

# Quality of Life & Next Gen Consoles: What Do We Do?

Evan Robinson

<http://www.enginesofmischief.com>

[evan@enginesofmischief.com](mailto:evan@enginesofmischief.com)

# Let's Talk About...

- Games Are Big Now
- Next Gen Games Will Be Bigger
- Quality of Life (Crunch Mode) is Scary Now
- How Do We Get Bigger & Manage To Have Lives?

# Orders of Magnitude: Hardware

<p>6502 1-2 Mhz 1978</p>	<p>5 8-bit registers (A, X, Y, P, S) 7 status bits in P \$00-\$FF zero page 16-bit address space 9000 transistors ~2 MB/s throughput</p>
<p>Pentium 3+ Ghz Today</p>	<p>8 8/16/32-bit registers (EAX, ECX, EDX, EBX, ESP, EBP, ESI, EDI) plus some... 14 status bits 32-bit address space 125 million transistors ~7 GB/s throughput (Athlon 64)</p>
<p>Cell ~4 Ghz Tomorrow</p>	<p>1 PPE processor (roughly equivalent to a Pentium) 8 SPE processors (128 registers, 256K local RAM each) 235 million transistors 25 GB/s + 77 GB/s throughput</p>

# Orders of Magnitude: Software

- 1985 (Mail Order Monsters): ~5,000 lines of 6502 ASM, ~25,000 of data
- 2003 (Acrobat): ~3,000,000 lines of C
- 2003 (Windows Server 2003): 50,000,000 LOC (according to Business Week)

# 19 Orders of Magnitude

- 3 in CPU speed (1 Mhz -> 1 Ghz)
- 3 in Display Size (1K chars -> 3M pixels)
- 5 in RAM Size (48K -> 1G)
- 5 in HD Size (88K -> 90G)
- 3 in project size (5000 LOC -> 3,000,000 LOC)

# 19 Orders of Magnitude

10,000,000,000,000,000,000

1,000,000 is million

1,000,000,000 is billion

1,000,000,000,000 is trillion

1,000,000,000,000,000 is quadrillion

1,000,000,000,000,000,000 is quintillion

so that's 10 quintillion or 10 million trillion times!

# NextGen

- Bigger (DVD vs. CD)
- Capable of Photorealism
  - What About The Uncanny Valley?
    - Better Motion, AI
  - Art Tools & Pipelines
- Multiprocessing (remember Dreamcast?)

# Quality of Life

- ea\_spouse, joe\_straitiff (LiveJournal)
- IGDA Quality of Life Summit
  - 34% expect to leave the industry within 5 years. 50% expect to leave within 10 years.
  - Fewer than one lead developer in 10 has over 10 years of experience
- Crunch Mode is the elephant in the living room.

# Hours & Crunch Mode

Crunch Mode is simply the long-term application of this idea:

If I can get  $X$  done in 8 hours,

Then I can get  $2X$  done in 16 hours.

# Hours & Crunch Mode

## Reasons We Use Crunch Mode:

- Testosterone: The Original “Stupid Drug”
- It’s Always Been This Way
- It Worked Last Time
- I Must Be Seen To Be Doing Everything Possible To Succeed
- I Can’t Measure Output

# Hours & Crunch Mode

1908: Ernst Abbe publishes study showing reducing hours from 9 to 8 increased total daily output.

1909: Chapman publishes *Hours of Labour* showing long-term variations in productivity as a function of workday length.

1926: Ford adopts five day, 40 hour week.

# Hours & Crunch Mode

## Lessons from the Literature re: Crunch Mode

- Productivity varies over the workday
- Productivity is hard to quantify for knowledge workers
- Five-day weeks of eight-hour days maximize long-term output
- At 60 hours/week, loss of productivity caused by working longer hours overwhelms extra hours worked within eight weeks.
- Continuous work reduces cognitive function 25% for every 24 hours. Multiple consecutive overnights have a severe cumulative effect.
- Error rates climb with hours worked and especially with loss of sleep.

# Books

*Peopeware and Waltzing With Bears*, by Tom DeMarco & Tim Lister

*Death March*, by Edward Yourdon

*The Mythical Man-Month*, by Fred Brooks

*1001 Ways to Reward Employees*, by Bob Nelson

*Code Complete, Rapid Development, and Software Project Survival Guide*,  
by Steve McConnell

*201 Principles of Software Development*, by Alan Davis

*Assessment and Control of Software Risks*, by Capers Jones

*The Inmates Are Running The Asylum*, by Alan Cooper

# Websites

IGDA: [www.igda.org](http://www.igda.org)

GDC: [www.gdconf.com](http://www.gdconf.com)

GamaSutra: [www.gamasutra.com](http://www.gamasutra.com) / [www.gamedeveloper.com](http://www.gamedeveloper.com)

Chris Crawford: [www.erasamatazz.com](http://www.erasamatazz.com)

Hiring Technical People: [www.jrothman.com/weblog/htpblogger.html](http://www.jrothman.com/weblog/htpblogger.html)

Managing Product Development: [www.jrothman.com/weblog/blogger.html](http://www.jrothman.com/weblog/blogger.html)

ea\_spouse: [www.livejournal.com/users/ea\\_spouse](http://www.livejournal.com/users/ea_spouse)

/. games: [games.slashdot.org](http://games.slashdot.org)

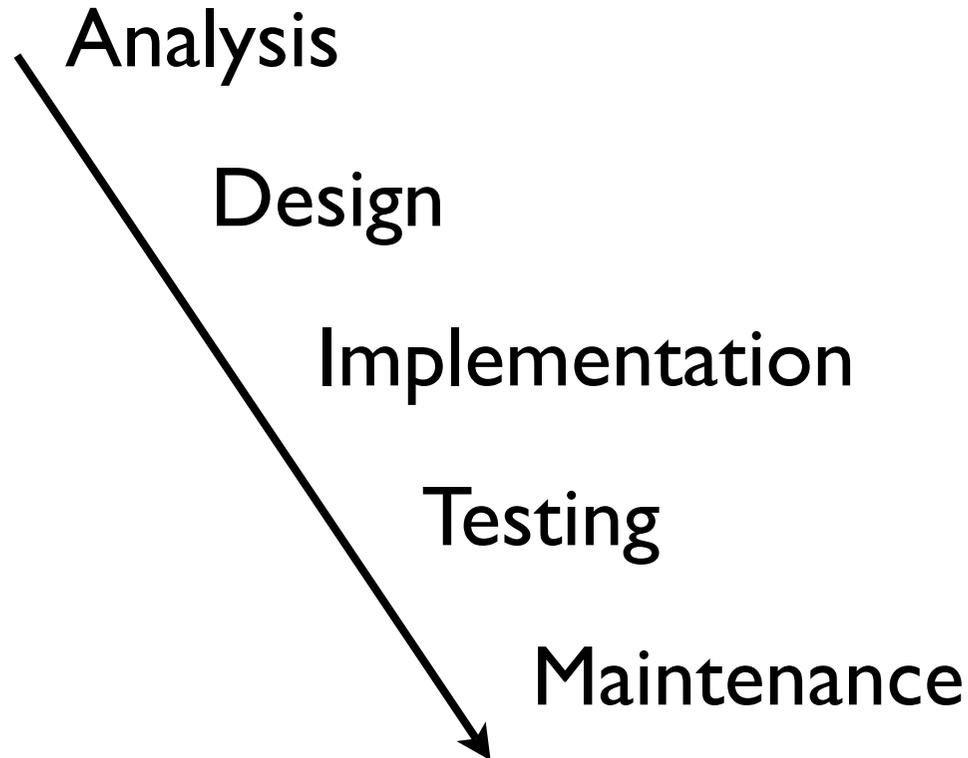
**Buddhist Scripture, 300 BCE**

**“Clear Thinking Leads  
to Nirvana; a Confused  
Mind is a Place of  
Death”**

# Metrics

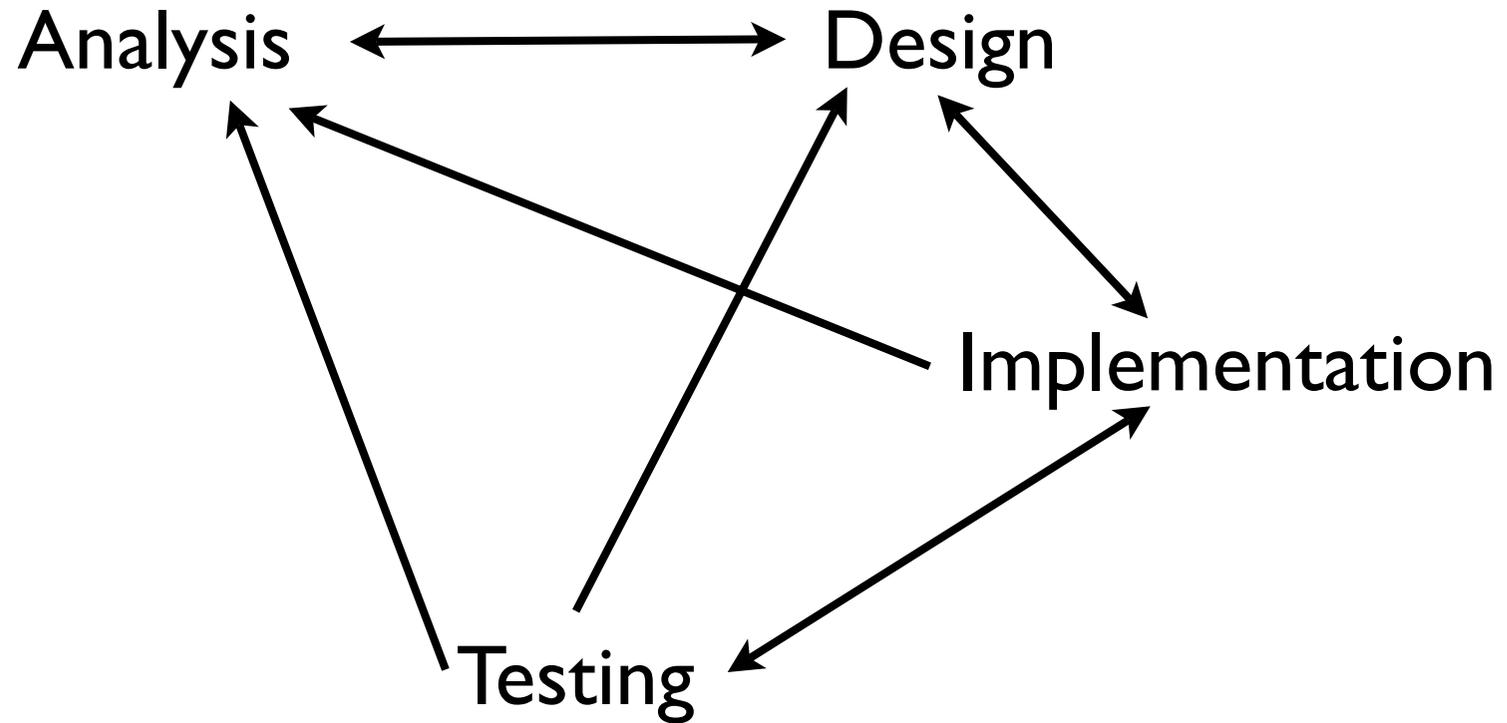
- “You Can’t Control What You Can’t Measure”  
Lord Kelvin (paraphrased)
- Find some predictive value that can be obtained before project is completed.
- Common candidates:
  - Lines of Code (LOC)
  - Function Points (FP)
  - Models, Textures, Levels
- SEI’s Personal Software Process (PSP)

# Waterfall Life Cycle



Developed for conversion of manual business processes into computerized processes.  
Ineffective for real-time systems.

# Cyclic Development



Iterative, Evolutionary, Spiral, Agile

# Scrum

The basic premise is that if you are committed to the team and the project, and if your boss really trusts you, then you can spend time being productive instead of justifying your work. This reduces the need for meetings, reporting and authorization. There is control, but it is subtle and mostly indirect. It is exercised by selecting the right people, creating an open work environment, encouraging feedback, establishing an evaluation and reward program based on group performance, managing the tendency to go off in different directions early on, and tolerating mistakes. Every person on the team starts with an understanding of the problem, associates it with a range of solutions experienced and studied, then using skill, intelligence, and experience, will narrow the range to one or a few options.

from [www.controlchaos.com/about/how.php](http://www.controlchaos.com/about/how.php)

# Scrum

- Scrum is an agile process to manage and control development work.
- Scrum is a wrapper for existing engineering practices.
- Scrum is a team-based approach to iteratively, incrementally develop systems and products when requirements are rapidly changing
- Scrum is a process that controls the chaos of conflicting interests and needs.
- Scrum is a way to improve communications and maximize co-operation.
- Scrum is a way to detect and cause the removal of anything that gets in the way of developing and delivering products.
- Scrum is a way to maximize productivity.
- Scrum is scalable from single projects to entire organizations. Scrum has controlled and organized development and implementation for multiple interrelated products and projects with over a thousand developers and implementers.
- Scrum is a way for everyone to feel good about their job, their contributions, and that they have done the very best they possibly could.

from [www.controlchaos.com/about/](http://www.controlchaos.com/about/)

# Is Agility The Answer?

“Process is only a second-order effect. The unique people, their feelings, qualities, and communication are more influential.

Some problems are just hard, some people are just difficult. These methods are not salvation.”

Alistair Cockburn

# Enjoy the Ride

- *[Gil (Steve Martin) has been complaining to Karen (Mary Steenburgen) about his complicated life; Grandma (Helen Shaw) wanders into the room -- Karen]*
  - **Grandma**: You know, when I was nineteen, Grandpa took me on a roller coaster.
  - **Gil**: Oh?
  - **Grandma**: Up, down, up, down. Oh, what a ride!
  - **Gil**: What a great story.
  - **Grandma**: I always wanted to go again. You know, it was just so interesting to me that a ride could make me so frightened, so scared, so sick, so excited, and so thrilled all together! Some didn't like it. They went on the merry-go-round. That just goes around. Nothing. I like the roller coaster. You get more out of it.
- ...
- **Karen**: I happen to LIKE the roller coaster, okay? As far as I'm concerned, your grandmother is brilliant.
  - **Gil**: Yeah if she's so brilliant why is she sitting in our NEIGHBOR'S CAR?

“Parenthood”, 1989