From **TANDBERG** to cisco About Culture and Innovation

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TANDBERG was the leading provider of telepresence, high-definition video conferencing and mobile video products and services. The story presented here starts with Jan Christian Opsahl and a group of engineers from Televerket (The Norwegian Telecom agency) joining the company around 1990. The first "real" product, a picture telephone for ISDN shipped in 1993. After a slow start, it took only took about a decade for TANDBERG to grow from a small Norwegian startup into an international "billion dollar" company with dual headquarter in Oslo and New York and representation in 90 countries and 1700 employees worldwide. By end of 2009, TANDBERG had nearly 500 engineers doing R&D, mainly in Norway and England, but also some in India and New Zealand.

In April 2010, Cisco aquired TANDBERG for 19 billion NOK (3.4bn USD).

a 35 minute presentation for FPGA Forum Trondheim, February 3, 2011

- History
- Development Principles
- Culture and Innovation
- Epilogue

History



TANDBERG Television Tandberg Storage TANDBERG Display Tandberg Romfart Tandberg Data Tandberg Bilvask & Pizza





Videofonprosjektet

= TANDBERG ca 1990

3 TANDBERG's first proper product (ca 1991)



TANDBERG (1993-1999)

TANDBERG (2000-2008)

TANDBERG (current products)

Codiar

Number of engineers in TANDBERG

Presseklipp 19. April 2010 TANDBERG solgt for 19 mrd NOK til amerikanske Cisco Systems

Revenue ~ \$40bn (~Intel) Market cap ~ \$120bn (~3xNokia) Number of employees: ~ 70k (~2xApple)

Example of a Product

HD output

HD output

input

C90 MAIN BOARD

- I Altera Cyclone III 120 for Audio switching (Nios II softcore 50 MHz)
- 9 TI 6727, audio dsp for echo control, compression, decompression, +++
- PowerPC 8347, main processor, application software, networking, user interface
- 3543 components / 15659 pins
- I6 layers
- 3264 nets

C90 VIDEO BOARD

- I0 Da Vinci DM6467 for video compression/ decompresion(I ARM, I dsp, 2 coprocessors),
- 5 Altera Cyclone III 120 for video scaling & composing(Nios II softcore 50 MHz)
- 15 Gbps video backplane
- 3.8 GByte DDR2 RAM
- 128 mbit x5 SDRAM
- 6097 components
- 30520 pins
- 22 layers
- 6490 nets

C90 AUDIO EXTENSION BOARD

- analog amplification
- high quality AD and DA converters
- pure electronics, no processor/SW
- •717 components
- 6 layers

C90 - from a geek point of view

- 10000+ components
- 44 (6+22+16) layers
- 56 processor cores
- several million lines of code (C and C++)

TANDBERG Codec C90

- Developed at Lysaker
- Started spring 2007

- First HW prototype arrived summer 2008
- Released late 2008 (~20 months of development)
- 2-3 people working with mechanics/design
- 4-5 people working with electronics/hardware
- 5-6 people working with FPGA development
- 40-50 people working with software development
- 4-5 test developers
- I person working with approvals

Our Development Process

As an engineer joining TANDBERG...

at first you might get this impression...

- No documentation
- No routines
- Fooling around
- Not following plans
- Decision are postponed
- Nobody decides
- Little respect for management
- Little modularization
- Lack of precision
- Sloppiness
- People are not working hard

but then you start to notice...

- No documentation
- No routines
- Fooling around
- Not following plans
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- People are not working hard

- People communicate
- Focus on important stuff
- Embedded slack
- Continuous planning
- Effective decisions
- Autonomous organisation
- Respect for the doers
- No integration period
- Spectacular products
- Fast deliveries
- Sustainable pace

... and while you still see the "negative" stuff, you will start to appreciate the "positive" stuff more.

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Observations from TANDBERG

- People communicate
- Focus on important stuff
- Embedded slack
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- Effective decisions
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- Spectacular products
- Fast deliveries
- Sustainable pace

THE **TANDBERG** WAY

We follow principles, not processes!

No corporate standards or procedures

Little documentation gives effective communication

Treat engineers as professionals, not as resources

Slack is embedded, and "skunk work" projects appreciated

"Plans are nothing, planning is everything"

No time recording or detailed cost control

"What we don't do is treat our employees like they're all, you know, criminals,"

(Jenn Mann, SAS Institute)

To fail is OK, therefore we deliver spectacular stuff

Doers are very much respected

Autonomous organization

Communication is a key skill for all our engineers

We are fast and "sloppy"

We release early and we release often

Embrace "chaos"

Product Development in TANDBERG

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Fra liten aktør til global leder

Our Innovation Process

Culture and Innovation

Trust

Slack

Alignment

"Det kan du bare drite i"

(no f&*^* way)

Per Haug Kogstad (arguably the most influencial person and key driver behind TANDBERGs success.)

Courage

"Man **skal** bryte regler!" (you should break rules!)

Creative Hotspots

Feedback

Execution

Collective Ownership

Epilogue

TANDBERG

SPEED AND PRECISION

Simplify - Socus - act - Approximately right rather than socurately wring - Think - Driver the Tree Tree, the

INTEGRITY AND ENTHUSIASM

Senial of humour - Honesty - High ethical etailoads -Exchement - Trustwarthiness - Ligally

EXCEED EXPECTATIONS

Paraonal initiative - Fighting april - Go the last mill

FUN AND PROFIT

Maximuse long term shareholder value - Pass på penga -Ore for ell, all for ene - Energy

TANDBERG FIRST

First In user benafits - Invovative - "Areativ gatakap" -Understanding customer needs

"Jeg var arbeidsløs og startet med en tom ølkasse" (Jan Christian Opsahl)

«Jeg fungerte ikke under Gerhard Heiberg. Ledelsesfilosofien i Aker er at sjefen tar alle beslutninger i all sin visdom. Deretter utfører slavene ordre.»

«Vi vingler fra grøftekant til grøftekant, og når vi så beslutter, har vi en så jævlig fart at vi treffer med 180 km i timen. Men da er vi også fremme før de andre har startet.»

«Hvis vi leverer 100 prosent kvalitet, så går vi konkurs.Vi må gå inn for 99,99 prosent, det er omtrent hva vi har råd til. Den siste 0,1 prosenten blir rett og slett for dyr. I elektronikk må det være rom for feilmargin.»

The more you tighten your grip, Tarkin, the more star systems will slip through your fingers. (Princess Leia) Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.

(General George Patton Jr)

"Controlling an organization by monitoring costs is like driving a car looking out the rear window."

(John Seddon)

Dicipline by itself will not produce great results. We find plenty of organizations in history that had tremendous discipline and that marched right into disaster, with precision and in nicely formed lines. (Collins, 2001)