
Experiences from Basic and Applied Research at Domestic and Foreign Organisations in Japan

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Experience from R&D in Japan - overview

- Canon Research Centre 1988-92
 - Canon R&D Headquarters 1992-3
 - University of Electro-Communications 1994-5
 - Asian Technology Information Program 1995-1999
 - Nokia Research Centre, 1999-

 - Shinshu University 1998-9
 - Editorial board of Japan Society of Applied Physics 1997-9
 - British Chamber of Commerce in Japan (BCCJ) - Science and Technology Action Group (STAG) 1994-7
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Basic R&D culture – experiences from Canon

- Corporate research centre
 - Visionary goals
 - Terabit memory, artificial eye, x-ray lithography
 - Large budget for re-educating newly hired engineers and researchers
 - On-the-job training and long learning
 - How to attract the best researchers
 - Taking the role of University research
 - Internationalisation and employing foreign experts
 - Innovation-, and patent-orientation
 - Originality and vertical integration
 - Partnering only in development and production phase
 - Roles of long- and shortterm research
 - Technology transfer knowledge exploiting
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Global R&D management at Canon 1992-93

- G-CDS (Global Canon Development System)
 - Mainly internal management of corporate satellite research groups
 - Managing multi-site global R&D teams, how to create a joint vision & clear responsibility areas & good efficiency
 - Results/experiences
 - Spin-off companies in the UK (Software, Audio)
 - Tapping creativity in other parts of the world
 - Strategic analysis of competing technologies
 - Technology Standardisation
 - R&D Headquarter support
 - Evaluation of research results
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Technology trend intelligence

- Asian Technology Information Program
 - On-the-ground presence a key
 - Aggressive site visiting and reporting
 - Give-and-take approach
 - Collaboration and openness
 - Analysing new products promptly
 - Japanese patents and patent applications disclosure as a wealth of information source
 - Creating technology roadmaps
 - Efficiency use of IT for dissemination
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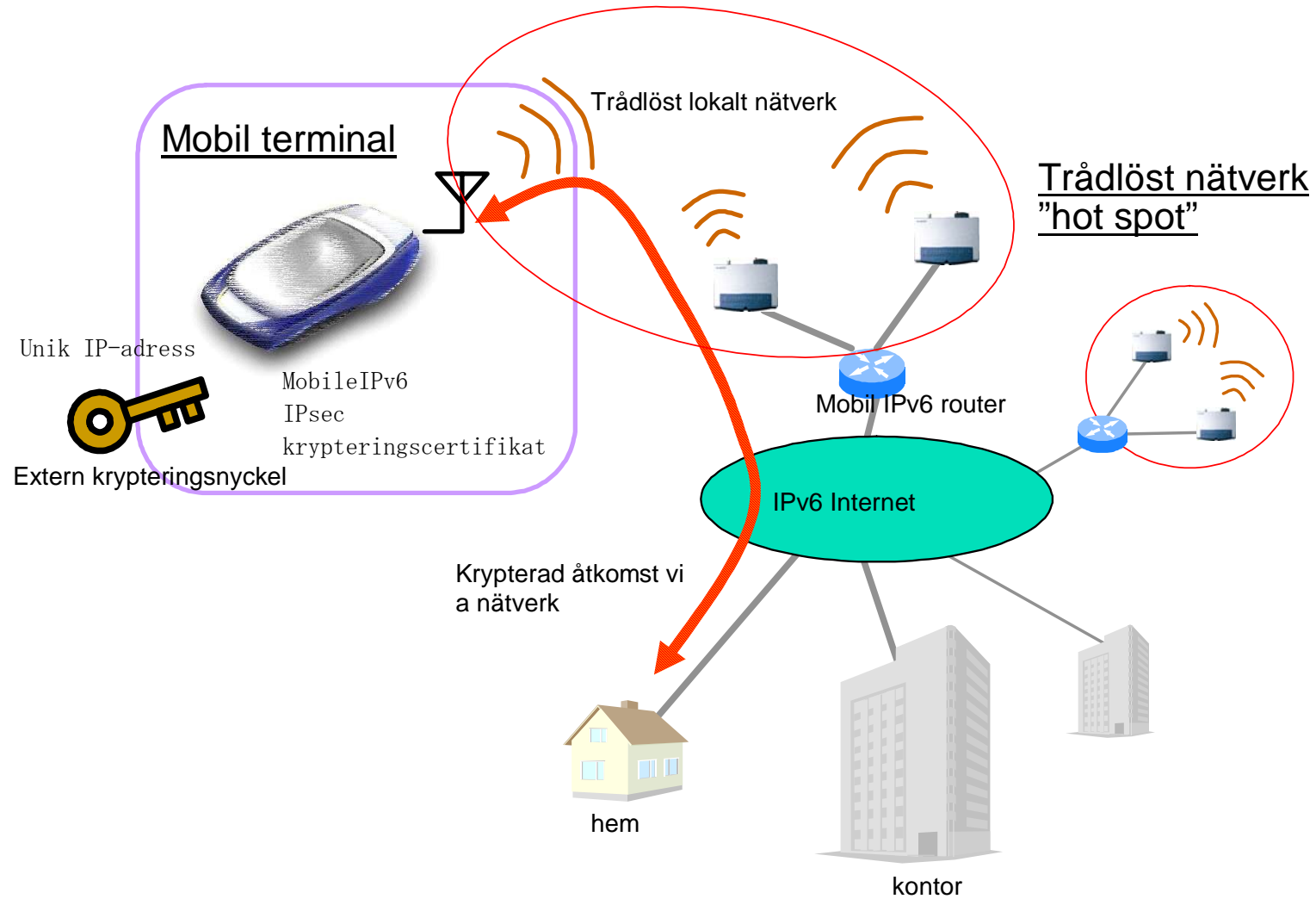
Multinational R&D in a Japanese environment

- Processes inherited from global development system
 - Customer/stakeholder orientation rather than company dedication
 - Collaboration with local universities and partners crucial
 - Japanese-style free-wheeling research rare. Even exploratory activities undergo rigorous project planning and follow up with well defined deadlines
 - Clear paths and processes for technology transfer
 - Overcoming the remote organisation stigma
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Partnering with Japanese R&D institutions

- Virtual organisations
 - Supplier relationship and access to basic R&D
 - Network of R&D subcontractors
 - On-the-ground access to latest technologies
 - Contract research
 - Government-funded R&D
 - University collaboration
 - Cultural differences in subcontracting with Japanese R&D
 - Valuating R&D partnerships
 - Case project: TAO/NTT Communications
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Case: Infrastructure for mobile Internet v6



Terminalprototyp för mobilt internet



- Världens första säkra terminal för mobilt Internet version 6
 - Utvecklad av Nokia-Japan och NTT Communications
 - Trådlöst nätverk med hög överföringshastighet
 - Mobilt internetprotokoll version 6 (IPv6)
 - IPSec säkerhetslösning (extern krypteringsnyckel) för enkel och omedelbar användning
 - Inmatning av säkerhetskod via en unik, personlig säkerhetsbricka
 - Kryptering med användarens unika IP-adress
 - Inbyggd Webbläsare
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Conclusions

- Japanese R&D is characterised by large visions, dedication to continuous learning, long-term approach, and diligence
 - Focusing and R&D efficiency is becoming more important
 - Processes are still local – difficult to attract international experts
 - Branding and reputation keys to successful partnering and hiring
 - Plenty of unknown Japanese expertise to exploit
 - Eagerness to learn but not-invented-here syndrome may still exist
 - Entrepreneurs are growing from university research
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