Research on globally distributed software engineering
Who am I?

- Rini van Solingen, 38 years old, married to Patricia, 2 kids (Bo en Bas), lives in Zoetermeer
- Technical informatics – TU-Delft (MSc) Technology Management – TU-Eindhoven (PhD)
- Head in the clouds, feet in the dirt (industry-science)
  - Schlumberger, Fraunhofer IESE, CMG/Logica, Mavim TUD, TUE, Stenden
- Loves to lead, investigate, teach, publish and coach
- 20% TUD, 80% Own Company, 20% Logeerplezier
The Delft Software Engineering Research Group (http://www.se.ewi.tudelft.nl/)

Group size:
• ~25 fte, including ~15 full time researchers (PhD candidates, postdocs).

Teaching:
• Programming and project skills of Delft computer science students
• ~20 MSc projects p/y in software engineering

Research:
• Software evolution
• Reverse engineering
• Software testing
• Services
• Model-driven engineering
• Web engineering
• Embedded systems
• Globally distributed SE
Close collaboration with industry
Adding a global perspective to SE

Source: Carmel & Agarwal, IEEE Software 2001
Four Types of Distance

**Geographical** (Kilometers, or door-to-door travel time)

**Temporal** (Timezone-distance, or % overlapping hours)

**Language** (Language distance, native vs. non-native)

**Cultural** (Cultural distance e.g. Hofstede dimensions)
On Culture….

Geert Hofstede (www.geert-hofstede.com)

• Power Distance Index (PDI)
• Individualism (IDV)
• Masculinity (MAS)
• Uncertainty Avoidance Index (UAI)
• Long-Term Orientation (LTO)
Allen Curve – 30 meter principle

The Research Challenge for GDSE

• Our Quest for GDSE research: “Creating the virtual 30 meters”

• Deep understanding of GDSE issues
  • Both theoretical and practical
  • Real versus perceived distance
  • Technological solutions are available and still sufficient additions feasible and required
  • The virtual project space as “dot-on-the-horizon”
Although: the Virtual 30-meters....
...for Software Engineers

Source code

Task status

Product features

My tasks
...Virtual 30-meters: Traceability

- Requirements
- Source code related to task
- Task status
- Test cases related to requirements
The GDSE Research Agenda

- Successfully deploying GDSE in practice
  
  *Best-practices of companies, success-factors and fail-factors from practice are an important focus in my research*

- Technological support for distributed sw-development
  
  *Technology to support a decreased perception of distance and increased transparency*

- Distributed agile development
  
  *Agile methods increase the level of informal communication, coordination and control; Agile might solve many issues in distributed development*

- Follow-the-Sun software development
  
  *The GDSE 'stress-test'; if tools and technology work for FtS, they are likely to be applicable elsewhere too*

- Teaching GDSE dynamics
  
  *Prepare our current student population for a career in which GDSE plays a role*
Best-practice 1:

If Single Roof is Possible: Do It!
Best-practice 2:

Complete Business-Case
Best-practice 3:

Communication is no Automatism
Best-practice 4:

Feedback is Crucial: Increments and Iterations
Best-practice 5:

Don’t put the ‘cut’ within the process
Best-practice 6:

Multi-site must be Multi-site: distribute teams over sites
Best-practice 7:

Meet: teams are not build up by themselves
Best-practice 8:

Time is Friend & Enemy
Best-practice 9:

Software is Developed by Specific Individuals
Best-practice 10:

Both Successes and Failures are Knowledge Investments
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• Distributed agile development
  Agile methods increase the level of informal communication, coordination and control;
  Agile might solve many issues in distributed development

• Follow-the-Sun software development
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Example 1: Technological Support for distributed agile

Figure 12.1: Presence dimensions

January 11, 2010
Example 2: experiment FtS development

[Diagram showing a flowchart and bar charts related to FtS development]
Example 3: Routing for FtS

Follow-the-sun Routing Model

This page contains a routing model for the selection of locations to deploy development sites for software engineering in a follow-the-sun configuration.
*This page is still under construction*

Please set the variables below and hit Calculate to find your routing options.

<table>
<thead>
<tr>
<th>Number of locations</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current locations (optional)</td>
<td>Select a country...</td>
</tr>
<tr>
<td>Number of overlapping work hours</td>
<td>2</td>
</tr>
<tr>
<td>Language</td>
<td>English</td>
</tr>
</tbody>
</table>

Results:
The countries are ordered from west to east. Between brackets you can find the following:
- score, indicating the match with the requested overlap
- total number of developers, available in that combination

Hover over a flag to see the country name.

- 🇺🇸 - 🇯🇷 - 🇺🇦 (12 | 25900)
- 🇺🇸 - 🇺🇦 - 🇺🇦 (12 | 25000)
- 🇺🇸 - 🇺🇦 - 🇻🇪 (12 | 20300)
- 🇺🇸 - 🇺🇦 - 🇷🇺 (12 | 18100)
- 🇺🇸 - 🇺🇦 - 🇷🇺 (12 | 17800)
- 🇺🇸 - 🇺🇦 - 🇷🇺 (12 | 14100)
- 🇺🇸 - 🇺🇦 - 🇺🇦 (12 | 9500)
- 🇺🇸 - 🇺🇦 - 🇺🇦 (12 | 5000)
Example 4: Distributed Scrum: Industrial Experiences
Example 5: GDSE Game

- Running GDSE company
- Deciding Lab locations
- Defining Strategy
- Customer focus
- Projects vs Products
- Advance decision making
- Teaching GDSE dynamics
Questions?

D.M.vanSolingen@tudelft.nl
Rini@RiniVanSolingen.nl

www.rinivansolingen.nl