

# Recent Trends in U.S. Game Development Processes

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# Summary

- **Introduction**
- **Development Processes**
  - Agile and Scrum
- **Software Configuration Management Tools**
  - Perforce
- **Build Manager**

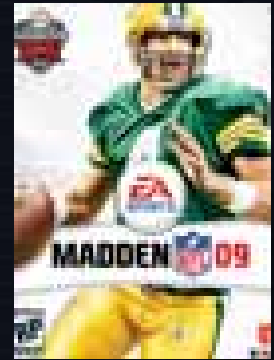
# Introduction

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# Electronic Arts (EA)

- 8500+ employees
- Largest third-party game publisher and 8<sup>th</sup> largest software company in the world
- Studios and offices worldwide



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# BioWare

- An EA Studio with offices in Edmonton, Canada and Austin, TX and 400+ employees
- BioWare's vision is to deliver the best story-driven games in the world.



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# Development Processes

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# Why?

- **Larger projects and teams more difficult to manage**
- **Maintain and improve quality**
- **Increased complexity of projects requires better tools (processes) to control risk**
- **Improve quality of life for developers**
- **Continual improvement, competition**

# Development Processes

- **Agile Software Development**
- **Scrum**
  - A popular Agile development process
  - Inspired by research from Japan



# Agile Software Development

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# Agile Software Development

- **Uncovering better ways of developing software by doing it and helping others do it**
  - From the “Manifesto for Agile Software Development”
- **Has become popular in game development in US**
  - Changing requirements, balance of process

# Agile Values...

- (a) Individuals and interactions over (b) processes and tools
- (a) Working software over (b) comprehensive documentation
- (a) Customer collaboration over (b) contract negotiation
- (a) Responding to change over (b) following a plan
- Both (a) and (b) have value, but Agile values (a) more

# Agile Principles

- **Highest priority is to satisfy the customer through early and continuous delivery of valuable software.**
- **Welcome changing requirements, even late in development.**
- **Deliver working software frequently, from a couple of weeks to a couple of months.**

# Agile Principles

- **Business people and developers work together daily.**
- **Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.**
- **Face-to-face conversation.**

# Agile Principles

- **Working software is the primary measure of progress.**
- **Agile processes promote sustainable development (maintain a constant pace indefinitely).**
- **Continuous attention to technical excellence and good design enhances agility.**

# Agile Principles

- **Simplicity is essential.**
- **The best architectures, requirements, and designs emerge from self-organizing teams.**
- **Team evaluates and improves behavior at regular intervals.**

# My Own Agile Thoughts

- **Lightweight as possible, but no more lightweight than needed**
- **Iterative development and deliverables, and frequent communication reduces risk**
- **Does not preclude written technical designs or roadmaps**
  - **Needed when creating complex systems**
- **Adapt it to your own situation and team.**



# Learn More about Agile

- **Agile Manifesto**
  - <http://agilemanifesto.org/>
- **Agile Alliance**
  - <http://www.agilealliance.org/>

# Scrum

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# Scrum

- **A popular Agile development process**
- **1986: Hirotaka Takeuchi and Ikujiro Nonaka**
  - Described a holistic development approach that values increased speed and flexibility, compared it to rugby
  - The New New Product Development Game (Harvard Business Review, Jan-Feb 1986)
- **1991-2001: Sutherland, Scwaber, and others**
  - Apply ideas to software development, describe, called it Scrum

# Scrum Use

- **Many game companies in US are using Scrum or an adaptation, or trying it**
  - Various teams in EA and BioWare use Scrum
- **Becoming very popular in US game development community**

# Scrum Roles

- **ScrumMaster**
  - Runs Scrum processes
  - Removes obstacles from team
- **Product Owner**
  - Represents stakeholders, voice of the customer
- **Team**
  - Includes developers

# Scrum

- **Product Backlog**
- **Sprint Backlog**
- **Sprint**
- **Deliver working version of software**
- **Repeat**

# Scrum Documents

- **Product backlog**
  - High level feature set of entire project
- **Sprint backlog**
  - Tasks needed to implement sprint requirements
  - Team members sign up for tasks
- **Burn down chart**
  - Shows number of tasks remaining for sprint

# Sprint Diagram

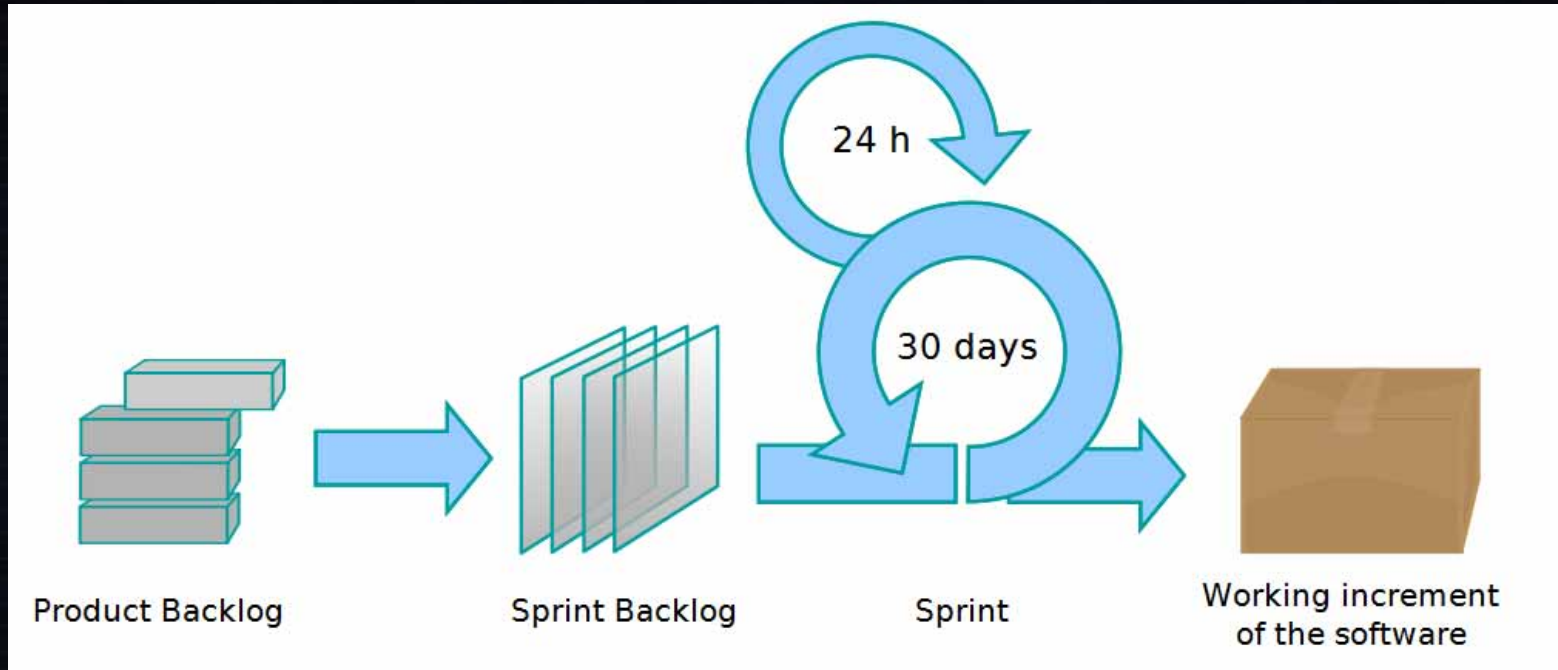


Diagram from Wikimedia Commons, Creative Commons license



# Scrum meeting

- **Once per day**
- **Attendees stand to keep meeting shorter**
  - Not for problem solving (handled offline)
- **Each team member answers three questions**
  - What have you done today?
  - What are you planning to do tomorrow?
  - Do you have any problems preventing you from accomplishing your goal?

# Teams

- **Scrum teams**
  - Cross disciplinary, 5-10 typically
  - Emergent: Many form, complete initiative, dissolve, while others long-lived
  - Embedded Tester (US: QA) in scrum team very useful
- **Scrum of Scrums (SoS)**
  - ScrumMasters attend SoS
  - Scrum of Scrum of Scrums possible
  - Used in teams of 500+

# Learn More about Scrum

- **Scrum Alliance**
  - <http://www.scrumalliance.org/>
- **Control Chaos**
  - <http://www.controlchaos.com/>

# Software Configuration Management Tools

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# Most Common

- **Perforce**
  - Most common in US games industry
- **Others**
  - Subversion
  - AlienBrain
  - CVS
  - Visual SourceSafe

# Perforce

- Solid server with good feature set
- Good client UI usable by programmers, artists, designers, managers, etc
  - Trained non-programmers (such as designers) with a short class
- Windows, Linux, Mac, etc
- <http://www.perforce.com/>

# Perforce at EA

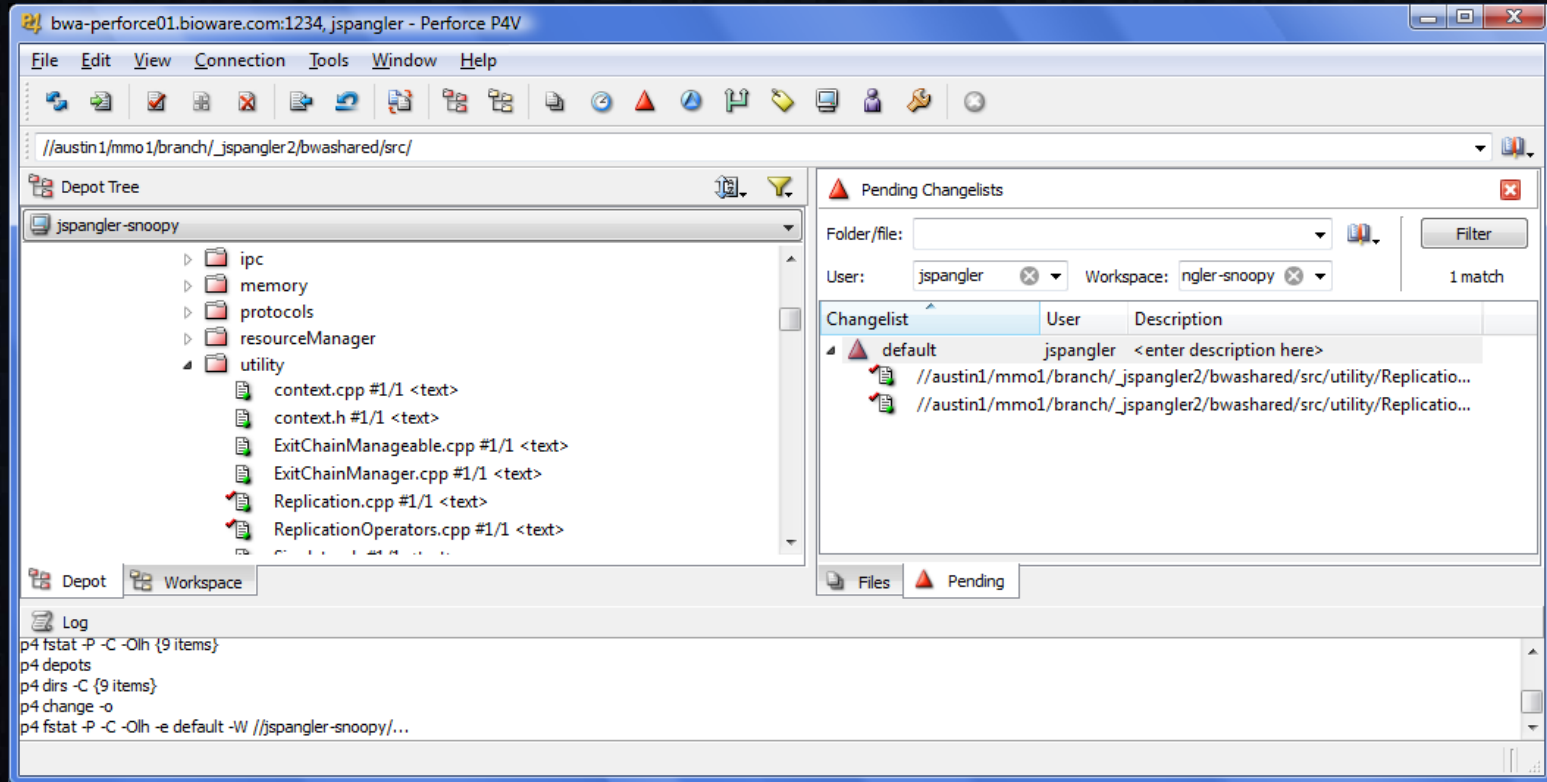
- **Over 4000 users on 90+ servers**
  - Spread among many worldwide studios
  - Team server has handled 1000+ users
- **Terabytes of data on largest server**
  - 90% of files are binary (data and assets)
- **My current project has 100+ users**
  - Several development tools use Perforce automatically

# Perforce at EA

- Typically each multi-project studio has one Perforce administrator
- For more information about Perforce at EA
  - Scaling Source Control for the Next Generation of Game Development, by Mike Sundy & Tobias Roberts
  - Perforce User's Conference, May 2007
  - [http://www.perforce.com/perforce/conferences/us/2007/presentations/eapresentation\\_paper.pdf](http://www.perforce.com/perforce/conferences/us/2007/presentations/eapresentation_paper.pdf)



# Perforce UI





# Perforce Strengths

- UI and command line clients
- Easy to integrate into build systems and tools
- APIs for many languages, including C++, Ruby, Python, Perl
- Can handle code, assets, and data

# Perforce Strengths Cont'd

- **Atomic operations**
- **Delayed copying of branched files decreases disk space usage**
- **P4proxy can help remote developers**
  - Caches repeated requests, decreasing bandwidth usage and increasing response times after first request

# Perforce Add-ons

- **P4Review** – Email updates of changes to subscribers
- **P4GT** – Graphics tools integration
  - Photoshop, Maya, 3DS Max, SoftImage XSI
- **P4SCC** – Visual Studio IDE integration
- **P4WSAD** – Eclipse and WebSphere **integration**
- **P4OFC** – MS Office integration
- **P4EXP** – Windows Explorer integration

# Perforce Hints

- **Limit the number of revisions for large asset types to conserve disk space**
- **Enable versioning for spec data (spec depot)**
- **If possible, branch code and data together**
- **Enable case-insensitivity if using Windows clients**

# Perforce Hints Cont'd

- **Changelist numbers can be useful for tracking**
- **64-bit Linux with XFS filesystem for server**
  - Much faster than Windows in EA's testing
- **Enable journaling and checkpointing, set up backups**

# Other SCM Tools

- DevTrack
- QuickBuild (PMEase)
- **In general, replacing some tools that have been built in house in the past**
  - More support and features without additional developers
  - Already tested and debugged
  - Greater trend in general – engines, libraries, dev tools



# Build Manager

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# Build Manager

- **Many names and variations of role**
  - Build manager
  - Build engineer
  - Build master
- **Part of Development or Testing (US: QA)**

# Possible Build Manager Roles

- **Implement and maintain build system**
  - Web-based UI interface common
- **Create automated code and data build tools**
  - Save time and reduce errors
  - Automated nightly and/or continuous builds
- **Create automated deployment tools**
  - New client patch, new server release, new burn, etc.

# Possible Build Manager Roles...

- **Maintain code and data trees in source control**
  - Major branching, merging, tagging
  - Can define process with development teams
- **Build Manager may have their own Scrum for the build and deployment system**
  - Could also join other scrums to add support for new data files to the build and deploy system

# Benefits

- **Allows Testing more control to deploy builds to different environments**
  - Very useful for online games like MMOs
- **Can lead to a more maintainable build system**
  - MMOs can live a long time

# Benefits Cont'd

- **Makes build management a goal with dedicated time, rather than spare time from game developers**
- **Testing can control of deployment via use of build and deploy system can help increase quality**

# Conclusion

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# Thank you

- **CEDEC Secretariat**
- **Gordon Walton, Bill Dalton, and Robert McKenna, BioWare - EA**
- **Mike Sundy, Tobias Roberts, and Kevin Patterson, EA**
- **Authors of the Agile Manifesto**



# Questions?

- Q&A
- Email: [jspangler@bioware.com](mailto:jspangler@bioware.com)
- Facebook and LinkedIn
- I only speak and read English (sorry).