Monitoring Code Quality and Development Activity by Software Maps

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Spin-off Company – www.softwarediagnostics.com
Challenges in SW-Development & Maintenance

- Challenging to find the balance.
- Internal quality:
  - "Less visible" aspects, e.g., modularity and clearly defined interfaces, and code complexity.
- External quality:
  - "Visible" aspects, e.g., features per iteration and post-delivery defects.

- Reasons for difficulties in finding the balance
  - Increasing internal quality – no short-term revenue.
  - Design short-cuts – give impression of quick development success.
  - Internal quality is largely invisible/non-understandable to managers and customers.
The Concept of Software Maps (1)

- Integrating information on code, runtime behavior, evolution

Automated Software Analysis

- Analysis & Data Mining
- Structure & Metrics
- Dynamics & Traces
- Evolution

Software Maps & Visualization

- Developer Maps
- Reports
- Debugging Timelines
- Call Graphs
- Quality Maps

Software System Artifacts

- Source Code
- Executables
- Repository

Development Team & Management

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The Concept of Software Maps (2)

Goals
- Making internal quality better visible and realizable to managers.
- Providing an effective communication means between managers and developers.

Example: JBoss
Red Hat Inc.
800,000 LoC
Java
“Early-warning system” detecting Costs and Risks

Files containing Bugs

- Complex files being changed in the context of bug fixes.
Conclusions & Future Work

- Software Maps aim at making internal quality visible.
- They provide a communication means between developers and management.
- Software Maps (www.softwarediagnostics.com) are in daily use in large development companies.
  - Medical Systems (Embedded C/C++)
  - Postage Systems (Embedded C/C++, C#)
  - Laser Scanning Systems (C++, C#)
  - Web portals (Java, C#/.Net, VB/.Net, PHP)
  - Windows Desktop applications (C++)
  - CAD Systems (C++)
  - Multimedia Consoles in Automobiles (C++, C#)
  - Financing & Insurance Systems (Cobol, ABAP)
  - ...

- Future work:
  - Long-term case studies with companies.
  - Field Studies.
  - Visualization techniques to support highest-level management.

Thank You.
Questions or Remarks?
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