



Can Diversity in Global Software Development be Enhanced by Agile Software Development?

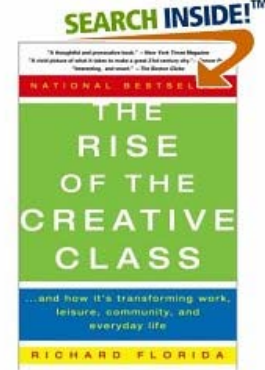
Orit Hazzan and Yael Dubinsky

Technion – Israel Institute of Technology



Main Message

- diversity benefits with communities and organizations that welcome it
- diversity is an inherited element of GSD
- we should embrace this inherent diversity by establishing a culture that allows for diversity
- agile software development creates a culture that allows for diversity; therefore, it may support GSD processes
 - gender diversity
 - management diversity



Large Cities Creativity Rankings

City	Creativity Index	%Creative Workers	Creative Rank	High-Tech Rank	Innovation Rank	Diversity Rank
1. San Francisco	1057	34.8	5	1	2	1
2. Austin	1028	36.4	4	11	3	16
3. San Diego	1015	32.1	15	12	7	3
3. Boston	1015	38.0	3	2	6	22
5. Seattle	1008	32.7	9	3	12	8
6. Chapel Hill	996	38.2	2	14	4	28
7. Houston	980	32.5	10	16	16	10
8. Washington	964	38.4	1	5	30	12
9. New York	962	32.3	12	13	24	14
10. Dallas	960	30.2	23	6	17	9
10. Minneapolis	960	33.9	7	21	5	29



America's Top Organizations for Multicultural Business Opportunities - 2005

Over 525,000 women and minority owned businesses had the opportunity to vote in the online election. The election was conducted in a Internet environment utilizing the latest technology available. Fortune 500 companies and Government Agencies were selected for the award based on business opportunities they provide to diversity owned businesses.

Produced By:

America's Top Organizations for Multicultural Business Opportunities -2005 

Rank	Top 50 Corporations	Rank	Top 50 Corporations
1	Lockheed Martin	28	Exxon Mobil
2	Bank of America	29	Walt Disney Company
3	BellSouth Corporation	30	Pitney Bowes
4	Dell	31	Fannie Mae
5	Wal-Mart Stores, Inc.	32	American Express
6	OfficeMax	32	Chevron
7	IBM	33	Starbucks Corporation
8	Procter & Gamble Co.	34	JCPenney Company Inc.
9	Boeing Company	34	Verizon Wireless



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If you are a final-year student or have recently graduated, you may be interested in joining American Express. We offer diverse and exciting careers with the opportunity for early responsibility, international experience, and outstanding personal growth and development. International graduate programs include, but are not limited to:

- Sales
- Marketing
- Project Management
- Finance
- Customer Service

Internships

American Express also offers international experience to undergraduate students seeking uniquely challenging Internships. Areas of focus are the same as above, and extend real opportunities for project-driven work that can truly effect change within our business operations.

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United States

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We strive to attract and retain professionals of all backgrounds and experiences at Deloitte & Touche USA LLP and to provide an inclusive culture. This allows us to offer clients the best solutions and help our people realize their greatest potentials.



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[LATINA Style magazine's 'Top 5 Companies for Latinas' Third year in a row.](#)

[Deloitte & Touche USA LLP Receives Silver Torch Award from the National Black MBA Association Committed to diversity, inclusion](#)

[Article: About the Diversity Initiative Leader Meet the driving force.](#)

[CIO Larry Quinlan Named To 'Black MBA' Top 50 Under 50 Competence, vision cited.](#)

[Press Release: Deloitte & Touche Makes Essence's Top 30 Companies for African-American Women The only professional services firm](#)

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Jared L. Cohon:

CMU President's Statement on Diversity

- I want Carnegie Mellon to be a place that celebrates these diversities rather than merely tolerating them, *because being a more diverse institution will make us a better institution*. In the classroom, studio, laboratory, office and dormitory, a multitude of experiences, perspectives and beliefs will enrich all that we do.

Source: <http://hr.web.cmu.edu/drg/overview/statement.html>



Software Industry

■ Problems

- Coping with change
- Software quality
- Management of software projects

■ Solution

- Agile development** -- enhances and supports diversity

■ Outcome

- Better processes

Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- Individuals and interactions** over processes and tools
- Working software** over comprehensive documentation
- Customer collaboration** over contract negotiation
- Responding to change** over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck	James Grenning	Robert C. Martin
Mike Beedle	Jim Highsmith	Steve Mellor
Arie van Bennekum	Andrew Hunt	Ken Schwaber
Alistair Cockburn	Ron Jeffries	Jeff Sutherland



Agile Software Development Methods

- All acknowledge **people centrality**.
 - Extreme Programming (XP)
 - SCRUM
 - Feature Driven Development
 - DSDM
 - Lean Development



Agile Software Development

- Better projects
 - Cost reduction: 5%-7% on average
 - Time to market: 25%-50% reduction
- Increases potential for diversity

Research Field (Yael Dubinsky's Ph.D.)



- The Department of Computer Science
- *Projects in Operating Systems*
- ~ 35 projects
 - 10-12 students in each
 - Studio environment
- Extreme Programming (XP)
- Coaching team was XP-trained



Studio/Lab





Management Diversity

■ Role Scheme

- **All** teammates are developers
- **Each** teammate has a role in the project management
- Roles are referred to as **practice representatives**



Groups of Roles

- Leading Group
- Customer Group
- Code Group
- Maintenance Group



Groups of Roles

- Leading Group
 - Coach
 - Tracker
- Customer Group
- Code Group
- Maintenance Group



Groups of Roles

- Leading Group
- Customer Group
 - End user
 - On-site customer
 - In charge of acceptance testing
- Code Group
- Maintenance Group



Groups of Roles

- Leading Group
- Customer Group
- Code Group
 - In charge of unit testing
 - In charge of design
 - In charge of code control
 - In charge of continuous integration
- Maintenance Group




Groups of Roles

- Leading Group
- Customer Group
- Code Group
- Maintenance Group
 - In charge of presentations
 - In charge of documentation
 - In charge of installation shield



Management Diversity

- Role scheme:
 - Accountability
 - Commitment
 - Involvement
- **Enhances diversity**



Role holders: What did you get from teamwork in agile software development? (*italics* ours)

- “1. Developing in a team allows the project goal to be more challenging and much more interesting. 2. *In this way you can learn more about other people ideas and solutions.*”
- “[It] taught me personally *how to cope with other people's shortcomings* as well as on my own, and *interact well with team members despite some disagreements.*”

Gender Diversity

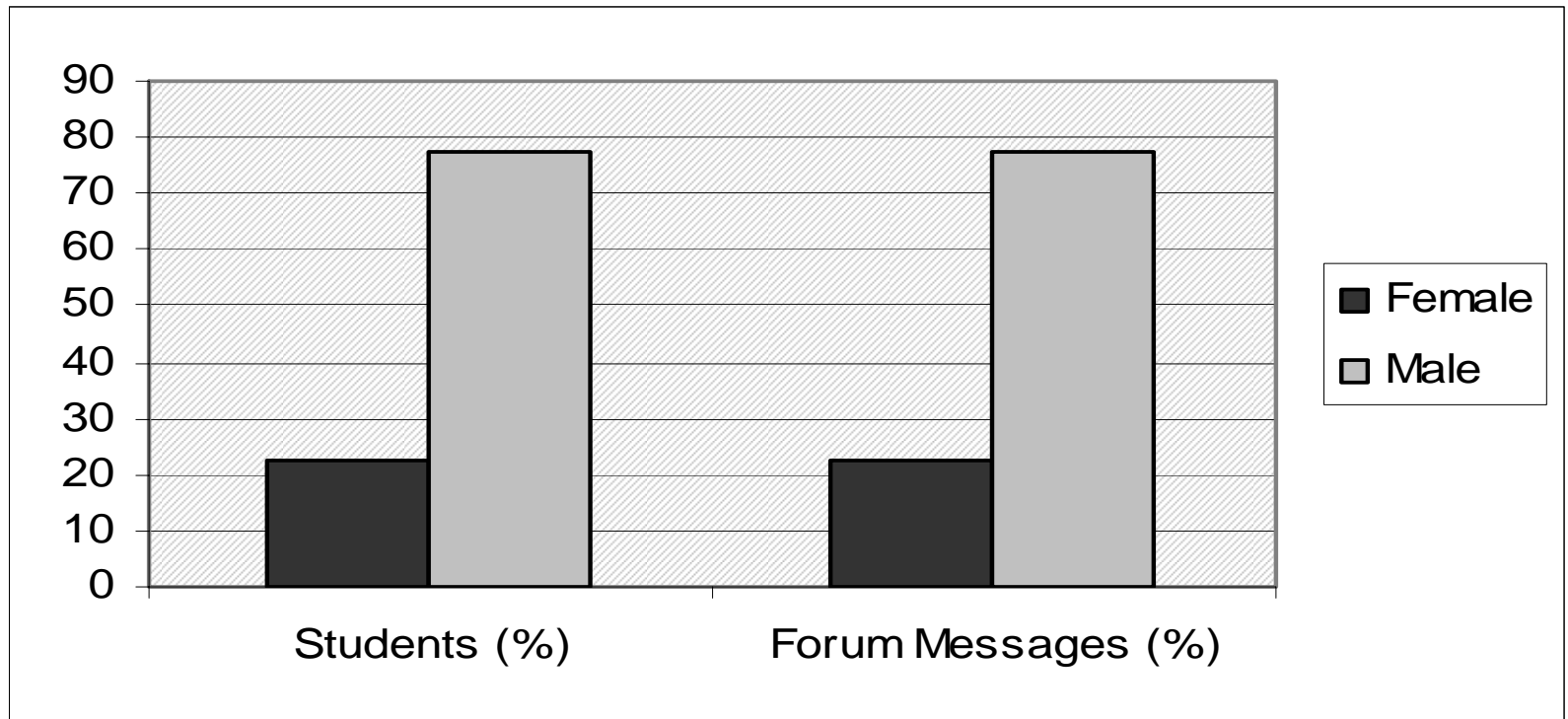
Data: 228 males (77.6%)

66 females (22.4%)

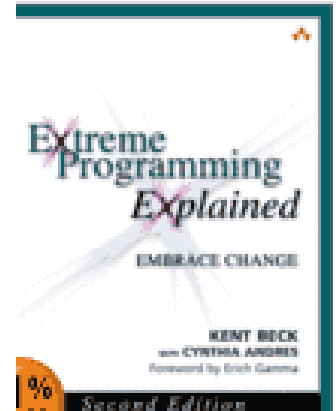
The percentage of the number of forum messages:

4702 messages by males (77.2%)

1391 by females (22.8%)



Beck with Andres, 2005, 2nd edition
Extreme Programming Explained



- **A principle – diversity:**

Teams need to bring together a variety of skills, attitudes, and perspectives to see problems and pitfalls, to think of multiple ways to solve problems, and to implement the solutions.

Teams need diversity. (p. 29).



Summary

- Diversity benefits with software development processes
- Diversity is an integral part of GSD
- This diversity should be supported
- Agile software development enhances and supports diversity
- **Agile software development may support and enhance GSD process**