COMP 3550

10.3 — REAL-WORLD ROLES IN SOFTWARE ENGINEERING

Week 10: Measuring Team and Project Successes

WHY ROLES AND TITLES MATTER

Why This Matters in Software Engineering

1. **Expectations**
   - Clarifies responsibilities and decision-making authority
   - Sets performance standards for the role
2. **Growth Paths**
   - Defines skills needed to move to the next level
   - Helps you plan your learning and career progression
3. **Hiring Fit**
   - Ensures candidates match the role’s needs
   - Makes team structure clearer to new hires

WHY ROLES AND TITLES MATTER

The Reality

- Titles vary widely between companies (“Software Engineer II” in one org ≠ another)
- Understanding responsibilities, not just titles, is key
- Roles evolve as projects and teams grow

SysAdmin
ITOPs
OpsSec
AISec
Pen Testing Engineer
Sec Engineer
SysDev
Front End Dev

Back End Dev
Full Stack Dev
Graphics Designer
SDE
Software Dev
Senior Dev
SDET
QA

BA
SDM
PM
Project Lead
Tech Lead
TPM
Principle Engineer

and more....

DEVELOPER ROLES

- **Core Development**
  - Front-End Developer — builds the user interface and client-side logic
  - Back-End Developer — builds server-side logic, APIs, and integrations
  - Full-Stack Developer — works across both front-end and back-end
  - Software Developer (SDE) — generalist coder across various domains
  - Senior Developer — experienced dev with deeper design/mentorship duties
  - Principal Engineer — senior technical authority, often cross-team

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  - Graphics Developer — focuses on rendering, animation, and visual systems
  - SDET (Software Development Engineer in Test) — writes automated tests, builds testing frameworks

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- **Modern Additions**
  - Mobile Developer — iOS/Android apps (native or cross-platform)
  - Embedded Systems Developer — IoT, hardware-level coding
  - Machine Learning Engineer — applies ML/AI models in production

TECHNICAL ROLES BEYOND CORE DEVELOPMENT

- **Quality & Testing**
  - QA (Quality Assurance) — manual & exploratory testing
  - SDET (Software Development Engineer in Test) — automation & testing frameworks
  - Performance Test Engineer — load/stress testing

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- **Operations & Deployment**
  - DevOps Engineer — CI/CD pipelines, infrastructure automation
  - Site Reliability Engineer (SRE) — uptime, scalability, monitoring
  - SysAdmin / IT Ops — system administration, network management

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- **Design & User Experience**
  - UI Designer — interface layouts, visual style
  - UX Designer — user flows, usability, research
  - Product Designer — blends UI/UX with business requirements

STRATEGIC AND MANAGERIAL ROLES

- **Agile / Team Coordination**
  - Scrum Master — facilitates Agile ceremonies, removes blockers, ensures the team follows the framework
  - Product Owner (PO) — manages the product backlog, prioritizes features, clarifies requirements for the dev team

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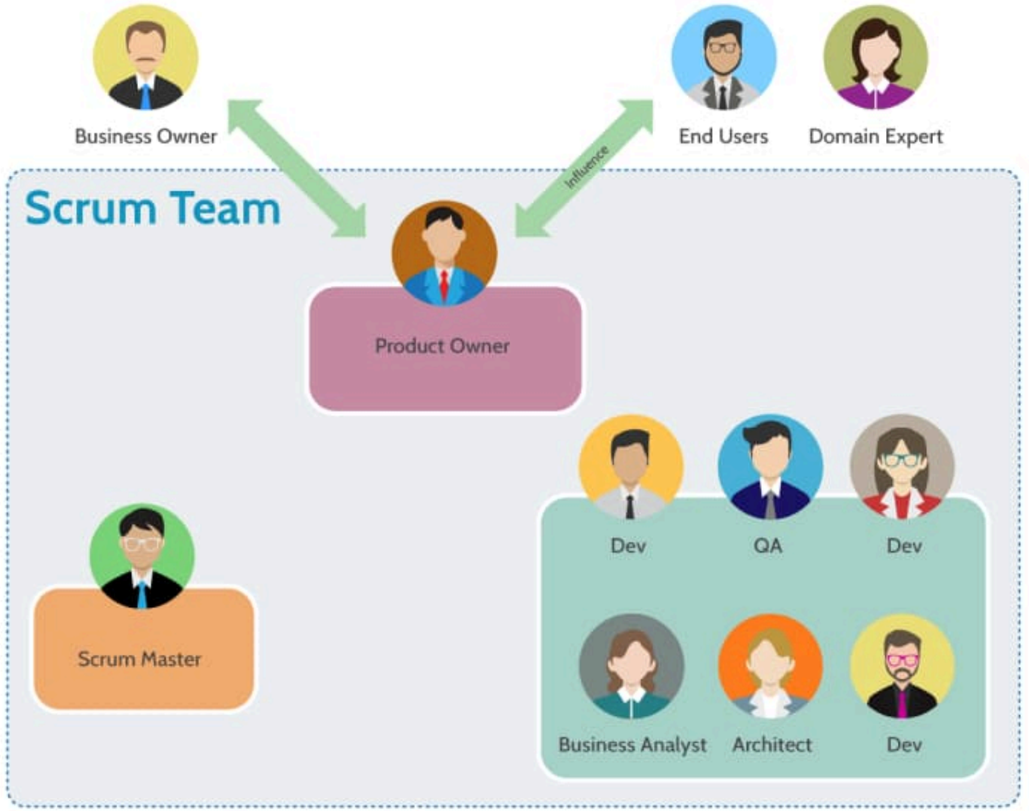
- **Analysis & Business Alignment**
  - Business Analyst (BA) — bridges business needs and technical solutions, writes requirements, validates scope
  - Software Development Manager (SDM) — oversees development teams, hiring, and performance management

TEAM COLLABORATION OVERVIEW

Different companies have different structures but here are some examples

Who makes up what level of **team**?



https://amoniac.eu/blog/post/fundamental-roles-in-a-software-development-team

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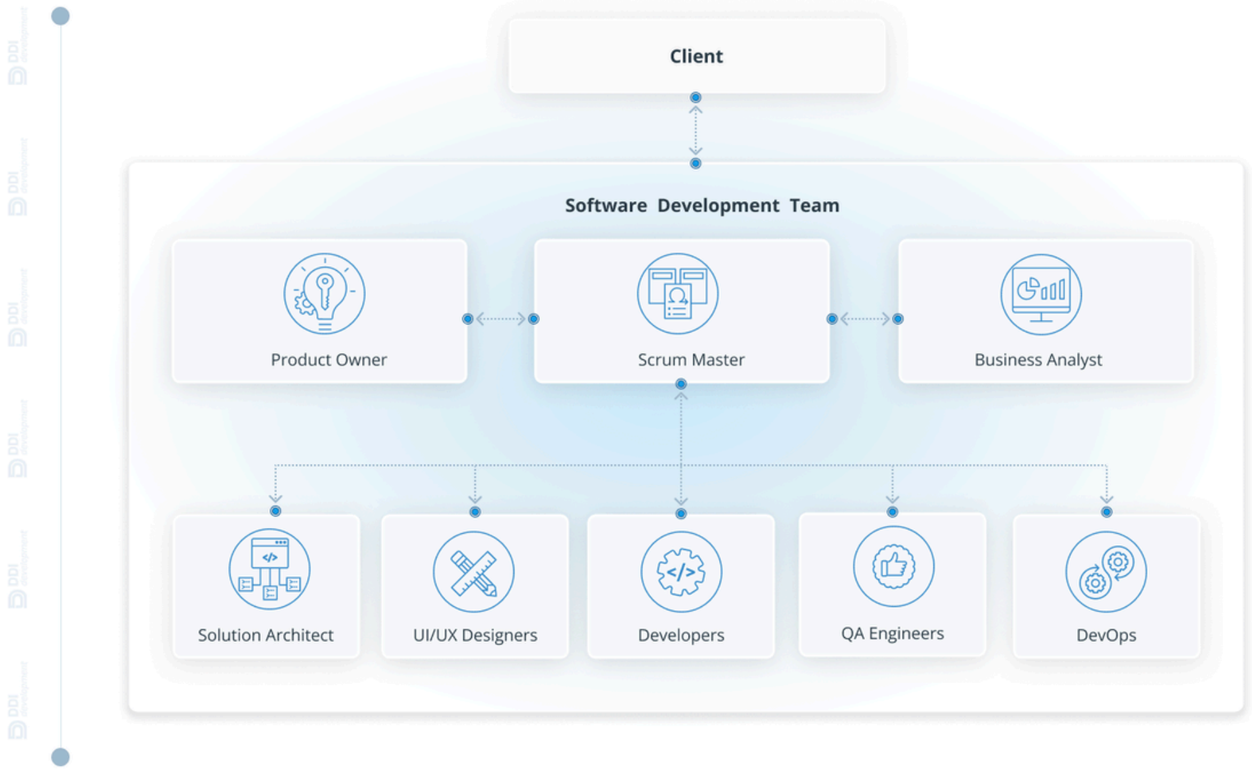
Now the BA is removed from the Software Team



https://ddi-dev.com/blog/programming/software-development-team-structure-main-roles-and-processes/

TEAM COMMUNICATION OVERVIEW

How They Communicate

- Daily Stand-Ups — quick sync on progress & blockers
- Sprint Planning & Retrospectives — plan upcoming work & improve processes
- Code Reviews — peer feedback and knowledge sharing
- Shared Tools — GitLab/Jira boards, Slack/Teams, design tools (Figma, Miro)
- Documentation — wikis, READMEs, architecture diagrams

PROJECT PAUSE & REFLECT

- **Pick a Role (or Two)**
  - From the list we discussed today, which roles are you most interested in? Why?
  - What skills or experiences do you already have that connect to that role?
  - What skills would you need to grow into it?
- **Look Back at This Term**
  - Which roles did you actually play in your project?
  - Were there roles you expected to fill but didn’t?
  - Were there roles you unexpectedly ended up doing?
- **Connection to the Future**
  - How did your role this term align (or not) with your interests?
  - How might you seek out opportunities to try other roles in the future?