operations.....	39
Table 14. Profile of International vs. Domestic Firms in 2005 .....	40
Table 15. Three Most Important Markets .....	43
Table 16. Firms' Characteristics by Operation Mode.....	46
Table 17. Distribution of Grading in 2005 and 2004 by Means (n <sub>1</sub> =72; n <sub>2</sub> =80).....	49
Table 18. Average Ownership Structure as of 31.12.2005 (n=161).....	50
Table 19. Ownership Structure by Firms' Age as of 31.12.2005 (n=161).....	52
Table 20. Detailed External Finance Seeking Structure (n=54) .....	55
Table 21. Revenue and Profit .....	62
Table 22. Number of Personnel, Age of Company, and Software Product Business .....	63
Table 23. End-Users by Different Groups (Dichotomy Label) .....	67
Table 24. The Modified NAPCS classification.....	73
Table 25. Target Market Classification.....	74
Table 26. The Number of Companies per each Software Type.....	75
Table 27. The Number of Companies per each Target Market .....	75
Table 28. Value and Risk Sources of the SaaS Model from the Provider's Perspective (adapted from Sääksjärvi et al. 2005).....	86
Table 29. Current State of the Software Product Industry.....	92
Table 30. Background Information of the Respondents .....	93
Table 31. Product Development and Productization.....	95

# List of Figures

Figure 1. World Software Product Market in 2005 and Estimates for 2007 (EITO 2006) .....	5
Figure 2. Types of Software Products (Nukari and Forsell 1999).....	6
Figure 3. Software Product and Service Business (Hoch et al. 1999).....	7
Figure 4. The Scope of this Survey: the Finnish Software Product Companies.....	9
Figure 5. Age Distribution of Software Product Companies (n=162) .....	13
Figure 6. Age of the Software Product Business (n=158).....	14
Figure 7. Responding Companies' Distribution of Total Revenue in 2005 (n=183).....	14
Figure 8. Percentage of Companies' Total Revenue from Company's Software Product Business in 2005 (n=172) .....	15
Figure 9. Distribution of Companies' Software Product Business Revenue in 2005 (n=183).....	16
Figure 10. Development of the Revenue at the Industry Level in 1997-2005.....	17
Figure 11. Revenue Growth Rates 2001-2005.....	17
Figure 12. Development of the Revenue (budgeted and actual) 1997-2006.....	18
Figure 13. Development of Revenue per Employee Grouped by the Age of the Software Product business .....	19
Figure 14. Development of Revenue per Employee Grouped by Software Product Business Revenue.....	19
Figure 15. Distribution of Overall Personnel in Software Product Companies (n=180).....	21
Figure 16. Development of the Software Personnel at the Industry Level.....	22
Figure 17. Percentage Change in Software Personnel from 2004 to 2005 (n=74).....	22
Figure 18. Companies Profit per Revenue (n=166).....	24
Figure 19. Most Important Improvement Areas 2006-2008 (n=158).....	24
Figure 20. Distribution of the Most Important Improvement Areas 2006-2008 Grouped by the Software Business Revenue.....	25
Figure 21. Distribution of the Most Important Improvement Areas 2006-2008 Based on the Age of the Software Product Business.....	26
Figure 22. Composition of a Typical Customer Sales Revenues of the Main Product (n=160).....	27
Figure 23. Composition of Business Revenue According to Software Firm's Size .....	28
Figure 24. The Different Sales Channels and Their Usage.....	29
Figure 25. Main Software Product's Delivery Channels .....	29
Figure 26. R&D Investment (% of total revenue) According to the Maturity of the Software Product Business in 2001-2004.....	33
Figure 27. Product Development Emphasis 2001-2005.....	33
Figure 28. Product Development Emphasis Based on the Age of Software Product Business.....	34
Figure 29. Describing Factors of the Product Development Process.....	35
Figure 30. Distribution of the Companies Using Open Source Components Significantly.....	35

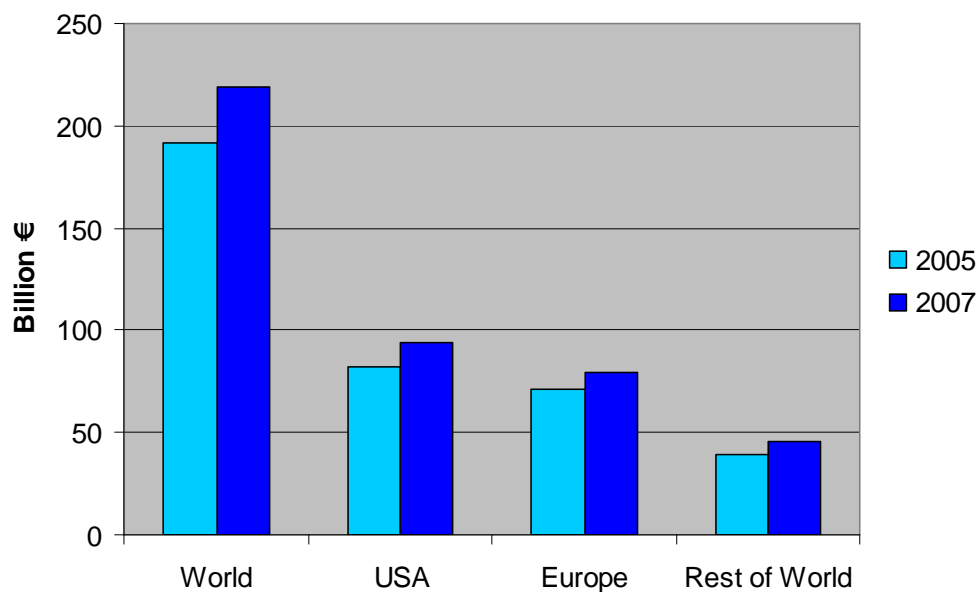
Figure 31. Distribution of the Companies' according to Age Using Open Source Component Significantly .....	36
Figure 32. Characterizing Factors of the Product Development Process .....	37
Figure 33. Firms with Revenue from International Operations (n <sub>1</sub> =175 and n <sub>2</sub> =89).....	38
Figure 34. Distribution of International vs. Domestic Firms by Revenue (n=175) .....	41
Figure 35. Distribution of International vs. Domestic Firms by Profitability (n=159).....	41
Figure 36. Distribution of International vs. Domestic Firms by Age (n=175).....	42
Figure 37. Improvement Emphases by International vs. Domestic Firms for 2006-2008 (n=161).....	42
Figure 38. Concentration of Exports (n=84).....	44
Figure 39. Functional Presence of Firms in Export Markets among Responding Internationalized Firms (n=103) .....	45
Figure 40. Frequency of Use of Alternative Operation Modes among Responding Internationalized Firms (n=103) .....	46
Figure 41. Fit for International Operations by already Internationalized Firms (n=88).....	48
Figure 42. Fit for International Operations by Domestic Firms (n=72) .....	48
Figure 43. Sample companies' ownership distribution (n <sub>1</sub> =161; n <sub>2</sub> =158) .....	51
Figure 44. Ownership Structure by Firms' Age as of 31.12.2005 (n=161).....	51
Figure 45. Opinion on the Availability of Risk Capital by Age (n=157).....	53
Figure 46. Availability of Finance and Impacts on Business Plan (n <sub>1</sub> =183; n <sub>2</sub> =56).....	54
Figure 47. Changes in Business Plan by Age (n=183).....	54
Figure 48. External Financing Plans (n <sub>1</sub> =161; n <sub>2</sub> =55) .....	55
Figure 49. Plans to Seek External Finance by Age, Revenue, Profitability and Expected Growth (n <sub>1</sub> =161; n <sub>2</sub> =161; n <sub>3</sub> =149; n <sub>4</sub> =145) .....	57
Figure 50. Detailed Plans to Seek External Finance by Age, Revenue, Profitability and Expected Growth (n <sub>1</sub> =55; n <sub>2</sub> =55; n <sub>3</sub> =55; n <sub>4</sub> =49) .....	58
Figure 51. Comparison of Financing Plans between 2004 and 2005 (n <sub>2004 - share of firms</sub> =156; n <sub>2005 - share of firms</sub> =146; n <sub>2004 - raising finance</sub> =56; n <sub>2005 - raising finance</sub> =51) .....	59
Figure 52. Categorization of the Companies.....	60
Figure 53. Actual Median Profitability for 2005 and Estimated Median Profitability for 2006.....	64
Figure 54. Composition of a Typical Delivery of the Main Product by Software Product Business Revenue in Different Groups.....	65
Figure 55. Percentage of Personnel in Sales and Marketing.....	65
Figure 56. Percentage of Personnel Abroad.....	66
Figure 57. Average Sales Channel Use by Each Category .....	66
Figure 58. Average Use of Internet and CD-ROM Delivery by Each Category.....	67
Figure 59. Consequences of the Lack of Financing.....	68
Figure 60. Characteristics of the Main Product's Business.....	68
Figure 61. Release Strategies for the Main Product by the Groups.....	69

Figure 62. Product Development Costs as Percentage of the Total Revenue .....	70
Figure 63. The Number of Foreign Countries in which the Companies Operate .....	70
Figure 64. Selection of Sales Strategies in International Markets .....	71
Figure 65. Categorization of Software Product Businesses.....	71
Figure 66. Total Revenue by Software Type.....	76
Figure 67. Total Revenue by Target Market.....	77
Figure 68. Total Revenue per Employee by Software Type.....	77
Figure 69. Total Revenue per Employee by Target Market .....	78
Figure 70. Average Software Product Revenue by Target Market.....	79
Figure 71. Average Profits by Software Type .....	79
Figure 72. Average Profits by Target Market.....	80
Figure 73. Profitability (profit per revenue) by Software Type.....	80
Figure 74. Profitability (profit per revenue) by Target Market .....	81
Figure 75. Percentage of Companies with International Business by Software Type .....	82
Figure 76. Percentage of Companies with International Business by Target Market.....	82
Figure 77. Example of the SaaS Business Model .....	85
Figure 78. Average Revenue from Software Product Business .....	87
Figure 79. Software Product Business's Share of the Overall Revenue.....	87
Figure 80. Average Software Business Revenue per Software Employee.....	88
Figure 81. Average Domestic Software Business Revenue .....	88
Figure 82. Percentage of the Companies Conducting International Business .....	89
Figure 83. Average Software Business Revenue from Abroad.....	90
Figure 84. Average Profit.....	90
Figure 85. Average Profitability (profit/revenue) .....	91

# 1 INTRODUCTION

## 1.1 Background

In 2005 the worldwide packaged software market was approximately 192 billion euros and is expected to reach 218 billion euros in 2007 (EITO 2006). It is the fastest growing ICT market sector and is estimated to grow annually 6.7% during years the 2005-2007. The U.S. software market was the largest market for software, accounting for almost 43% of the world market. The European software market was approximately 70.9 billion euros in 2005 and is forecasted to grow significantly, to 79 billion euros in 2007 (EITO 2006). According to EITO's report in 2006, the European ICT market was 659 billion euros and the share of software was 10.7%. The worldwide ICT market was 1 949 billion euros in 2005. Software products had a 9.8% share of the whole ICT market in 2005.



**Figure 1. World Software Product Market in 2005 and Estimates for 2007 (EITO 2006)**

In Finland, the software industry has grown rapidly during the 1990's. However, the European companies have lagged behind the U.S. firms in the packaged software segment, due, e.g., to small and diverse home markets, low degree of productization<sup>1</sup> and internationalization, and weak links to universities (Malerba and Torrisi 1996). This seems to be true also for the Finnish software companies. However, the trend seems to be towards greater degrees of both productization and internationalization, i.e. from custom software developed for local markets towards mass-market software intended for international distribution.

Unfortunately, the Finnish software product industry does not have an industrial classification code of its own, making even the basic statistics unavailable. The Center of

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<sup>1</sup> We are using the term "productization" in this report to refer to the degree of standardization in the software offering of a company, both in terms of technology and marketing.

Expertise for Software Product Business (Ohjelmistotuoteliiketoiminnan osaamiskeskus), has initiated a series of national software industry surveys in order to alleviate this problem. Previous surveys have been carried out in 1997 and 1999-2006. This report contains the findings of the 9th national software product business survey, conducted by the Software Business Laboratory (Ohjelmistoliiketoiminnan laboratorio) and the Institute for Strategy and International Business (Yritysstrategian ja kansainvälisen liiketoiminnan laboratorio) of the Helsinki University of Technology (Teknillinen Korkeakoulu). This research was commissioned by the Centre of Expertise for Software Product Business and Federation of The Finnish Information Industries (Tietoalojen liitto) in co-ordination with the Software Entrepreneurs Association (Ohjelmistoyrittäjät ry.), Ministry of Trade and Industry, and National Technology Agency (Tekes).

## 1.2 Software Products and Software Product Business

The offerings of the software industry can be roughly divided into three categories: software products, customer tailored software (or customized software), and embedded software, as shown in Figure 2. (Nukari and Forsell 1999). In this study, we are interested in *software products* as a product category that is distinct from embedded or integrated software on one hand and customer tailored software on the other. We do this by focusing on the *object of trade* and the *degree of customization*.

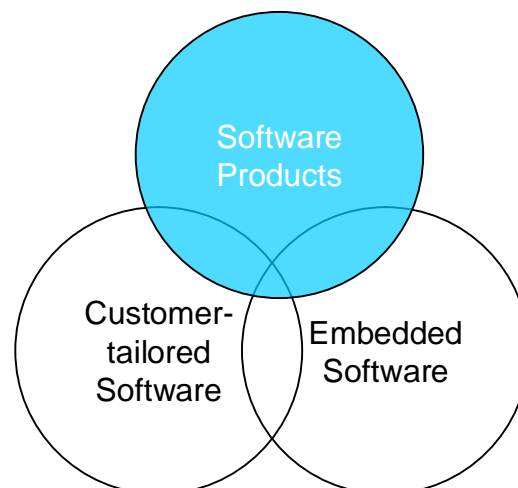


Figure 2. Types of Software Products (Nukari and Forsell 1999)

### 1.2.1 Object of Trade

Software products are traded on their own, not as part of other products. Although software product business often includes other things, such as installation, training, and even customization, the main object being traded is software.

Embedded software, on the other hand, consists of software that is built into other products, such as cellular phones, refrigerators, paper machines, or television sets, and is not sold separately. Though embedded software shares several characteristics of the “pure” software products (developed once, sold in many identical copies, high development costs, and low manufacturing costs), it is excluded from this study since it can not be bought separately (i.e. without buying the good it is embedded to).

### 1.2.2 Degree of Productization

Software can be prefabricated, developed specifically to the needs of each customer, or both. This dimension, the degree of productization, is crucial for differentiating between the software product and project business. The degree of productization ranges from standard, “packaged” software products that are delivered “as is” i.e. without any changes to a large number of customers, to customer tailored software, i.e. software that is developed according to the requirements and needs of the individual customers. Figure 3. illustrates this degree of productization and shows the positioning of software products within it.

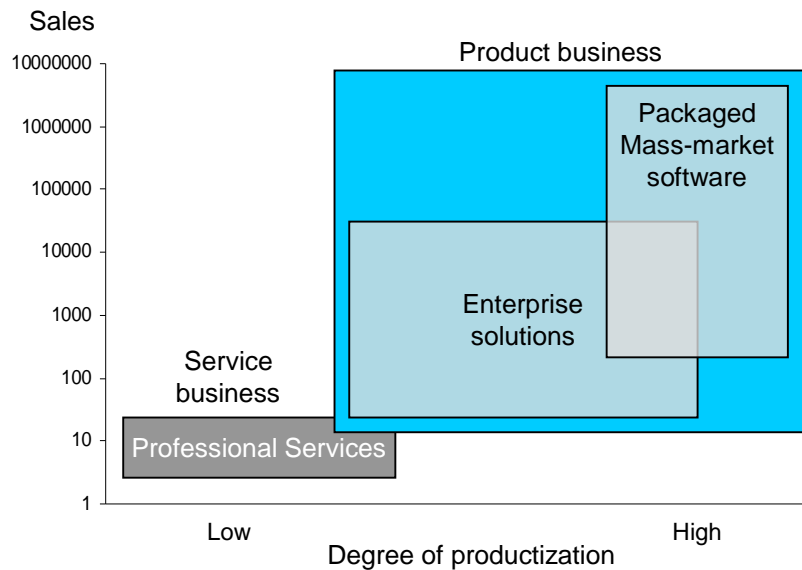


Figure 3. Software Product and Service Business (Hoch et al. 1999)

Productization means the standardization of the elements in the software offering. The term productization includes several technological elements from the very early stages of designing a product (i.e. the management of the user requirements, selection of the underlying technology, design of the product architecture etc.) to the more commercial elements of selling, marketing, and distributing the product (i.e. to the positioning of the product, after sales activities, and delivery channels). Some of the key elements influencing the degree of productization are the target market of the product, concepts, benefits, positioning, requirements, features, specifications, delivery channel, marketing, selling, and packaging (adapted from Cooper 2000).

“Pure” software products are highly productized and often referred to as packaged, mass-market, or shrink-wrap software. These kinds of products are delivered to a large number of customers in exactly the same format – without any customer tailoring. This being the case, the product development and order-delivery processes are completely separated. Software products of this kind can be sold to millions of customers with close to zero marginal costs since there are hardly any traditional manufacturing costs. For example, the costs of the first CD containing the Microsoft Windows 95 operating system were above \$1 billion. The cost of producing the second CD was less than \$3 (Hoch et al. 1999). Typical examples of packaged software products include word processing software, spreadsheets, accounting software, and operating systems.

In the enterprise application business at least some customization is almost certainly needed in order to implement and integrate the software to suit the customers' processes, other information systems, and IT infrastructure. This also places certain limits to the number of customers; the number of customers is in the hundreds or thousands rather than in millions. Installation projects may take months or even years, instead of hours or minutes required by mass-market software products. However, enterprise solutions business is based on pre-developed software products, making it a highly productized business segment. In many cases, the customization is made by changing the program's configuration (parameterization) thus requiring no changes to the actual software product (and its source code).

At the low end of the productization spectrum, still belonging to software product business, we have occurrences in which the customization is done by changing the source code of the software product on a customer specific basis. Here, the distinguishing feature is that the amount of work going into customer-specific tailoring is small compared to the whole effort of the actual product development.

Customized software consists of software developed to the requirements and needs of individual customers. This business is often based on selling projects, not software, and has many characteristics of the service industry. However, the differences between the product and service business are considerable and the change of focus in a firm's business model from one to the other is not so easy to accomplish (see e.g. Hoch et al. 1999, Lassila 2006). There is strong evidence that majority of the service companies have failed in their product business initiatives. Some of the main differences between the product and service businesses are listed in Table 1. (Nambisan 2001).

**Table 1. Comparing Product and Service Companies on Five Key Issues  
(Nambisan 2001)**

<b>Key issue</b>	<b>Software product companies</b>	<b>Software service companies</b>
<i>Intellectual property rights</i>	Very important	Less Important
<i>Product complementary</i>	Very important	Less Important
<i>Returns from scale</i>	A fixed-cost structure allows for higher returns from scale	A variable-cost structure makes increased returns from scale rare
<i>Abstracting knowledge and integrating technology</i>	The company must be able to gather generic product knowledge so that the product can be used in a variety of contexts.	Knowing clients' idiosyncrasies is more important than the knowledge abstraction.
<i>Connections with users</i>	Architecture level technology integration is important for the smooth running of the end product Companies have long-term relationships: typically the users are technologically sophisticated	Companies rely upon data-interface-based technology integration: the primary emphasis is on development efficiency Companies have project-driven relationships: typically, the users are technologically unsophisticated

### 1.3 The focus of the survey

This survey is focused on the Finnish software product companies and their software product business. In this survey, we define the software product and the software product business as follows:

- **Software product** is an application that is productized and can be customized to suit the customers' needs by configuration
- **Software product business** is business concerning software products where the customer tailored parts are not an essential part of the whole software
- **Own software product business** is software product business, which is based on company's own, in-house developed and maintained software products

In Finland the software product industry generates approximately 30% of the whole software industry's revenues. The scope of the survey is presented in Figure 4.

Decisions concerning SW product  
business are made:

		in Finland	Abroad
SW development is done:	in Finland	Included	Included
	Abroad	Included	Not included

Figure 4. The Scope of this Survey: the Finnish Software Product Companies

## **2 THE FINNISH SOFTWARE PRODUCT INDUSTRY: CURRENT STATE AND FUTURE PROSPECTS**

### **2.1 Review of the Research on the Finnish Software Product Industry**

In Finland, the empirical studies which have focused specifically on the size and demographics of software products business started in 1995. A Finnish venture capital company called SFK collected information about software exports among the Finnish software companies through a survey. SFK reported that the exports then were about 75 million euros. A more systematic effort to collect data from the industry started in 1997 when Culminatium Oy (Helsinki Centre of Expertise), Finnish Information Processing Association (Tietotekniikan liitto), and Helsinki University of Technology conducted their first study in the field.

Information about the fundamentals of the industry has been provided by the national software industry surveys between 1997 and 1999-2006 and this report is the 9th one in this series. However, already in the late 1980's ATK-kustannuksen vuosikirja (Tiihonen 1988) provided statistical information about the whole software and hardware cluster in Finland. Moreover, the software product industry has been included as part of the whole software or IT industry in several studies (e.g. Toivonen 2002).

The Finnish software product industry has not been thoroughly studied, as is the case in many other countries, including the USA. Seppänen et al. (2001) has studied software industry research in the USA and they suggested two main reasons for the lack of research in this area. First, software product industry was found to be so complex that defining and setting the frames for the industry is extremely hard, if not impossible. Second, it could be argued that there is no such industry as a software product industry. The second argument assumes that software does not differ from other information products and, therefore, there is no need to study software separately from. Consequently, the number of studies related directly to the Finnish software product industry is very limited.

However, in addition to the annual Finnish software product industry surveys, there are two recently published research studies about the Finnish software markets, which focus on the strategic development evaluation of the entire Finnish software industry. The other addressed the situation and the future prospects of the entire Finnish software industry in 2004 (Tyrväinen, Warsta and Seppänen 2004) and the other study focused more on the vertical software solutions and the possibilities of the Finnish software companies in the vertical markets in general (Tyrväinen et al. 2005).

### **2.2 Implementation of the Survey**

This was the 9th time the software product industry survey was conducted. The survey was conducted during May-June 2006 using a web-questionnaire. Invitations to participate in the survey were sent to 1 863 companies, which were selected using the company classification of Itella Finland and contact lists of the Centre of Expertise for Software Product Business. According to the estimates of different industry and research institutions, there were approximately 1 100 software product companies in Finland at the end of 2005 (1 100 in 2004). We received responses from 184 (220) software product companies i.e. from ca. 17% of the companies in the industry. We estimate that the

responding companies generated over 68% of the whole industry's revenues and over 80% of the international revenues. Moreover, we systematically approached the larger companies in order to estimate volumes at the industry level and in order to increase the generalizability of the results. Based on the above, we conclude that the results of this research study represent very well the Finnish software industry in general. However, unfortunately some of the companies did not answer to all of the questions of the survey questionnaire and therefore we show the number of responses for each question that is reported in this paper. The methodology, sample selection, data collection, and analysis of the survey are explained in more detail in Appendix I.

### 2.3 Regional Distribution of the Companies

The software industry is geographically very concentrated in Finland, since 86% of the companies are located in the proximity of technology centers and universities. In addition, 52% of all the companies and 72% of the large companies (i.e. companies, whose software product business revenue is over 3 million euros) are located in the capital region. Furthermore, over half of the companies (55%) were located in the Uusimaa province. Pirkanmaa and Keski-Suomi were the other provinces that were home for at least ten companies. Together, these three provinces hosted 70% of the responding companies. The regional distribution could indicate the reasons for "centralization" of the companies: six provinces of the highest number of the responding companies have both universities, which provide high-level technological education and technology centers in the population centre. The geographic distribution of the companies is presented in Table 2.

**Table 2. Location of the Software Product Companies and Their Revenue Distribution (n=183)**

Province	Revenue from companies' own software product business in 2005 (million euros)					Total
	<0.2	0.2-0.99	1-1.99	2-2.99	3-	
Uusimaa	27	31	11	9	31	109
Pirkanmaa	5	6		2	5	18
Keski-Suomi	4	6	1	1	1	13
Varsinais-Suomi	5	4				9
Pohjois-Pohjanmaa	2	2	1	1	1	7
Pohjois-Savo	1	3				4
Pohjois-Karjala	1	1	2			4
Satakunta	2			1		3
Kymenlaakso	3					3
Etelä-Karjala	1	1				2
Etelä-Pohjanmaa	2					2
Päijät-Häme		1				1
Pohjanmaa					1	1
Itä-Uusimaa	1					1
Kanta-Häme		1				1
Keski-Pohjanmaa		1				1
Kainuu	1					1
Lappi		1				1
Ahvenanmaa						1
Etelä-Savo					1	1
No location given	1				1	1
<b>Total</b>	<b>55</b>	<b>58</b>	<b>15</b>	<b>14</b>	<b>41</b>	<b>183</b>

The companies' revenue from their own software product business and their geographical distribution is shown in Table 2. From Table 2, we can see that 76% of the companies with revenue exceeding 3 million euros from their own software product business are located in the Uusimaa area. The relatively high number of companies with over 3 million euros of revenue compared to the rest of the companies is explained by the fact that these companies were systematically contacted if they had not responded to the survey in time. This was done in order to estimate the industry volumes more precisely and to increase the generalizability of the survey's findings.

When we take a closer look at the locations of the respondents, it is noticeable that the software companies are usually located very close to the technology centers. Despite the good infrastructure that enables telecommuting, thanks to well working communication networks, software product companies are still mostly located in the largest cities. The seven most popular Finnish cities, listed in Table 3, hosted 143 companies, which represents 71% (75% in 2004) of all of the respondents. The most popular cities were the same as in the previous year's survey. In Table 3, we present the software product companies divided into five groups according to their revenue in these seven cities. The table also shows that the larger companies are mostly located in the technology centers and in the major cities.

**Table 3. Location of the Companies by City and Software Business Revenue**

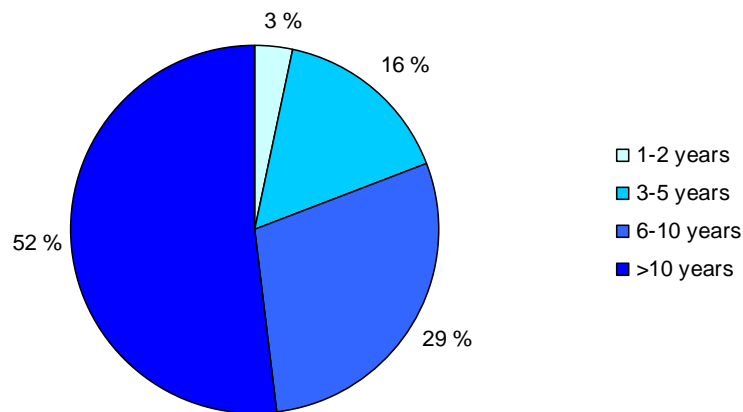
City	Revenue from companies' own software product business in 2005 (million euros)					Total
	<0.2	0.2-0.99	1-1.99	2-2.99	3-	
Helsinki	15	20	9	7	19	70
Espoo	6	7	2	2	11	28
Tampere	2	6		2	5	15
Jyväskylä	2	6	1	1	1	11
Turku	5	2				7
Vantaa	2	3			1	6
Oulu	2	2	1		1	6
Total	34	46	13	12	38	143

A possible explanation for the geographical concentration location of the software product companies is that the importance of technology centers and universities, which often enable networking and supporting services, is high and valued by the software product companies.

## 2.4 Age of the Software Product Companies

The age of the responding software product companies varied a lot. Even though the Finnish software product industry is regarded as a relatively young industry, the oldest companies in the business are more than three decades old. On the other hand, there is a large number of companies, which were founded in the late 1980's - early 1990's and also several companies that were founded after 1999. The average age of the responding companies was 13 years (11 in 2004) and the median age was 11 years (10 in 2004). However, according to the industry experts, the distribution of the companies in this sample is probably biased. There are at least two explanations for this. First, the emphasized focus on the largest companies (that often are older) skews the age distribution. Moreover, in this survey, the start-up companies were not reached well, i.e. they did not respond to this survey for reasons not well known. One likely reason is that

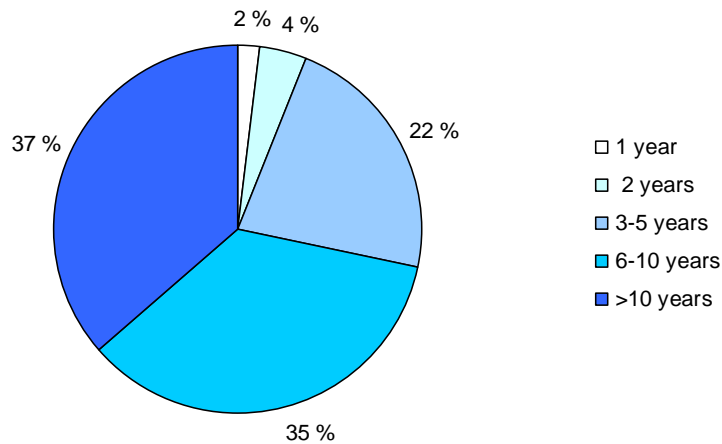
the start-up companies can be classified in numerous industry classifications, especially if they are spin-offs from the parent company. It is also more difficult to find and reach the small and new companies than existing and well established companies. Nevertheless, according to the industry experts, the number of young software product companies should be larger. Regardless of the possible bias in the companies' age distribution, it is interesting to compare this distribution to the previous year's distribution. The share of the young companies (age under 3 years) is 3% (5% in 2004 and 4% in 2002), whereas it was 13% in 2001. Clearly, during the industry boom in 1999-2001, the number of companies that were founded was greater than after those years. Age distribution of software companies is presented in Figure 5.



**Figure 5. Age Distribution of Software Product Companies (n=162)**

As can be seen in Figure 6, 6% (9% in 2004, 12% in 2003, 11% in 2002, and 21% in 2001) of the companies have been in the software product business for less than three years. Despite the relatively large amount of young companies (26% less than five years old), 72% of companies (63% in 2004) had been in the software product business for more than five years. The average age of the software product business was 9.9 (9.2) years and the median was 7.5 (8.5) years. As was mentioned earlier, according to the industry experts this distribution does not accurately represent the whole industry: according to the experts, the proportion of the young companies should be a bit larger.

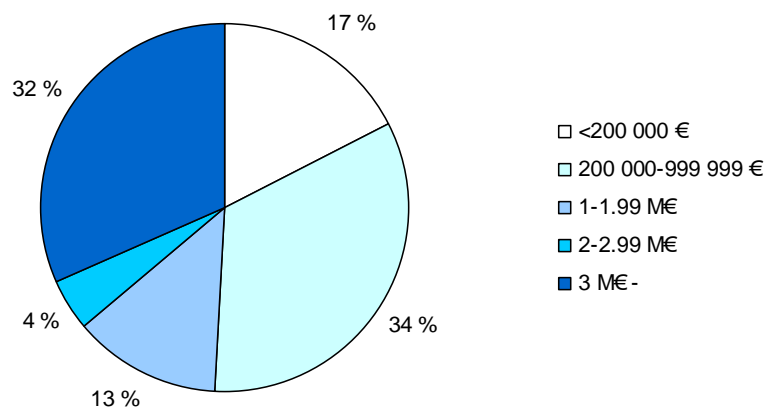
As Figure 6. shows, despite the fact that the Finnish software product industry is rather immature, there are many companies that have been in business for more than a decade. When we look at the largest companies, which are mainly publicly listed stock companies, we can see that these companies were mostly founded before the mid-1990s, some of them even dating back to much earlier years.



**Figure 6. Age of the Software Product Business (n=158)**

## 2.5 Revenue

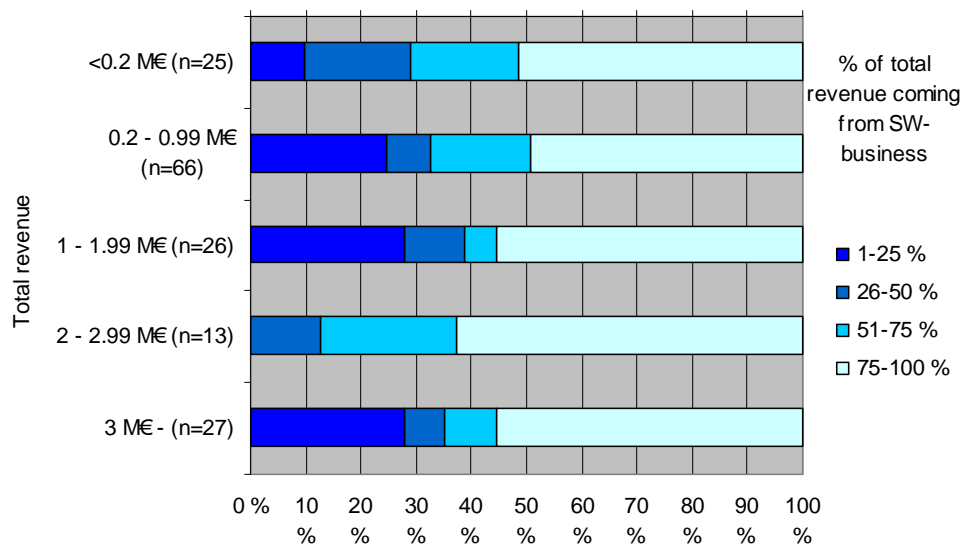
We asked companies about their revenue in the year 2005 and their budgeted revenue for the year 2006. In addition, we asked how their software product business revenue is divided between the domestic and the international markets. The software product companies had an average total revenue of 16.9 million euros (13.6 million euros in 2004) and a median revenue of 0.9 (0.9) million euros in 2005. The average software product business revenue was 4.1 (3.9) million euros and the median revenue was 0.5 (0.5) million. The significant difference between the averages and medians is explained by the amount of large companies that raise the average figures upwards. As can be seen by studying the medians, most of the companies are relatively small. Distribution of the responding companies' total revenue in 2005 is presented in Figure 7.



**Figure 7. Responding Companies' Distribution of Total Revenue in 2005 (n=183)**

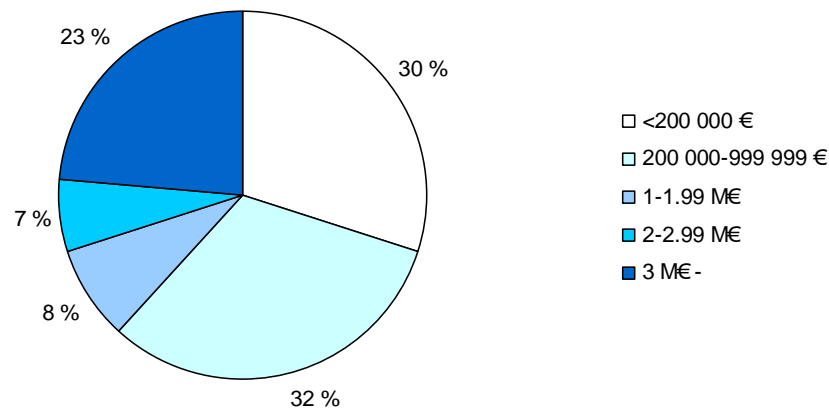
The total revenue tends to grow when companies mature, which is evident in the positive correlation between the total revenue and the age of the company. The dependencies between revenue and age were quite similar as in previous year. In order to shed more light regarding the business focus of the respondent companies, Figure 8. shows the percentage of the companies' own software product business revenue in relation to the overall company revenue. On average, the respondents received 71% (54% in 2004) of their total revenue from their own software product sales and the median was 90% (58%). As Figure 8. shows, the responding companies' core business of this survey often was the software product-based business. This is quite understandable, since these companies are probably more eager to participate in this survey and also to improve the conditions in the Finnish software business environment.

In 2005, only 26% of companies (35% in 2004) with the total revenue ranging from 0.2 to 0.99 million euros received less than 26% of their total revenue from the software product business. In addition, 28% (39%) of companies with total revenue ranging from 1 to 1.99 million euros received less than 26% of their total revenue from the software product business and these represent a significant change to the last year.



**Figure 8. Percentage of Companies' Total Revenue from Company's Software Product Business in 2005 (n=172)**

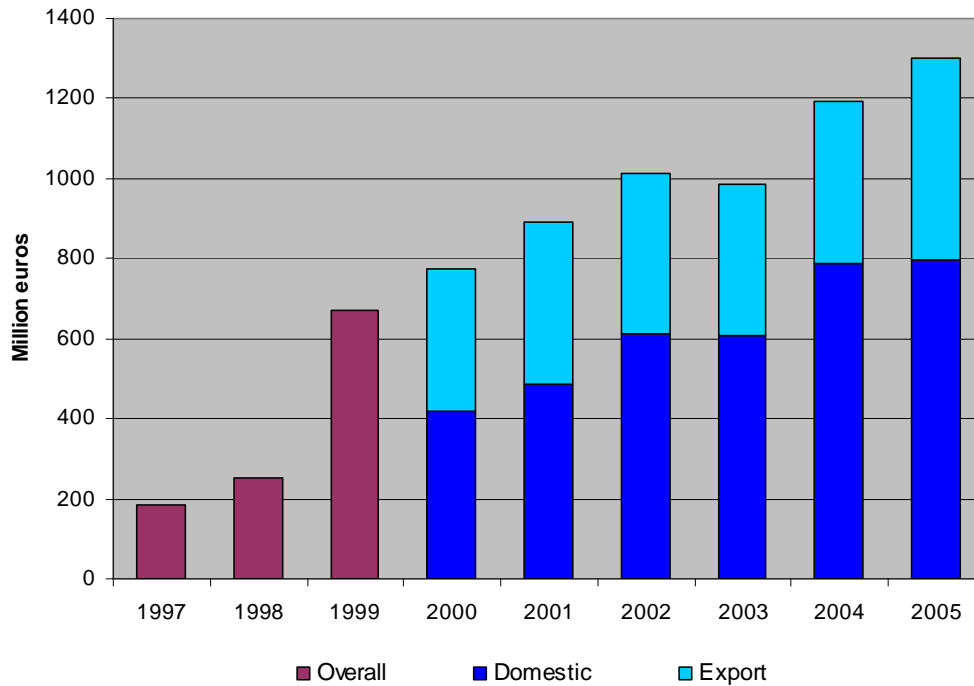
Figure 9. shows the distribution of the responding companies based on their revenue from the companies' own software product business. We can see that majority of the responding companies are rather small as 30% of the companies generated less than 200 000 euros and 62% of the responding companies' software product business revenue (64% in 2004) did not exceed 1 million euros in 2005.



**Figure 9. Distribution of Companies' Software Product Business Revenue in 2005 (n=183)**

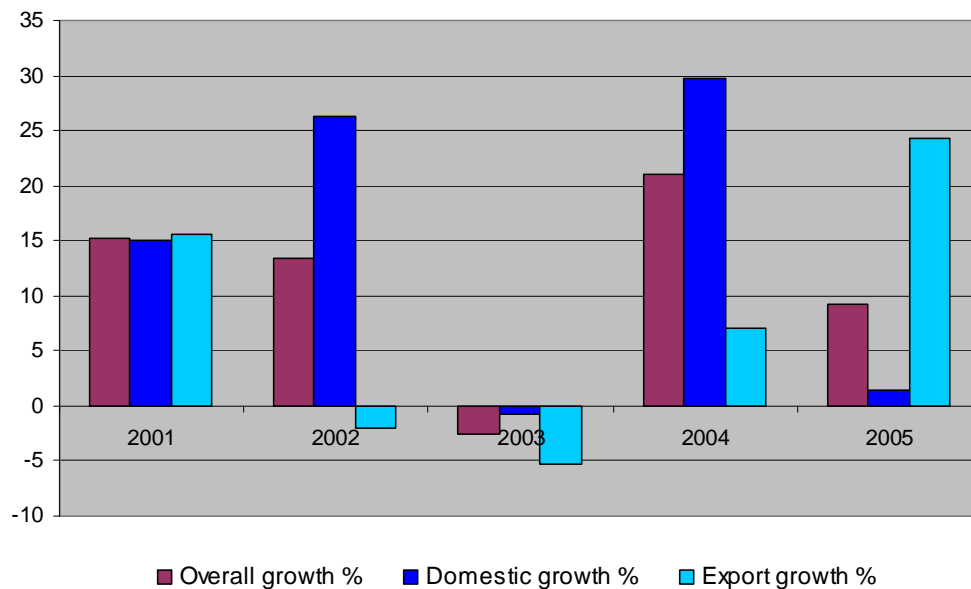
In order to extrapolate the overall value of the industry we did the following. First, we systematically checked with the industry experts and from different software company listings that we had reached all the companies whose software product business revenue exceeded 3 million euros in 2005 – there were 43 such companies. After that, we calculated a “rough” coefficient by dividing 1057 (1 100 is the total number of companies in the industry – the 43 largest companies = 1 057) by 136 (the number of companies participating the survey whose software product business revenue in 2005 was known and not exceeding 3 million euros), which equaled 7.77. Taking into consideration that our sample had an overrepresentation of the large companies, we rounded the coefficient down to 6.45. By using this method the overall calculated value of the industry is 1 301 million euros and the value of exports is 504 million euros. It is worth mentioning, that the value of the 43 largest companies alone was 816 million euros of which 404.7 million euros came from exports. Thus, over 80% of the export came from the 43 largest companies.

The software product revenue grew by 9.2% in 2005 (21% in 2004) reaching 1.3 (1.19) billion euros. Especially the international revenue increased by 24.2% (7%) amounting to 504 (406) million euros. The development of the industry revenue is presented in Figure 10. Since the figures before the year 2000 were calculated using a different estimation approach, they are not directly comparable to those from the years 2000-2005.



**Figure 10. Development of the Revenue at the Industry Level in 1997-2005**

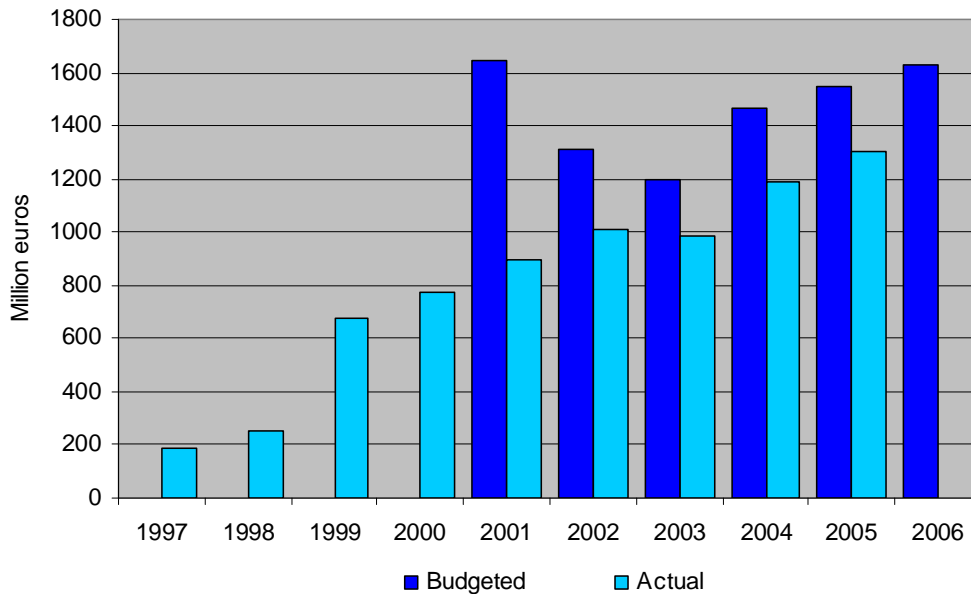
Revenue growth rates are presented in Figure 11. From the figure we can see that the growth rates have varied a lot, especially the domestic revenues. In 2003, in the aftermath of the industry boom years, Finnish software product companies experienced a slump as the growth rates were all negative.



**Figure 11. Revenue Growth Rates 2001-2005**

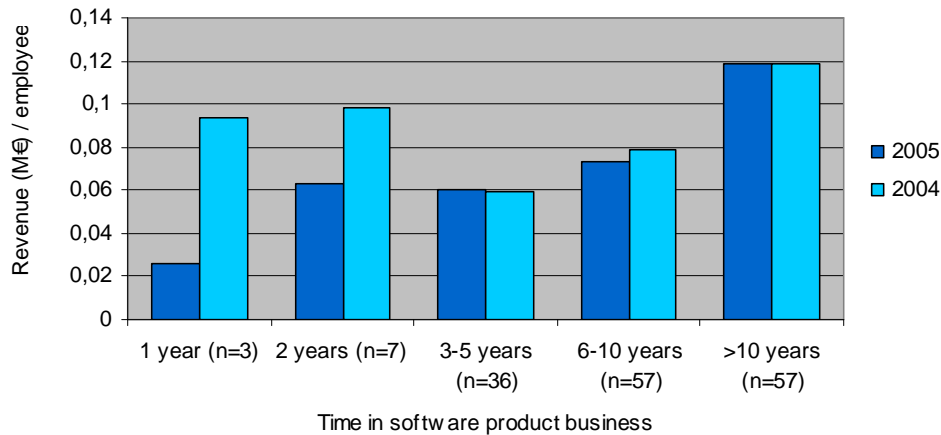
From Figure 12. we can see the budgeted figures that are the estimated values of the industry (based on the responding companies) given in the software industry survey in

the previous year. From the figure we can see the trend that the companies' budgeted revenues have risen for the past three years. As actual revenues have followed the budgeted figures, this predicts growth also for this year. We can also see from Figure 12. that the changes in the economic situation after the year 2000 have also made the companies to be more realistic in estimating their growth prospects in the recent years.



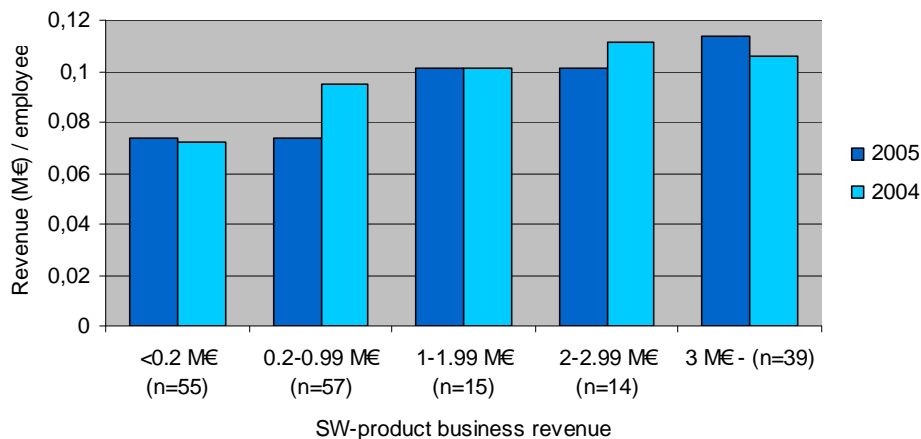
**Figure 12. Development of the Revenue (budgeted and actual) 1997-2006**

The total revenue and the amount of employees working for the companies that responded to the survey were calculated and the resulting figure revenue per employee was ca. 109 000 euros (111 000 euros in 2004). However, the number of the large companies strongly influences this ratio. When we calculated the revenue per employee ratio as an average of the single companies' mean ratios, the ratio is 87 000 (92 000) euros per employee. When we studied the development of the revenue per employee ratio based on the time that the companies had been in the business, we found that the ratio was typically higher for those companies who had been in the business for a longer period of time. This indicates that it can take some time before the first product is successfully launched into the markets and before it starts to generate revenue. Compared to the year 2004, the companies with less than 3 years in the software product business have sunk to a lower level than 3-5 year old companies: from 90 000 euros in 2004 to 60 000 in 2005. This is shown in Figure 13.



**Figure 13. Development of Revenue per Employee Grouped by the Age of the Software Product business**

When we take a closer look at how the revenue collected from software product business affects the revenue per employee ratio, we can see that the companies with software product business revenue exceeding 1 million euros reach the ratio of over 100 000 euros per employee. Companies that are smaller than this are more likely to still be in the product development phase, which is also reflected in the moderate figures (under 100 000 euros per employee) presented in Figure 14.



**Figure 14. Development of Revenue per Employee Grouped by Software Product Business Revenue**

We also asked the companies about their budgeted figures for the next year and it seems that the smaller software product companies expect the fastest growth rate in their software product business revenue for the year 2005. Some of these companies are probably just about to launch their products to the markets, which could cause a substantial increase in their sales. In addition, it is often more difficult for the young and small companies, than for the established companies, to estimate their future sales. It is worth noting that a relatively small amount of all of the responding companies answered to the question about their future expectations. It could be argued that the companies

with positive views were more eager to answer these questions compared to those who did not see the future so positive. Therefore, the figures in Table 4. should be interpreted with caution.

**Table 4. Expected Annual Growth of Software Product Business for the Year 2005 (n=96)**

Annual growth expectation	Revenue from companies' own software product business in 2005 (million euros)				
	<0.2	0.2-0.99	1-1.99	2-2.99	3-
<0 %	3	0	0	1	1
0-10 %	5	2	1	2	2
10.1 – 20 %	2	2	2	1	7
20.1 – 40 %	2	11	3	1	4
40.1 - 100 %	8	11	4	4	1
>100 %	10	3	1	1	1
Amount of companies	30	29	11	10	16
Mean	233 %	58 %	40 %	66 %	25 %
Median	67 %	40 %	33 %	39 %	17 %

We studied also how the companies have actually grown from the year 2004 compared to their growth estimates for the year 2005. Unfortunately the number of companies for which this comparison could be made is relatively small (n=63). On average, the companies had expected an annual growth of 81% (161% in 2004 and 259% in 2003) but the actual growth was 24% (271% in 2004 and 181% in 2003). The expected median growth was 25% (47% in 2004 and 33% in 2003) and the actual growth only 5% (7% in 2004 and 20% in 2003). The differences in the averages and the medians mean that some of the companies have been able to increase their revenue significantly, but on the other hand some companies have suffered from decline in their revenue. As the differences to the previous year's median of the expectations show, the companies were more optimistic in their growth expectations for the year 2005 than a year before. The expected and actual medians and averages are presented in Table 5.

**Table 5. Expected and Actual Growth in Software Product Business in 2005 (n=63)**

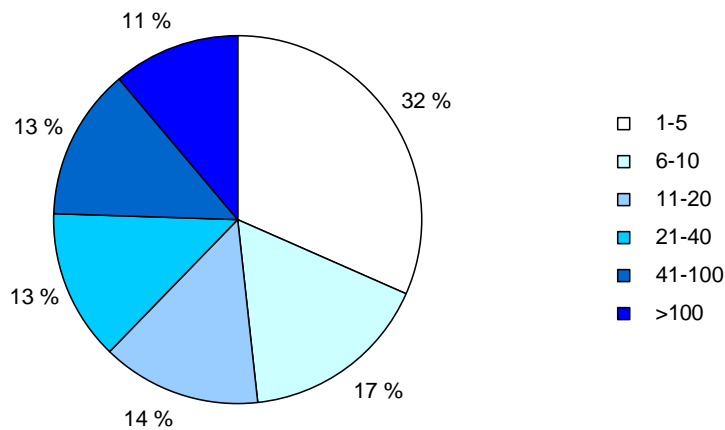
Annual growth in 2005	Revenue from companies' own software product business in 2005 (million euros)					
	<0.2 (n=18)		0.2-1.0 (n=25)		1- (n=20)	
	Mean	Median	Mean	Median	Mean	Median
Expected (in 2004)	175 %	64 %	44 %	25 %	28 %	23 %
Actual	35 %	-6 %	12 %	0 %	148 %	32 %

## 2.6 Personnel

The companies responding to the survey employed a total of 28 091 people working in 184 companies (24 281 people working in 198 companies in 2004). Most of the employees, approximately 85% (89% in 2004), work in companies with revenue of at least 3 million euros from their own software product business. Out of these 28 091 employees, some 6 620 of them were worked in software product business. When this is

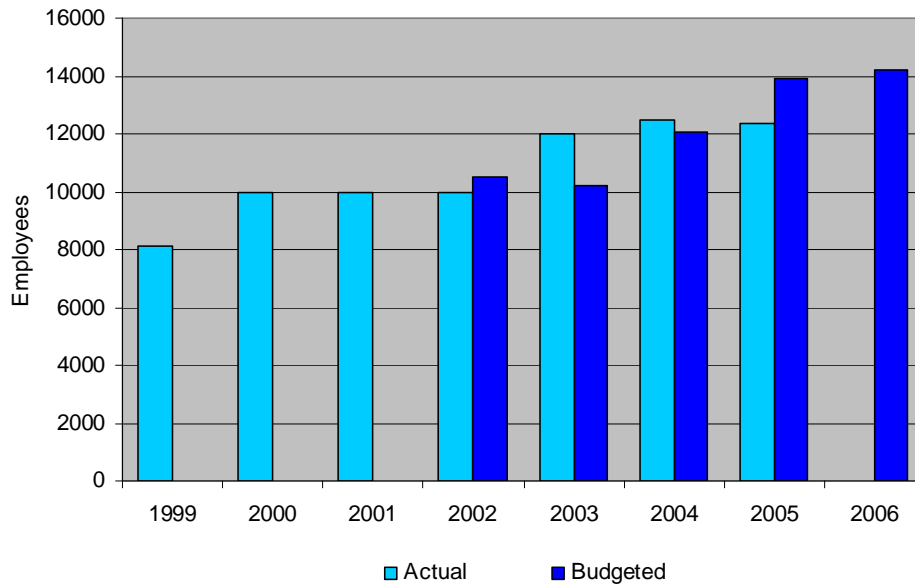
extrapolated to the industry level, the amount of employees working in software product business was about 12 340 in the year 2005. This extrapolation was made in the same way as the extrapolation for the revenue. On average, there were ca. 160 employees per firm (median 12 employees) and of them 21 people were working in the software product business (median 6 employees).

When we take a closer look at the distribution of the personnel in the software product firms that responded to the survey, it can be seen that 32% (28%) of the companies have less than six employees. On the other hand, only 11% (13%) of the firms employ more than 100 people. As mentioned before, the large companies are overrepresented in our sample. Figure 15. shows the distribution of the companies' personnel.



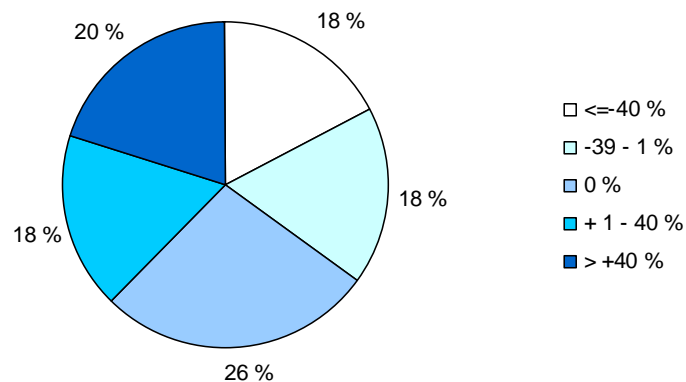
**Figure 15. Distribution of Overall Personnel in Software Product Companies (n=180)**

At the industry level, the total number of software professionals stayed on the same level as last year. The extrapolation was done using the same approach as when calculating the revenue of the industry. Particularly the smaller companies' (revenue from their own software product business less than 3 million euros) numbers of personnel decreased while for large companies the total number of their personnel increased by 7%. Furthermore, the companies had a positive outlook for recruiting in 2006, as they budgeted for 11% increase in the software product business personnel. Small companies plan to increase personnel on average 13% in 2006, while the large companies plan for 5% increase in their personnel. Development of the software product business personnel in 1999-2005 and budgeted estimates for 2002-2006 are presented in Figure 16.



**Figure 16. Development of the Software Personnel at the Industry Level**

Unfortunately, only 74 companies reported the number of personnel in the software product business both in 2004 and 2005. These 74 companies employed 1 948 software professionals in 2005 (3 852 in 2004), with an average of 26 (70) and a median of 7 people (20). Actually, 62% of the companies had decreased or kept the same amount of software employees, 18% had increased the software personnel from 1% to 40% and 20% of the companies have increased the amount of their personnel by more than 40%. The changes in the number of software product business personnel are presented in Figure 17. When we compare these changes to the percentage changes in the software personnel from 2003 to 2004, the most notable finding is that the share of the companies, which increased the number of their software employees over 40% increased from 9% to 20%. In addition, the share of the companies decreasing their number of software employees from 0% to 39% decreased from 55% to 44%.



**Figure 17. Percentage Change in Software Personnel from 2004 to 2005 (n=74)**

## 2.7 Profitability

For the software product companies, the year 2005 was not as challenging as the previous year. Among the responding companies, as can be seen from Table 6, the year 2005 was generally speaking a good one. While in 2004, 10% of companies with revenue less than 1 million euros from software product business were unprofitable, for 2005 this figure was only 6.8%. In 2005, 62% of companies (35% in 2004) with revenue less than 1 million euros from software product business had an breakeven year: they made no profits nor made losses.

**Table 6. Companies' Average Profits**

Revenue from companies' own software product business in 2005 (million euros)	Mean	Median	Sum	n
< 0.2	0.000	0.001	0.00	47
0.2-0.99	0.066	0.012	3.7	56
1-1.99	0.159	0.200	2.4	15
2-2.99	0.438	0.100	56.5	14
3 -	6.849	1.000	253.4	37
Total	1.870	0.030	316.0	169

Altogether, the companies that responded to the survey generated 316 million euros of profits (170 million euros in 2004). Moreover, the companies with software product business revenue less than 3 million euros, generated in total 62.6 (5.3) million euros of profits. In addition, it has to be noted that 169 out of 184 companies (171 out of 220 in 2004) reported their profits for the year 2005. There is a tendency that companies doing relatively well are more eager to report their profits.

From Table 7, we can see that only 5.9% (5.3%) of the companies generated larger losses than 0.5 million euros in the year 2005. 54.5% (62.5%) of the companies were in the range of from 0.5 million euros losses to 0.1 million euros profits. However, almost 40% of the companies (32% in 2004) generated larger profits than 0.1 million euros as can be seen in Table 7.

**Table 7. Companies' Profits in 2005**

Profit (million euros)	Frequency	Valid Percent	Cumulative Percent
<-0.5	9	5.3 %	5.3 %
-0.5 - 0	45	26.3 %	31.6 %
0.01 - 0.1	62	36.2 %	67.8 %
0.11 - 1	40	23.4 %	91.2 %
>1	15	8.8 %	100.0 %
Total	171	100.0 %	

Figure 18. presents the companies' profits in relation to their revenues in the year 2005. There were no significant differences in the profitability based on the companies' revenue sizes: the majority of the companies have remained profitable.

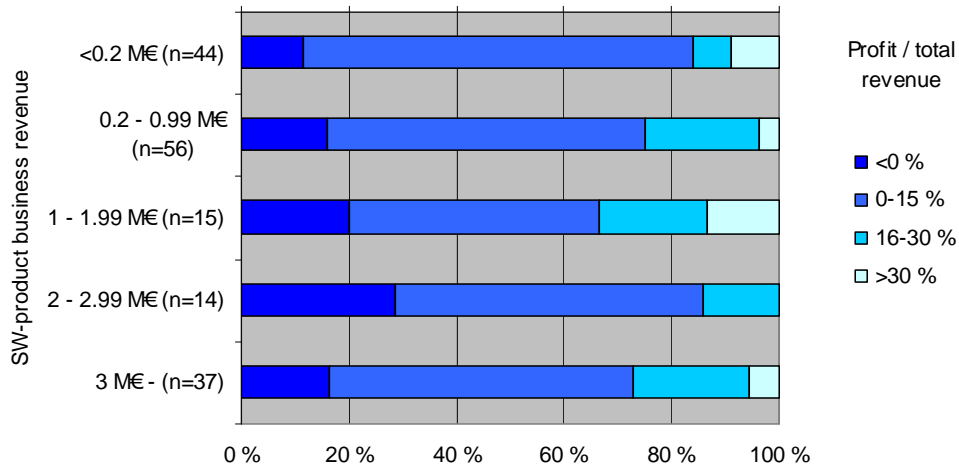


Figure 18. Companies Profit per Revenue (n=166)

## 2.8 Improvement Areas

In this survey, we asked about nine possible improvement areas that companies can focus on, as presented in Figure 19. The companies were asked to mark their two most important improvement areas with numbers 1 and 2, where 1 was the most important and 2 the second most important improvement area in the next three years. The companies were also asked to mark their two least important improvement areas with numbers 8 and 9, where 9 was the least important improvement area and 8 was the second least important improvement area. Productization was thought to be the most or second most important improvement area by 38.5% of companies and product development by 33.5%. Moreover, 34% of the companies rated international sales and marketing as the most important or the second most important improvement area. It is worth mentioning that only 5% of the companies rated product development as the least important or the second least important improvement area whereas 12.4% of companies reported productization to be least or second least important improvement area. Improvement of personnel knowledge and networking and cooperation were also quite often ranked as important improvement areas as can be seen from Figure 19.

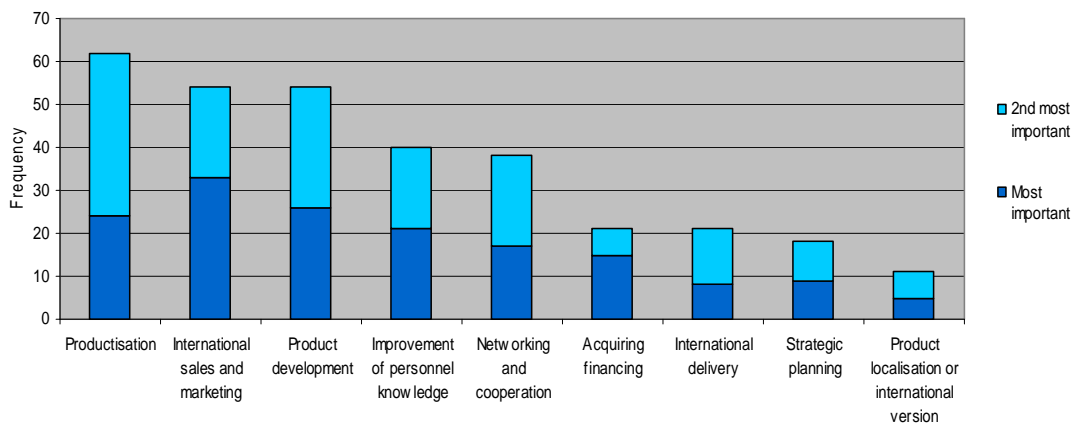
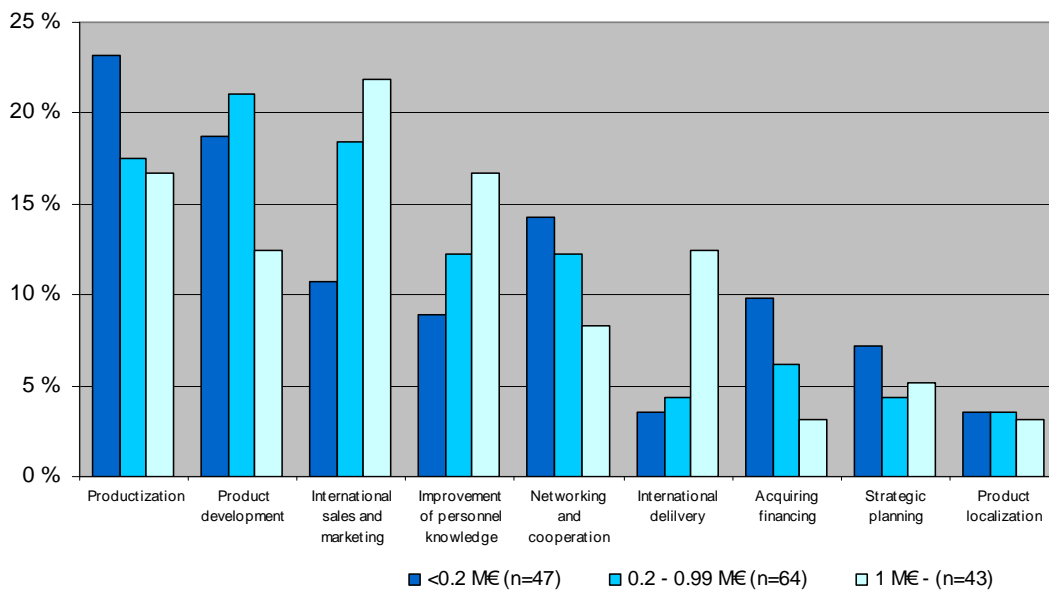


Figure 19. Most Important Improvement Areas 2006-2008 (n=158)

We also studied how the size of the company, defined by software product business revenue, affects the improvement areas. The most important improvement areas were productization and product development, which have risen from last year's fourth and fifth place. It seems that the companies are concentrating on issues related to the scalability of their business. Not surprisingly, the small companies (revenue less than 2 million euros) selected most often the productization as the most important improvement area. Product development, networking, and cooperation in addition to international sales and marketing were also very important improvement areas for the smaller companies.

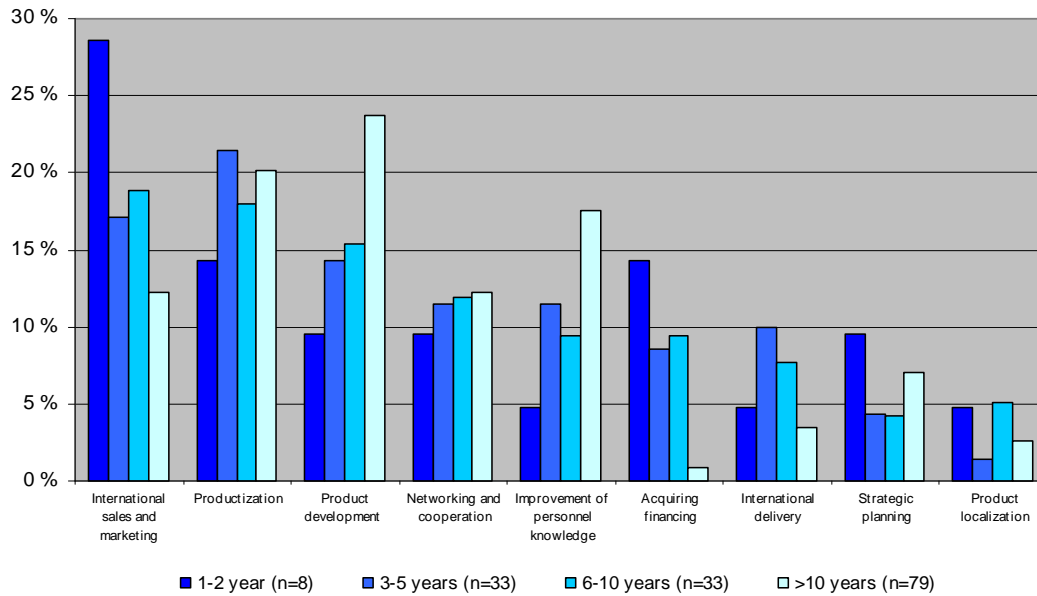


**Figure 20. Distribution of the Most Important Improvement Areas 2006-2008 Grouped by the Software Business Revenue**

The larger companies ranked most often international sales and marketing as their most important improvement area. Improvement of personnel knowledge was also important improvement area for the larger companies as well as productization. Despite the company's size in general, the most important improvement areas seemed to relate to the very fundamentals of the software product business i.e. to productization, product development, international sales and marketing, and networking. International delivery has also become an important improvement area for the larger companies, which is further underlined by the increase in international sales. The first and second most important improvement areas by the size of the company are presented in Figure 20.

We also studied how a company's age affected the ranking of the improvement areas. The youngest companies saw most often international sales and marketing as well as productization as their most important improvement area. Young companies also saw acquiring finance as an important improvement area, as can be seen from Figure 21. Companies aged between 3 to 5 years considered productization and international sales and marketing as the most important improvement area, just as in 2004. The companies aged between 6 to 10 years saw most often the international sales and marketing or the productization as the most important improvement area. For companies older than 10

years, product development, productization, and improvement of personnel knowledge was regarded as the most important improvement areas.



**Figure 21. Distribution of the Most Important Improvement Areas 2006-2008 Based on the Age of the Software Product Business**

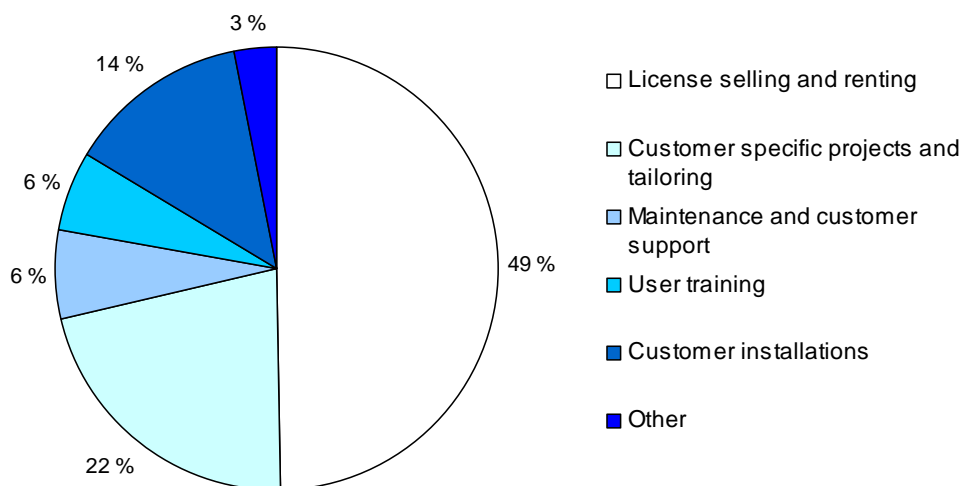
### 3 CHARACTERISTICS OF THE BUSINESS

#### 3.1 Main Product

In this section we examine the business and revenue models of the Finnish software product companies. In order to gain a deeper understanding of the business models and product development methods used by the Finnish software product companies, we asked them various questions related to e.g. development, end-users, and product development investments. In the following sections we present our findings regarding e.g. composition of the sales revenues, revenue models, usage of open source components, sales channels, and delivery methods.

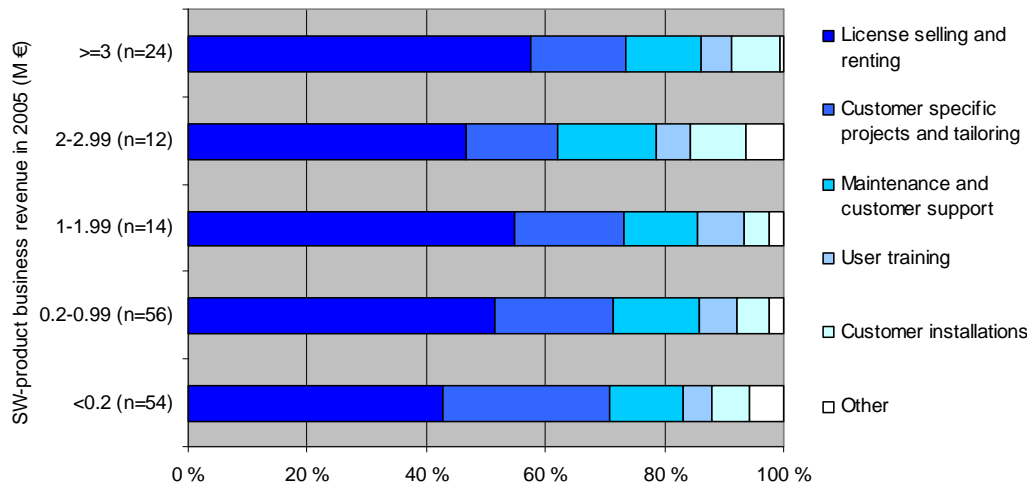
##### 3.1.1 Composition of the Sales Revenue

The companies were asked about the composition of their sales revenue from their main product. We asked how their revenue was divided between the following categories, which were: software license sales or renting, customization, integration and software development projects, customer installation and implementation, user training, maintenance, updates and support, and other. Figure 22. shows how the typical customer sales were distributed into the above-mentioned categories for all respondents. From this figure, we can see that on average 49% (45% in 2004) of the sales revenue came from licenses. Customization and tailoring accounted for the second largest amount, 22% (25% in 2004) of the revenues. Installations accounted for 14% (13%) and maintenance and training both 6% of the customer revenues as a whole. In summary, roughly half of the Finnish software product companies' revenues come from license sales and half from product related services.



**Figure 22. Composition of a Typical Customer Sales Revenues of the Main Product (n=160)**

Figure 23. shows the main product's composition of software product sales in 2005 according to the software firms' revenue. License sales make up over from 43% to 58% of the typical delivery of the software products. Based on the previous years, we can conclude that half of the software product firms' revenue comes from license sales and half from software related services.



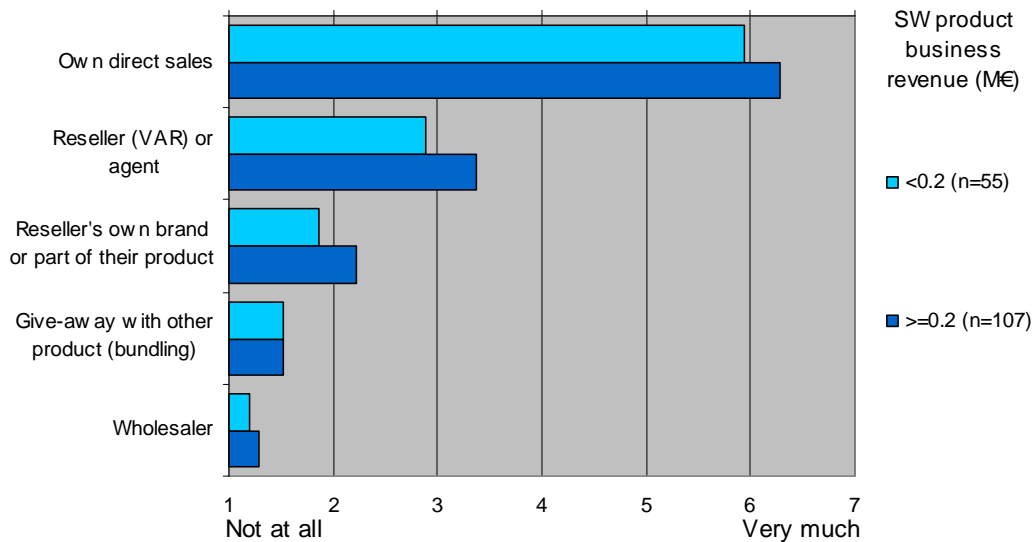
**Figure 23. Composition of Business Revenue According to Software Firm’s Size**

However, it has to be said that for some of the companies it is somewhat difficult to distinguish between the license and maintenance revenue. For example, a company might receive maintenance revenue, which includes updates or new versions (upgrades) of the product. Customer support fees could also be included in the maintenance figures and also this could qualify as license selling as well. Due to this “bundling” of the software product and services related to it the companies find it difficult to divide their sales revenues into the above-mentioned categories, i.e. the line between the products and services has become more blurred.

In addition to the above, the software companies paid only a marginal share of their main product’s revenues to third parties, on average just 4.9% (6.7%), which is even less than last year. Large companies paid bigger percentage to third parties than the small ones.

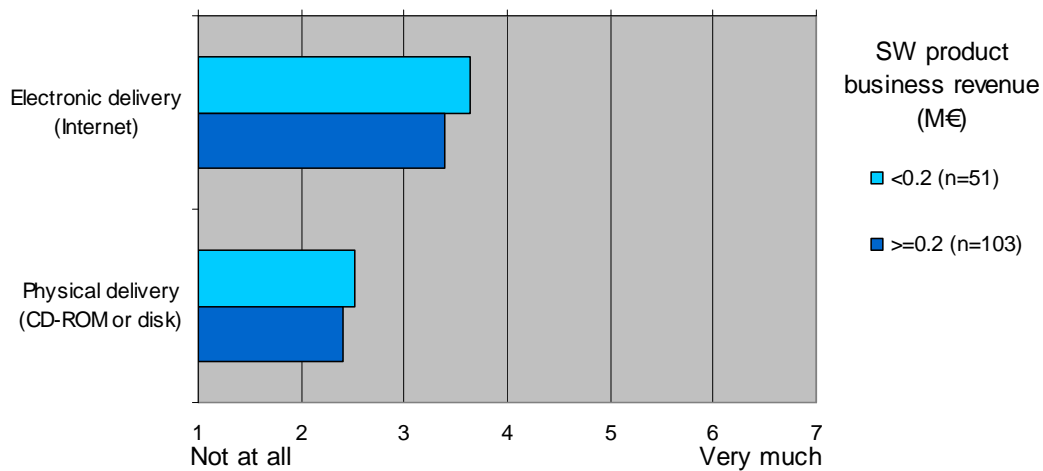
### 3.1.2 Sales Channels and Product Delivery Methods

We asked the companies what different sales channels they preferred to use in their main software product sales and how the actual product was being delivered. We listed the various sales channels and delivery methods and asked the companies to estimate how much they used them on a 7-point Likert scale, where 1 meant “hardly at all” and 7 “very much”. As in previous years, again the most common way of reaching the customer was through software firms’ own direct sales. Resellers and agents were the second most popular sales channel as in last year. The other sales approaches were seldom used, as can be seen from Figure 24. The biggest change is that the small companies do not use resellers as much as last year.



**Figure 24. The Different Sales Channels and Their Usage**

Both the large (software product business revenue more than 0.2 million euros) and small companies (software product business revenue less than 0.2 million euros) rely more on electronic delivery method (the Internet) than using physical delivery, e.g. CD-ROM, DVD, or memory card. Delivery channels are shown in Figure 25.



**Figure 25. Main Software Product's Delivery Channels**

### 3.1.3 End-Users and Market Segments

We asked the companies to identify their main product's typical end-users. We categorized the different end-users into six groups according to their size and whether they were organizations or consumers. The categories were the micro enterprises (1-4 employees), small enterprises (5-50 employees), medium enterprises (51-250 employees), large enterprises (over 250 employees), public (government) sector, and private consumers. The majority of the Finnish software firm's products are sold to enterprises and to the public sector, and only few software products are solely targeted towards the consumers. In the previous years, only from 5% to 10% of the Finnish software

companies have responded that they target consumers as the typical end-users of their products. From Table 8. we can see that also the share of the micro enterprises was low. It has to be noted that since one company can (and usually does) have customers in more than one customer segment (hence the dichotomy label), the overall sums of the percentages in individual columns can reach above 100% in Table 8.

**Table 8. End-Users in Different Market Segments**

Dichotomy Label	Revenue from companies' own software product business in 2005 (million euros)				
End-user	< 0.2	0.2-0.99	1-1.99	2-2.99	3 -
Micro enterprise	18%	12%	13%	0%	5%
Small enterprise	42%	31%	40%	29%	17%
Medium enterprise	51%	43%	33%	29%	27%
Large enterprise	36%	46%	60%	57%	37%
Public sector	18%	38%	47%	36%	32%
Private consumer	9%	9%	7%	0%	5%
Number of cases	55	58	15	14	41

### 3.1.4 Releasing New Versions of the Software

We also asked the companies on which basis they release new versions of their main software products. In the case of the smaller companies, with software product business revenue not exceeding 0.2 million euros, 68% (49 in 2004) of them release a new version without a pre-defined cycle. In the case of the larger companies (software product business revenue more than 0.2 million euros), 35% (24% in 2004) of them indicated that their version releases were not based on a pre-defined cycle. Based on the responses, the smaller companies can be said to be more customer friendly than the larger companies in their release cycles as they released more often versions of their software based on the customers' needs. Popularity of basing the release of the new versions on a fixed, predefined schedule has increased from last few years as 54% (44% in 2004) of the larger companies responded to do so. Only 16% of larger companies release price differentiated versions of their products. The version release basis of the respondent companies is presented in Table 9.

**Table 9. Basis of Releasing a New Version of the Main Product**

Dichotomy Label	Revenue from companies' own software product business in 2005 (million euros)	
Release basis	< 0.2 (n=53) % of responses	0.2 – (n=110) % of responses
In every customer delivery	15.1 %	10.9 %
Without pre-defined cycle	67.9 %	34.5 %
Based on the customer need	62.3 %	42.7 %
On a fixed schedule	3.8 %	53.6 %
Simultaneously multiple price differentiated versions	9.4 %	15.5 %

There were no actual changes in how many versions per year companies released a new version of their main product compared to 2004 and 2003. Small companies (software product business less than 0.2 million euros) released on average three to four versions a year whereas most of large companies (software product business revenue more than 0.2 million euros) released new versions of their main software product annually. Although

the large companies' release cycles seem to be longer than small companies, percentage of large companies who release products less frequently than once a year is a lot smaller than percentage of the small companies as Table 10. indicates. However, in overall the differences in the release frequency of the new versions between the small and large software companies were little.

**Table 10. Version Release Interval of the Main Product**

Version release interval	Revenue from companies' own software product business in 2005 (million euros)	
	< 0.2 (n=52)	0.2 – (n=106)
Monthly or more frequently	9.6 %	0.0 %
Every second month	3.8 %	5.7 %
3-4 times a year	25.0 %	22.6 %
2 times a year	19.2 %	29.3 %
Annually	21.2 %	31.1 %
Less frequently	21.2 %	11.3 %
Total	100.0 %	100.0 %

We have also studied how the maturity of the software development processes affects version release intervals. We have found only very low correlations between the version release intervals and the maturity of the software development processes. Naturally, the type of the software produced affects among many other factors to the need for releasing new versions. For instance, in security business (e.g. virus protection) version release is critical when a new virus appears but in game industry there are rarely many versions released of the same game (minor patches and updates excluded).

### 3.2 Research and Development

On average, in 2005, the software product companies invested 31% (27% in 2004) of their revenue on R&D. There was a significant increase in small companies' R&D investments (relative to the amount of total revenue). Particularly companies that generated revenue from their own software product business less than 0.2 million euros increased their R&D investments on average from 32.7% of their revenues in 2004 to 40.0% in 2005. Also the companies with revenue of 0.2-0.99 increased their investments into R&D by 5.1%. In addition, the median investment of all the companies (n=150) increased from 18% in 2004 to 20% in 2005. However, it is important to notice that there was a notable increase in terms of firms' revenue in 2004 when at the same time the relative amount of total revenues invested in R&D decreased only by 4.4%. This implies that the relative amount of total revenues invested in the R&D decreased, but the absolute amount invested in R&D remained almost on identical level compared to the 2003. Therefore in 2005, the companies increased their R&D investments significantly as we keep in mind that their revenues from software product business have also grown rapidly at the same time (9.2% in 2005 and 24.2% in 2004). In Table 11. we present the average and median product development investment (percentage of the revenue) for the year 2005 of those companies whose software product business revenue is known.

**Table 11. Product Development Investments in 2005 (% of Total Revenue)**

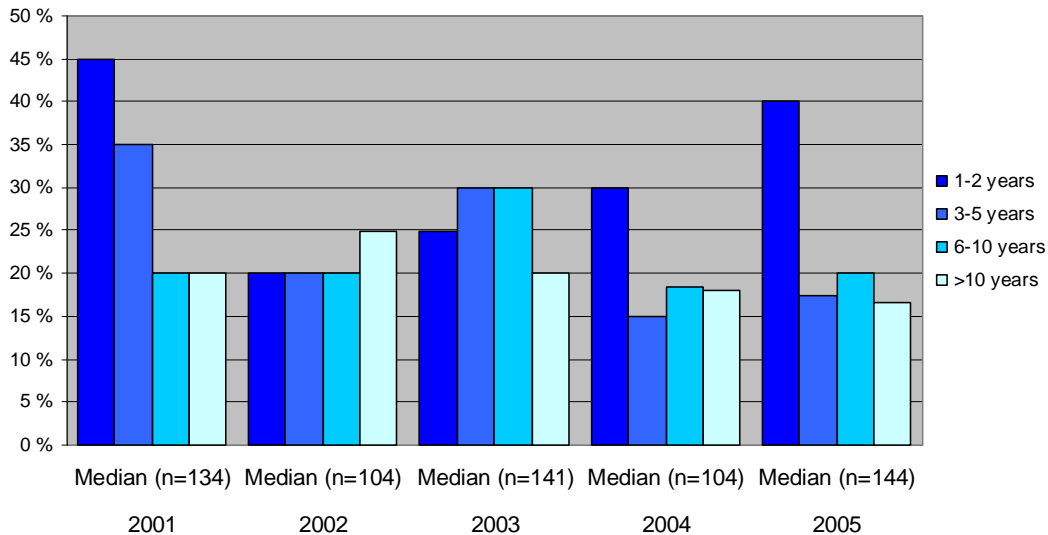
Revenue from companies' own software product business in 2005 (million euros)	Mean	Median	n
< 0.2	40.0 %	20.0 %	44
0.2–0.99	29.4 %	20.0 %	53
1 -	25.0 %	18.0%	53
Total	31.0 %	20.0 %	150

Table 12. presents the product development investments based on the amount of time the company has been in the software product business. In 2004, on average, the less than one-year-old companies invested 44.8% and the two-years-old companies invested 18.8% of their revenue in R&D. The investments in 2005 were 33.3% and 22.9% respectively. R&D investment shares increased significantly in all age groups besides one-year-old companies and over ten-years-old companies. Average shares of the ten-years-old age group stayed the same but the median figure dropped to 16.7% (18.0% in 2004). Our sample of one-year-old companies is very small but it seems that the average R&D investments of the young companies are not yet in the level of 2001, when the one-year-old companies invested 169% of their revenue on R&D. However, average R&D spending of 6-10-years-old companies has increased by almost ten percentages.

**Table 12. Product Development Investments in 2005 in Relation to the Age of Software Product Business**

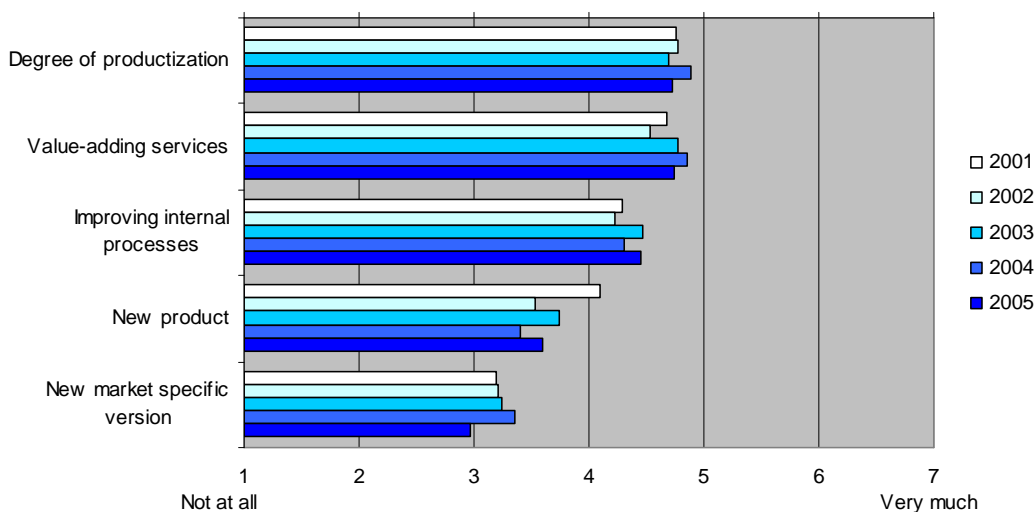
Time company has been in software product business (years)	Mean	Median	n
1	33.3 %	30.0 %	3
2	22.9 %	50.0 %	7
3–5	29.8 %	17.5 %	34
6 – 10	37.9 %	17.5 %	50
> 10	24.0 %	20.0 %	53
Overall	70.8 %	20.0 %	150

Figure 26. shows the medians of R&D investments according to the maturity of the software product business. Majority of the young companies (age of software product business 2 years or less) increased their R&D investments in 2005 and the R&D investments seem to be rising to the level of year 2001. Mature companies (age of software product business three years or more) increased their R&D investments from 2004 except for the companies that are over ten years old. It has to be noted that the young companies' R&D shares have increased every year since 2002.



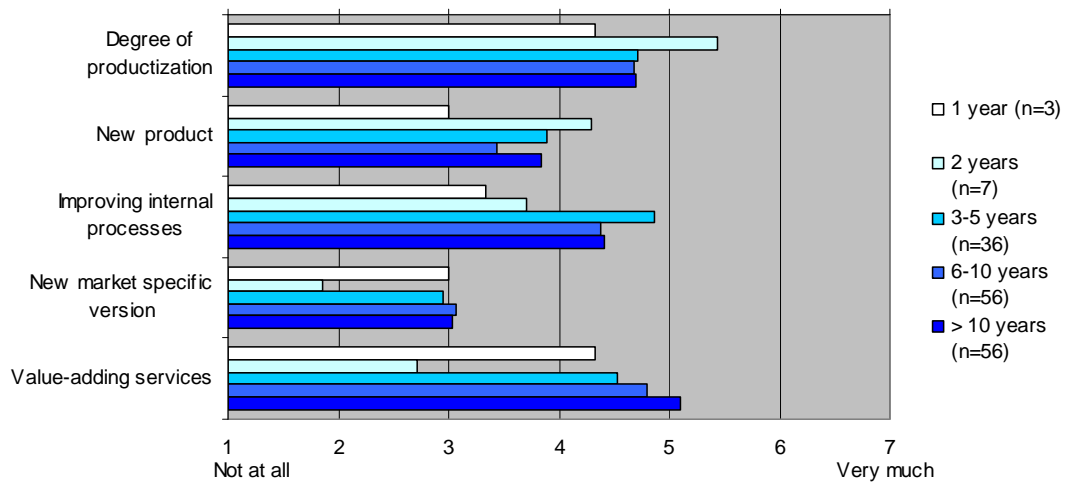
**Figure 26. R&D Investment (% of total revenue) According to the Maturity of the Software Product Business in 2001-2004**

We also studied how the focus of the product development has changed amongst the respondent companies from 2001 to 2005. During these years, most product development emphasis had been placed on increasing the degree of productization and on creating value-adding services. In 2005, value-adding services rose to be the most important focus area bypassing the degree of productization. Emphasis on new product development is still lower than in year 2001, but it seems that the level has stabilized as Figure 27. indicates. In addition, at the same time, 40% of the companies respondent that they were investing in the development of new products (33% in 2004). However, the most important R&D focus areas for both small and large companies were the development of value-added services and raising of the degree of productization. Interestingly development of new market specific versions was not considered as nearly as important as in last year's survey.



**Figure 27. Product Development Emphasis 2001-2005**

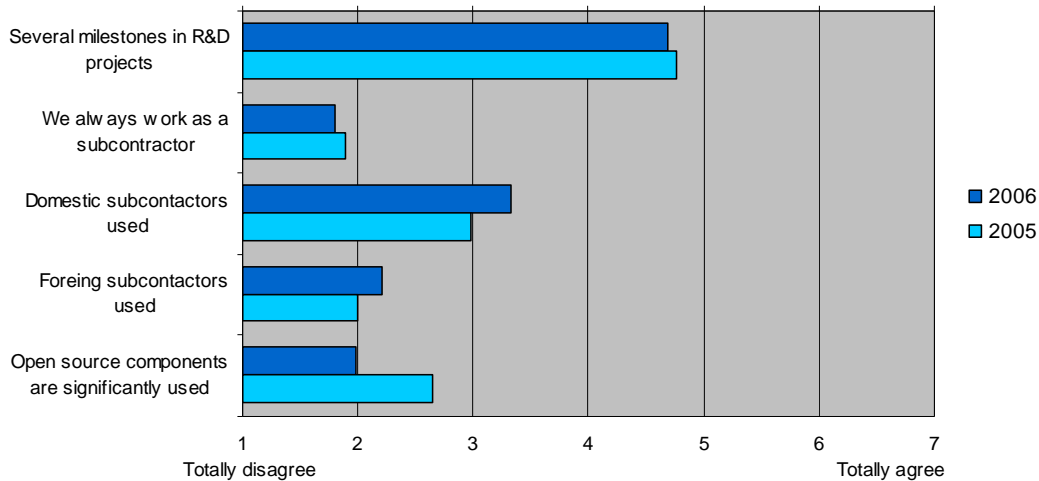
Unlike 2004, in 2005 the companies that have been in the software product business for less than six years did not emphasize leveraging the degree of productization more than older companies. They also considered value-adding services much less important than mature companies as opposed to 2004. In 2005, the companies that were three years old or older emphasized degree of productization more than improving the R&D and delivery processes, but the difference between these is very small and it has become much smaller than in last year. It is interesting to note that the older software companies are investing more on new product development than last year. Product development emphasis sorted by the age of software product business can be seen in Figure 28.



**Figure 28. Product Development Emphasis Based on the Age of Software Product Business**

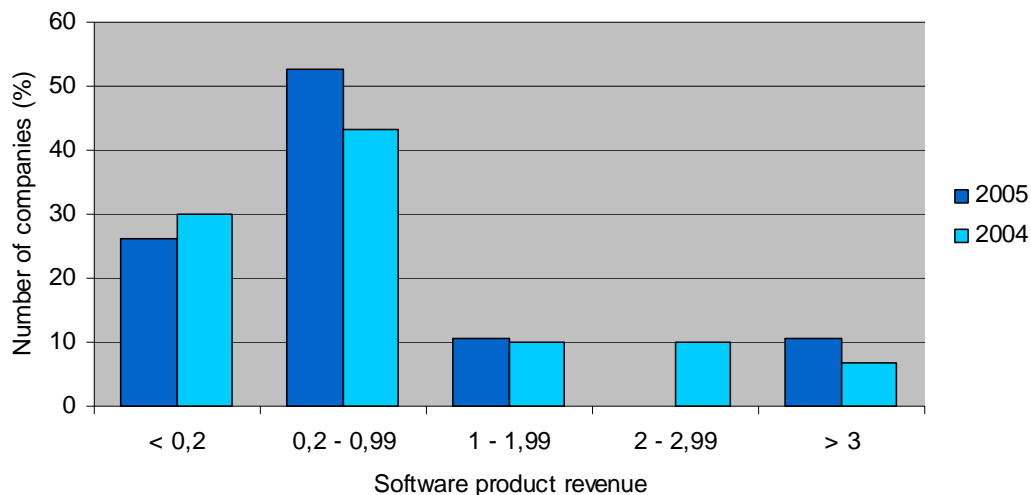
### 3.3 Product Development Processes

We asked companies about their product development processes and 40.6% of the companies answered that they do not systematically set milestones in their product development projects (given no more than a value of 4 on the 7-point Likert scale). One of the most interesting findings is that the usage of subcontracting is growing: 35% (25% in 2004) of the responding companies subcontracted significant amounts of R&D from the domestic market and 16% (12% in 2004) of the responding companies subcontracted significant amounts of R&D from abroad. The averages of the used approaches in product development are depicted in Figure 29.



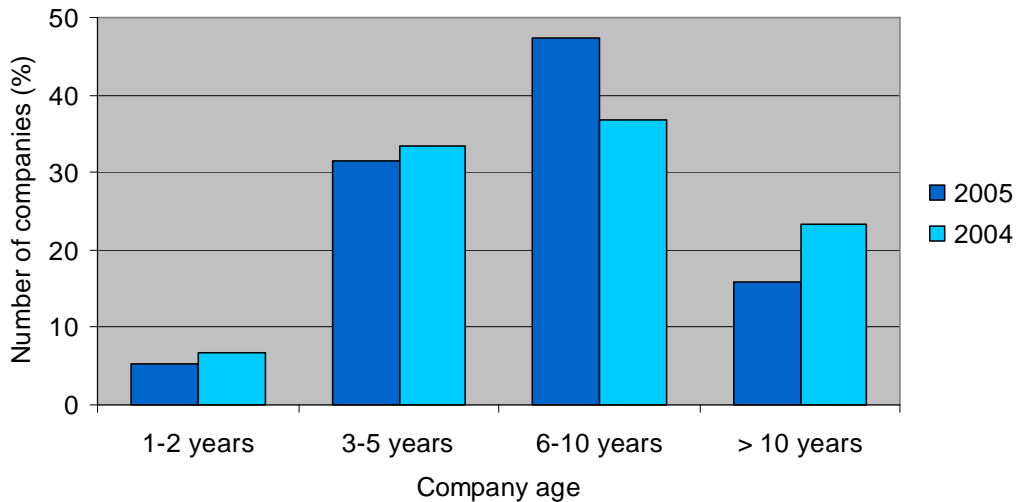
**Figure 29. Describing Factors of the Product Development Process**

Companies were also asked about the usage of open source components in their software product development. The results showed that 12.1% (19.9% in 2004) of the companies used open source components significantly in their software product and its development (given at least a value of 5 on a 7-point Likert scale). As most of these companies were small, only 15.9% (26.7% in 2004) of the companies that reported about the usage of the open source components had software business revenues over 1 million euros, see Figure 30.



**Figure 30. Distribution of the Companies Using Open Source Components Significantly**

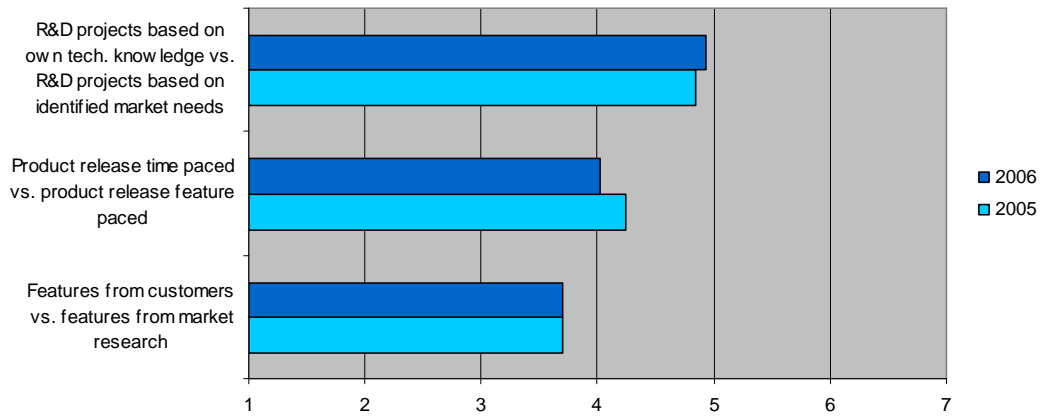
When we take a look at the age of these companies 37% (40% in 2004) of them were less than six years old. Evidently, also the older companies use open source components and six to ten years old companies were the biggest group that uses open source components as can be seen from Figure 31.



**Figure 31. Distribution of the Companies' according to Age Using Open Source Component Significantly**

We also asked the companies to estimate their product development processes by some statements, where the far-ends were not necessarily opposites, but describe i.e. how the information about customer/end-user needs is gathered and how the decisions concerning the development of new products is done, see Figure 32. 67.5% of the companies (64.2% in 2004) indicated that the new product development projects are at least partly based on understanding the market needs, instead of basing the decisions merely on the companies own technological competence (given at least a value of 5 on a 7-point Likert scale). In addition, 39.2% of companies (32.5% in 2004) released versions of their new products based on a fixed time schedule (given no more than a value of 3 on a 7-point Likert scale).

On the other hand, 42.4% of the companies (48.1% in 2004) were including almost all of the product's planned features despite the delays in the product release (given at least a value of 5 on a 7-point Likert scale), which indicates that companies use evenly both temporal and event based product release strategies. Furthermore, the majority of the companies gathered requirement and feature needs from their customers whereas the market research was more rarely used, as only 36.5% of the companies (32.9% in 2004) indicated doing so (given at least a value of 5 on a 7-point Likert scale).



**Figure 32. Characterizing Factors of the Product Development Process**

## 4 INTERNATIONAL OPERATIONS

Software product business is typically dependent on high volumes, reusability, and wide market acceptance. Therefore, international expansion will at some point become a necessary step for growing companies beyond the growth limits imposed by the size of the Finnish market, which counts for ca. 0.5% of the world software market. But internationalization is also highly risky. The pressure on early internationalization, required resource intensity, the dynamism of external environment, fierce competition, and the general immaturity of the industry are only some of the factors that contribute to the high risk level of internationalization. These risks impact not only the growth and profitability prospects of the internationalizing firm, but often also the very viability of the business. These arguments justify the special attention put to international operations in this report.

This section provides an overview of Finnish software product industry firms' international operations. More specifically, the focus of this chapter is on identifying the typical profile of an internationally operating software product firm and its differences from its domestically operating siblings. We also analyze data on the process of internationalization, on primary foreign markets, on modes of international entry, and on the resource propensity of the analyzed firms for international operations.

### 4.1 Scale of International Operations

Overall, 103 (59%) out of the 175 responding firms had some revenue streams from foreign markets in 2005, and thus can be considered as internationally operating. This represents a significant increase from the 46% reported a year ago (49% in 2003). The distribution of internationally operating firms as well as the distribution of their foreign revenue share are presented in Figure 33. We can observe that well over half of the companies with international sales received only one quarter or less of their revenue from outside of Finland. In fact, one third of the responding internationalized firms had less than 5% of their revenue coming from abroad. On the other hand, almost one fifth of the firms generated 75% or more of their revenue abroad. The share of firms receiving 25 to 75% of their revenues from abroad remained the same as last year at 27%. This U-shaped distribution suggests a gap between initial sales abroad and full-scale internationalization.

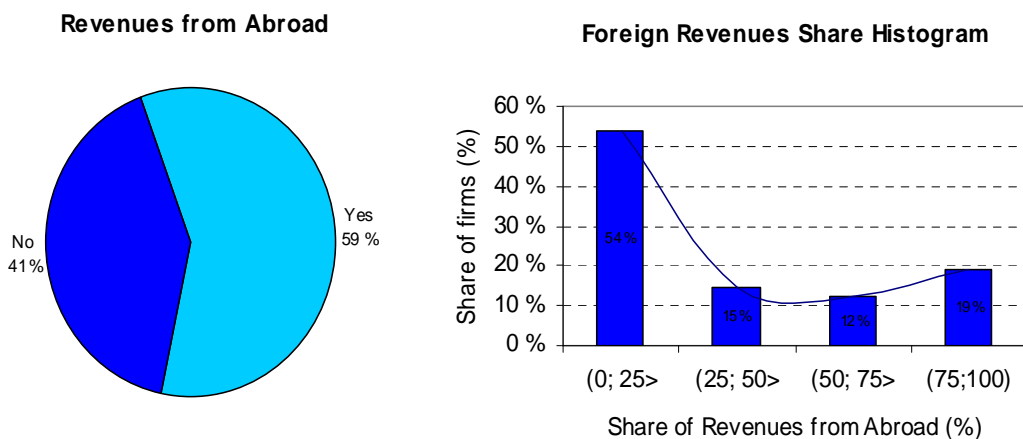


Figure 33. Firms with Revenue from International Operations ( $n_1=175$  and  $n_2=89$ )

## 4.2 Profile of Internationally Operating Firms

The basic indicators of international operations and their averages from 2005 and 2002 for internationalized firms are presented in Table 13. The average number of foreign markets targeted in 2005 was 7.8. This represents a significant growth in geographic coverage, as the corresponding figure was just 3.9 in 2002. Last year, the corresponding figures were 9.4 and 5.3. Also the median number of export countries had grown significantly: from 1.5 export countries in 2002 to 3.0 in 2005. The corresponding figures from the year 2004 were 4.0 and 2.0. This indicates that software product firms are internationalizing roughly at the same pace as before but this year's sample consists of relatively less internationalized companies than the one last year.

Probably the most important internationalization indicator, the share of foreign revenue, shows that 33% of revenue (21% in 2002) was generated abroad in internationalized software product companies. However, almost half of the firms gained only about 18% or less of their revenue from international operations. Hence, the corresponding median is 13 percent units lower, at 20%. Also, the median for export share in 2002 was just 5%. The figures indicate a significant increase in the share of foreign revenue among the sample firms during the last three years both in terms of mean and median figures. Compared to last year's results the average numbers indicate a slight increase in the share of foreign revenue but the overall medians stay roughly at the same level. The mean shares of revenues from abroad discovered last year were 31% in 2004 and 20% in 2001, and the corresponding medians 20% and 3%.

On average, internationalized firms had employees in 1.3 countries excluding Finland and almost 60% of the firms did not have any employees abroad. A little less than one quarter of their total employees (including those based in Finland) focused on export business on a full-time basis. Again, the corresponding median value is only 10% (5% in 2002). The strong increase since 2002 suggests that many companies today assign significantly more employees to foreign operations than they did three years ago. However, these figures are almost an exact match to those in last year's sample. All in all, there has been positive development in the software sector. On average the sample companies are bigger and more internationally oriented than they were three years ago.

**Table 13. Indicators of International Operations**

<i>Indicator</i>	2005			2002		
	<i>Mean</i>	<i>Median</i>	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>N</i>
Number of countries generating revenue, excl. Finland	7,8	3,0	88	3,9	1,5	82
Share of revenues from outside of Finland (%)	33 %	20 %	89	21 %	5 %	82
Number of countries where company had employees, excl. Finland	1,3	0,0	89	0,9	0,0	82
Share of employees focusing full-time on foreign operations (%)	24 %	10 %	88	15 %	5 %	81

A comparison of some key descriptive statistics between internationally and domestically operating companies is presented in Table 14. The average total revenue of internationalized firms was 25.5 million euros in 2005. There was a significant difference in total revenue between internationalized and domestic firms both in terms of mean and median values. The average internationally operating company was almost five times bigger than the average domestic software company. The findings are close to those from last year's results. Last year the average turnover for an internationally operating firm was

24.9 million euros. Domestically operating firms grew on average from 2.0 million euros reported last year to this year's 5.2 million euros. The median, however, dropped from 0.5 million to 0.3 million this year. Also the median of total revenue by international firms fell from 1.8 million euros to 1.6.

All mean values are greatly influenced by some large companies' figures. For instance the average profitability of internationalized companies in 2005 is largely biased downwards by some companies' heavy losses. Hence, the median better describes the actual situation of the firms. Still, also the median values indicate differences in most company characteristics between domestic and international software product firms. Internationally operating firms are bigger both in terms of revenue and number of employees as well as profits than their domestically operating siblings. They also expect a stronger growth during the next three years. On the other hand, they may be less profitable as domestically operating firms, which yet again tells about the risky nature of internationalization.

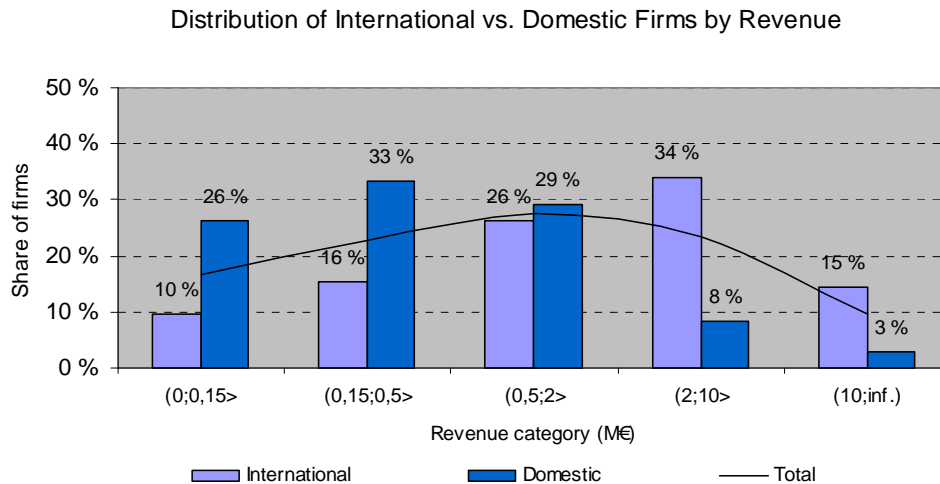
**Table 14. Profile of International vs. Domestic Firms in 2005**

<i>Indicator</i>	<i>International</i>			<i>Domestic</i>		
	<i>Mean</i>	<i>Median</i>	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>N</i>
Revenues in 2004 (M€)	24,9	1,8	109	2,0	0,5	101
Predicted growth rate 2004-2005	39 %	20 %	69	32 %	20 %	87
Proportion of revenues in 2004 from own SW products (%)	74 %	100 %	91	75 %	80 %	93
Age of company	12,5	11	83	10,9	11	95
Age of own software product business	10,3	8	84	9,7	8	94
Number of employees in 2004	207,4	20	113	18,1	6	104
Profit in 2004 (M€)	2,0	0,07	92	0,2	0,03	86
Return on sales	-2 %	6 %	92	10 %	6 %	85
R&D per sales in 2004 (%)	27 %	20 %	61	30 %	15 %	78

In order to analyze the differences in the distribution of revenue between international and domestic firms, we have used a modified histogram<sup>2</sup>, which is presented in Figure 34. It shows that domestic firms tend to have lower sales volumes than international firms. In the categories of middle income firms the shares are quite similar, but in the category of smallest revenue the share of domestic firms is over twice as big as that of internationalized firms. On the other hand, only 8% of domestic firms have revenues from 2 to 10 million euros whereas the share of internationalized firms is 34%. All in all, there seems to be a strong relation between internationalization and larger revenues.

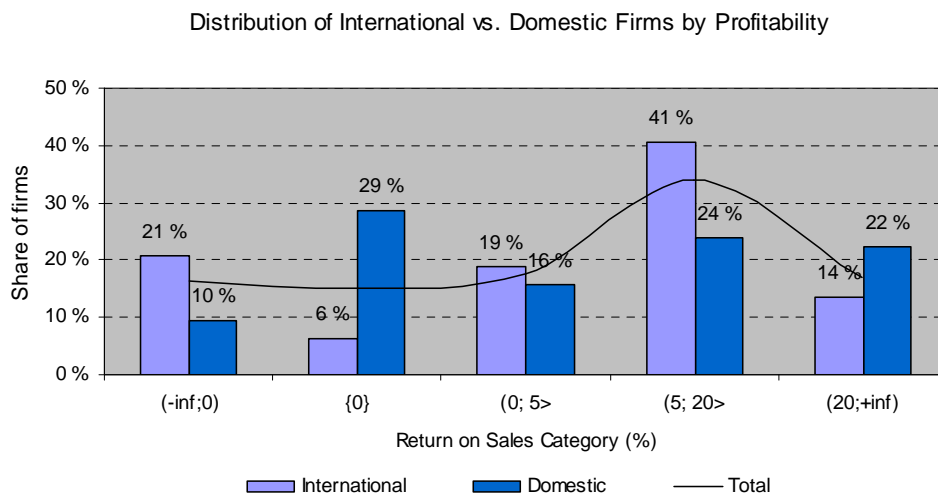
The average profits of both domestic and international firms are close to zero. Both figures are shifted downward by a few firms with great financial losses in 2005. Median of internationalized firms was about 50 000 euros and of domestic firms just 9 000 euros. The distribution of domestic firms by profitability is much more centralized and is highly concentrated around zero. Approximately 83% of domestic firms have profit between 0 and 100 000 and just 15% report profit in excess of 300 000.

<sup>2</sup> Modified histogram: The bar chart showing frequency of occurrence within a series of variable (non-constant) ranges. While this chart can emphasize differences between variables, it should not be used to conclude on shape of distribution due to the irregular categories and consequent deformation of distribution shape.



**Figure 34. Distribution of International vs. Domestic Firms by Revenue (n=175)**

On the other hand, the profit distribution of internationally operating firms is wider, with 15% of these reporting losses, and over 30% reporting profits in excess of 300 000 euros. This clearly indicates that international operations are significantly riskier in general than domestic ones. These risks are associated with greater growth opportunities, if the firm is successful. Another, perhaps more objective and comparable measure is profitability. The following analysis focuses on return on sales (profit divided by annual sales). The distribution of international and domestic firms is presented in Figure 35.



**Figure 35. Distribution of International vs. Domestic Firms by Profitability (n=159)**

Highly surprising is the finding that age, both in terms of mean and median, is almost identical for both international and domestic firms. This would suggest that decision to internationalize is in software business highly independent of maturity of the firm in terms of age. Even closer examination of age distribution, as presented in Figure 36., does not uncover any significant differences between the age structure of international and domestic firms.

Distribution of International vs. Domestic Firms by Age

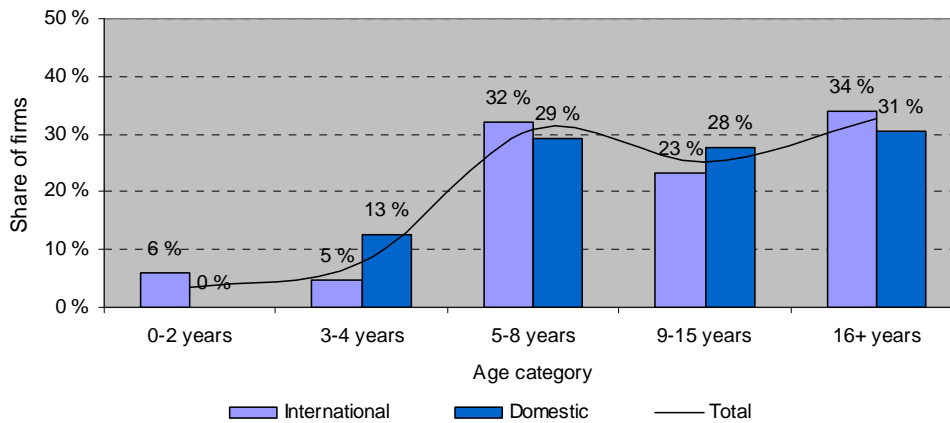


Figure 36. Distribution of International vs. Domestic Firms by Age (n=175)

### 4.3 Improvement emphasis

The next issues of our interest are the differences in emphasis on key improvement areas. The importance of nine areas as perceived for horizon of three years by international vs. domestic firms is presented in Figure 37. The average internationalized firm in our sample finds as key areas for improvement international sales and marketing, R&D of new products, productization and knowledge and skills of personnel.

The findings are well in line with those of last year. Last year also the most important improvement area by internationalized firms was considered to be international sales and marketing, followed then by knowledge and skills of personnel and networking and cooperation. There were no drastic changes as the five most important areas are the same apart from their order having been changed slightly.

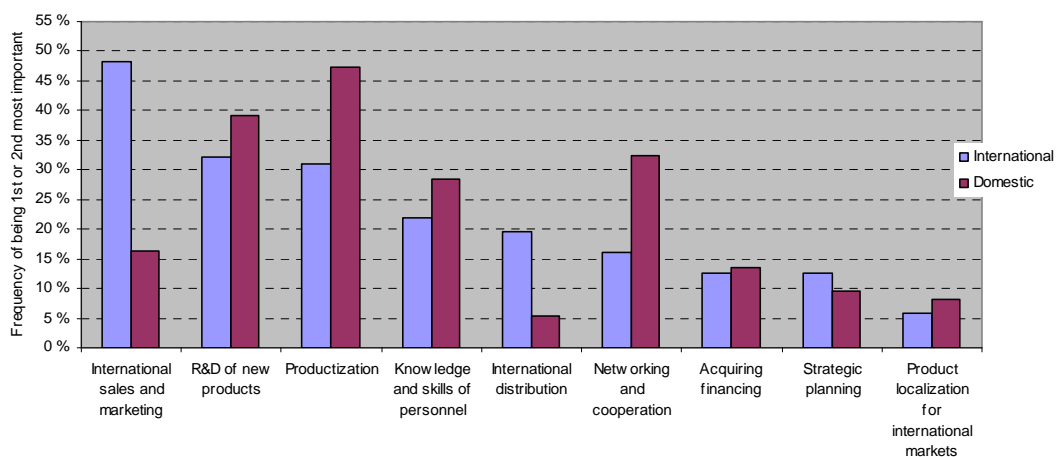


Figure 37. Improvement Emphases by International vs. Domestic Firms for 2006-2008 (n=161)

The most significant difference in importance perception between internationally and domestically operating firms is in international sales and marketing, and also in international distribution, which are found much more important by international companies. The results indicate that for many currently domestically operating firms, internationalization is not currently issue of high priority. However, distribution of the answers is highly heterogeneous. While productization, R&D of new products and networking and co-operation are the top three improvement areas for domestically operating firms, still about every sixth domestic firm found international sales and marketing as one of the two most important improvement areas. These findings are in line with last year's results.

Product localization for international markets was felt to be more important by domestic firms than international ones. This can be explained by the fact that most of the internationally present firms have already gone through product localization phase and established corresponding processes, while for some domestic firms thinking of internationalization this is the current issue to deal with. This assumption gains further support by the fact that both R&D of new products and productization were on average considered more important by domestic firms than by international firms.

#### 4.4 Primary Foreign Markets

The next issue being of major concern when analyzing international operations is to find out what geographic markets are perceived as the most important ones, how foreign sales are distributed between them, and, in addition, if and what functions are located in these major export markets.

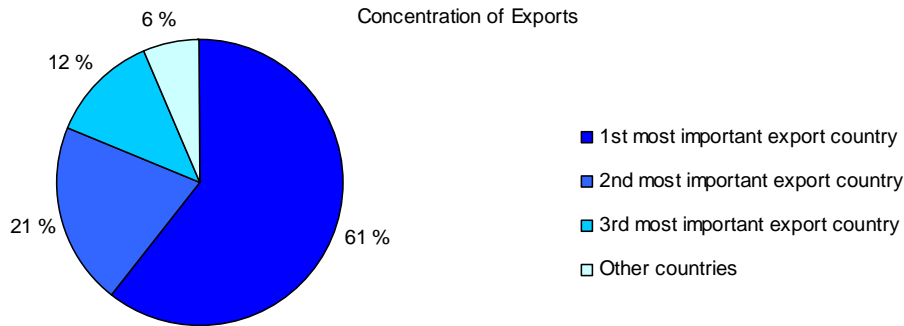
The Swedish market was reported to be on top in terms of importance as presented in Table 15. Three Most Important Markets. Sweden, USA and Germany have been reported as one of the three most important markets most often. As other most important markets were mentioned the UK, Estonia, Norway, France, Spain and Denmark. The structure of geographic markets in 2005 has remained quite similar to the year before. However some changes, such as the growing importance of Spain and the diminishing importance of Russia, took place.

**Table 15. Three Most Important Markets**

Rank	1st export country (n=86)		2nd export country (n=68)		3rd export country (n=45)		1st-3rd export country* (n=199)	
1	Sweden	23 %	Sweden	16 %	Sweden	16 %	Sweden	19 %
2	USA	20 %	Germany	13 %	USA	11 %	USA	13 %
3	Estonia	13 %	Norway	9 %	France	9 %	Germany	10 %
4	UK	9 %	UK	9 %	Germany	7 %	UK	8 %
5	Germany	8 %	Spain	6 %	Spain	4 %	Estonia	8 %
6	Holland	6 %	USA	6 %	Austria	4 %	Norway	5 %
7	Japan	3 %	France	4 %	Norway	4 %	France	4 %
8	Switzerland	3 %	Denmark	4 %	Denmark	4 %	Spain	4 %
...	...	...	...	...	...	...	...	...
		100 %		100 %		100 %		100 %

\* Probability of being one of the three most important export markets

The concentration in a single foreign market has significantly increased since last year. In the sample of 84 firms, on average 61% of the export volumes came from single foreign market compared to last year's 41%. The three most important countries now stood for over 90% of all exports. The concentration of exports for 2005 is shown in Figure 38.

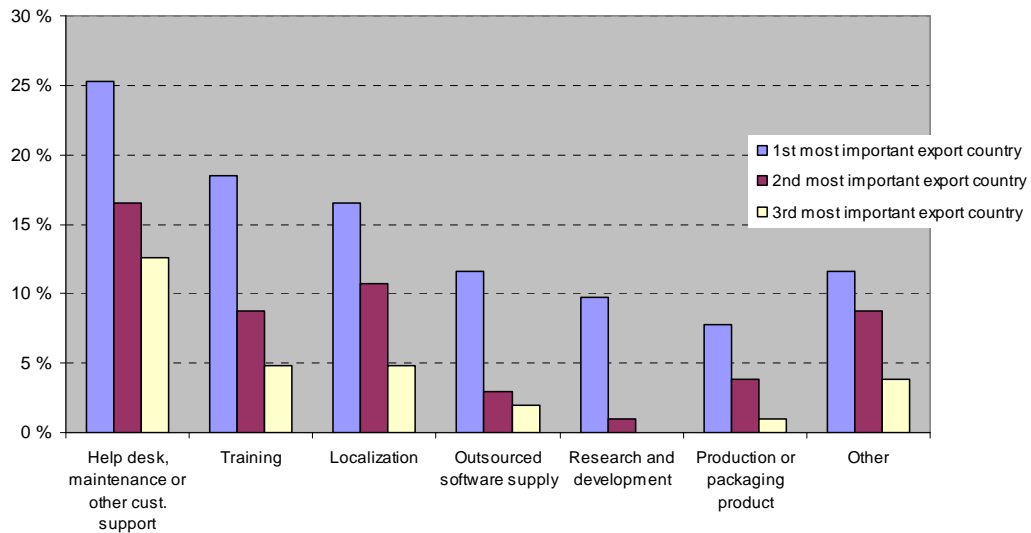


**Figure 38. Concentration of Exports (n=84)**

Figure 39. shows functional presence of firms in the three most important markets. Although most of the activities are generally organized and taking place domestically due to the generally small size of analyzed firms, many companies report on wide portfolio of functional presence also in their primary foreign markets.

Help desk, maintenance and other customer support services took place directly in occupied markets in 25% of the first most important export countries in sample firms. It was also the most common activity abroad in second most important export countries. 18% of the firms reported training activities at their primary target markets, and 17% localization activities. All these findings are in line with the fact that it is quite common in software industry that additional services including customer training, maintenance and multiple forms of customer support can unlock substantial value and bring corresponding revenue to supplier, and thus they are most often engaged in such activities.

In functions such as help desk, training and especially R&D it is noticeable that their share is much higher in the most important market while decreasing with every additional market, in the case of R&D close to zero, as it was last year also. This can be assigned to centralization of these on local basis and provided coverage to more than one country.

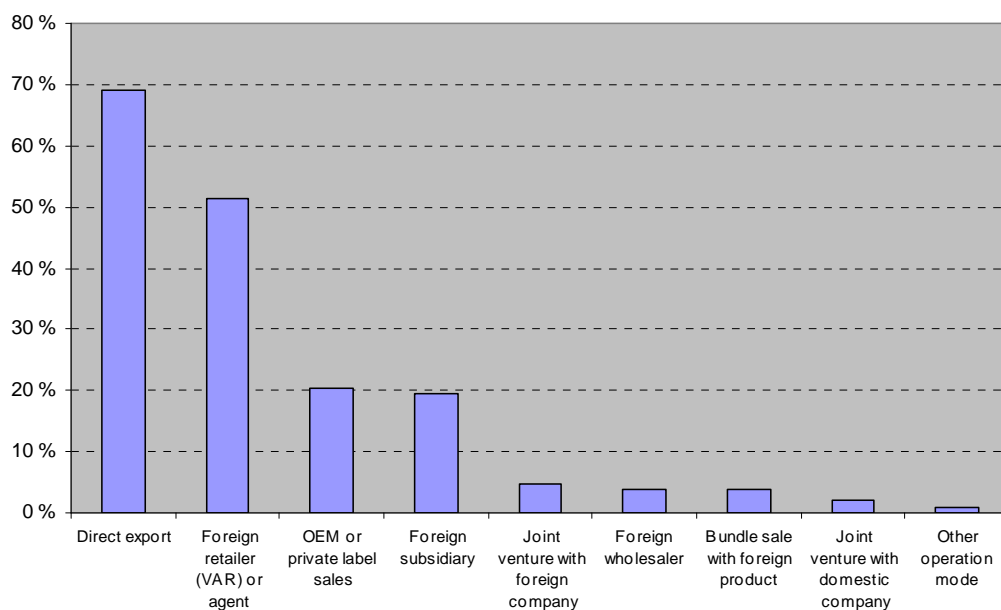


**Figure 39. Functional Presence of Firms in Export Markets among Responding Internationalized Firms (n=103)**

## 4.5 International Operation Modes

In order to understand the means different groups of firms were using to direct their products and services to foreign markets, we have analyzed their international operation modes in terms of popularity and consequently built profiles of typical users for most common operation modes.

By far the most popular operation modes used for foreign sales, same as the year before, were direct export followed by foreign value-adding retailer or agent. Direct sales were reported by 69% (50% last year) of internationalized firms, while about 51% (35% last year) of them made use of retailer or agent. About every fifth firm had their own foreign subsidiary or was selling to OEM or under private label. Joint ventures, foreign wholesalers and bundle sales with foreign products were in Finnish software product industry used only rarely. All in all, the relative distribution and order among different means of operation modes remained virtually the same as last year while the scope of foreign operations increased slightly. The level of use of individual international operation modes is shown in Figure 40.



**Figure 40. Frequency of Use of Alternative Operation Modes among Responding Internationalized Firms (n=103)**

Direct sales was the most popular sales mode targeting on average 8.3 countries, as shown in Table 16. Typical firm using this operation mode was rather small in terms of revenue, had rather high expected growth, on average small losses, and only limited international operations both in terms of number of markets and share of revenue from them. In general, direct export seems to be a common mean for smaller firms with not fully developed internationalization.

**Table 16. Firms' Characteristics by Operation Mode**

International operation mode		Operation mode characteristics		General firm characteristics				Intl. operations firm characteristics	
		Share of firms used by	No. of countries operation mode used in	Revenues (2005) [M€]	Predicted sales growth (2005-2006)	Profit (2005) [M€]	Age [years]	No. of revenue gener. foreign countries (2005)	Foreign revenue share (2005)
Own direct export	Mean	69 %	8,3	4,9	55 %	-0,01	11,1	8,6	36 %
	Median		3,0	1,2	38 %	0,06	9,0	3,0	25 %
	(n)	(71)	(71)	(71)	(68)	(69)	(71)	(70)	(71)
Foreign retailer (VAR) or agent	Mean	51 %	6,6	4,7	77 %	-0,20	11,0	10,5	40 %
	Median		3,0	1,4	38 %	0,06	9,0	4,0	40 %
	(n)	(53)	(53)	(53)	(48)	(50)	(53)	(53)	(53)
OEM or private label sales	Mean	20 %	12,2	9,0	63 %	0,04	11,8	11,4	44 %
	Median		3,0	3,3	42 %	0,06	9,0	3,5	30 %
	(n)	(21)	(21)	(21)	(19)	(21)	(21)	(20)	(21)
Own foreign subsidiary	Mean	19 %	5,0	10,4	60 %	-0,21	12,1	14,3	47 %
	Median		2,0	4,1	41 %	0,11	9,5	9,0	48 %
	(n)	(20)	(20)	(20)	(18)	(20)	(20)	(20)	(20)

Foreign retailer or agent was also deployed on average in 6.6 revenue generating foreign markets. Typical firm had usually rather small revenue, high expected growth, and some

losses. The third commonly used operation mode, OEM or private label sales, was usually used to cover large number of markets. Firms using this mode had quite a high revenue, optimistic growth outlook, and rather high share of foreign revenue.

A foreign subsidiary, an operation mode typically used by larger companies, was usually established in 5 countries. Such firms had more stable growth expectations, on average negative profit and a share of international revenue.

## **4.6 Resource Fit for Internationalization**

The objective of this short subchapter is to analyze resources of sample firms from the perspective of their fit to international operations and to make some findings on general predisposition of Finnish software product industry firms to operate on foreign markets. The firms were asked to grade the fit of selected resources on 7-point Likert scale. The value seven represented a complete fit for international business, while the value of one for domestic one.

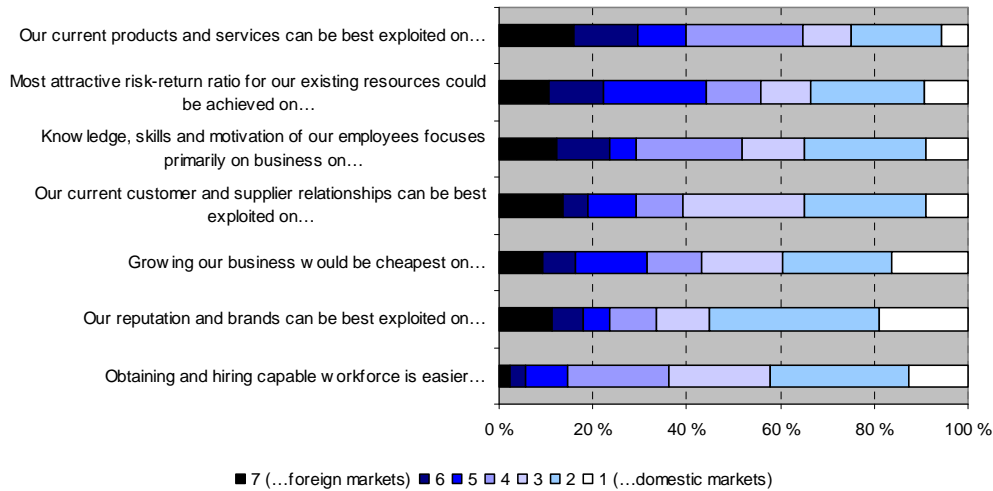
### **4.6.1 Internationalized firms**

The chart showing distribution of grading by already internationalized firms is in Figure 41. Highest rating by far, on average 4.2 points, was given to the fit of current products and services for foreign markets, as was the case last year also, even if the grade was now slightly higher than last year's 4.0 points. The question whether most attractive risk-return ratio for existing resources could be achieved domestically or abroad received a rating of 3.9. The third most fit resource for international operations was the knowledge, skills and motivation of employees receiving a grade of 3.7 points. Last year they were both graded 3.8 points. Current customer and supplier relationships were as well slightly in favor of international operations receiving 3.6 points.

Growing of a business was considered to be slightly cheaper domestically as suggested by the 3.4 points it received. Reputation and brands were also graded in favor of domestic operations receiving 3.1 points. Last year also they were considered better suitable for domestic operations.

On average all grades apart from the question concerning growing of business rose by 0.1 -0.2 points from last year. The question concerning the risk-return ratio, on the other hand, rose by 0.4 from last year. These findings represent a slight increase in fitness for international operations. Also, the distribution of grades remained virtually untouched. The distribution of grading in 2005 and 2004 by means is presented in Table 17.

**Resource Fit for International vs. Domestic Operations  
Internationalized Firms**

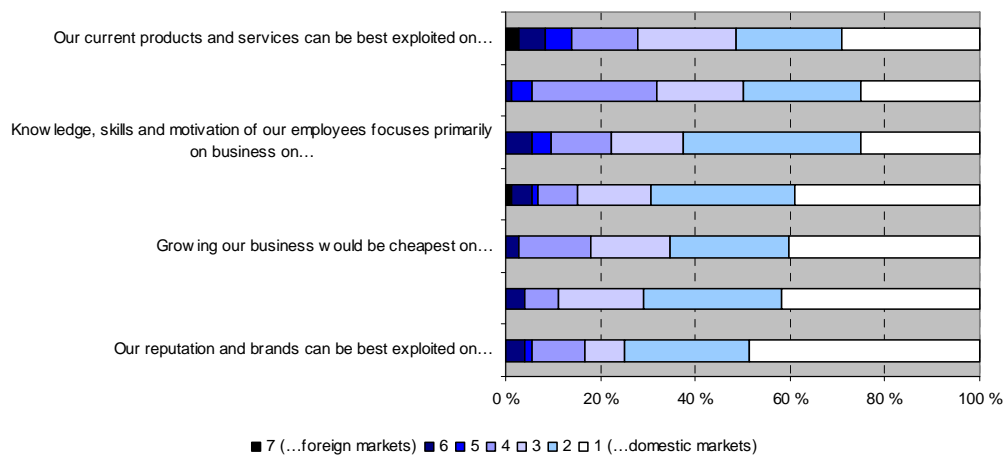


**Figure 41. Fit for International Operations by already Internationalized Firms (n=88)**

#### 4.6.2 Domestic firms

The distribution of grading by domestic firms differs a great deal from that by internationalized firms, as shown in Figure 42. The highest rating, 2.7 points, was given to the fit of current products and services for foreign markets, as was the case among internationalized firms as well. The question whether it is easier to find capable workforce in domestic markets or foreign markets was graded second highest receiving 2.6 points. The question whether the knowledge, skills and motivation of employees focuses primarily on business on foreign or domestic markets was graded third highest, receiving 2.5 points.

**Resource Fit for International vs. Domestic Operations  
Domestic Firms**



**Figure 42. Fit for International Operations by Domestic Firms (n=72)**

As suggested by the distribution of grading, the first three resources represent the best potential for internationalization, as the other resources were all graded 2.2 points or less. Both domestic and international companies find growing of a business cheapest domestically. All in all, the estimated order of resources by fitness for internationalization is roughly the same for both internationalized and domestic firms, the difference being that the average ratings by domestic firms are more strongly in favor of domestic operations.

**Table 17. Distribution of Grading in 2005 and 2004 by Means (n<sub>1</sub>=72; n<sub>2</sub>=80)**

<i>Resource</i>	<i>2005</i>		<i>2004</i>	
	<i>Internationalized</i>	<i>Domestic</i>	<i>Internationalized</i>	<i>Domestic</i>
Our current products and services can be best exploited on...	4,2	2,7	4,0	2,5
Most attractive risk-return ratio for our existing resources could be achieved on...	3,9	2,2	3,5	2,0
Knowledge, skills and motivation of our employees focuses primarily on business	3,7	2,5	3,6	2,1
Our current customer and supplier relationships can be best exploited on...	3,6	2,1	3,5	2,1
Growing our business would be cheapest on...	3,4	2,2	3,5	2,1
Our reputation and brands can be best exploited on...	3,1	2,0	3,0	1,8
Obtaining and hiring capable workforce is easier...	3,0	2,6	n/a	n/a

## 5 FINANCING AND OWNERSHIP

The financing needs of the Finnish software product companies are different compared to Finnish companies in general. The whole industry is young, dynamic and global by nature which makes it imperative for companies to internationalize rapidly, influencing the financing needs. These factors contribute to making the software product industry quite specific in terms of the investment opportunities the industry can provide and the resulting financial structures in the industry.

This section examines the typical financing sources for software product firms and what is the resulting ownership structure in the industry. We also examine the plans for the future of the firms to acquire external financing.

### 5.1 Ownership

The largely equity based financing reflected in the financial structure of Finnish software companies differs significantly compared to more established industries. In addition, the presence of different types of shareholders aside from founders can significantly influence strategic choices a firm has. Therefore, this subchapter will examine the typical ownership structure of the firms.

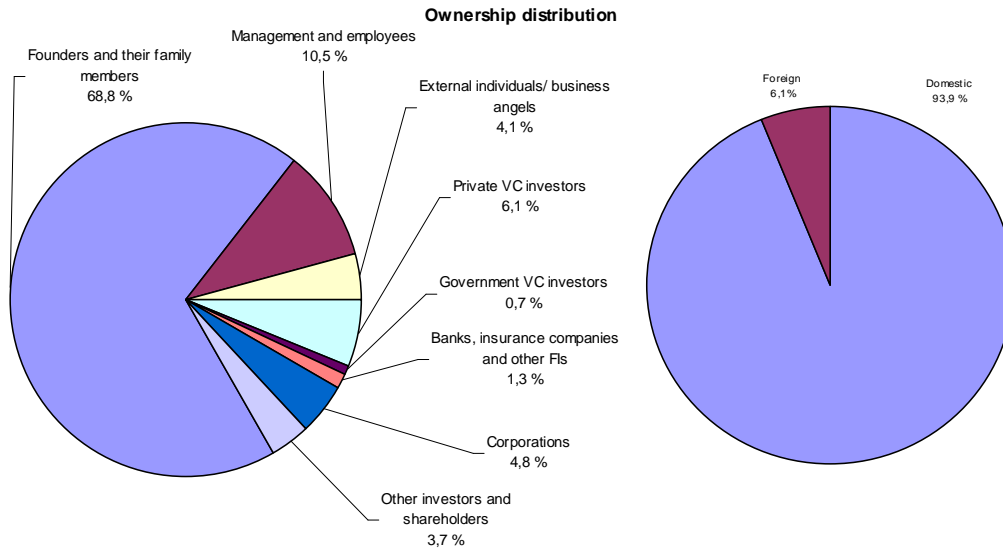
The average structure of ownership, classified according to the type of ownership, is presented in Table 18. The sample used for ownership structure analysis consists of 161 responding companies. The majority of the ownership was held by the founders and their family members, representing on average 69% of the ownership. This represents a 4 percent unit decrease compared to last year. The second biggest share, about 11%, was owned by management and employees followed by private Venture Capital (VC) investors with 6 percent.

From the perspective of the dynamics of the ownership, there was an increase in the share owned by private VCs and business angels. On average in our sample, almost 7% was held by venture capital investors. Out of this, about 6.1% belonged to private venture capitalists and just 0.7% to government VC investors. A private venture capitalist was present in 28 of the 183 firms (15% share) and a government VC was present in just 8 firms (4%). The share of business angels was up from last year's 2.6% to a share of 4.1%. The most significant decrease was in the ownership share of corporations that fell from last year's 6.9% to 4.8%. The remaining share was owned by financial institutions and other investors. There were no significant changes in the distribution among different shareholders.

**Table 18. Average Ownership Structure as of 31.12.2005 (n=161)**

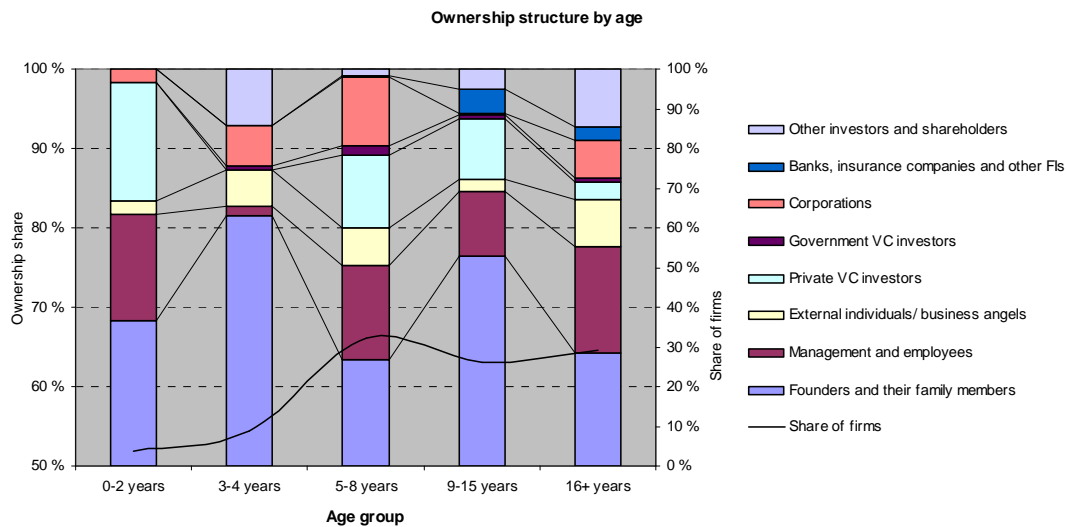
<b>Ownership type</b>	<i>Total</i>
Founders and their family members	68,8 %
Management and employees	10,5 %
External individuals/ business angels	4,1 %
Private VC investors	6,1 %
Government VC investors	0,7 %
Banks, insurance companies and other FIs	1,3 %
Corporations	4,8 %
Other investors and shareholders	3,7 %
<b>Total</b>	<b>100,0 %</b>

In the sample, companies' ownership was principally in domestic hands (Figure 43.). On average, 93.9% of company ownership was domestic. Of the 158 of sample companies, in 128 there was no foreign ownership at all. When foreign ownership was present, the average share was 32% and the median share 16%, which is virtually unchanged from last year.



**Figure 43. Sample companies' ownership distribution (n1=161; n2=158)**

Another useful perspective to study the ownership structure is to group the ownership structures along their age. For this purpose, overall usable sample of 161 firms was divided into five groups according to their age. The sample is somewhat biased towards the older end of firms. The two youngest groups contain only 3.7 and 8.7% of the available sample, respectively, whereas the three last groups all contain more than 25% of the sample. Figure 44. presents the resulting average ownership structure as distributed along the firms' age.



**Figure 44. Ownership Structure by Firms' Age as of 31.12.2005 (n=161)**

The ownership share held by founders and their family members in Finnish software product firms was strong and relatively stable over the whole life cycle ranging from 63 to 82%. This is somewhat surprising considering the large share of older firms in the sample. The ownership share of management and employees was also relatively stable over the age groups ranging from about 8 to 13% apart from the second youngest group where the share of management was a mere 1.3%. The distribution among management and employees by age groups was very similar last year. The shares held by others were more volatile between age groups.

Corporate ownership share was quite unstable in relation with the age of the analyzed firms. Starting from just 0.2% for the group of the second oldest firms, it went up to 8.7% in 5 to 8 years old firms. The share of corporate ownership decreased significantly from last year in all other age groups apart from companies in the age between 5 to 8 years. The drop was most significant in the two youngest age groups dropping by 7.4 and 9.2% units respectively.

The trend of decreasing share of VC ownership when firms mature noted in previous years' surveys, following the logic of risk capital, is less apparent in this year's survey. Instead, the share of private VCs was quite stable. The share held by VC investors was highest for companies in the age groups 0 to 2 years, 5 to 8 years, and 9 to 15 years, scoring on average 15, 9 and 8% respectively. In the remaining two groups the share was zero and 2.2%. Government VC investors had strongest ownership stake in 5 to 8 years of age firms, as it was last year also. The share was 1.2%. In other age groups the share was almost nonexistent varying between zero and 0.5%. The ownership of banks and other financial institutions was present only in the three most mature age groups, and the least risk bearing companies counting for 0.2 to 3.0% of ownership. The detailed firm ownership structure by age is also represented in Table 19.

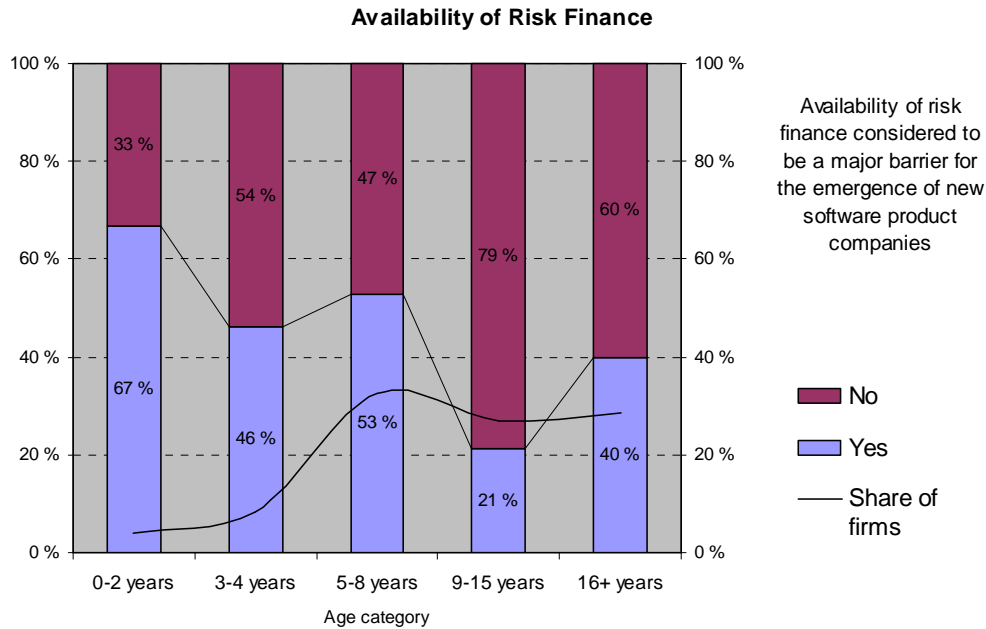
**Table 19. Ownership Structure by Firms' Age as of 31.12.2005 (n=161)**

	<i>0-2 years</i>	<i>3-4 years</i>	<i>5-8 years</i>	<i>9-15 years</i>	<i>16+ years</i>
Founders and their family members	68,3 %	81,5 %	63,3 %	76,5 %	64,2 %
Management and employees	13,3 %	1,3 %	12,0 %	8,1 %	13,4 %
External individuals/ business angels	1,7 %	4,4 %	4,8 %	1,6 %	5,9 %
Private VC investors	15,0 %	0,0 %	9,1 %	7,6 %	2,2 %
Government VC investors	0,0 %	0,5 %	1,2 %	0,5 %	0,4 %
Banks, insurance companies and other FIs	0,0 %	0,0 %	0,2 %	3,0 %	1,7 %
Corporations	1,7 %	5,1 %	8,7 %	0,2 %	4,8 %
Other investors and shareholders	0,0 %	7,1 %	0,8 %	2,6 %	7,3 %
Share of firms	3,7 %	8,7 %	32,3 %	26,1 %	29,2 %

## 5.2 Access to Finance

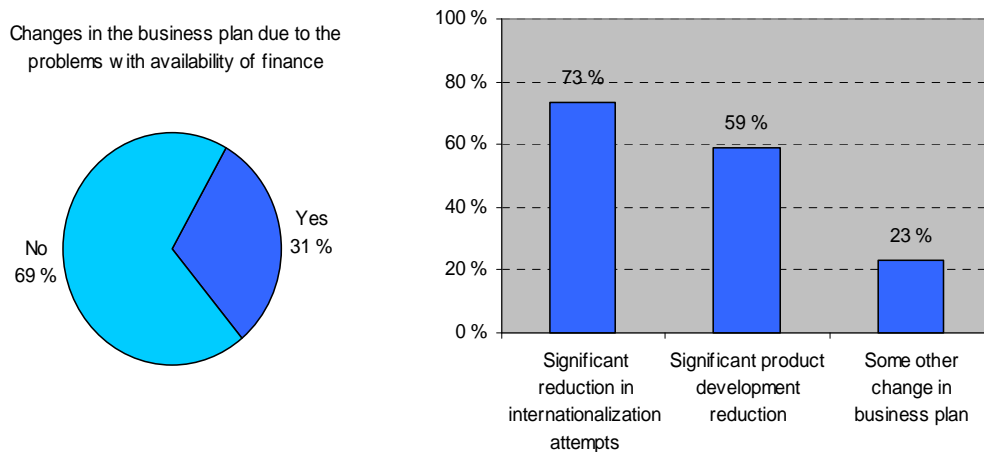
Access to external financing is especially critical for dynamic young innovation-based industries. Most of the firms in the software product industry are young with extensive investments made into research and development while having yet limited or not any sources of internal financing. At the same time, high pressure on rapid expansion and internationalization even intensifies the urgency of need for external financial backing. Therefore, in this subchapter we will present how accessible firms find external financing, and what are the possible impacts of finance availability problems.

On average, 40% of the 157 firms considered the availability of risk finance to be a major barrier for the emergence of new software companies. This was up from last year's 35% by 5% units. However, as shown in Figure 45., there were clear differences in this perception based on the firms' age. Older firms were on average less likely to perceive the availability of risk finance a major barrier for the emergence of new software companies except for the group of oldest firms of which 40% considered lack of risk finance a barrier.



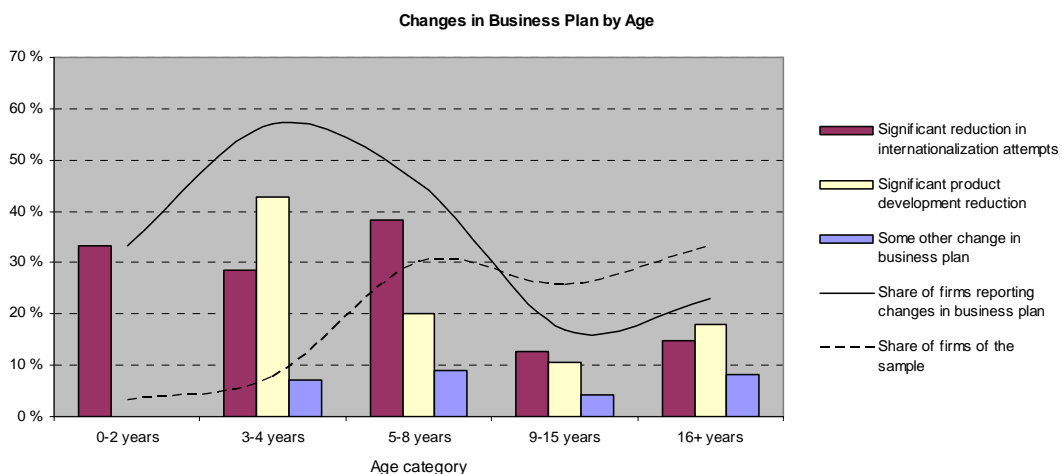
**Figure 45. Opinion on the Availability of Risk Capital by Age (n=157)**

On average 31% of a sample of 183 respondent companies (24% in 2002, 25% in 2003, 31% in 2004) reported having been forced to significantly change their business plans due to problems in the availability of finance as depicted in Figure 46. For the majority of companies, access to risk capital is not a problem because of low growth orientation and thereby little need for external finance. However, for highly growth-oriented minority of companies that create the majority of growth and employment, access to risk capital is a crucial enabler of productization and internationalization. Of those companies that had to change their business plans because of problems in the access to finance, 73% had to significantly reduce internationalization attempts and 59% to reduce product development or productization. 23% reported some other significant change in business plan.



**Figure 46. Availability of Finance and Impacts on Business Plan ( $n_1=183$ ;  $n_2=56$ )**

Although evidence from other sources would suggest the problems with access to finance being highest for young companies, the relation is not linear, as illustrated in Figure 47. The share of firms between 5 and 8 years of age reporting changes in business plan due to lack of finance was only 12% units lower than that of the second youngest group of firms. However, when interpreting the results it has to be noted that the share of young firms is small in the sample and this may bias the results and surely decreases their significance. However, this may suggest another potential and worrying explanation: capable entrepreneurs never started the venture they would have started if the financing were not a barrier. In other words, rather than finding companies of less than two years old complaining the financing problems changing their plans, we may just not observe the companies if they do not exist, i.e., the potential entrepreneurs changed their plans before starting the venture in the first place.



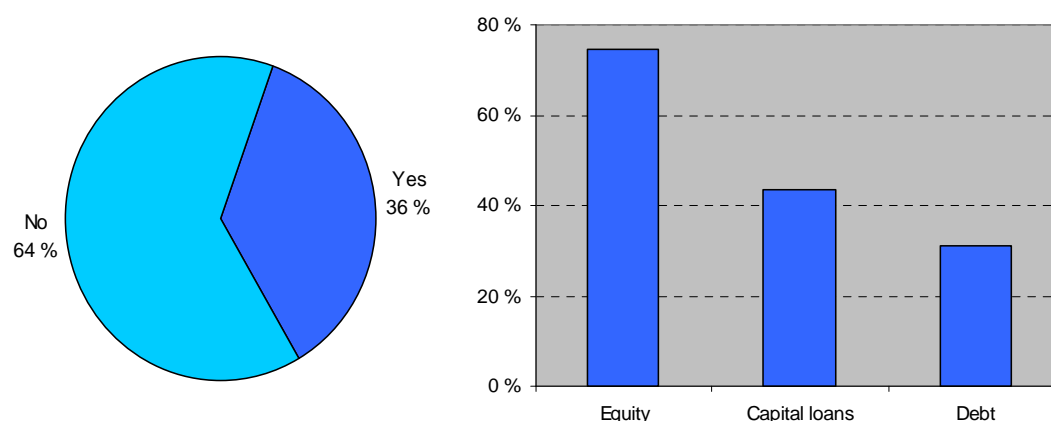
**Figure 47. Changes in Business Plan by Age ( $n=183$ )**

### 5.3 Financing Plans

The focus of this subchapter is on firms' intentions to seek external financing, structure of financing intended to be sought, how are the financing plans influenced by firms' age,

revenue, profitability and growth expectations, and what are the reasons behind recent changes in plans for external financing.

36% of the 161 responding firms planned to seek external finance within the next two years (2006-2007) as shown in Figure 48. This is exactly the same share as last year. The distribution among the preferred sources of finance changed slightly from last year. About 75% of firms declaring to seek for financing in the next two years intended to raise additional equity based financing, which is less than last year's almost 90%. Over 43% of these companies aimed to raise capital loans (40% last year) and 31% were planning to raise debt finance (43% last year). The fragmentation of financing plans was also at the same level as last year. The external financing plans are being exhibited in more detail in Table 20.



**Figure 48. External Financing Plans ( $n_1=161$ ;  $n_2=55$ )**

Average value of equity financing aimed to be raised in years 2006 and 2007 for the companies intending to do so was 1.81 million euros (median was 1.0 million euros). This represents an increase of about 780 000 euros from last year. In the case of capital loans the average value was 990 000 euros (450 000 euros last year) and for debt financing about 870 000 euros (700 000 euros last year). The corresponding median values for both capital loans and debt were 500 000 euros. Altogether external finance was sought approximately 300 million euros as equity, 80 million euros as capital loans and 60 million euros as debt.

**Table 20. Detailed External Finance Seeking Structure ( $n=54$ )**

Source of Finance	Percentage
Equity only	35 %
Capital loans only	13 %
Debt only	9 %
Equity and capital loans	20 %
Equity and debt	11 %
Capital loans and debt	2 %
All finance sources	9 %
<b>Total</b>	<b>100 %</b>

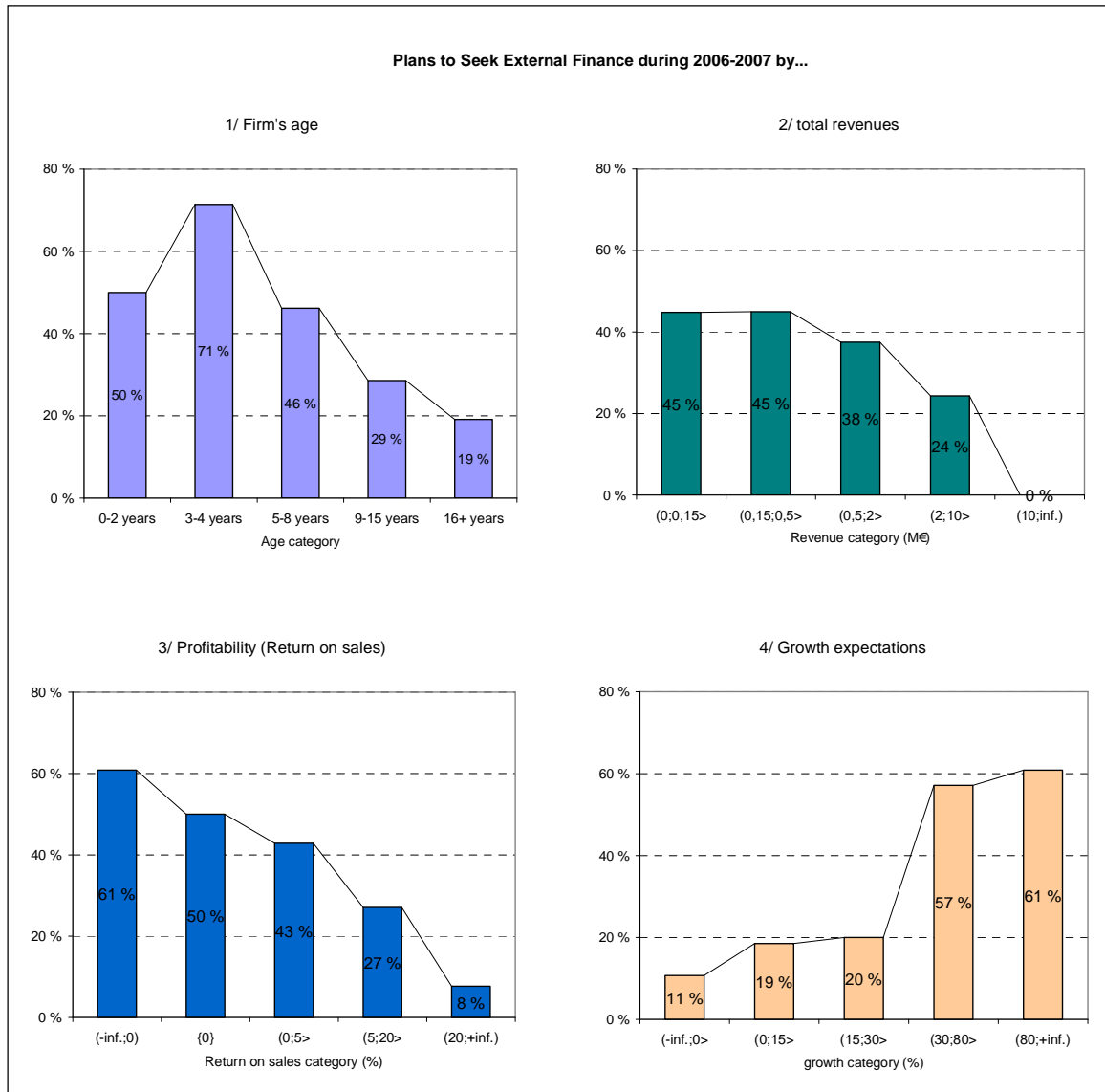
In order to understand the typical profile and grouping of firms planning to seek external finance, we have structured firms' by age, revenue, profitability and growth expectations and compared proportions of them intending to seek external finance during 2006 and 2007 as presented in Figure 49.

The highest proportion of firms intending to raise external finance in the horizon of two years, 71%, was in the group of firms between 3 and 4 years. Last year the highest proportion of firms by age was in the group of youngest firms. However, it has to be noted again that there were very few firms that were younger than 2 years in the sample which may partly explain the result. Plans to raise new external finance decreased rapidly and steadily when firms grew older being just 19% for the oldest category of firms.

When categorizing the companies by revenue, the most frequent plans for external financing were in firms having zero to 500 000 euros of revenue having a 45% share of those firms intending to raise external finance. This indicates an increase in willingness to raise external finance already in the earliest stage of development. This may indicate an increase in firms' confidence to try to raise external finance without any reference sales. The same trend was found in last years' survey. A very significant change was found in the category of firms having over 10 million euros in revenue where the proportion of firms intending to apply for external finance in the horizon of two years fell back to zero from last year's 13%. Nevertheless, in this case it has to be noted that there were only seven responding firms in this category.

Profitability, measured by return on sales, had a clear and almost linear negative relation with plans to seek for external finance. Approximately half of the firms from negative to 5 percent profitability, or ROS (Return of Sales), intended to raise external finance, while this was the case for only 27% of those having ROS between 5% and 20%. The share of firms willing to raise external finance with ROS over 20% was only 8% whereas last year 12%. The findings support the negative effect of internally generated financing displacing the demand for external finance.

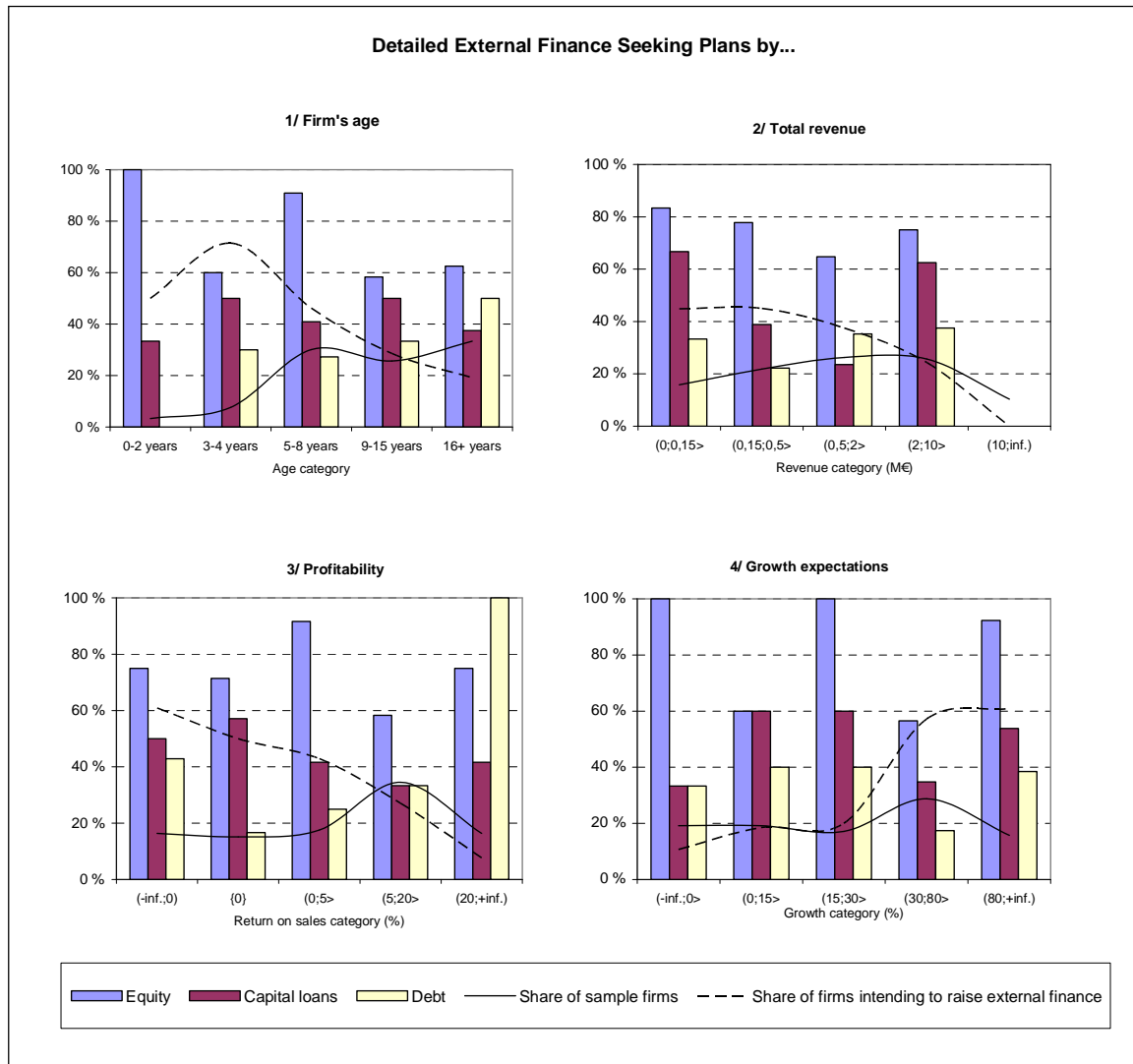
As expected, the plans to seek for external finance were strongly correlated with growth expectations for 2-year horizon measured by compound annual growth rate. External finance acquisition was planned only by 11% of firms having expected CAGR (Compound Annual Growth Rate) from negative to zero and by 19% of firms having growth expectations between zero and 15%, while for firms with expected growth of 80% and more per annum it was 61%.



**Figure 49. Plans to Seek External Finance by Age, Revenue, Profitability and Expected Growth ( $n_1=161$ ;  $n_2=161$ ;  $n_3=149$ ;  $n_4=145$ )**

When looking at the structure of external finance planned to be sought, we can recognize also some interrelations especially with the revenue, age, and growth expectations of firms. Generally, small firms had higher proportion of planned capital loan financing plans. With increasing maturity, debt financing plans become most popular.

Equity was, like last year also, by far the most popular type of external finance independent of company age, revenue, profitability or growth. Unlike earlier, however, equity financing plans seemed to be rather stable over all company characteristics as in this year's sample there was no clear correlation between seeking of equity and company age, revenue, profitability or growth expectations. The detailed financing plans of firms by age, total revenue, profitability and sales growth expectations is presented in Figure 50.

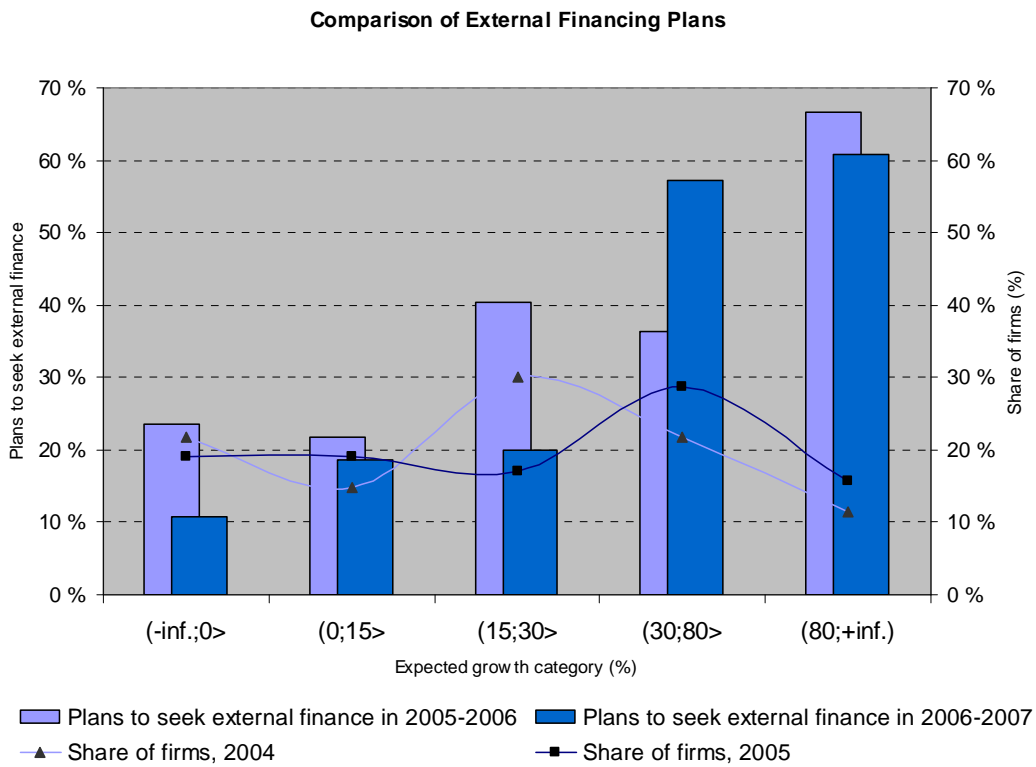


**Figure 50. Detailed Plans to Seek External Finance by Age, Revenue, Profitability and Expected Growth ( $n_1=55$ ;  $n_2=55$ ;  $n_3=55$ ;  $n_4=49$ )**

These findings on structure dependence are coherent with financial theories suggesting that more mature and stable firms with lower risk are aiming to utilize financial leverage by employing debt instruments, which are reachable to them. On the contrary to that, highly risky young firms with hopes for rapid growth are limited in their choices and usually seek for financing on equity and capital loan markets. Also, the preference for equity independent of company age, revenue, profitability or growth expectations supports the findings of recent empirical studies suggesting that software companies usually prefer equity to debt financing.

The 36% share of firms intending to raise external finance in 2005 remained constant from 2004. This 36% share of firms intending to raise external finance is between the shares from 2003 and 2002, 41% and 30% respectively. There are two possible interpretations for this. Either firms experience lower growth expectations and thus need less external financing to support their expansion, or external financing has become less available or more expensive since 2003. The comparison of external financing plans structured by growth expectations as in years 2004 and 2005 is presented in Figure 51.

The comparison chart suggests that both of these interpretations may have empirical backing. While firms having prospects of 30% to 80% growth changed their consideration for external financing upward, the firms in all other categories limited their plans to raise external finance or kept them roughly at the same level as last year. The situation when firms reduced external financing plans, while having same growth expectations, may indicate a decrease in the confidence on the feasibility of raising external finance. In addition to that, as indicated by population distribution curve on the chart, there have been changes in future prospects. The share of firms expecting a growth from zero to 80% increased or remained constant while the share of firms with highest growth expectations reduced. The general adjustment has led to decrease of expansion financing demand and consequently to a lower level of external finance plans, as noted before.



**Figure 51. Comparison of Financing Plans between 2004 and 2005** ( $n_{2004 - \text{share of firms}} = 156$ ;  $n_{2005 - \text{share of firms}} = 146$ ;  $n_{2004 - \text{raising finance}} = 56$ ;  $n_{2005 - \text{raising finance}} = 51$ )

## 6 BUSINESS MODELS OF THE COMPANIES

Creating an appropriate business model for a certain market is a crucial challenge for a software company. There are numerous dimensions in the business model that can vary across companies so it is unlikely to find two software companies with exactly identical business models. In order to analyze and clarify the diversity of various innovative business models of the software companies, we have categorized business models by two essential dimensions, the degree of productization and the revenue distribution between the license sales and service sales. In this section of the report, we describe our findings related to the types of business models that companies use.

### 6.1 Categorization of the Companies

In order to understand better the various business models that are used, we have categorized the companies into four major groups based on the degree of productization and the source of revenue (e.g. Hoch et al. 1999 and Cusumano 2004).

#### 6.1.1 Categorization Variables

We categorized the companies according to two variables. The first was the degree of productization of the software offering; the second was the share of “pure” product business from overall business, i.e. the percentage of revenue acquired from product licenses.

We asked the companies about the degree of their main offering’s productization by asking how well their main product could be duplicated without customer-specific tailoring. The degree of “pure” product business was measured by asking about customer billing: how many percentages of their total billing of an average customer delivery were based on the product offering.

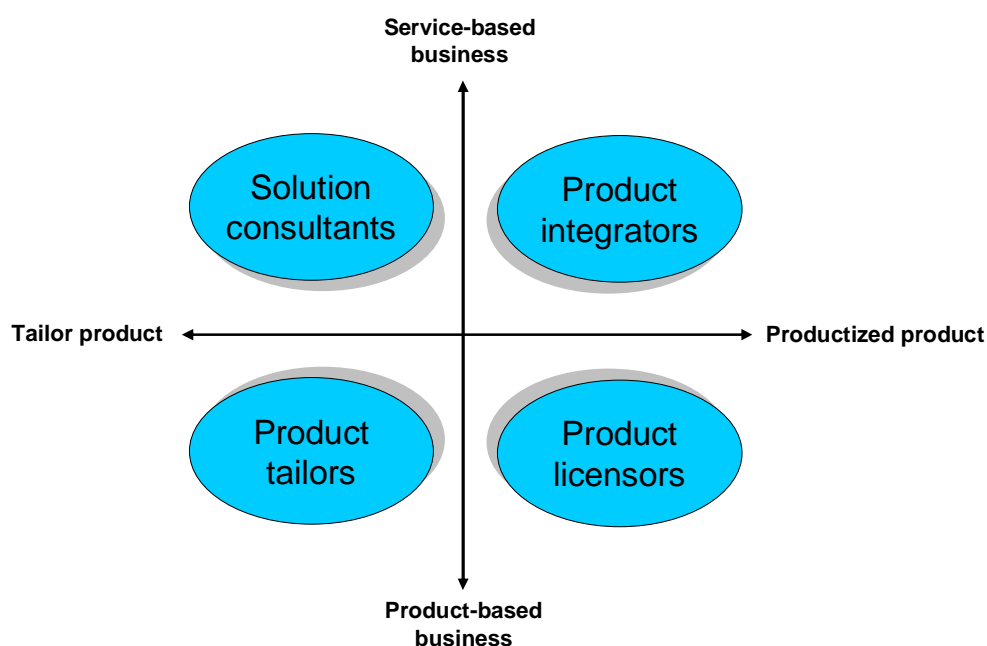


Figure 52. Categorization of the Companies

Based on the answers to these two questions, we categorized the companies to four classes depending on the type of the business they practiced. We labeled these categories as the product licensors, product integrators, solution consultants, and product tailors as shown in Figure 52. We placed each company to one of these four groups, which consisted of 48 product licensors, 53 product integrators, 19 solution consultants, and 31 product tailor companies.

### **6.1.2 Categorization Criteria**

According to our definition, the product licensor companies consist of those that had 1) more than 60% of their product business revenue coming from the sales of product licenses and 2) whose product could be duplicated to customers without customer specific tailoring “quite often”, “often”, or “always”. The product licensor companies base their product business on product that is highly productized and most of the revenue is obtained through licenses, thus the title “product licensor”.

We considered a company to be a product integrator if it had 1) 60% or less of their product business revenue coming from product licenses and 2) products that could be “quite often”, “often”, or “always” duplicated to customers without customer specific tailoring. The product integrator companies’ customers are mainly enterprises; they emphasize services in their offering, and often integrate their offering to suit the customer’s IT infrastructure. This is why they are named the “product integrator” companies.

We considered a company to be a solution consultant 1) if it had less than 40% of its product business revenue coming from product licenses and 2) if its product “could not be at all”, “could not be almost at all”, “could be only very limitedly”, or “could be only in some extent” duplicated to different customers without customer specific tailoring. - The solution consultants had more revenue coming from services than products, thus the name “solution consultants”.

Contrary to the solution consultants, the product tailors were defined to 1) earn 40 % or more from product licenses and to 2) have equally low level of productization of their offering as the solution consultants. Thus both the solution consultants and product tailors had to do customer specific tailoring work in order to duplicate and deliver their product to different customers. Because the main bulk of the revenues of the product tailors come from products, but still they have to do tailoring work, we labeled them “product tailors”.

### **6.1.3 Description of the Categories**

Based on the above-mentioned variables according to which we performed the categorization, we can describe the groups on a high level as follows:

- Product licensor companies are companies that have a highly productized software offering and that focus their business to develop and sell the product to mass markets. These companies are in the “purest” end of software product business and often expected to have high growth potential.
- Product integrator companies also have highly productized software, but the software is only the core of their offering, services being the main part of it. Services consist of the user training and maintenance to name but a few.
- Solution consultants have product with low degree of productization and, thus, they have to do much tailoring work for each customer. Therefore their business

is in the “impurest” end of software product business. The solution consultants are counted as product business because the core of their solution is based on a product.

- Product tailors are companies whose business revenue is based on product licenses but whose product has a low degree of productization. Thus, some of their revenue is based on product tailoring and customer specific projects.

To find out more interesting characteristics about these groups, we outline their differences in following sections based on the survey data.

## 6.2 Key Figures

### 6.2.1 Revenue and Profit

When considering the results presented in Table 21, we can see that on average the product integrators and product tailors have higher revenues. This fact is most obvious in the case of the product integrators; this is probably because several large IT houses reside in this group. The revenue per employee of the companies with a high degree of productization is about the same as that of those companies with a lower degree of productization.

In 2003, we observed that when comparing the median revenue in the categories with same degree of productization (i.e., comparing product licensors to product integrators and solution consultants to product tailors), the categories with more emphasis on services had more revenue. However, the situation has been reversed in 2005 and 2004 in the case of the two groups with a small degree of productization. Regarding the issue of revenue per employee, there are initial traces that revenue would be higher in the service oriented groups, i.e. in solution consultants and product integrators. When looking at the median revenue, we also note that in all groups except product integrators, companies are relatively small. Average revenues grew fast in all groups except in solution consultant group, which decreased by 10%. There has been growth of about 49% in the average revenue for product licensors, 52% for product licensors and even 182% for product tailors.

**Table 21. Revenue and Profit**

Company type	Average revenue (million euros)	Average revenue (euros per employee)	Median revenue (euros)	Median profit (euros)
Product licensor (n=48)	2.97	86 000	433 000	13 000
Product integrator (n=53)	8.85	89 000	1 000 000	45 000
Solution consultant (n=19)	0.94	92 000	300 000	0
Product tailor (n=31)	3.70	82 000	760 000	85 000

The fact that the revenue per employee ratio is relatively low in each group may mirror that in each group, there is a high number of companies that are still immature and in their first product development phase. The more mature companies unfortunately did not answer to these questions and therefore these figures are lower than figures describing the whole software industry.

## 6.2.2 Personnel and Ages of Product Businesses

Table 22. indicates that company categories with productized offerings are, on average, older than the companies with a lower degree of productization. The product integrators group has the highest average (and median) number of personnel, the group where the large IT houses reside. Compared to 2004, the solution consultant group has dropped by ca. 14%, product tailor group has experienced 67% growth, and product integrators have grown 68%.

The median number of personnel is relatively small in each category, with the highest number occurring in the product integrator category, which has been typical during the previous years. The median numbers of personnel were close to last year's numbers, except for the solution consultant group in which the median number of personnel decreased from 7 in 2004 to 4 in 2005.

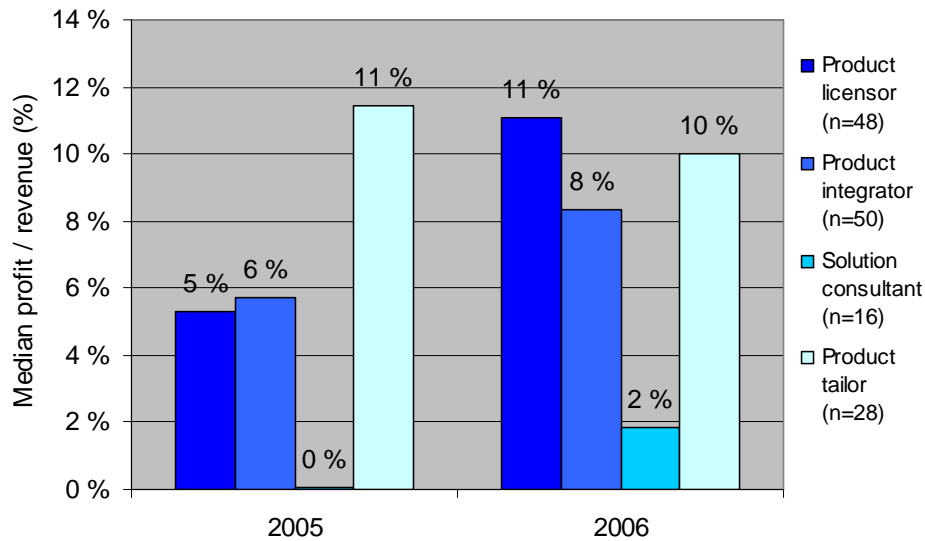
In 2003, an interesting finding was that businesses whose income was product-based were the youngest companies both in median age of company as well as in median and average age of the product business. This is no longer true in 2004 or 2005; now the product-based and service-based businesses are mixed in terms of these age-based findings and the degree of productization seems to be the only dimension, which has statistical relationship with the age of a company. Natural interpretation for this relationship would be that the productization of the total offering is time consuming task, especially if it has to be financed by cash flow revenues instead of acquiring external financing.

**Table 22. Number of Personnel, Age of Company, and Software Product Business**

Company type	Average number of personnel	Median number of personnel	Median age of company	Median age of SW product business	Average age of SW product business
Product licensor (n=48)	29	8	10.5	10	11
Product integrator (n=53)	79	14	10	8	10
Solution consultant (n=19)	12	4	9	6	7.5
Product tailor (n=31)	30	10	9	6	8.5

## 6.3 Actual and Estimated Profit Margin

In each group, the “median” company had a non-negative profit margin figure. The first two groups had almost equal profitability in 2005. The first three groups saw their future positive and believed to be able to raise their profit margins – even up to 11% by the product licensor companies. Especially the product licensor companies predict a large growth surge in their profitability from 2005 to 2006, as in the last year (2004 to 2005). However, the product licensor group's median profit margin decreased from 8% in 2004 to 5 % in 2005. In the other groups, the expectations that companies had in 2005 for their final 2005 figures had not realized very well: the groups had in 2005 predicted profitability of 14%, 10%, 8%, and 8%, in the respective order. The materialized figures are, as shown below, 5%, 6%, 0%, and 11%. On the positive side, product tailor group's median profit margin is higher than expected.



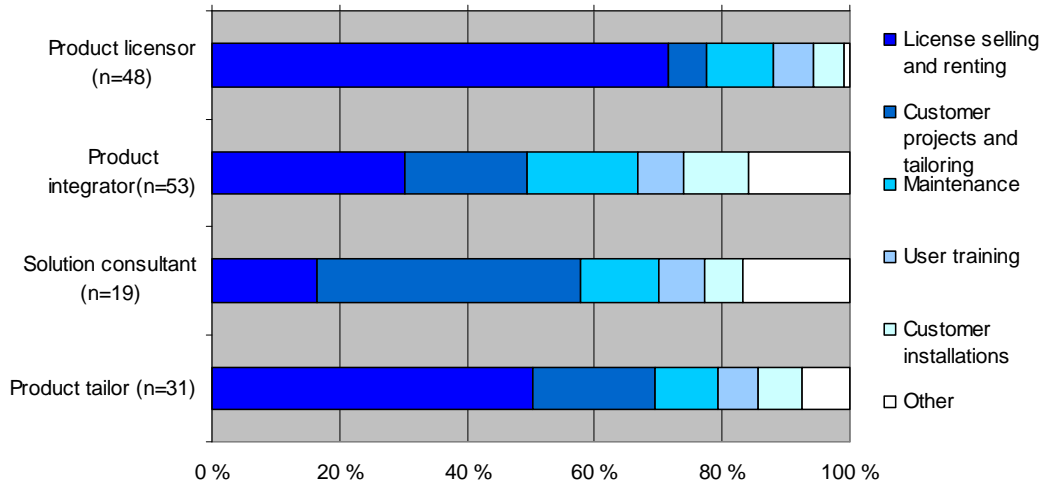
**Figure 53. Actual Median Profitability for 2005 and Estimated Median Profitability for 2006**

## 6.4 Additional Descriptive Figures

### 6.4.1 Revenue

The following description illustrates the composition of the typical delivery method of the main product; expectedly, the methods largely correspond to the four business models types. The product licensor companies have on average more than 79% of their total revenue acquired from license selling and renting whereas product integrator companies' business is less than 37% product-based. This figure is less than 20% and more than 57% for solutions consultants and product tailors, respectively. These figures are very close to those from 2005, except that share of "other" increased significantly in case of product integrator, solution consultant and product tailor groups. This can indicate an emergence of the new innovative business models where the role of new components of the total offering is substantial. With the product integrators, solutions consultants, and product tailors, the share of the customer projects and tailoring parts of the total revenue is substantial: 20% or more with each group. With the solutions consultants, this figure is in fact more than 50%.

The solution consultant companies obtain only about 20% of their revenue from license sales, their main source of revenue being the product-based customer projects and tailoring. Compared to the product integrators and solution consultants (the groups labeled as having a service-based business model in this report), the product licensors and product tailors expectedly obtain a high share of their total revenue from license selling and renting. Breakdown of the main product's sales revenues is presented in Figure 54.

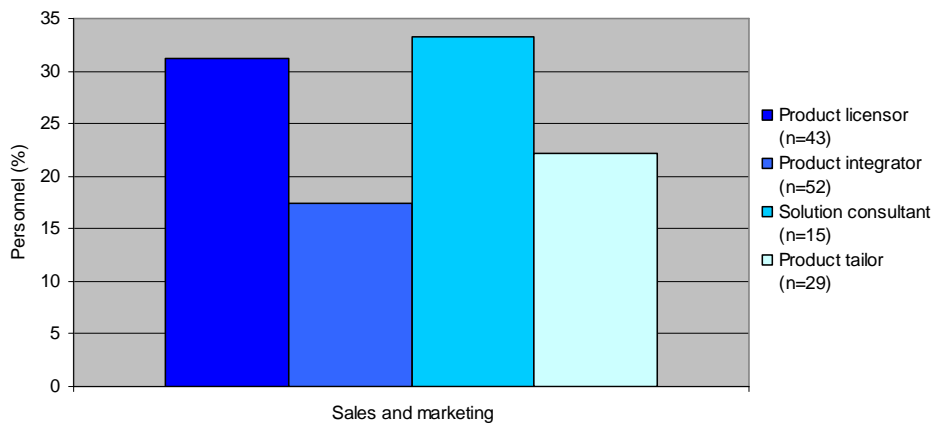


**Figure 54. Composition of a Typical Delivery of the Main Product by Software Product Business Revenue in Different Groups**

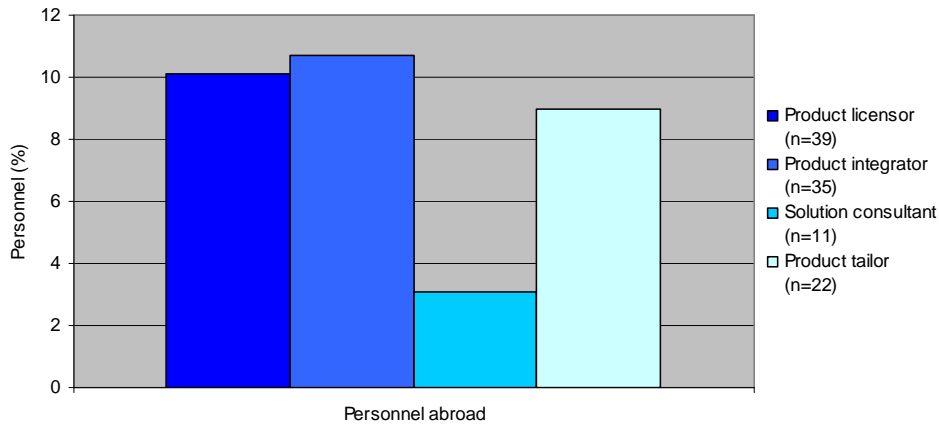
#### 6.4.2 Personnel

By studying the companies' business revenues, we can find traces of the allocation of personnel according to the functions in the companies. Below, Figure 55. presents the share of personnel of the companies that work in the sales and marketing function. In the solution consultant group, the share of sales and marketing personnel increased significantly from 22% in 2004 to 33% in 2005, whereas in the product integrator group the share decreased from 26% in 2004 to 17.5% in 2005. In the product licensor and product tailor groups, the shares of sales and marketing people remained approximately at the same level as in the previous year.

Figure 55. shows the share of personnel working abroad. The share of personnel abroad increased in all groups. In the solution consultant group this figure is relatively low – only about 3%. For the product licensor and product integrator groups, the figure is about 10% and for the product tailor group the share is 9%. These figures are in line with the fact that the share of internationalized companies increased significantly in 2005.



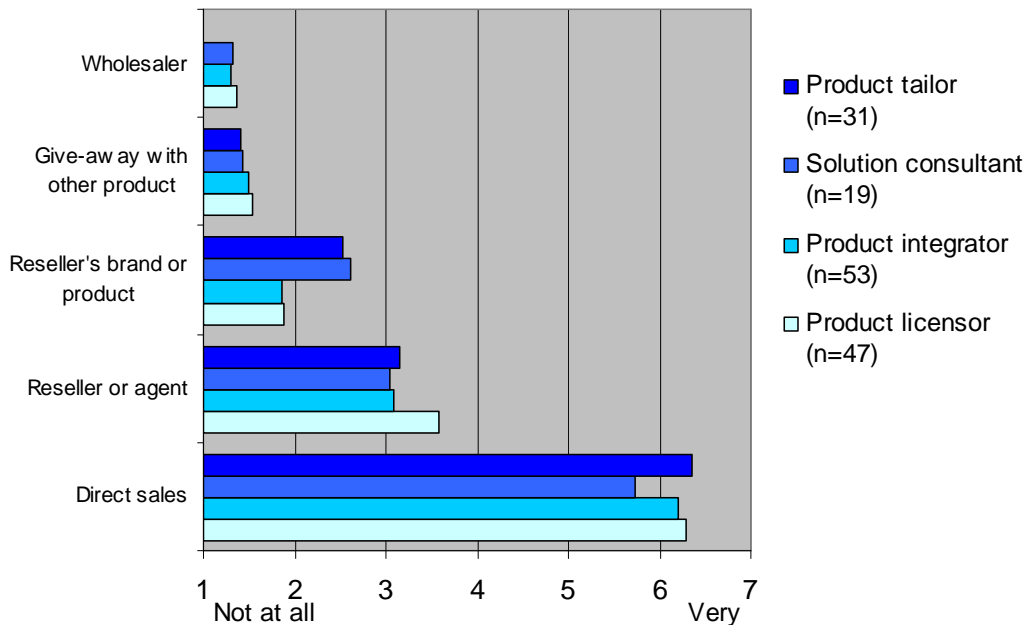
**Figure 55. Percentage of Personnel in Sales and Marketing**



**Figure 56. Percentage of Personnel Abroad**

### 6.4.3 Sales and Distribution

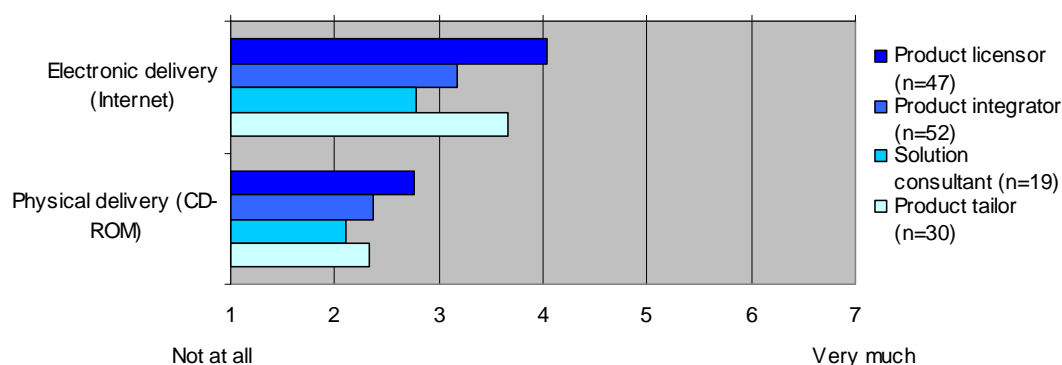
Direct sales channel was the most commonly used sales channel in all groups. Using resellers and agents was also quite common. Using a reseller's brand to sell the product or selling product as a part of reseller's product was only used in a few cases and the same holds true with bundling and wholesalers. The majority of the companies in all categories did not use the last-mentioned sales channels in any situation. The findings related to sales channels are very closely the same as the findings in the previous year, see Figure 57.



**Figure 57. Average Sales Channel Use by Each Category**

Electronic delivery through the Internet appears to be more popular than delivery on a CD-ROM. The results are almost the same as in the previous year. The biggest changes were that the product tailors increased the usage of the electronic delivery and that the

product licensors and product integrators decreased their usage of the physical delivery as shown in Figure 58.



**Figure 58. Average Use of Internet and CD-ROM Delivery by Each Category**

#### 6.4.4 Customers

The majority of the business is conducted with other companies and public administration in every group whereas private consumers are the most unusual customers.

**Table 23. End-Users by Different Groups (Dichotomy Label)**

End-user	Type of the company			
	Product licensor	Product integrator	Solution consultant	Product tailor
Micro enterprise	19 %	13 %	5%	10 %
Small enterprise	29 %	40 %	47 %	39 %
Medium enterprise	38 %	49 %	68 %	39 %
Large enterprise	46 %	57 %	26 %	55 %
Public sector	44 %	36 %	16 %	39 %
Private consumer	13 %	8 %	0 %	10 %
Total	189 %	203 %	162 %	192 %
Number of cases	48	53	19	31

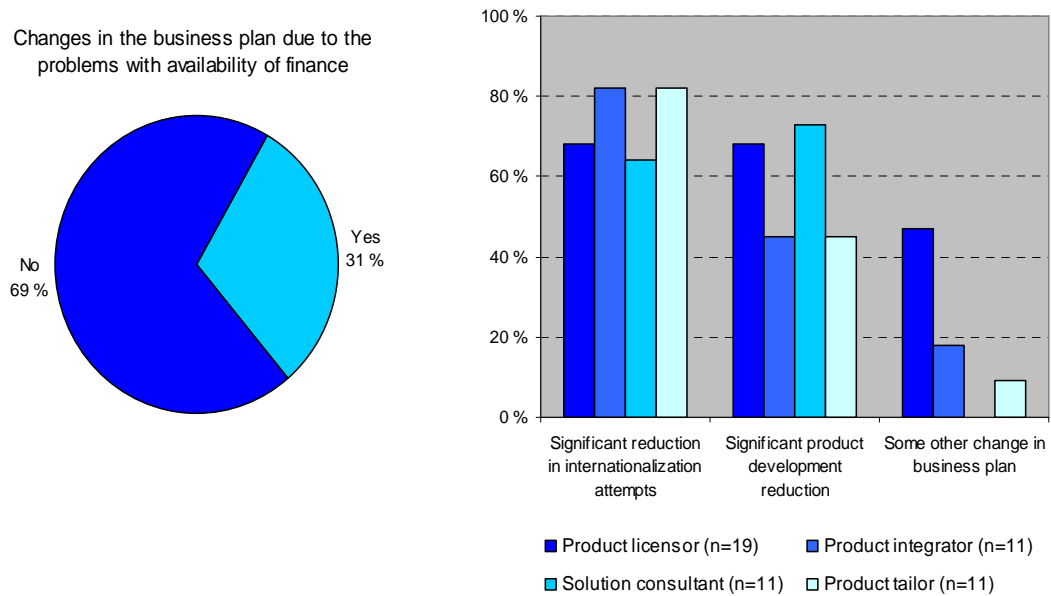
Companies with a lower degree of productization were most dependent on their key customers: product tailors received 32.4% and solution consultants on average 31.8% of their revenue from their largest customer. The product licensor companies had an average of 22% and product integrator companies 23%. These figures are higher than in the previous year, thus in general companies are more dependent on their key customer, which can be seen as a negative trend.

#### 6.4.5 Financing

In 2005, the lack of financing had affected on average 31% of software product businesses. More specifically, we asked the companies if the lack has affected their product development, internationalization attempts, or something else. Substantial reduction in both internationalization ability and product development ability were observed as can be seen in Figure 59.

In 2003, the degree of productization appeared to be closely linked to the internationalization capabilities of a company so that companies with a highly

productized offering had significantly reduced their attempts at internationalization. In 2004 and 2005 however, no such observation differentiates the groups with high and low degrees of productization. From these figures we can see that the product integrators and product tailors more likely reduced their internationalization attempts because of the problems with the availability of financing.

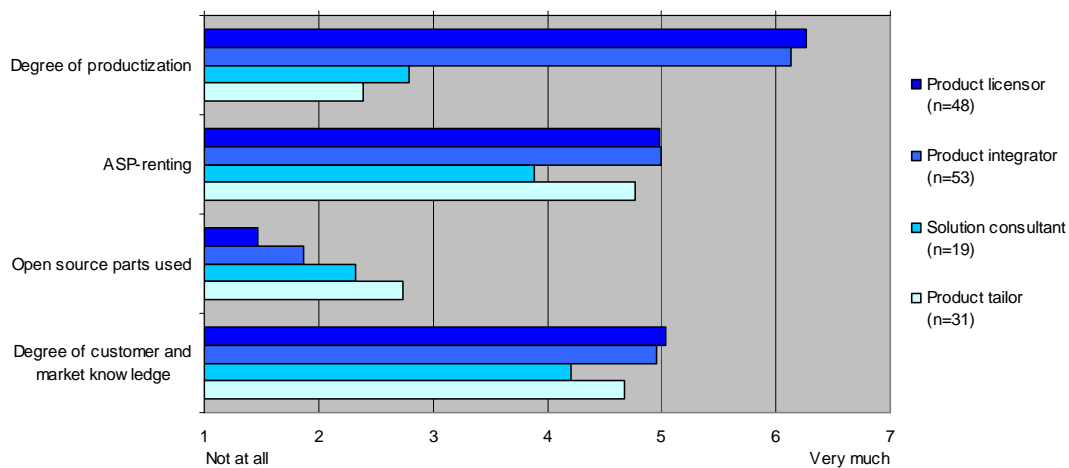


**Figure 59. Consequences of the Lack of Financing**

## 6.5 Main Product

### 6.5.1 Characteristics of the Main Product

The most noticeable differences in the characteristics of the main products' business were that the product licensors and product integrators used most often Application Service Provider (ASP) model and that product tailors used open source components most often. The product licensors and product integrators seem to have slightly better knowledge of the markets than the other companies.



**Figure 60. Characteristics of the Main Product's Business**

## 6.5.2 Version Releases

As in 2004 and 2003, releases of the main product were most often done based on customer needs in the case of companies with a low productization degree, and on a pre-defined basis by high productization degree companies. Expectedly, low productization degree companies were those that often stated that they release a new version “in every customer delivery”. Compared to the previous year, the product tailors have increased their version releases in the “every customer delivery” category. The solution consultants, expectedly, only rarely did releases on a pre-defined basis. The basis of release was asked using a dichotomy label since the reason for a version release is often a combination of several factors. Release strategies are presented in Figure 61.

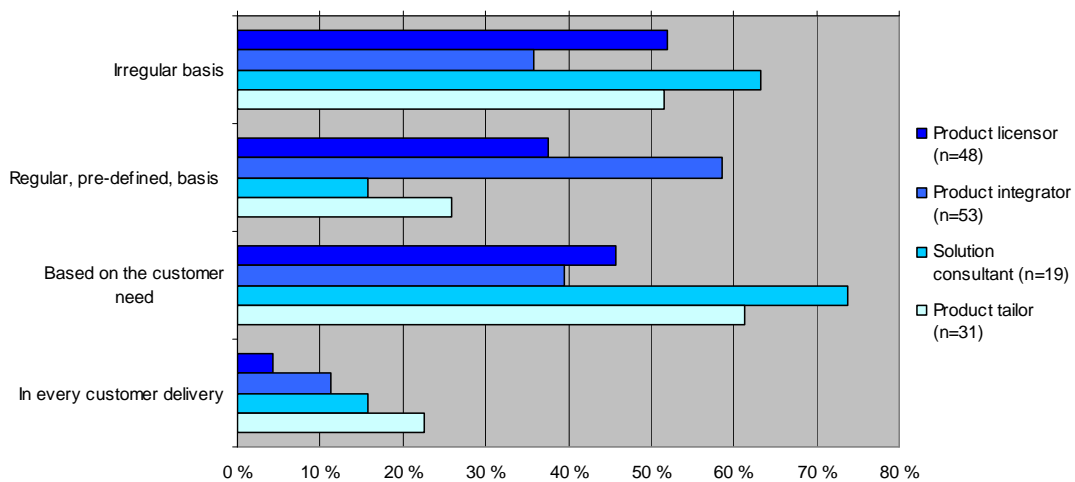


Figure 61. Release Strategies for the Main Product by the Groups

## 6.5.3 Product Development Investments

Some noticeable differences are present in the investments to product development between the categories. The product licensors have clearly higher investments to product development than the other groups. The product licensor group’s investment share is 35% and the other groups’ investment shares were on average 25%. The differences are naturally large between the companies: for instance, in 2002 a product licensor company had invested two times and another product licensor company four times their revenue into product development. This is understandable, as some product licensor companies are heavily financed by the venture capitalists and may thrive for a longer period concentrating on product development without having to resort to income financing.

Investment shares decreased from previous year in all groups. The product tailor group has the lowest share whereas it had the second higher share in previous year. In general, the differences between groups decreased. Compared with the realized figures for 2005, the estimate for 2006 suggests that all other groups, except product integrator, will reduce their investments into product development.

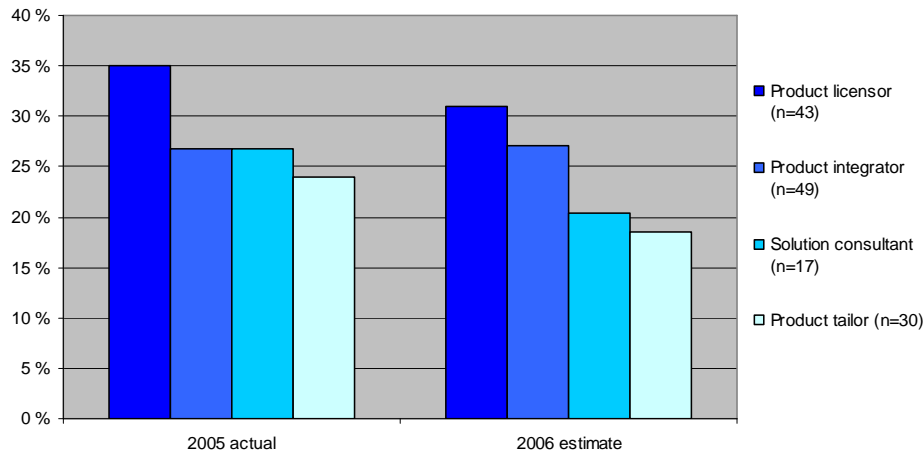


Figure 62. Product Development Costs as Percentage of the Total Revenue

## 6.6 Internationalization from a Business Model Viewpoint

### 6.6.1 Number of Countries

As in 2004 and 2003, more than half of the companies in each category except product licensors were “domestic” in their product business. In all groups, roughly 30-40% of companies the number of foreign countries where the company ran operations was from one to five. The share of such companies increased for solutions consultants and product integrators and decreased for product licensors and product tailors. In the product licensor group, the share of companies that had product business in more than five countries abroad increased from 21% to 31% and it increased also in the product tailor group from 4% to 16%, whereas it decreased in the product integrator group from 10% to 7%. The observation that product licensor companies are the most internationalized ones has been often documented in prior studies.

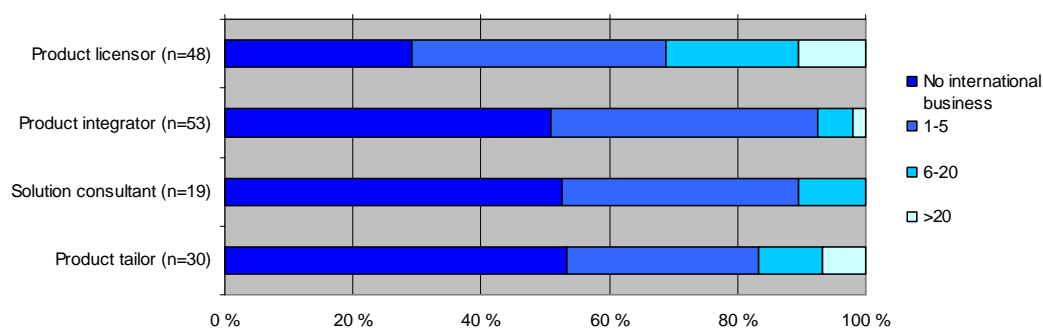


Figure 63. The Number of Foreign Countries in which the Companies Operate

### 6.6.2 Internationalization Strategy

Direct sales and reseller were the two most often used sales strategies in international markets in all categories and the use of these strategies increased significantly from the previous year. The strategies of selling using a reseller’s brand or product, through subsidiary, and via joint venture were only rarely used compared with the two strategies mentioned above. However, the use of resellers brand or product increased slightly. This

ordering of the five strategies as they are classified here has been commonly observed in this study.

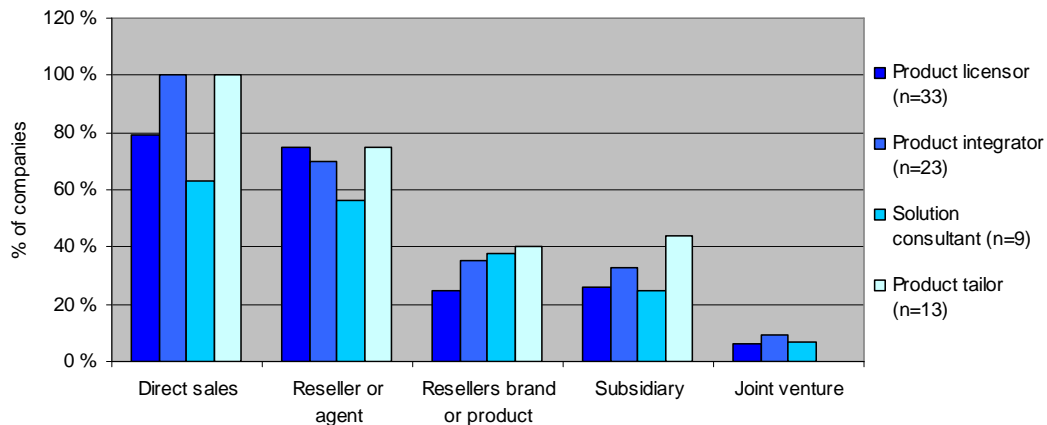


Figure 64. Selection of Sales Strategies in International Markets

## 6.7 Conclusions

The purpose of this chapter has been to categorize companies by two dimensions into four groups according to their business model and to analyze the differences between these groups. The classification dimensions are the degree of productization and the share of product-based business (vs. service-based business) of the total revenues. The labels that we used for the four groups of companies are the product licensor, product integrator (“standard solution”), solution consultant, and product tailor companies. Common characteristics of the four groups are outlined in Figure 65.

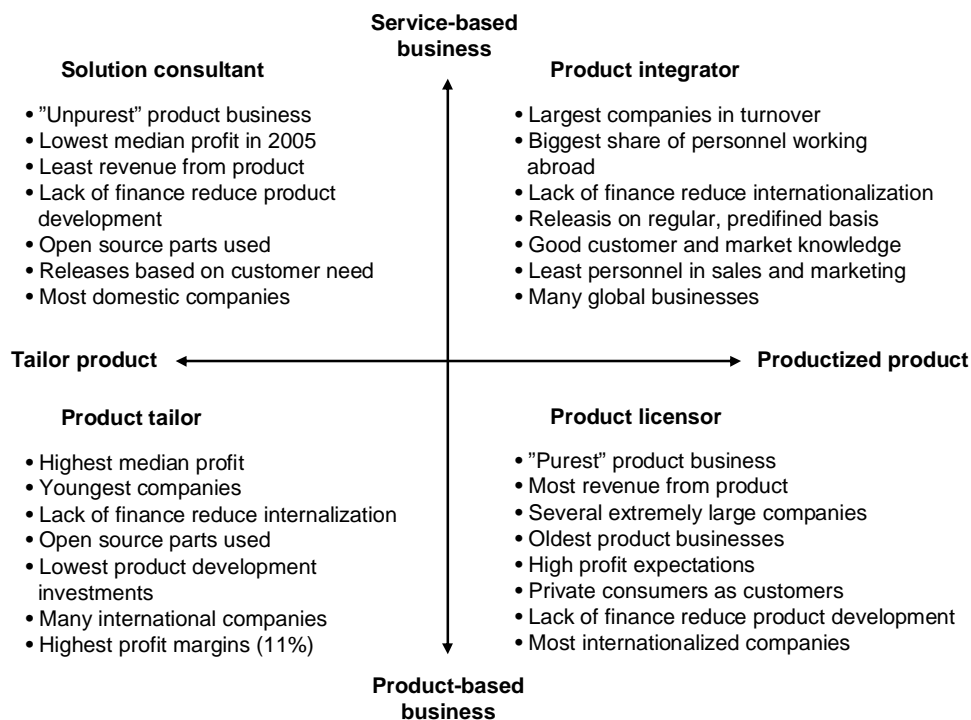


Figure 65. Categorization of Software Product Businesses

## 7 INDUSTRY CLUSTERS

### 7.1 GENERAL

One of the aims of the software product industry cluster study is to define a system of classifying the software product companies. In this report, the classification is done by categorizing the companies according to their software product types and by the target customer markets the companies are selling their products in. These two categorizations produce a matrix where the companies are positioned according to their software product types and target markets. From this classification it is possible to identify promising clusters and companies in the clusters based on a variety of criteria including high growth, profitability, degree of internationalization etc. In the survey the companies were asked to provide information of their main software product. The companies are included in the analysis based on the categories they belong to. However, in this report we do not report results of the categories with less than six companies due to reasons related to the confidentiality of the respondent companies.

#### 7.1.1 Software Classification

The companies were categorized according to the modified North American Product Classification System (NAPCS 2003). Applying an existing software classification makes it possible to adopt a system, which has been found practical in other countries and at the same time this facilitates easier comparison between international research studies on software industry clusters. The two main classes of software type in the NAPCS are the System software and Application software types (see the definitions below). These are then further divided into various subcategories.

**System software is defined as:**

“The low-level software required to manage computer resources and support the production or execution of application programs but which is not specific to any particular application”

**Application software is defined as:**

“Software program that performs a specific function directly for the end user”

The companies were asked to provide information of their main product. Table 24. presents the modified NAPCS classification system.

**Table 24. The Modified NAPCS classification**

<b>1. System software</b>	<b>2. Application software</b>
<b>1.1 Operating systems software</b>	<b>2.1 General business productivity applications</b>
- All client and network operating systems	- Office suite applications
<b>1.2 Network software</b>	- Word processors
- Network management software	- Spreadsheets
- Server software	- Simple databases
- Security and encryption software	- Graphics applications
- Middleware	- Project management software
- Other network software	- Computer based training software
<b>1.3 Database management software</b>	- Other business productivity software
- Includes all DBMSs	<b>2.2 Home use applications</b>
<b>1.4 Development tools and programming languages software</b>	- Games
- Software testing tools and testing software	- Reference
- Program development tools	- Home education
- Programming languages software	- Other home use application software
- Other development tools software	<b>2.3 Cross-industry application software</b>
<b>1.5 Other systems software</b>	- Professional accounting software
	- Human resource management software
	- Customer relations management software
	- Geographic information system software
	- Web page/site design software
	- Other cross industry application software
	<b>2.4 Vertical market application software</b>
	<b>2.5 Utilities software</b>
	- Compression programs
	- Antivirus
	- Search engines
	- Font
	- File viewers
	- Voice recognition software
	- Other utilities software
	<b>2.6 Other application software</b>

### 7.1.2 Target Market Classification

The other dimension in the cluster matrix is the target customer markets. Target customer markets are the markets the companies are targeting with their product. While there are huge number of possible target markets, for this study the target markets were chosen so that they fit to the economic and IT market situation in Finland. Each company was asked to provide the target market for their software product. Table 25. provides a list of the target markets.

**Table 25. Target Market Classification**

<b>Target customer market</b>
No specific industry segment (horizontal application)
Electronics and high technology
Information Communication technology (ICT)
Telecom
Mobile
Aviation and defense industry
Research and science
Nanotechnology
Biotechnology
Chemistry
Banking, financing, and insurance
Legal services
Knowledge intensive business services and consulting
Energy
Construction
Manufacturing
Mining
Retail and wholesale
Real estate and maintenance
Transportation and logistics
Agriculture and forest industry
Health services
Traveling and tourism
Public sector
Communities
Education
Training
Media and entertainment
Games and animation
Affluent services
Some other target market

## **7.2 DISTRIBUTION OF THE COMPANIES**

The companies were asked to provide information of their main software product. The companies selected the type of software of their main product and the main target market their product is sold to from the lists. At the top level, it can be seen that application software group is almost four times more popular than system software, see Table 26. This is reasonable as developing system software is more complex, slower, and more expensive than developing application software. In addition, the markets for application software products typically have higher volumes and are easier to reach than the markets for system software products.

The most popular software type is cross-industry application software, which is designed to perform and manage a specific business function or process that is not unique to a particular industry. In other words, this includes horizontal applications i.e. software that is not industry specific. On the other hand, the vertical market application software is also popular. It is software that performs a wide range of business functions for a specific industry such as manufacturing, retail, healthcare, engineering, restaurants etc. Also general business productivity application software was common.

Among system software, the most popular type was network software. The following tables present the distribution of the respondent companies according to their software type and target market.

**Table 26. The Number of Companies per each Software Type**

<b>Software types</b>	<b>Number of companies</b>
<b>System software:</b>	32 (total)
Operating systems software	1
Network software	17
Database management software	8
Development tools and programming languages software	6
Other systems software	0
<b>Application software:</b>	126 (total)
General business productivity applications	19
Home use applications	7
Cross-industry application software	46
Vertical market application software	32
Utilities software	8
Other application software	14

**Table 27. The Number of Companies per each Target Market**

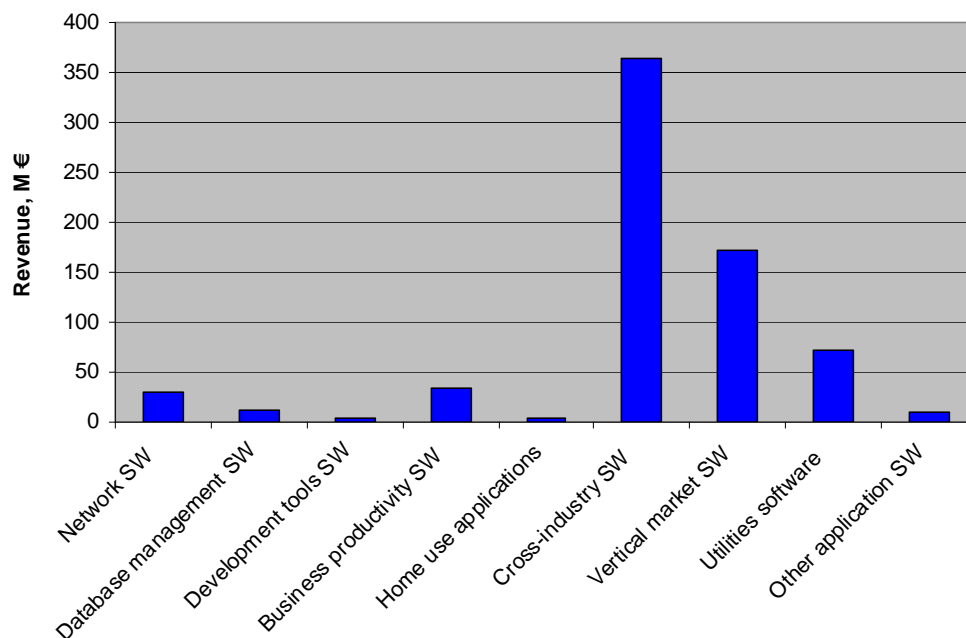
<b>Target customer market</b>	<b>Number of companies</b>
No specific industry segment (horizontal application)	42
Electronics and high technology	9
Information Communication technology (ICT)	14
Telecom	7
Mobile	9
Aviation and defense industry	0
Research and science	1
Nanotechnology	0
Biotechnology	1
Chemistry	1
Banking, financing, and insurance	10
Legal services	1
Knowledge intensive business services and consulting	1
Energy	0
Construction	3
Manufacturing	13
Mining	0
Retail and wholesale	10
Real estate and maintenance	0
Transportation and logistics	2
Agriculture and forest industry	1
Health services	9
Traveling and tourism	0
Public sector	5
Communities	1
Education	4
Training	1
Media and entertainment	2
Games and animation	4
Affluent services	2
Some other target market	9
<b>Total</b>	<b>162</b>

When we take a look at the target markets, see Table 27, it is clear that most companies prefer the “No specific industry segment”, which is software that can be used by all customer segments. The ICT, Manufacturing, Banking, Retail, and Health services were also very popular target markets. The least popular target markets were Aviation, Nanotechnology, Energy, Mining, Real estate, and Travel in which none of the respondents operated.

## 7.3 REVENUE

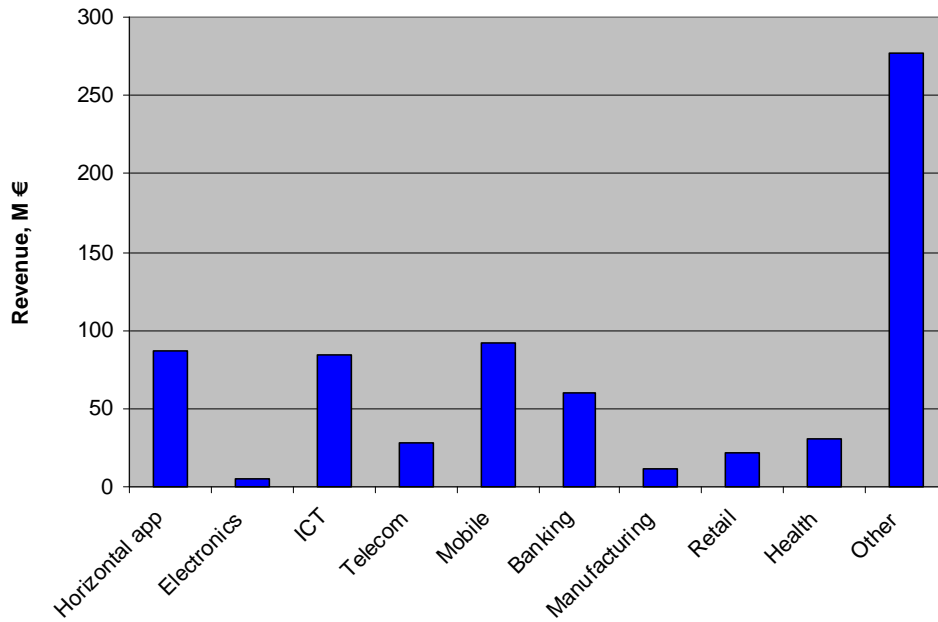
### 7.3.1 Total Revenue

The total revenue and the software product business revenue vary significantly across the various clusters: the types of software and the target markets (Figure 66.). Out of the different software types the Cross-industry application software and Vertical market application software had by far the largest total revenue.



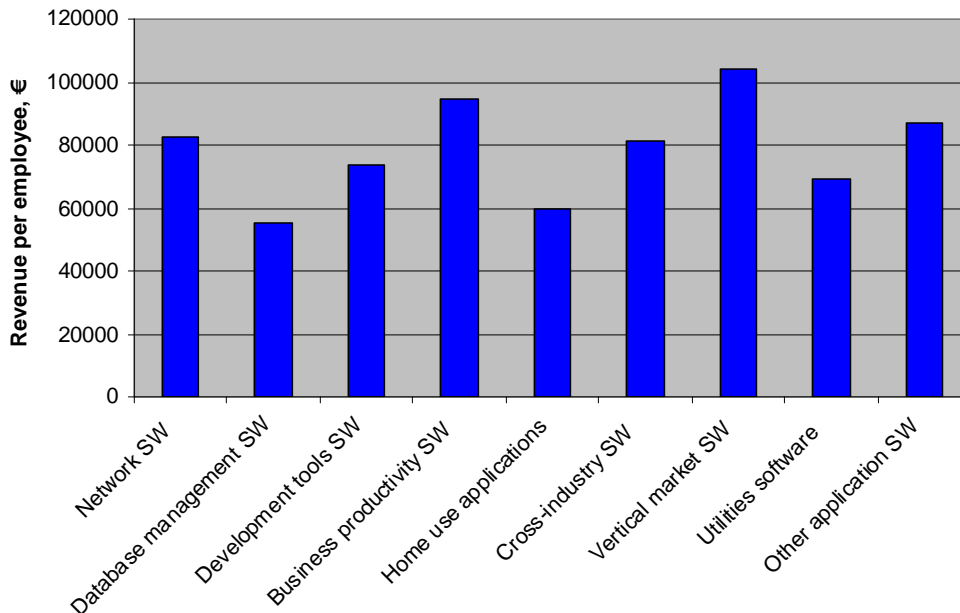
**Figure 66. Total Revenue by Software Type**

From the target markets, the Other had the largest total revenue because it contains companies that are large, have multiple software products, and operate in more target markets than one. The Horizontal application, ICT, Mobile, and Banking had high revenues as well (Figure 67.). On the other hand, Electronics, Manufacturing, and Retail have very low revenue figures. These clusters lack large companies and therefore the total revenue figures are very low. In addition, a possible source for bias is that not all of the Finnish companies that belong to these categories answered to this survey and therefore the total revenue numbers should be treated as indicating only.



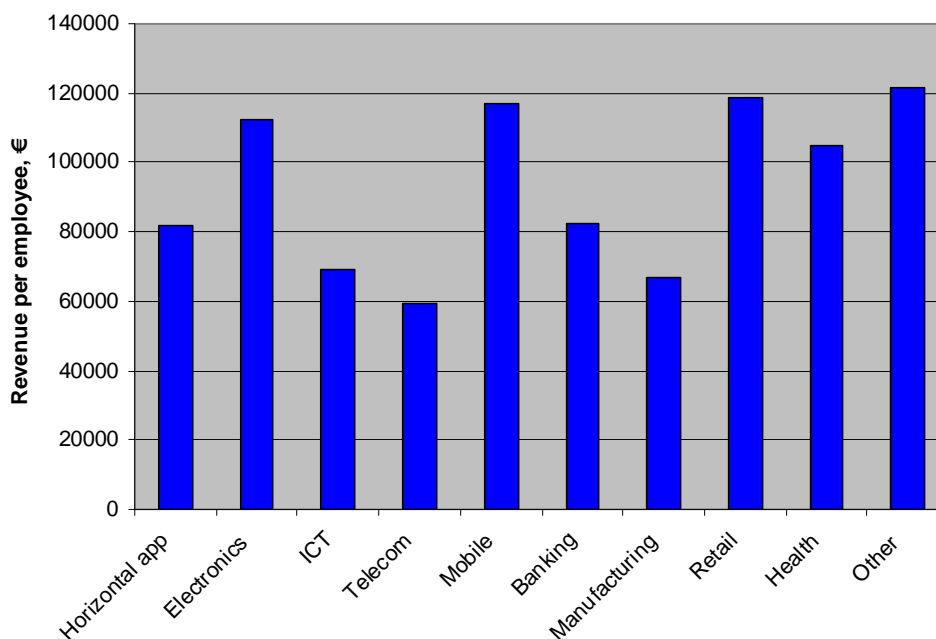
**Figure 67. Total Revenue by Target Market**

However, when we take a look at the revenue per employee figures (Figure 68.), the situation is quite different. The largest revenue per employee figures were in the Vertical market software and Business productivity software clusters. The Database management and Home use applications had the lowest revenue per employee figures, which were roughly half of the overall industry's figure of 109 000 euros per employee.



**Figure 68. Total Revenue per Employee by Software Type**

As for the target markets (Figure 69.), the largest revenue per employee figures were in the Electronics, Mobile, Retail, and Other categories. On the other hand, the figures for Telecom, ICT, and Manufacturing were low, only around 60 000 euros.



**Figure 69. Total Revenue per Employee by Target Market**

### 7.3.2 Software Product Revenue

As Figure 70. shows, the Mobile and Other sectors were clearly the largest clusters according to average software revenue. The next largest ones were the ICT and Banking. This result is biased by the fact that typically the software companies in the Other category had more than one product and target market and therefore were larger than the other categories' firms in general. According to the responses the Electronics and Manufacturing are smallest sectors.

The previous figures show that the Horizontal applications, ICT, Mobile, and Banking were large clusters when measured by their revenues. This comes as no surprise as the communication technology related sectors are generally known to be very large in Finland. The No specific target market (Other for short) category naturally had high revenue as there are so many large companies in that sector as companies that had multiple "main" products and target markets for them answered in the survey that they belong to this category. Of the software types, the largest total revenues are in the Cross-industry application software and Vertical market software, which also were the most popular categories.

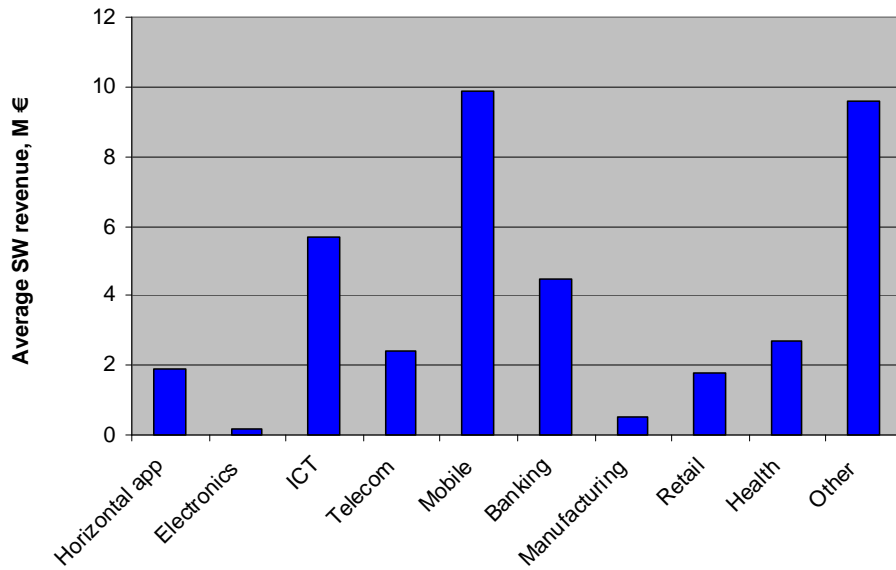


Figure 70. Average Software Product Revenue by Target Market

## 7.4 PROFITABILITY

The average total profit and profitability of each cluster varied a lot between the categories, see Figure 71. For example, the average profits for the Cross-industry software products and Utilities software clusters were very good while the Network software and Home use application software clusters were unprofitable.

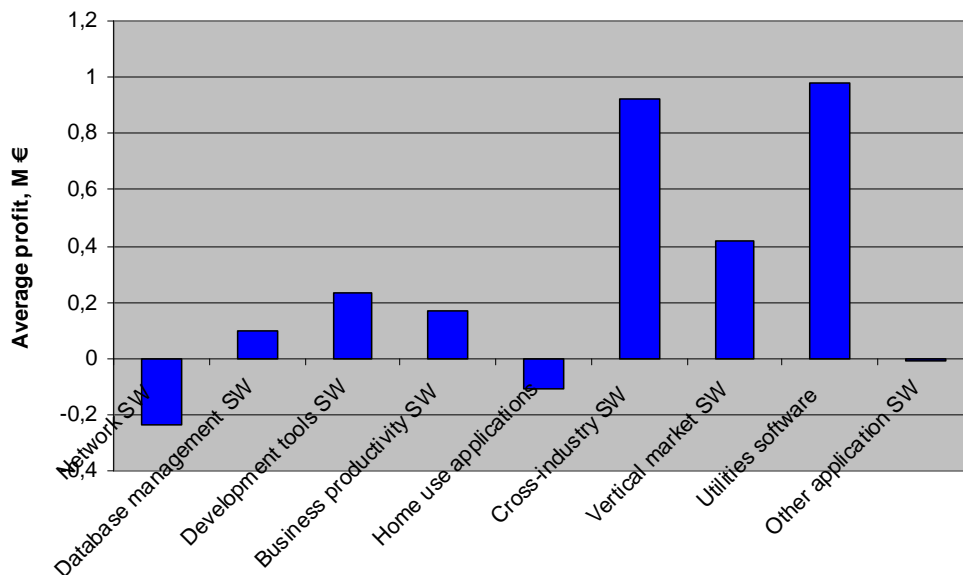
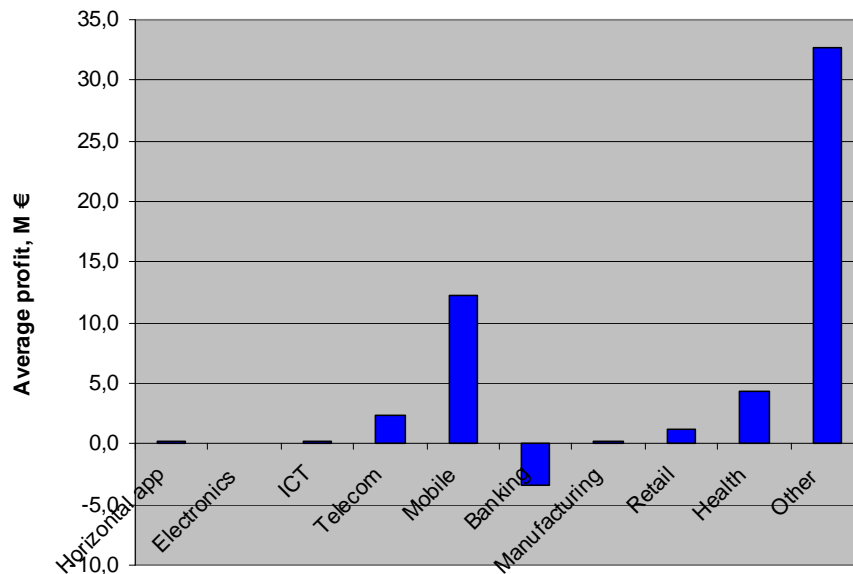


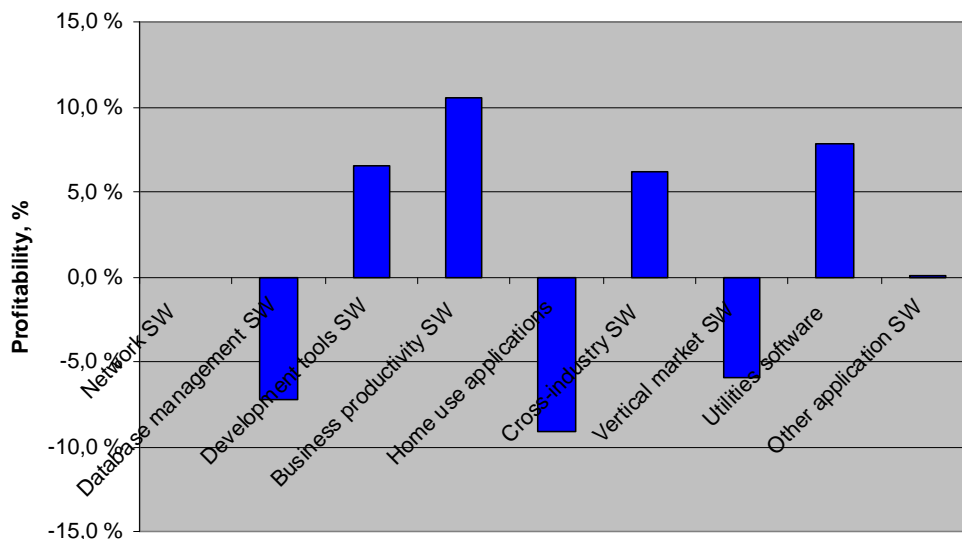
Figure 71. Average Profits by Software Type

As for the target markets (Figure 72.), the Mobile and Other categories were quite profitable while the Banking cluster was creating losses and Horizontal applications, Electronics, ICT, Manufacturing, and Retail on average had very low profits.



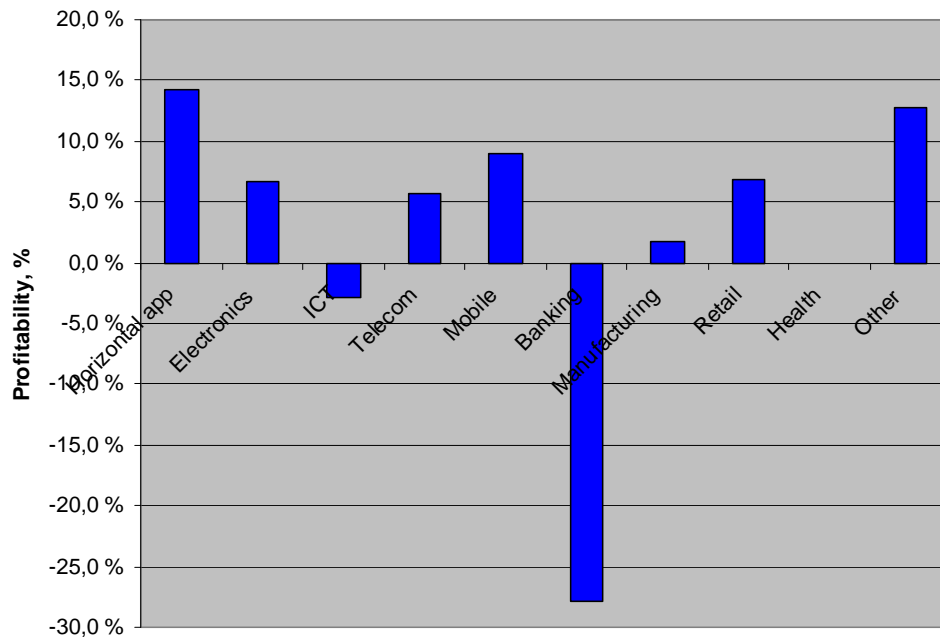
**Figure 72. Average Profits by Target Market**

The profitability was reported as the total profit in relation to the total revenue and these figures show that on average the Business productivity software had over 10% profitability and the Developer tools, Cross-industry, and Utilities software clusters had over 5% profitability, see Figure 73.). These are very good figures compared to overall industry's profitability of 2.8%.



**Figure 73. Profitability (profit per revenue) by Software Type**

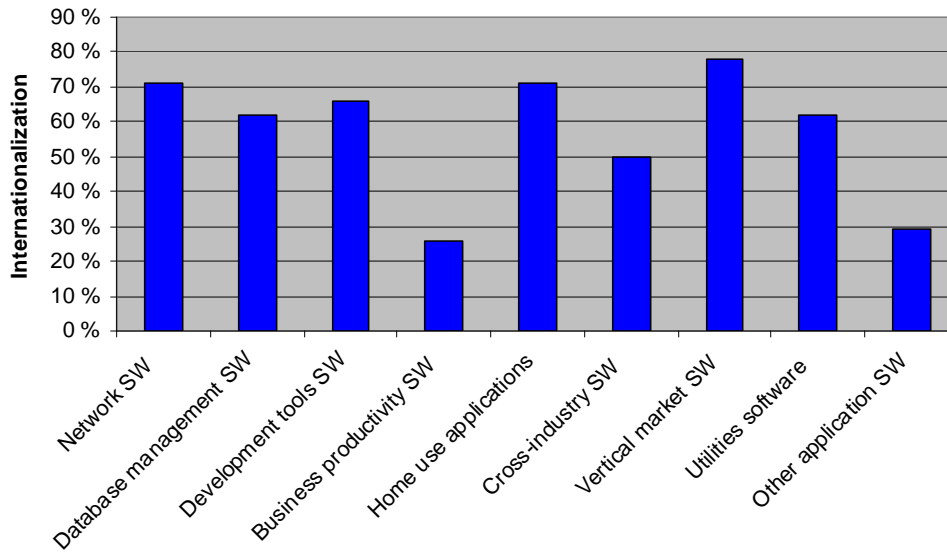
As for target markets the following showed high profitability: the Horizontal applications and No specific target market (Other for short), see Figure 74. On the other hand, the Banking cluster was on average highly unprofitable.



**Figure 74. Profitability (profit per revenue) by Target Market**

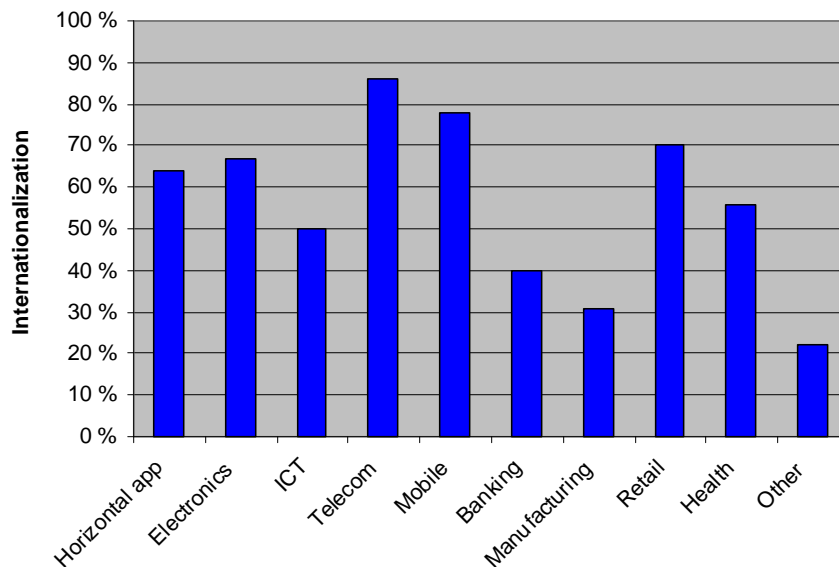
## 7.5 INTERNATIONALIZATION

The level of internationalization was measured by what percentage of the cluster's companies received revenue from abroad, i.e. had international business. From Figure 75. we can see that the Finnish companies have increased their internationalization rate as in six categories over 60% of the companies had international business.



**Figure 75. Percentage of Companies with International Business by Software Type**

For the target markets, the Telecom and Mobile sectors were the most internationalized followed by Retail, Electronics, and Horizontal applications (Figure 76).



**Figure 76. Percentage of Companies with International Business by Target Market**

## 7.6 CONCLUSIONS FROM THE CLUSTER STUDY

The software industry cluster research brings out many differences between the categories. Unfortunately many of these clusters have only limited number of companies

in them, which limits the generalizability of the findings. Still this research brings out some new issues and questions. On the software type side, the Cross-industry application software was the most popular and also had the highest revenue. In case of the target markets, the No specific target market (Other) was by far the most popular followed by the ICT and Manufacturing clusters. When looking at the revenue, the Other category is very large. There are many large IT companies in it that have high revenues. On the other hand, revenue per employee figures of the Electronics, Mobile, Retail, and Other are high compared to the industry average of 109 000 euros.

From the figures presented in this section we can see that the cluster research provides some interesting results. For example, it is possible to e.g. identify highly profitable clusters and highly internationalized clusters. This information allows us e.g. to pick out more promising areas for further study.

## 8 OFFERING SOFTWARE AS A SERVICE

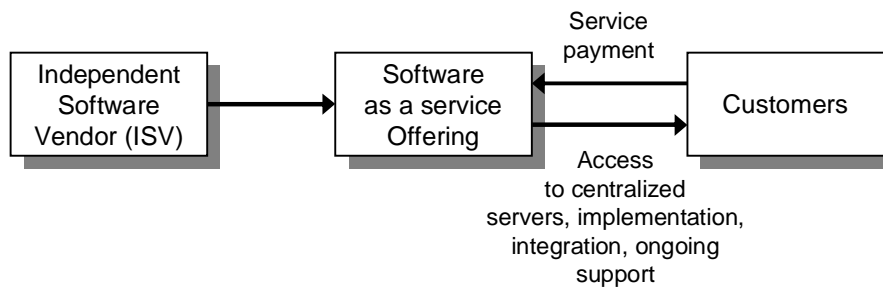
### 8.1 Service-Oriented Perspective

For the past few years Software as a Service (SaaS) has been a growing trend in the international markets. Among the strongest proponents of the SaaS concept have been many of the largest software companies such as Google, Microsoft, Oracle, and SAP. Now also the Finnish software companies have noticed the growth potential of offering services to their customers. This can be seen e.g. from the growth figures as the number of software companies offering SaaS services has grown: in 2005, 54% of the respondents offered their software as a service compared to 37% in 2004 and 38% in 2003.

To put it briefly, SaaS is a networked e-commerce business model, i.e. SaaS is all about selling and buying (online) services (Lassila 2006). SaaS services can also be described as being the next generation of the Application Service Provider (ASP) services. However, instead of the limited outsourcing perspective the SaaS model should be understood as a one-to-many e-commerce arrangement dealing with digital products (Sääksjärvi et al. 2005). The most important differences between the SaaS and the “old” ASP model are that SaaS applies an e-commerce point-of-view instead of the ASP model's outsourcing view, the SaaS model emphasizes the capability and need to (mass) customize customer solutions, and SaaS is a coherent business model concerned with value creation and value appropriation whereas ASP is more of a technical definition. The characteristics of SaaS are the following (Lassila 2006):

- For the customer SaaS enables online access to an application over the network (availability anywhere, anytime)
- SaaS application usage is both provided and consumed simultaneously (hence the term "service")
- The customer gains only the access to use the application(s), the ownership of the software is not transferred to the customer (signifying the change of emphasis from owning to using the application)
- The SaaS solution is centrally managed and offered as one-to-many service to the customers (thus providing the benefits of economies of scale)
- The SaaS provider alone is responsible to the customer for the service, even if other stakeholders are involved in creating the service (one party is responsible for the whole service)

Here we define SaaS as follows: “Software as a Service is time and location independent online access to a remotely managed server application, that permits concurrent utilization of the same application installation by a large number of independent users (customers), offers an attractive payment logic compared to the customer value received, and makes a continuous flow of new and innovative software possible” (Sääksjärvi et al. 2005). Figure 77. presents a simplified example of the SaaS business model.



**Figure 77. Example of the SaaS Business Model**

However, the differences between the product and service business are considerable and the change of focus in a firm's business model from one to the other is not easy to accomplish (Hoch et al. 1999, Sääksjärvi et al. 2005, Lassila 2006). For example, the scale economies, which are associated with product business (and especially with information goods), are not easily achieved in the service business. Moreover, the economies of scope (e.g. applying domain area how-to knowledge) are harder to take advantage of in the product-based business as they usually e.g. increase the complexity of the software development (Nambisan 2001). The SaaS model tries to bridge the gap between the software product and service business as it changes the focus from owning the software to using the software to enhance and/or enable the customers' own businesses. The model also examines the service aspect of the software business and ways for the software companies to successfully offer software as a service to their customers.

Some of the proposed SaaS benefits for the customers include that SaaS enables them to focus on their core competencies, offers easier access to technical expertise, frequent and free upgrades, and economic access to valuable software applications at anytime and from anyplace. Potential risks for the customers include e.g. less possibilities of tailoring and integration options, increased risk of losing business-critical data, and online service performance related problems. For the SaaS providers, the proposed benefits of offering SaaS services includes e.g. scale economies in both production and distribution costs, expansion of the potential customer base, more predictable cash flows, and shortened sales cycle. Potential risks include e.g. the difficulty of managing the partner network, initial reduction in revenues when moving to the SaaS model (collecting service fees instead of license and consultation fees), possible performance and scalability problems depending on the technical solution, and high initial investments when starting the SaaS business, see Table 28. For a more thorough discussion of these benefits and risks see e.g. Sääksjärvi et al. 2005, Lassila 2006.

From the software firm's point-of-view, the SaaS concept contains many challenges, e.g. how a software product-based company can expand its (existing) business with the SaaS model with minimum disruption to current sales and distribution channels? Some other issues concerning the Software as a Service model are e.g. the SaaS model's requirement for the companies to be able to transform their product business into online service business and the difficulty of managing the necessary partner network in order to create SaaS service offerings. In summary, the major challenges of the SaaS model from the software product companies' perspective are: 1) how to achieve returns from scale, 2) while holding on to scope economies, and 3) how to benefit from partners' (whether they are users or suppliers) complementary skills and assets, and 4) at the same time fulfil customers' requirements of customization (Lassila 2006). The following section provides some statistics about how the Finnish software companies that offer SaaS services have

performed compared to the other Finnish firms that do not (yet) offer their software as a service.

**Table 28. Value and Risk Sources of the SaaS Model from the Provider's Perspective (adapted from Sääksjärvi et al. 2005)**

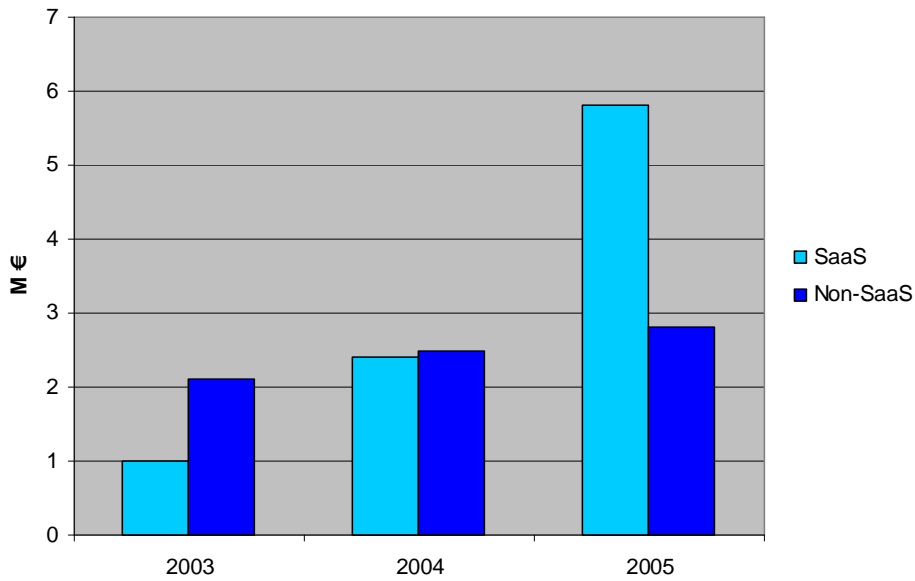
Benefits for the SaaS provider	Risks for the SaaS provider
1. SaaS enables economies of scale in production and distribution (one-to many offering)	1. It is difficult to manage the complex network of suppliers, which is required for integrating the product and service businesses
2. The cash flows from SaaS are more predictable than in traditional software sales (recurring revenue)	2. Moving to using the SaaS model initially reduces the turnover as the revenue comes from service fees instead of license sales
3. SaaS expands the potential customer base	3. Performance and scalability issues are to be expected, depending on the technical solution used
4. The sales cycle of SaaS services is shorter than that of traditional software sales	4. High initial investment in starting the SaaS business (building and maintaining the required IT infrastructure and costs of buying 3rd party software)
5. SaaS lowers version management and maintenance costs	5. The customisation of the SaaS applications typically incurs extra costs
6. By successfully integrating products and services into a SaaS offering, provider creates barriers to entry for competitors	6. Requires commitment to a more frequent release/upgrade cycle

## 8.2 SaaS Development Statistics

In this year's and in the previous years' software industry surveys, the companies were asked whether they offer their software as a service with a 7-point Likert scale where selecting 1 means "totally disagree" and 7 "totally agree". In this section we have analyzed the data collected in the years 2003, 2004, and 2005 in order to see how the respondent companies, both companies that offer SaaS services (those who answered 5 or more) and those who do not (those who answered 3 or less) have fared in comparison to one another.

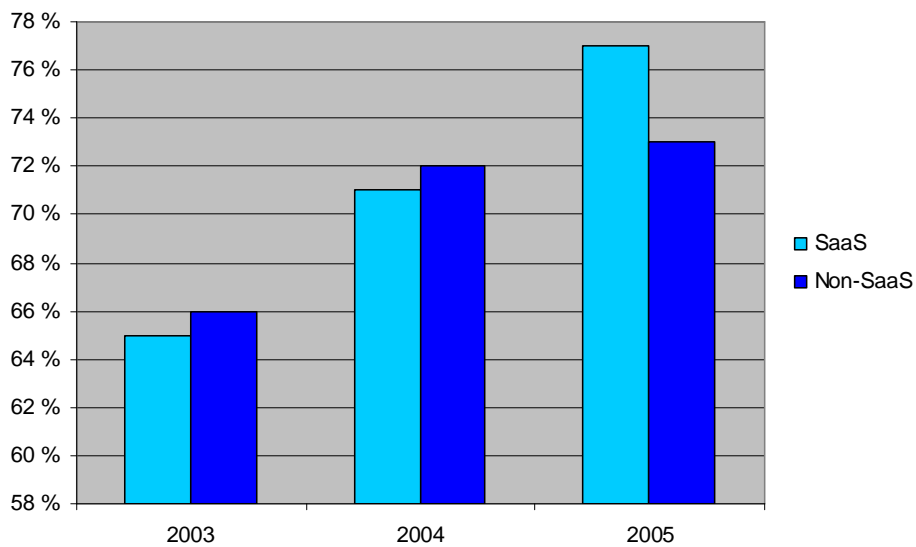
### 8.2.1 Revenue

Based on the analysis of the revenue figures, SaaS companies seem to be a little more successful than the companies that do not offer SaaS services (which we refer to as "non-SaaS" companies). Starting from "lower levels" of revenue in 2003, the SaaS companies on average have managed to grow more than their non-SaaS counterparts as can be seen from Figure 78.



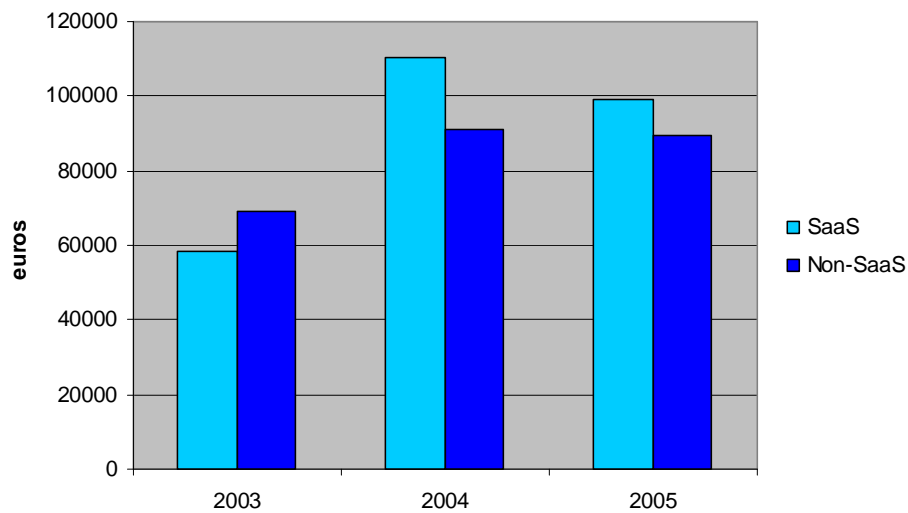
**Figure 78. Average Revenue from Software Product Business**

During the three year period, the SaaS companies have managed to increase the ratio of their software product based business' share of the overall revenue (see Figure 78.) and seem to be now starting to reap the scalability related benefits of their business model. However, we have to keep in mind that the year 2003 was a turning point for the Finnish software industry because the overall revenues of the industry actually decreased in that year and then started to grow in the following years. As Cusumano (2003) has pointed out, the software product companies have started to take notice of the inherent benefits of the service-related business such as recurring revenue and long term customer relationships, which can be very beneficial during economic slumps.



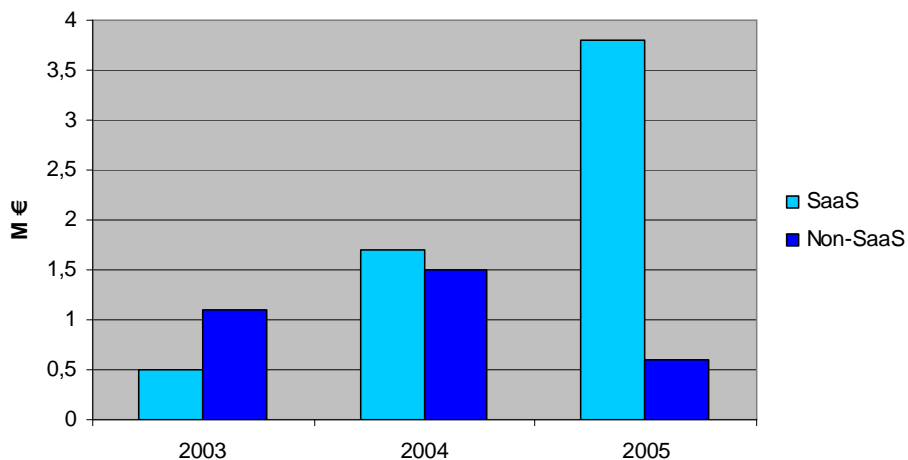
**Figure 79. Software Product Business's Share of the Overall Revenue**

Unfortunately, the Finnish software companies' revenue per employee figures are low compared to the most successful countries in the world such as USA, Ireland, and Israel as can be seen from Figure 80. However, the Finnish companies have improved the average revenue per employee figures over the last few years although this year the companies seem to have taken a step backwards in this respect as these figures decreased a little. From Figure 80, we can also see that SaaS companies' numbers were a little lower than non-SaaS companies in 2003 but in 2004 and 2005 they bypassed the non-SaaS companies' numbers.



**Figure 80. Average Software Business Revenue per Software Employee**

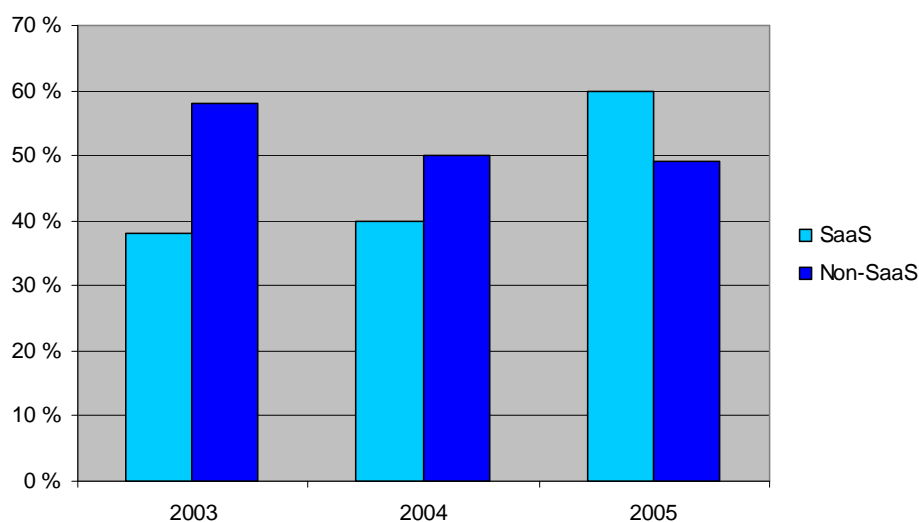
When we take a look at the average domestic revenue figures, the SaaS companies appear to be more successful in increasing their sales especially, see Figure 81. Possibly because SaaS services seem to be more appealing to the customers who are increasingly demanding solutions that address their problems in an economic and flexible way plus offer cost transparency, which are all things that the buyers seem to appreciate more and more these days.



**Figure 81. Average Domestic Software Business Revenue**

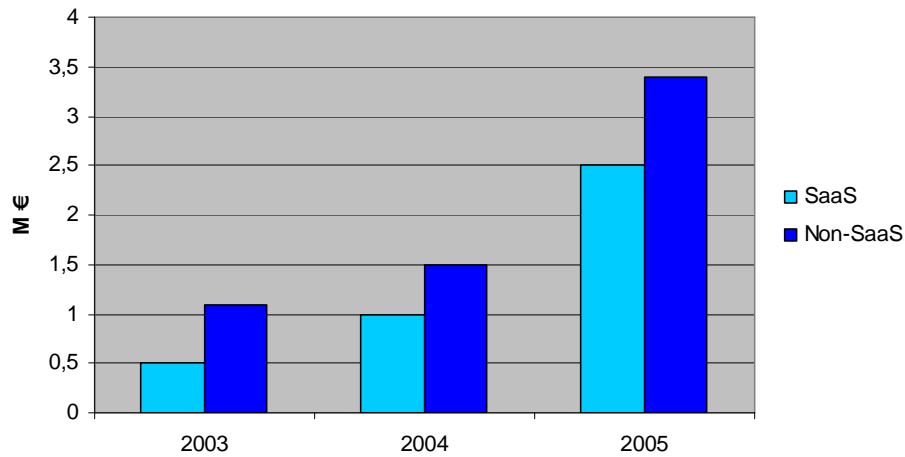
## 8.2.2 Internationalization

When we take a look at how the SaaS and non-SaaS companies are faring in conducting international business, the non-SaaS companies seem to be doing a little better. Despite that SaaS companies have increased their internationalization rate over the years as more and more SaaS companies receive revenues from abroad, as can be seen from Figure 82, their average software business related revenue from abroad is still lower than non-SaaS companies foreign revenues (see Figure 83).



**Figure 82. Percentage of the Companies Conducting International Business**

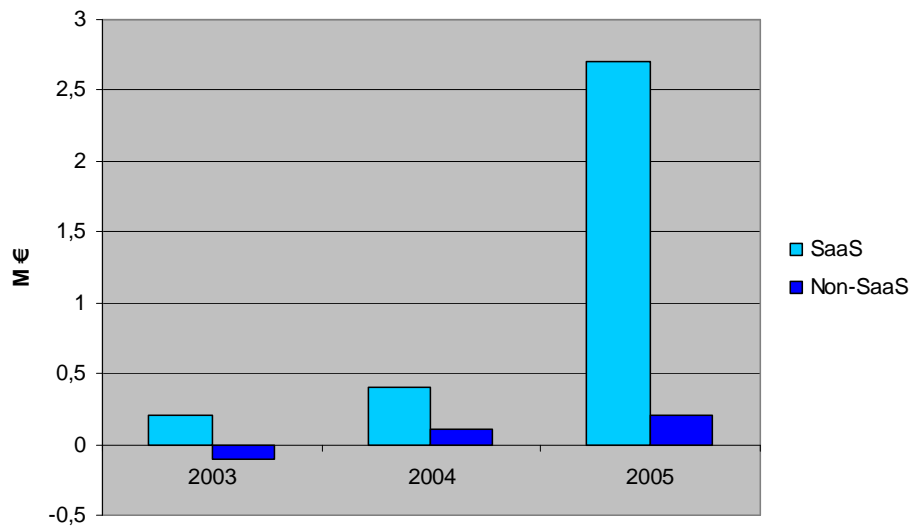
One explanation for this could be that since the number of companies offering SaaS services has grown, some of them are (still) in the early phases of entering the foreign markets and are just starting to offer their services to the foreign customers. This takes more time at least in the beginning and is more difficult than for those non-SaaS companies who have already established a “foothold” with their software products and are now concentrating on expanding their businesses. However, the SaaS companies’ revenue figures are growing faster than the non-SaaS firms and it remains to be seen whether they will reach higher levels than that of non-SaaS companies in 2006.



**Figure 83. Average Software Business Revenue from Abroad**

### 8.2.3 Profitability

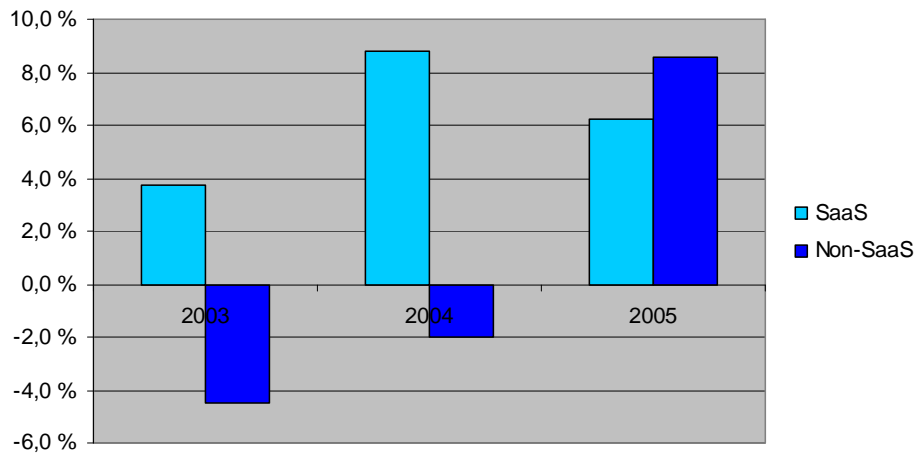
In terms of profits, the SaaS companies have fared a lot better than their non-SaaS counterparts in the three year period since they have, on average, had higher profit figures than non-SaaS companies. This result is probably related to the fact that the SaaS companies have higher revenues (see Figure 78.) than the non-SaaS companies and those are just reflected here in these average profit figures (Figure 84.).



**Figure 84. Average Profit**

However, when we take a closer look at the average profitability figures (see Figure 85), the profitability of the SaaS companies is higher than that of non-SaaS-companies, which are actually on average unprofitable in 2003 and 2004, until 2005 when the non-SaaS companies' profitability is 8.6% compared to the SaaS companies' 6.2%. One reason for

this could be the higher R&D investments of the SaaS companies in 2005, which were on average 36.3% of the total revenue compared to non-SaaS companies' 30.6%.



**Figure 85. Average Profitability (profit/revenue)**

In conclusion, the data from the three year period of 2003 to 2005 seems to indicate that the adoption of the Software as a Service business model has helped the SaaS companies as they appear to be doing a little better than the non-SaaS companies. In addition, in comparison to this year's industry survey's overall results, the SaaS companies have fared better than the industry on average judging by the findings presented in this chapter.

## 9 CONCLUSIONS

### 9.1 The Current State of the Finnish Software Product Industry

In 2005, the Finnish software product industry's revenue grew to 1.3 billion euros (1.19 in 2004) representing 9.2% (21%) growth from 2004. As a very positive sign, international business grew by 24.2% (7.1%) amounting to 504 (406) million euros. Growth was evident especially amongst the large companies. Furthermore, companies' profitability increased from the previous year's 2.2% to 2.8%. In 2006, expectations for the future are positive as the companies are predicting that their revenues continue to grow for the third consecutive year. Unfortunately, the amount of employees in the software product business stayed on the same level as last year. The main points of the survey are summarized in Table 29.

**Table 29. Current State of the Software Product Industry**

<b>Current state of the software product industry in Finland</b>
<ul style="list-style-type: none"><li>▪ <b>Software product revenue continued to increase</b><ul style="list-style-type: none"><li>○ The software product revenue grew 9.2% (21%) reaching 1.3 billion euros in 2005 (1.19 billion euros in 2004)</li><li>○ International business increased by 24.2% (7.1%) amounting to 504 million euros (406 million euros in 2004)</li><li>○ Domestic revenue grew by 1.4% (29.7%) and was 798 million euros (786 M €)</li></ul></li><li>▪ <b>The amount of personnel stayed on last year's level</b><ul style="list-style-type: none"><li>○ The industry employs ca. 12 340 software professionals (12 400 in 2004)</li><li>○ Companies are planning to recruit more personnel in 2006</li></ul></li><li>▪ <b>Profitability has improved from last year's 2.2% to 2.8%</b><ul style="list-style-type: none"><li>○ 24% of the companies had profitability over 15% (27% in 2004)</li><li>○ 15% of the responding companies were unprofitable in 2005 (14% in 2004)</li></ul></li><li>▪ <b>Internationalization rate has increased</b><ul style="list-style-type: none"><li>○ Over half of the companies (59%, 46% in 2004) have international operations but most of them receive only a small share of their revenues from abroad</li></ul></li><li>▪ <b>Financing situation is still very challenging for young firms and for companies seeking internalization</b><ul style="list-style-type: none"><li>○ Significant number of companies (31%) seeking external financing had to change their business plans due to problems with the availability of financing (31% in 2004)</li><li>○ Young firms still find the availability of risk finance as a significant barrier for the emergence of new software product companies (67% of less than 2 year old firms, 64% in 2004)</li></ul></li></ul>

In 2005, we observed many signs of positive development in the Finnish software product industry. However, we also noticed that the Finnish software product industry still continues to struggle with the same main challenges as in the previous years. Despite the fact that there are already some fully internationalized and mature companies, majority of the companies are still rather immature. This can be seen in the moderate revenue figures, in the low revenue per employee ratio, and in the low degree of productization. Raising the degree of productization continues to be one of the most important issues for the software product companies. At difficult economic times, this is especially challenging as companies have to find a balance between the long-term productization aims and short-term need for cash, which is often acquired by doing customer-specific projects. In order to find a balance, good and clear vision and strategy for the products and business is needed in addition to suitable and flexible software production processes. Moreover, according to this survey's findings, many of the

companies are still in a relatively early stage of their product development and only low share of the majority of the internationalized companies' revenues come from abroad. However, in 2005 software companies placed productization, product development, and international sales and marketing as their main areas for improvement that they focus on.

The current capital market situation is particularly limiting the operational possibilities for young companies that are developing their first software product. Unfortunately, software products are difficult to produce without raising external finance, which enables the companies to focus on developing the product instead of concentrating on doing customer specific projects. Changes in the companies' business plans due to problems with the availability of financing emphasize the important role of the venture capitalists and the public capital. Table 30. presents the background information of the companies that responded to the survey.

**Table 30. Background Information of the Respondents**

<b>Background information of the companies who responded to the survey</b>	
▪	<b>Location: industry is geographically very concentrated</b>
○	86% of the companies are located in the proximity of technology centers and universities
○	52% of all the companies are located in the capital region, 72% of the larger companies (software product business revenue more than 3 million euros)
▪	<b>Age of the companies</b>
○	Average age is 13 years (median 11 years) and average age of the software product business is 10 years (median 7 years)
▪	<b>Size: most of the companies are small or mid-size</b>
○	30% of the companies generated less than 200 000 € on software product business in 2005 (31% in 2004)
○	Average revenue per employee was 109 000 euros (111 000 € in 2004)
○	32% of the companies employed 5 people or less (31% in 2004)
▪	<b>Financing: external financing is sought in order to facilitate growth</b>
○	69% of the companies are owned by founders and their family members (73% in 2004)
○	Share of VC ownership 6.1% (3.7% in 2004) and of foreign ownership 6.1% (4.2% in 2004) are low
○	36% of firms intended to seek external financing in 2006-2007 (36% in 2004)

## 9.2 Implications of the Findings and Points for Consideration

The study brought up some issues that we think need further discussion. These issues included financing, raising the degree of productization and mastering product development, networking, and internationalization. In the following sections we discuss each of these issues based on the findings of this year's survey.

### 9.2.1 Financing and Ownership

Finnish software product companies have very conservative financial structures with little debt or outside equity especially compared e.g. to the Finnish biotech companies. While good for survival, such conservative capital structures are not optimal for rapid growth and internationalization, which are important for the long-term viability and overall growth of the industry. Overcoming the barriers for growth and internationalization success is crucial for tapping the growth and job creation potential of the industry.

Problems in the availability of external finance are very serious for the growth-oriented, young, small, and negative cash-flow companies as these companies would need it the

most. These companies are significantly more pessimistic than the older companies concerning the lack of financing, which they see is preventing the emergence of new software product companies. The current financial environment seems to discourage capable potential entrepreneurs from starting new growth-oriented ventures or existing entrepreneurs from investing in growth. Public policy measures should be targeted to make the environment more rewarding for growth-oriented new ventures and their investors.

Internationalization success is imperative for growth, wealth creation, and successful exits for investors, which are the necessary conditions for them to make risky investments in the software product companies. Foreign investors appear to provide highly valuable internationalization support for their portfolio companies and in doing so complementing the domestic investors. However, the amount of foreign investments and ownership in Finnish software product companies is very small. In addition to adding to the supply of risk capital, attracting more foreign investors into investing in the Finnish software product companies could help the industry also by improving the internationalization success leading to both increasing growth expectations and subsequently increasing supply and demand for domestic risk capital. The participation of foreign investors in creating globally successful Finnish software product companies should be encouraged.

### **9.2.2 Productization and Product Development**

As this study shows, the majority of the companies still suffer from an inadequate productization level, a problem that is unfortunately typical for the whole European software industry. Raising the level of productization is a complex and challenging issue that influences most aspects of a software product company, from business models to internal processes and to technologies and architectures used. However, it was interesting to note that companies have now placed productization and product development as their most important improvement areas.

In addition, finding the appropriate delivery channels, ways of marketing the product and positioning the product to the markets are some of the areas that have been neglected. The key questions the software product companies should be concentrating on are how to enable and/or enhance their customers' business. Furthermore, in order to help companies to understand the time and effort needed in productization, e.g. industry statistics, productization, and internationalization workshops as well as models of how to manage the productization issues are needed. For example, by collecting information of the industry best practices and distributing the findings to the other companies (especially to the young and small) in Finland can also help them to manage their products and R&D better in order to grow their software product business. Finally, noteworthy was also the finding that the usage of subcontracting is growing amongst software product companies: especially the usage of domestic subcontractors has risen. Table 31. contains the most important issues related to product development and productization.

**Table 31. Product Development and Productization**

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<b>Product development and improvement issues</b>
<ul style="list-style-type: none"><li>▪ <b>R&amp;D investments of young firms increased for the third consecutive year</b><ul style="list-style-type: none"><li>○ Companies with age of software product business 1-2 years invested in R&amp;D on average 40% of turnover (30% in 2004)</li><li>○ Companies with age of software product business 3-10 years invested in R&amp;D on average 31% of turnover (15% in 2003)</li><li>○ Average R&amp;D investment of the companies is 31% of the overall revenue</li></ul></li><li>▪ <b>The most important R&amp;D focus areas for both small and large companies were the development of value-added services and raising of the degree of productization</b><ul style="list-style-type: none"><li>○ 40% of the companies are investing in the development of new products (33% in 2004)</li></ul></li><li>▪ <b>The usage of subcontracting is growing</b><ul style="list-style-type: none"><li>○ 35% of responding companies subcontracted significant amounts of R&amp;D from domestic market (25% in 2004)</li><li>○ 16% of responding companies subcontracted significant amounts of R&amp;D from abroad (12% in 2004)</li></ul></li><li>▪ <b>Improvement areas</b><ul style="list-style-type: none"><li>○ The most important improvement areas were productization and product development, which have risen from last year's fourth and fifth place</li><li>○ Focus of the small companies was in productization and product development</li><li>○ Focus of the large companies was in international sales and marketing, productization and improvement of personnel's skills and knowledge</li></ul></li></ul>

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### 9.2.3 International Operations

This year, 59% of the Finnish software product firms reported receiving revenues from abroad, which is a significant change to last year's 46%. However, on average only a low share of their revenues came from foreign markets. Moreover, when looking at the distribution of foreign revenue shares, there is still a significant gap between initial sales abroad and full internationalization.

Internationalization correlates with high growth potential. Internationalized firms reported higher revenue and growth expectations compared to their counterparts limited by the small domestic market. Furthermore, internationally operating firms were bigger both in terms of revenue and number of employees as well as profits than their domestically operating siblings. However, internationalization is also highly risky. While domestic firms reported relatively balanced profitability, internationally operating ones may be less profitable as domestically operating firms which yet again tells about the risky nature of internationalization. Our analyses suggest that early internationalization can be very rewarding in terms of growth, but there is also high risk associated with it.

In general, firms in the Finnish software product industry find their products and services suitable for the international markets and foreign markets attractive. The problems preventing most of them from internationalization are the costs and risks associated with international expansion and the availability of financing for internationalization. However, the software product business is volume-based and international expansion is a necessary step for companies that are growth-oriented. Necessity of internationalization accelerated by industry dynamics and saturation of the Finnish market, combined with the risk associated with it indicates how crucial this step is for further viability of business.

### 9.3 Concluding Remarks

Three large software exporting countries, India, Israel, and Ireland are examples of very successful software exporters. One thing all these countries have in common is that there has been a national strategy to promote their software industries in general and software exports in particular. All of these countries have actively promoted and facilitated the internationalization of software product companies. The existence of a national strategy for software exports can, therefore, be recognized as an important part of software export success (Heeks and Nicholson 2004). In a comparison to other software exporting countries that have not succeeded that well, e.g. to Russia, China, and the Philippines, revealed that either these countries had no national strategy at all or it had no focus.

The detail of strategies for achieving the visions set varies. Common strategies have been that governments have acted to stimulate the supply of working and venture capital to software firms. All these three countries have used a raft of tax breaks, marketing subsidies, grants, loans, and a combination of both liberalization and promotional intervention. Also, all three countries have invested in software-related research and development directly via government and indirectly via tax breaks for private sector R&D.

Finland is a country of limited resources. Therefore, it would be vital for the industry to create a focused strategy to support activities of software product companies. Based on the results of this survey, we identified the following crucial development areas:

- Increasing the internationalization rate of their business is a challenge for most of the companies
  - Further improvement of the knowledge and skills related to internationalization is needed especially in case of the SMEs
- Improvement of the knowledge and skills needed in software productization and product management
- The support efforts should be concentrated on the most promising clusters in order to develop internationally capable and competitive companies
  - The strengthening and development of networks and supporting services especially in case of small companies is important

Productization, risk capital, and internationalization are three interrelated, critically important issues that should be simultaneously improved in order to enable growth and creation of wealth and employment because:

- Without sufficient availability of risk capital, it is hard for software product companies to focus on productization if their operations need to be financed by customer projects
- Without success in internationalization, which is imperative for growth, wealth creation, and successful exits for investors, private investors will not have incentives to invest risk capital in software companies
- Without sufficient level of productization, it is hard to enter and grow in the global markets

The Finnish public and private sector should work closely together with their international counterparts in order to help to remove or lower the barriers for internationalization of the Finnish software product companies.

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# APPENDIX I: RESEARCH METHODOLOGY

## Sample Selection and Data Collection

Defining the target group was a challenging task because software product business is not classified as a line of business or industry in Finland. According to the estimates of different industry and research institutions there were approximately 1 100 software product companies in Finland at the end of 2005 (1 100 in 2004). We used following approaches in order to reach the companies in our target group.

In the earlier surveys (until the year 2001), the target group was defined by a database, which contained software companies names and information gathered by the Centre of Expertise for Software Product Business. However, since it is uncertain how well this database represented the Finnish software product business companies in Finland, we opted for another approach. In the year 2001, we used Statistics Finland (Tilastokeskus) lists to gather addresses of Finnish software companies. This approach resulted in mailing the questionnaire to 4 452 companies, because Statistics Finland has the industry codes on three-digit scale i.e. 72 200 software developing, manufacturing and consulting.

From the year 2003 onwards, we have used a company called Mailer for the selection of the appropriate industry codes, which assumedly contained software product companies. We used Mailer instead of e.g. Statistics Finland, because Mailer provided industry codes on five-digit scale instead of the three-digit scale. The selected industry codes were checked and approved by experts, see Table 1. below.

**Table 1. Industry Codes Selected for the Mailing List**

Industry code	Explanation
642021	Data transferring service companies
642022	Tele communication companies
64203	Software transfer service companies
72100	Computer hardware consulting companies
722001	Computer software companies
722002	Other computer service companies
722003	Computer consulting companies
723001	Computer service centurms
723002	Computer recording companies
724001	Database companies
724003	Network service companies

This year we combined the contact addresses gathered by the Centre of Expertise for Software Product Business with the addresses received from Itella's company classification list. We mailed the questionnaire to all the companies that were listed under the industry codes presented in Table 1. above. However, since software product companies can be found under several industry classification codes (e.g. software design, databases, telecommunication etc.) we went through the company lists and in order to reduce "double-mailings" we removed listings where the same company had two or more addresses. All in all, we mailed the invitation to participate in the survey to 1 863 (2 298 in 2005) companies. In addition to this, we sent twice remainders via e-mail to the companies' contact persons, which were mainly CEOs.

## Conducting the Survey

The implementation of this survey was divided into four phases: planning the survey, gathering the data, analysis of the data, and reporting the results.

## **Planning the Survey**

Planning of the survey was done in December 2005-March 2006. The questionnaire used in the survey was designed in January-March 2006. Several software product business specialists from the industry and academia were involved in the process of creating and finalizing the questionnaire. The questionnaire was tested in March 2006.

## **Gathering the Data**

Data collection was done in April-June 2006. The invitation to participate in the web-survey was mailed in April and a follow-up e-mails were sent in May and June 2006. Companies which had incompleting survey questionnaires were also contacted by phone in order to increase the response rate. Unfortunately, most of the large enterprises had not answered the survey because of the legislation of public limited companies. Extra effort was made in order to gather at least the numerical data of the large companies; they were contacted by phone and their annual reports were also studied. Information of 21 companies was gathered in other ways, mostly by phone but also using the Internet and companies' annual reports.

All in all, we received responses from 184 (220 in 2005) software product companies i.e. from ca. 17% (20%) of the companies in the industry. We estimate that the responding companies generated over 68% of the whole industry's revenues in 2005 and over 80% of the revenues received from international operations.

## **Analysis of the Data**

The analysis of the data was done in August-September 2006. SPSS 14.0 software was used in the statistical analysis. We performed statistical analysis by collecting and reviewing descriptive information, i.e. sums, averages, distributions, and correlations etc., on the collected variables. For example, we used correlations to describe the dependencies of the variables. We also performed some exploratory factoring, cluster analysis as well as regression analysis among other statistical analysis tools.

## **Reporting the Results**

Preliminary results were presented to the press on the 22nd of August and this final report was written in July-September 2006.

## **Questionnaire**

The web-questionnaire contained 50 questions of which most had several sub items. The questionnaire consisted of background questions (respondent demographics) and the rest of the questions were divided into 5 sections:

- 1) characteristics of the firm's software product business
- 2) international business
- 3) corporate financing and ownership
- 4) general company information (revenue, personnel and business development)
- 5) corporate strategy, product development, and networking

The first part focused on the main software product and the business related to this product. We asked questions related to the number of customers, the degree of customizing, markets and end-users, as well as the business models used by the companies. The international business section consisted of questions regarding e.g. on the importance of international business, as well as the most important export countries. The amount of personnel in foreign countries, internationalization strategies and distribution channels were also covered. We also asked the companies about their intention to grow their business in domestic or international markets. The ownership and financing section asked on the

ownership distribution of the company. We also asked the intention of the company to acquire funding in 2006-2007.

In order to get basic statistics on the companies, we asked for information about revenues as well as profits, and product development investments. We also asked about the allocation of personnel and possible challenges in recruiting. In addition, we asked about most and least important areas of development in the business. In the corporate strategy, R&D and networking section, we asked questions about common strategy, importance of the product business, and about the R&D activities. Finally, we asked for information on the respondent, including position, tenure, and share in the company, as well as contact information.

We tested the questionnaire with ten industry experts and five members of the academia before mailing it. We learned that it took ca. 25-35 minutes to fill in the questionnaire. We changed the wordings of several questions, as well as shortened the questionnaire based upon the feedback from the testing.

## **Evaluation of the Results**

### **Reliability of the Study**

The reliability of the received responses was strengthened by several systematic checks that answers are logical and in line with other answers of the company. Because of the relatively large amount of responding companies, it was difficult to verify all of the answers companies have given. Oftentimes companies want to give more positive views of their situation than the actual condition is. Also, companies often tend to have very optimistic views on future that may not always be realistic. In order to overcome these problems and the possible bias in the data, we gathered the TOP-50 (ranked in the order of their revenue) companies' financial figures from e.g. their annual reports. In addition, in order to assist in the interpretation of the data we have presented the data and findings to industry experts in order to understand the phenomena better and validate the conclusions. These experts are consultants and analysts and members of the academia with many years of experience in the study of the ICT field.

### **Validity of the Study**

Validity relates to how well questions asked measure the actual phenomenon and not something else. Questions that were not understood homogeneously in the testing phase of the questionnaire were changed or removed. Also, we obtained secondary assessments of knowledge intensity from industry experts in order to reduce the chance of making systematic errors. Overall, we believe that the validity of the study is good based on the experience of conducting this survey for the ninth time. However, it seems that in the survey we did not reach small companies very well for some reason. This can bias the results, since companies that are not able to grow their business have not responded the survey and, therefore, the results may be too optimistic (or positive) in general.

### **Response Rate**

Overall, we received 233 (285 in 2004) responses, of which 184 (220) did software product business in 2005. According to professional estimates, there were about 1 100 Finnish software product companies at the end of 2005. Therefore we reached ca. 17% of the industry as a whole. However, this sample is not a direct cut from the whole industry: the amount of large companies is overrepresented because of the more accurate searching and better response rate of the larger companies. In addition, we did not reach the smallest companies as well as expected.

### **Suggestions for Further Research**

The findings and limitations of this research suggest several areas where further research would be interesting and beneficial. First, this study is based on quantitative survey, where a typical respondent is at high executive position. This naturally narrows the areas covered in the survey, e.g. software

engineering and product development processes were hardly covered in this study. Also, the method of using quantitative survey does not enable to gain deeper understanding of the actual processes and drivers in the companies and with case studies this knowledge could be dramatically improved. Moreover, this kind of data could be compared to other software product industry surveys conducted abroad and further analysis of the current state of the Finnish industry could be made. The Software Business Laboratory of the Helsinki University of Technology is currently working actively with universities in different European countries in order to conduct this survey also abroad.

The original idea for the need of the software product industry research came in the mid-1990s and one of the main reasons behind this survey was to prove that the software product industry is an actual industry with national significance or at least has the potential to become one. A question could be stated, whether the goals of this kind of survey should be refocused in the near future, e.g. should software related services be included in this survey in the future.

## **APPENDIX II: RESEARCH PROJECTS RELATED TO THE FINNISH SOFTWARE PRODUCT INDUSTRY AND OTHER INTERNET LINKS**

### **Research projects**

- The Annual Finnish Software Industry Survey (OSKARI)  
<http://www.sbl.tkk.fi/oskari/>
- Capabilities, Processes, and Support Mechanisms for Creating Successful Global New Ventures (CGS)  
<http://www.tuta.hut.fi/units/Isib/research/cgs/cgs.php>
- Freeway to Internationally Competitive Software Product Business (FRISBEE)  
<http://www.sbl.tkk.fi/frisbee/>
- Capabilities and Infrastructure of the Software Product Industry (CAPISTUS)  
<http://www.sbl.tkk.fi/capistus/>
- Software Business Foundations (SBF)  
<http://www.sbl.tkk.fi/foundations/>

### **Other Internet links**

- Finnish Software Business Cluster  
<http://www.swbusiness.fi/>
- Federation of The Finnish Information Industries  
<http://www.tietoalat.fi>
- Finnish Software Entrepreneurs Association  
<http://www.ohjelmistoyrittajat.fi/>
- Software Business Laboratory (SBL)  
<http://www.sbl.tkk.fi/>
- National Technology Agency (Tekes)  
<http://www.tekes.fi/>
- Statistics Finland  
<http://www.stat.fi/>
- BIT Research Centre  
<http://www.bit.hut.fi/>

## APPENDIX III: FINNISH SOFTWARE PRODUCT INDUSTRY STATISTICS

	2005	2004	2003	2002	2001
Revenue, overall (M €) <sup>1</sup>	1 302	1 192	985	1 011	892
Revenue, domestic (M €) <sup>1</sup>	797	786	606	611	484
Revenue, international (M €) <sup>1</sup>	504	406	379	400	408
Avg. share of SW product revenue	68%	58%	54%		
Number of personnel <sup>1</sup>	12 340	12 500	12 000	9 950	10 000
Avg. revenue per employee	109 000	111 000	113 000	107 000	105 000
Avg. profitability	2.8%	2.2%	0%	-2%	
Profitability over 15%	24%	27%	24%	15%	
Unprofitable	15%	14%	20%	25%	
Ratio of investment per revenue	31%	27%	31%		
Companies with intl. operations	59%	46%	50%	46%	37%
% of revenue from abroad [0;25]	54%	57%	63%		
% of revenue from abroad [75;100]	19%	15%	18%		
Companies age, years (avg/med)	13 / 11	11 / 10	11 / 10	12 / 10	
Number of years in SW business (avg/med)	10 / 7	9.2 / 8.5	9.5 / 7.5		
Number of respondents	184	220	196	223	278

<sup>1</sup> These figures represent the whole industry i.e. they have been extrapolated to the industry level



HELSINKI UNIVERSITY OF TECHNOLOGY  
Software Business Laboratory  
Institute of Strategy and International Business



## Finnish Software Industry Survey 2006

This report contains the findings of the 9th annual software industry survey. The survey's objective is to provide information about the current situation of the Finnish software product companies. This survey focuses on the software product companies and their product development and product management, profitability, internationalization, sales, and financing related issues. The main topics of this report are:

- Current state and future prospects
- Characteristics of the business
- International operations
- Financing and ownership
- Business models of software firms
- Clusters in software industry
- Software as a Service
- Conclusions of the findings

New additions in this year's report are the chapter on Software as a Service and the statistic section, which contains the Finnish software industry's development figures 2001–2005.



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