

From PhD Grad to Industry Expert

PhD Thesis

Starting My PhD Thesis

June 2003: “Electro-Mechanical Engineer” (UCL)

Started PhD in September 2003 (ULiege)

Supervisor: Dr. Anne-Marie Habraken

Title: Numerical Simulations of the “SPIF”



- ▶ PdH Thesis
- ▶ Apply for a Job
- ▶ Company
- ▶ R&D Team
- ▶ Career Evolution
- ▶ How we Work
- ▶ PhD Skills
- ▶ Conclusions



Numerical Simulations of the **Single Point Incremental Forming** Process

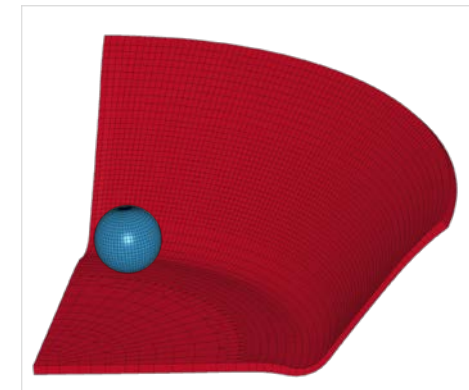
Software Development in the FE code “Lagamine”, to model metallic forming processes

Main topics:

- Bibliographic study of forming process
- Structure of a Finite Element Code to reduce computation times
- Implicit vs. Explicit
- Contact Formulation
- Parallel Computation

Funded by a Research Project

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Manuscript available here: <http://bictel.ulg.ac.be/ETD-db/collection/available/ULgetd-04182009-184505/>

Move to Industry

...Then What?

Finished end of 2008 (graduated the following February)

Decided to apply for a job in private company

Main motivation? Wrote in my resume:

I would like to work in industry to use my theoretical and research training in more practical applications.

Success!

- Hired by Samtech S.A. in January 2009, only 2 months later

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Why Samtech?



Spin-off of the ULiege (est. 1986) to develop and market SAMCEF

- Finite Element code started end of 1960s at the LTAS
- Customers include
 - Largest aerospace companies in Europe
 - Defense
 - Automotive
 - Energy (nuclear and wind)

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SAMCEF now integrated in Simcenter Nastran (SOL402) and marketed worldwide

Samtech also develops aircraft sizing, wind-turbine and optimization products

The Whole R&D Team



Large R&D team of 21 people in Liege working on SAMCEF

- **Most of them hold a PhD...**
... about half from the ULiege!
- Various backgrounds all working on the same product
 - Mechanical Engineering
 - Civil Engineering
 - Material Science
 - Electro-Magnetics
 - Fluid Mechanics
 - Acoustics
 - Parallel Computing
 - DevOps (source code management, builds and tools)

Collaboration with other teams in US and China

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My Personal Career Evolution



- Hired by Samtech S.A. in January 2009
 - Started Software Engineer Specific tasks
 - After 2 years Project Leader Part of the product
 - After 6 years **Product Development Manager** **Up to 10 people**
 - After 11 years Software Development Architect 4 teams
- 2 careers opportunities
 - People manager
 - **Technical Expert**
- Money?
 - PhD value approximately 400 EUR gross / month for starting salary
 - With PhD, evolution perspective:
 - 100 – 200 EUR gross / month
 - 75 – 150 EUR net / month

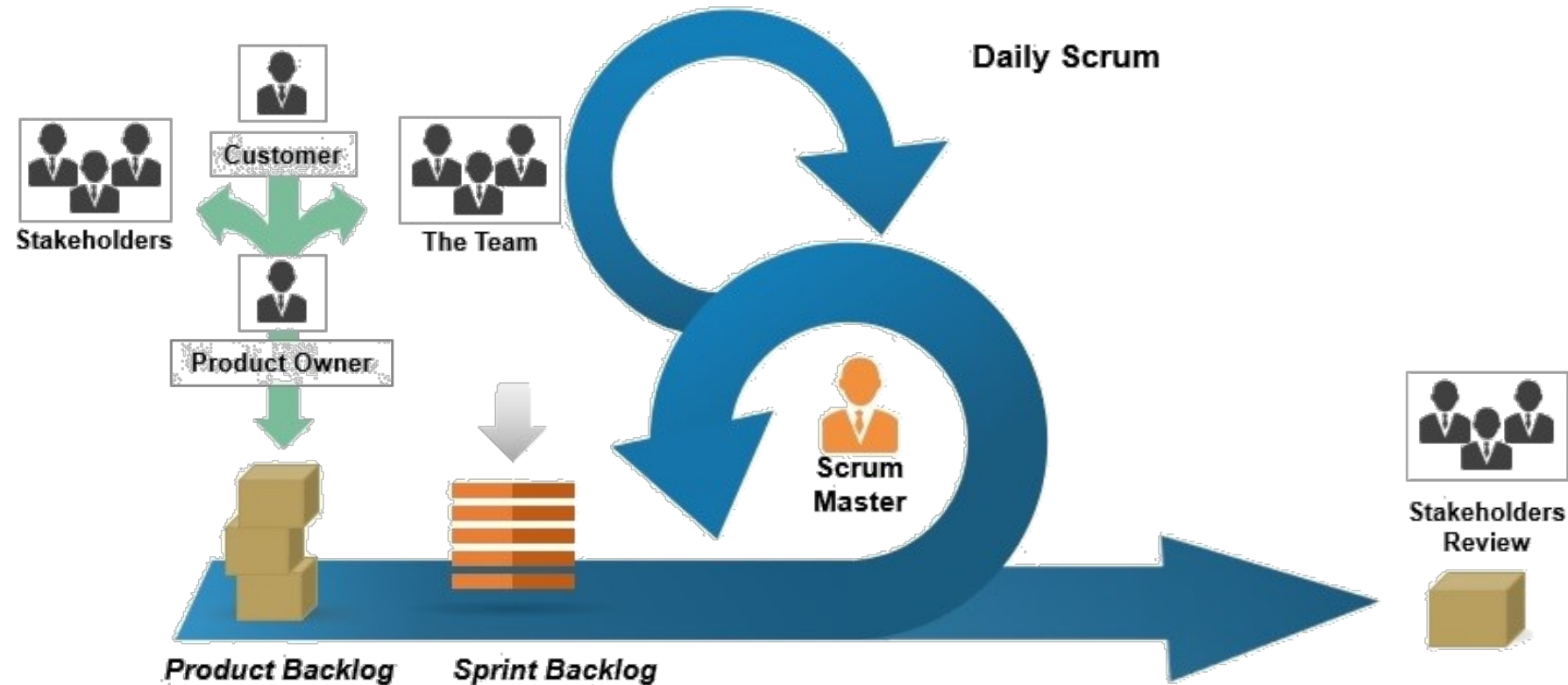
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Skills

Our Methodology: Agile Product Development

All Siemens DISW products are developed using an Agile methodology (Scrum)

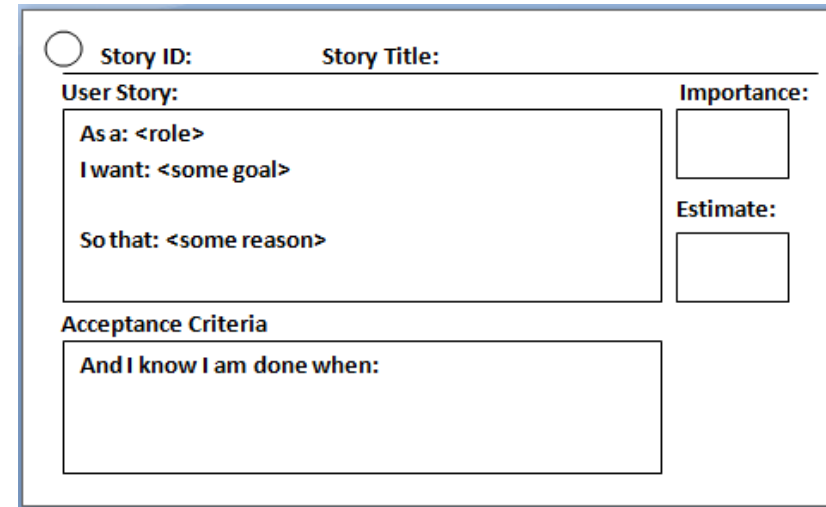
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Developers' Day-to-Day Job

Based on a user story, a developer can either:

- Go straight to development (rarely)
- Start by gathering information through
 - Bibliographic review
 - Analysis of similar past projects
 - Prototyping
 - “Spike” (timeboxed analysis, short, concrete outcome)



○ Story ID: _____ Story Title: _____

User Story:

As a: <role> _____

I want: <some goal> _____

So that: <some reason> _____

Importance: _____

Estimate: _____

Acceptance Criteria

And I know I am done when: _____

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Most skills learned throughout the PhD are highly valuable

Which PhD Skills?

Technical skills

- Team work: the research is yours... but it does not mean you work alone!
 - Give a status report to your supervisor and agree on future strategy
 - Collaborate with other people involved in project
 - Discuss with colleagues
- Know where and how to find information
 - Perform a literature review
 - Think critically
 - Understand, extract and synthesize information
 - Find the right person
 - Design a plan to generate & analyze data to figure it out
- Structure a (very) large document
- Know how to finish a project
 - Nothing is 100%, identify perspectives
 - Set your own deadlines and try and meet them
- **Become an expert on a specific field starting from scratch**

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Which PhD Skills?

Soft skills

- Communicate in English
- Teach / coach students
- Plan and organize meetings
- Remain motivated for a long project
- Attend conferences
 - Prepare a presentation targeting to your audience
 - Talk in front of a group of experts
 - Travel to a different country for work
- Small talk with colleagues

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Conclusion

A PhD is a...

- Not only the path to an academic career...
... but a bridge between your degree and industry
- **Unique** opportunity to
 - Keep on learning new skills... while being paid
 - Perform research without pressure from profitability
 - Be surrounded by experts
- Great personal journey



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Questions?



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