

# Experiences as a Doctor in Industry

**Petros Belimpasakis, Dr. Tech**  
**Principal Researcher**  
**Nokia Research Center**

**NOKIA**

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# About me

- Have been with Nokia Research Center since 2000
- Main research area has been Home Networking & Multimedia Content Sharing
  - Lately expanded my focus towards Mixed Reality
- Completed both my MSc & Dr. Tech in TUT
  - Department of Communications Engineering

# Presentation Outline

Why get a PhD?

Doctor in the industry

Studying while working in the industry

# What is a expected in an MSc thesis

- The student is expected to
  - Demonstrate his/her ability to use known scientific methods
  - Apply scientific methods in solving a given problem
  - Write fluent scientific text

# What is a expected in a Doctoral thesis

- The student is expected to
  - Create new and original scientific knowledge
  - Demonstrate his/her ability to write mature scientific text

# Why get a PhD?

The most important question that someone needs to ask him/herself

# Some answers could be: Because...

- I want to get more money in the future
  - The Dr. prefix sounds better than Mr, Mrs, Ms
  - People will respect my opinion
  - I have nothing better to do now
  - Would like to continue student life
  - My mother wants me to do so
- 
- Those are not really good reasons, so reconsider

# The road is bumpy...

- ... and without a solid answer you will possibly give up sooner or later. (Better give up earlier)
- You will probably face challenges, disappointments, surprises. You need to have a concrete target that drives you, in order to make those problems appear small / insignificant to the expected end result



# You should get a PhD if...

- It is needed in your personal targets, once you finish your studies
- A target that you truly believe in and would drive your motivation on a daily basis



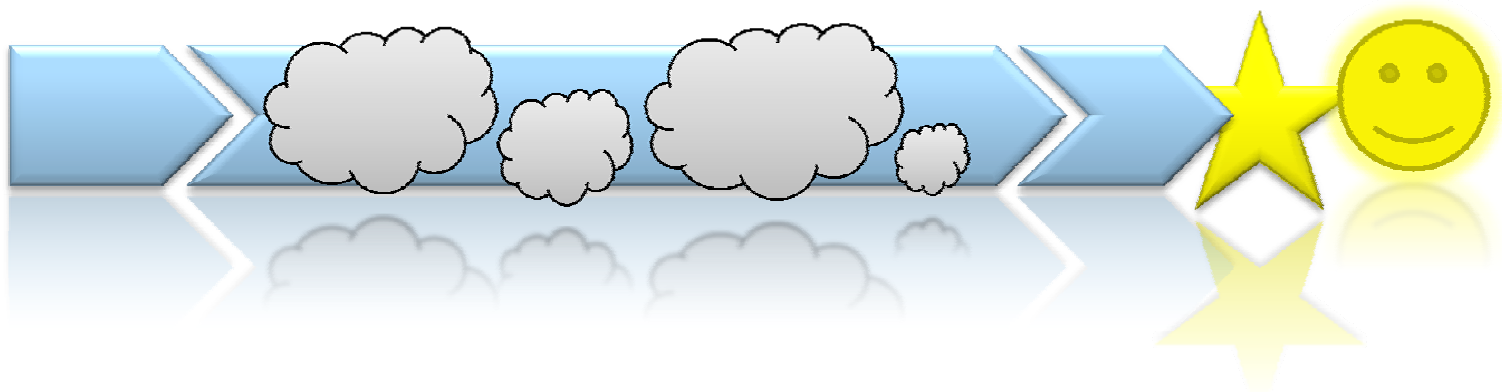
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# In the academic world

- Things are straight forward:
  - You need a PhD to advance, get promotions

# In the industry world

- The industry nowadays needs independent thinkers and problem solvers
- A PhD gives formal recognition that you
  - Are an expert in a specific area
  - Know the scientific discipline and publication process
  - You can present your findings and result in a clear and understandable way
  - You can evaluate research produced by your peers

# Myths about scientific career in industry

- You cannot publish your work
- There is lack of freedom, very controlled environment
- Short term, not interesting research

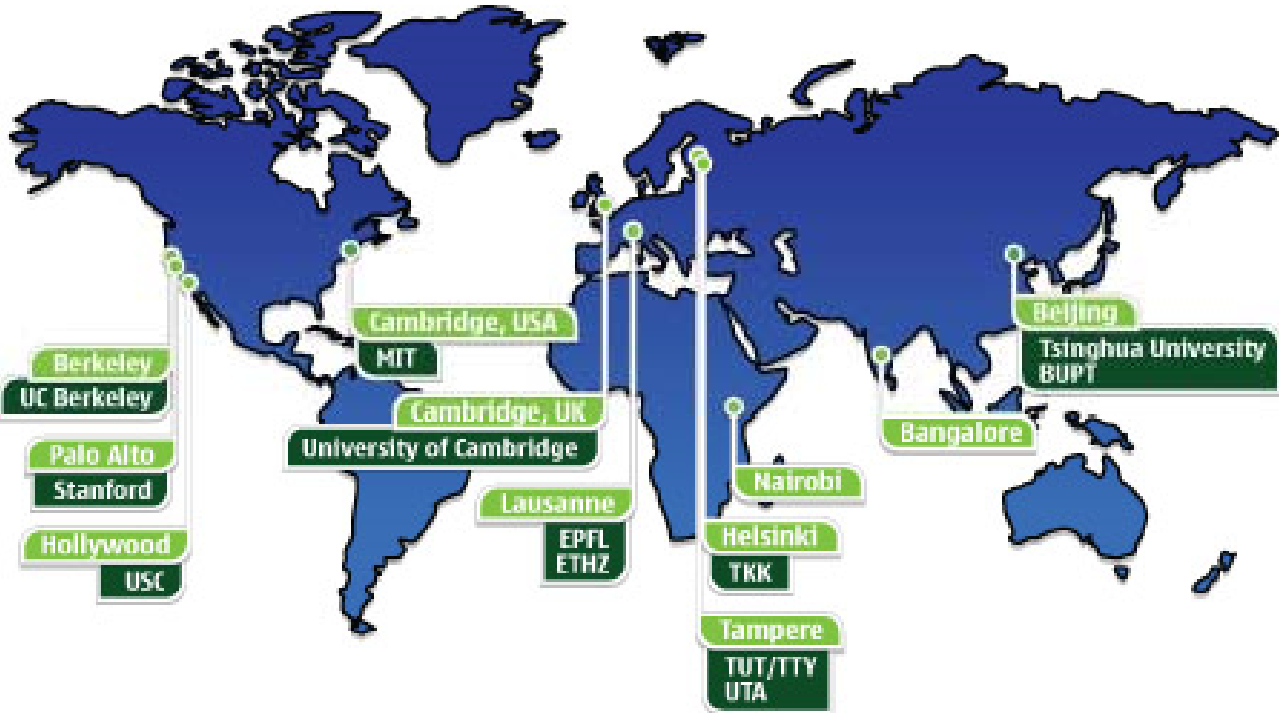
# Industrial problems getting more complex

- Problems are getting deeper and more complex than ever
- It is not any more about getting the knowledge and simply applying it
- There is need both for deep in-house research and collaboration with other
  - Industrial partners
  - Research institutes
  - Academia
- The typical “subcontracting” of complex work to a university does not work on the long term

# Open Innovation model

- Deep industry-academia collaboration by
  - sharing resources
  - leveraging ideas
  - tapping each other's expertise
- Allows us to
  - create vibrant innovation ecosystems
  - multiply our efforts
  - enhance innovation speed and efficiency
  - derive more value for our organizations and ultimately for our end-customers

# Nokia Research Center example



# Industry-Academia collaboration

- The “subcontracting mode”
  - “We want a solution to this problem. You deliver”
- The “open innovation mode”
  - “Lets work together, as one team”
- Working together means having the same understanding, valid scientific approach to the problem
  - Industry-academia people working as peers
  - Similar job description requirements

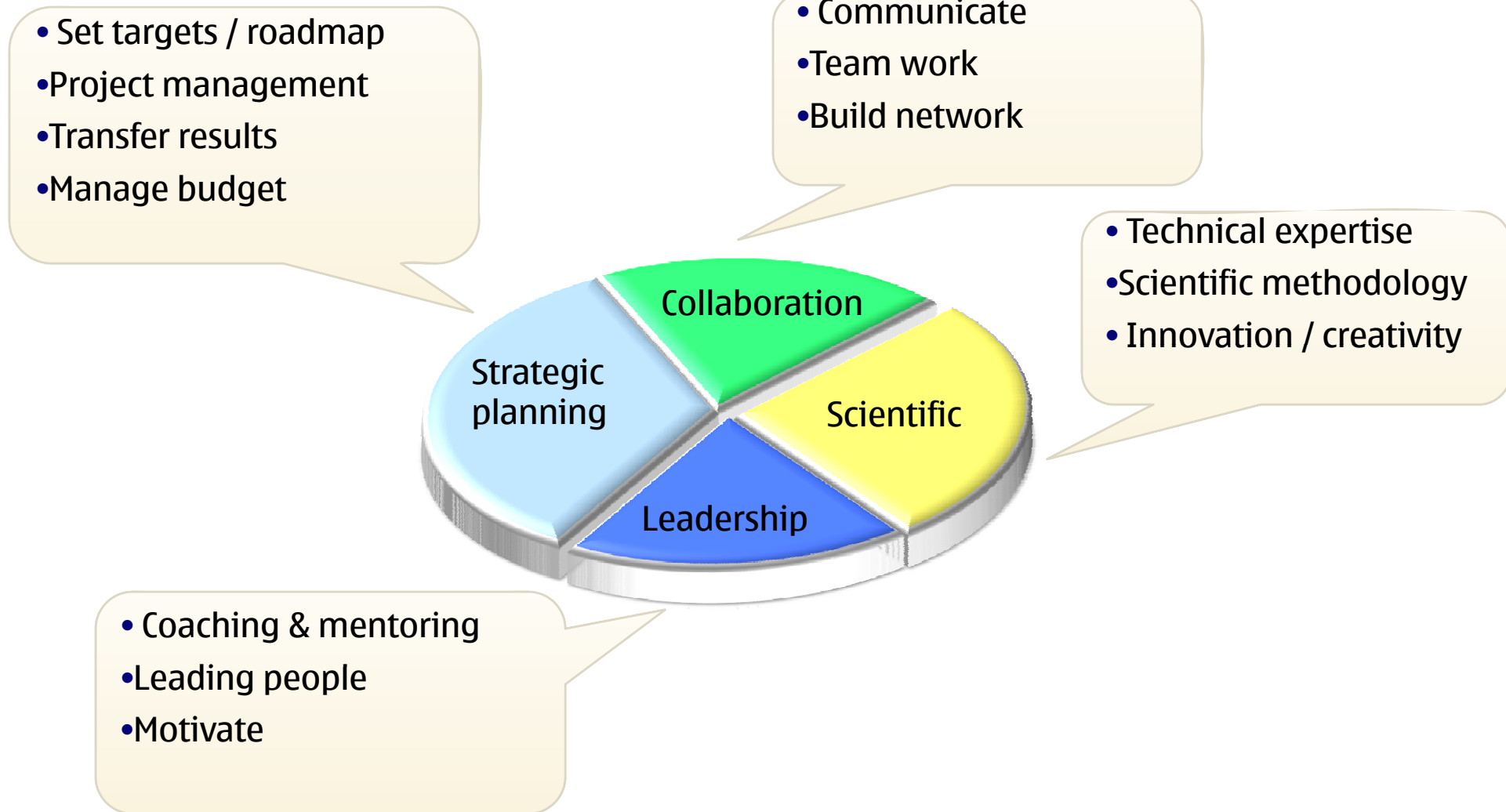
# What is expected by a PhD holder in the industry

- Be the expert/main reference point in his area
  - Other people in the company would consult him as the well know authority
  - Shares experiences and knowledge with others (also outside research unit)
- Provides scientific / academic approach in problem solving
  - Investigate problems, identify solutions. Both short and long term
  - Deal with complex problems
- Provides new ideas to research work, and input to research decisions
  - Understands the business needs of his company
  - Can influence future research (e.g. new project proposals)
  - Identify new ways of working
- Promote scientific knowledge & network
  - Disseminate research results in scientific conferences
  - Build network to other experts in the area
  - Build strategic partnerships

# Roles

- Individual contributor
  - Working as part of a team
  - Leading a project
  - Participating in a collaboration with external parties
- Team leader
  - Focus on building a good team (recruiting people, etc)
  - Taking care of the day-to-day administrative issues for running the team
  - Helping team members in achieving their personal targets (personal development)
- Note: The team leader is not necessarily the only way to advance. Individual contributors/researchers could advance to higher positions than team leaders in some organizations

# Skills that might be handy...



# Some of the things I have been doing

- A little bit of everything
  - Identifying research projects and making project proposals
  - Running small 1-person projects
    - Studying existing research work
    - Coming with solutions
    - Prototyping, hands-on implementation
  - Getting good results -> running 4-5-person projects
    - Orchestrating research project
    - Deeper research work
  - Getting results to our customers
    - Supporting our customers with Standardization activities
- Even greater challenges ahead
  - Preparing collaboration projects (e.g. under EU IST FPx framework, or Celtic or Tekes. Very important role of the industry in order to get project funding)
  - Forming the consortium, figuring the roles, effort estimations
  - Proposal preparation / submission
  - Positive answer -> negotiations & project plan preparation
  - Running the day-to-day project with wider collaboration.

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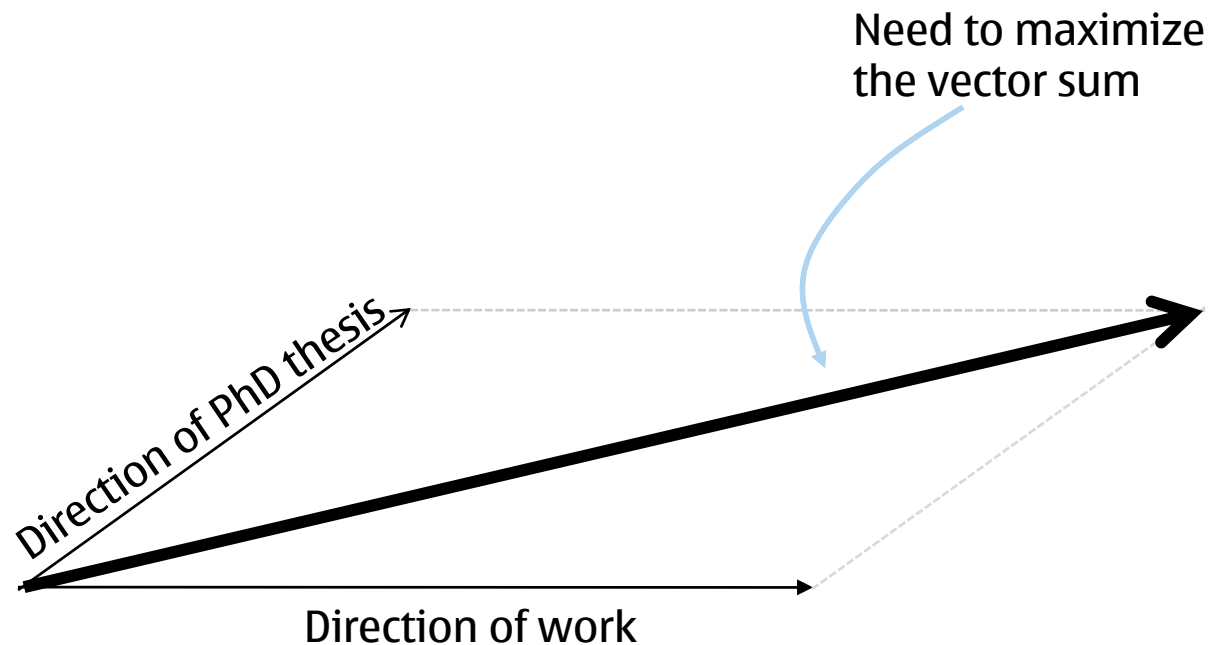
- Results
  - Patenting / securing intellectual property (i.e. investment of the company)
  - Scientific publications -> getting others interesting in our work
  - Building prototypes that could be trialed by early adopters (Beta labs)
  - Transferring knowledge to business units for delivering to products
- Collegial support
  - Passing knowledge to new team members
  - Supervising students working on their thesis
- Reviewer/Evaluator
  - Conference Technical program committees
  - Journal paper reviewing
  - EU project evaluations

# Doing a PhD while working in the industry

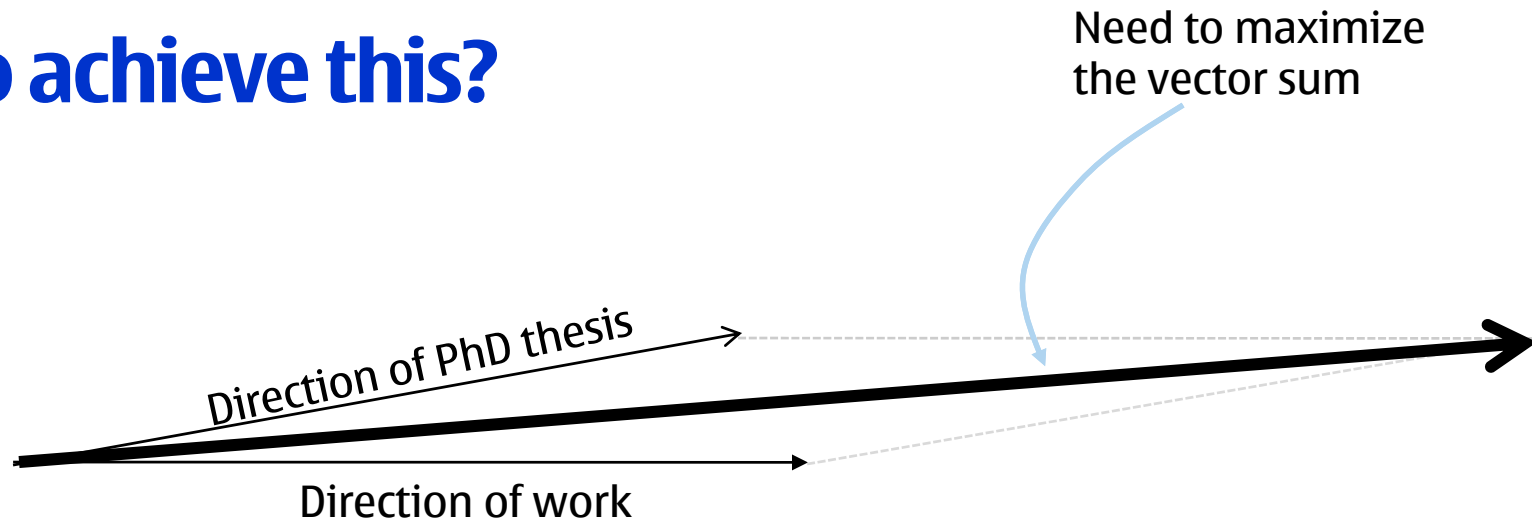
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- The “I will do the PhD in my free time”, “whenever I have time”, “1-2 courses a year”, etc. do not seem to work very efficiently.

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- Efficiency:



# How to achieve this?



- Requires that
  - You carefully pick the topic of your thesis
  - Your actual work does not change often (this is almost gambling nowadays)
  - Getting understanding/commitment from your employer/manager (who is hopefully holding a PhD, so understands)

# Other considerations while working & studying

- Many of the industrial research topics are suitable for PhD work
  - The work part could be the problem identification / problem solving
  - The thesis could additionally build on the theoretical aspects of the results
- Be prepared for potential delays in publishing, due to IPR issues
- Be prepared to long work hard, work over nights, work over weekends
- Make sure that your family understands and supports your goals

# Conclusions

- Make sure you know why you are here
- There is definitely need for PhD holders in the industry, and it will grow as research problems get more complex
- A PhD is always a good “tool” for your future career, if dealing with science
- Working and studying is possible, but with very careful planning, high commitment and luck