

Peopleware & Global Software Development: Perspectives from Spain

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1. Peopleware (I)



- ✓ Knowledge is the most significant economic resource of a post-capitalist society (Drucker, 1998)
- ✓ Knowledge plays a more important role than any other of the inputs for this organizations (Starbuck, 1992)
- ✓ IT Organizations as Knowledge Intensive Organizations (KOI).
- ✓ KOIs, require effective measurement techniques for the development of their employees, both from the perspective of knowledge as well as competency elements (Hurley & Green, 2005).

1. Peopleware (II)



- ✓ Yes, yes, but... What about SE?
- ✓ Is it really about people?. Let's see....:
 1. Failure rates in software projects are high, and qualified software engineers pertaining to software development teams are key factors in the software development process and their shortcomings and caveats (Pressman, 2005)
 2. Aspects like teamwork, group dynamics, nominal developer productivity and organizational factors, among others, are the main issues in software systems (DeMarco & Lister, 1987)
 3. Software development is an intense human capital activity, more intense in intellectual capital (Sommerville & Rodden, 1996)
 4. The human dimension is a key element in software engineering, with greater importance than the technical dimension sometimes (Constantine, 2001)

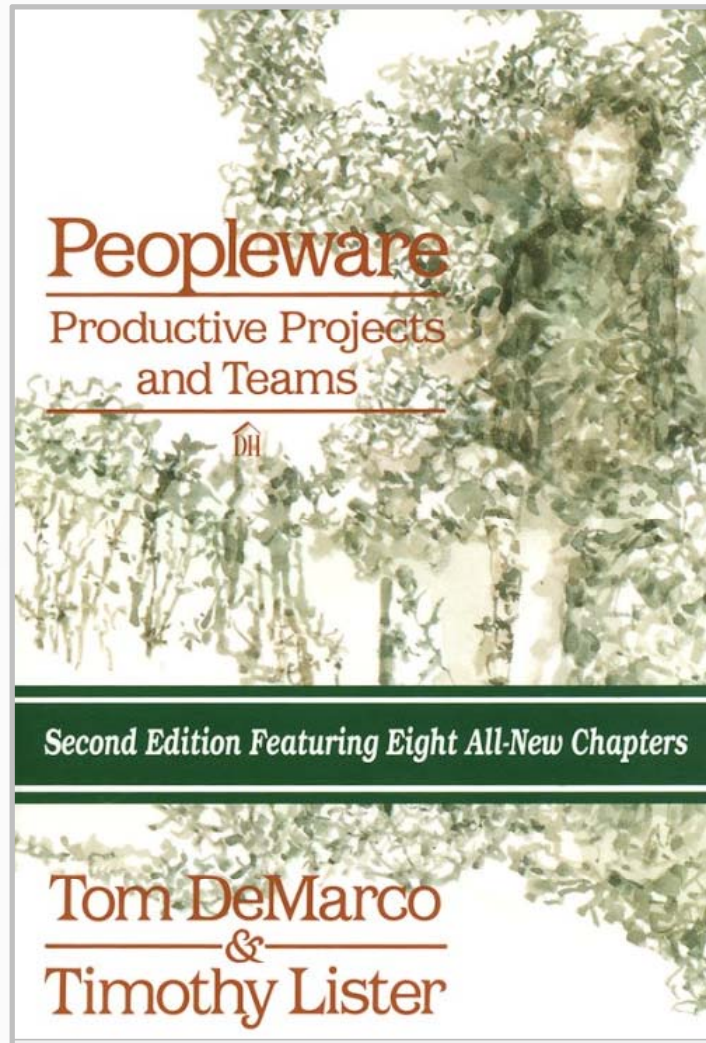
1. Peopleware (III)



✓ Cont:

5. Individual differences have been identified as one of the paradigms for the research of human factors in software development (Curtis, 2002)
6. Poor management of human factors in technical projects, and software engineering projects can be considered as technical projects, can hinder the use and effectiveness of technology (Ives & Olsen, 1984).
7. After product size, people factors have the strongest influence in determining the amount of effort required to develop a software product (Boehm, 1981),
8. “Personnel attributes and Human Resource activities provide by far the largest source of opportunity for improving software development productivity” (Boehm et al., 2000).

1. Peopleware (IV)

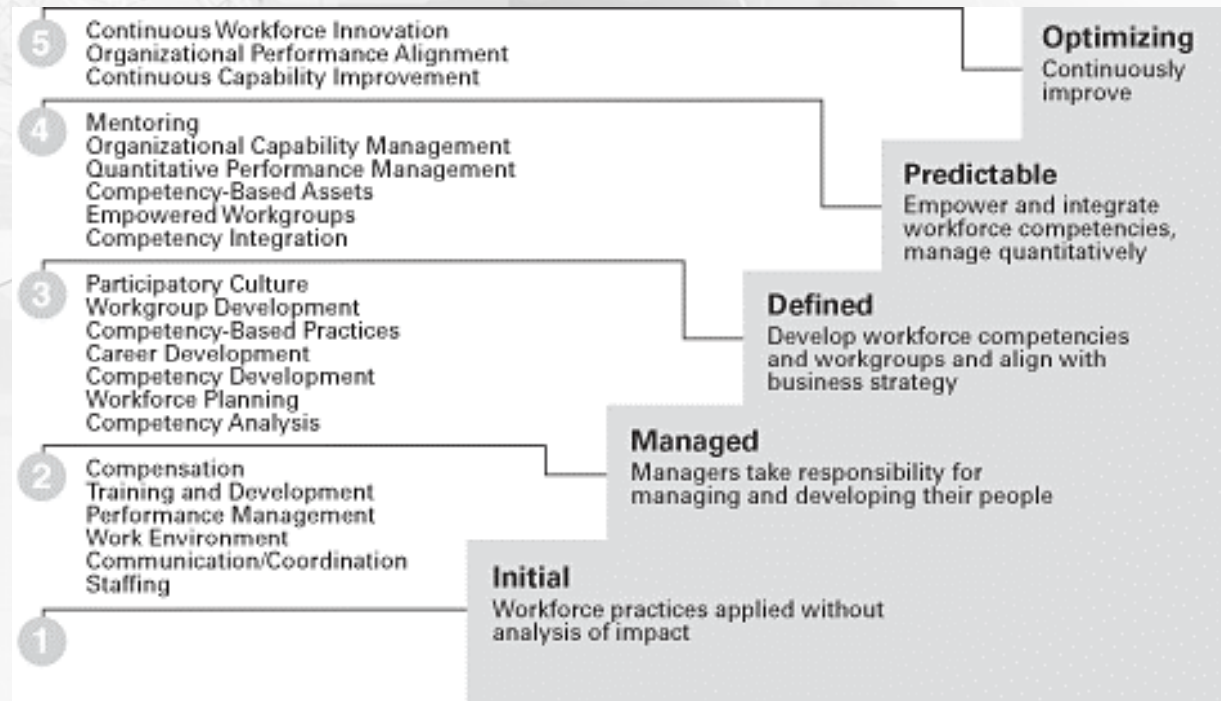


- ✓ Computer Technology: HW+SW+People.
- ✓ Peopleware!!!
- ✓ First used by Peter G. Neumann in 1977.
- ✓ It includes all people related issues: teamwork, group dynamics, organizational factors,... **productivity.**
- ✓ It's not only about technology, it's (also) about people!

2. People-CMM



- ✓ Developed by SEI (1995) V2 → 2002
- ✓ P-CMM Guides organizations in improving their processes for managing and developing their workforces.
- ✓ Architecture:



2. People-CMM



- ✓ Performance Management in P-CMM:
 - ◇ Performance Management (level 2)
 - ◇ Quantitative Performance Management (level 4),
 - ◇ Organizational Performance Alignment (level 5)
- ✓ The purpose of Performance Management is to establish objectives related to committed work against which unit and individual performance can be measured, to discuss performance against these objectives, and to continuously enhance performance.
- ✓ The purpose of Quantitative Performance Management is to predict and manage the capability of competency-based processes for achieving measurable performance objectives.
- ✓ The purpose of Organizational Performance Alignment is to enhance the alignment of performance results across individuals, workgroups, and units with organizational performance and business objectives.

3. Global Software Development (I)



- ✓ Globalization of the world economies brought significant changes to nearly all industries, and in particular it includes software development (Smite et al., 2010).
- ✓ GSD involves the development of application software through interactions of people, organizations, and technology across nations with different backgrounds, languages, and working styles (Herbsleb & Mockus, 2003).
- ✓ AKA:
 - ◇ Offshore software development
 - ◇ Global software work
 - ◇ 24-h development teams
 - ◇ Follow the sun and round the clock
 - ◇ GSD

3. Global Software Development (II)



- ✓ GSD → paradox: some stated that GSD are highly productive while others asseverate that GSD teams perform sub-optimally (Milewski et al. (2008).
- ✓ Benefits:
 - ◇ Greater availability of human resources and multi-skilled workforce
 - ◇ Lower Costs
 - ◇ Strategic regional presence for improved customer service
 - ◇ shorter time-to-market cycles
 - ◇ improvement in the ability to respond quickly to local customer needs
 - ◇ The mix of developers with different cultural backgrounds may foster new ideas
 - ◇ Productivity improvements
 - ◇ Efficiency
 - ◇ Access to new markets...

3. Global Software Development (III)



✓ Challenges:

- ◇ Communication, coordination, and control
- ◇ Knowledge transfer
- ◇ Issues regarding the protection of intellectual property
- ◇ Less efficiency
- ◇ Higher conflict rates
- ◇ Disparities in team members' strategies, behaviour and assumptions about the work at hand and how to work with others
- ◇ Differences in opinion about the nature of the software development process
- ◇ High failure rates
- ◇ Lack of trust
- ◇ Lack of Quality
- ◇ Socio-Cultural distance



4. People in GSD



- ✓ Additionally, software development in a GSD context may increase this complexity significantly with respect to communication, coordination and control issues Conchuir et al. (2009).
- ✓ Main challenges related to personnel:
 - ◇ Communication
 - ◇ Knowledge Management
 - ◇ Coordination
 - ◇ Collaboration
 - ◇ Socio-Cultural distance (Lack of group awareness)
 - ◇ Lack of trust

5. Suggestions for managing people in GS



✓ Suggestions:

- ◇ Communication:
- ◇ Knowledge management, competence management and performance appraisal
- ◇ Coordination and collaboration
- ◇ To increase trust

5. Suggestions for managing people in GS



- ✓ Issues about performance:
 - ◇ Cross organizational management.
 - ◇ Aggregated metrics
 - ◇ Consortium improvement
 - ◇ Metrics about the main issues related with GSD management (from service contractor side)
- García-Crespo et al. 2010:
 - Partner-Supplier election
 - Work packages assignation
- ◇ Metrics about the benefits of certain activities:
 - Mentoring, social events...
- ✓ Do it in a personal, group, corporation and consortium environment

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