SSW-555: Agile Methods for Software Development

Crystal

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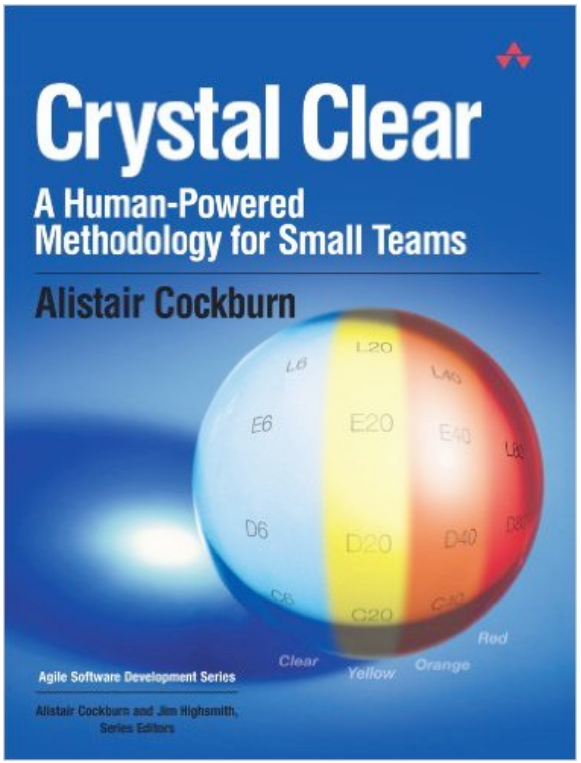
Acknowledgements

Some of the material in these slides is from *Agile Software Development* by Alistair Cockburn

Some of the material in these slides is from *Crystal Clear: A Human-Powered Methodology for Small Teams* by Alistair Cockburn

Today's topics

- Crystal Clear
  - Properties
  - Strategies
  - Techniques
  - Roles and work products
- Crystal Clear vs. XP
- Crystal Family of Methods



Alistair Cockburn on process and plans

"*Focusing on skills, communications, and community allows the project to be more effective and more agile than focusing on processes and plans.*"

– Alistair Cockburn

Process and planning are important, but people, interactions, community, skills, and talent are more important

Many teams follow the letter of the process rather than the spirit of the process

Crystal (1992)

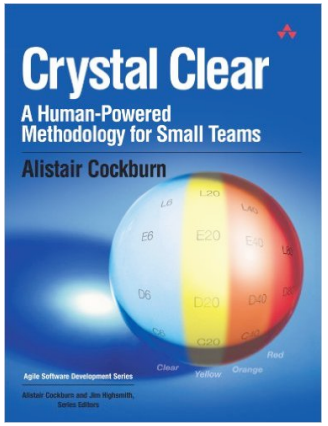
Alistair Cockburn interviewed successful projects and extracted the processes that helped lead to success

- Teams were succeeding without traditional formal methods

Crystal is a ***family*** of methods and a set of guidelines that you adjust to meet your project's needs

Different flavors of Crystal for different project needs

- Just as no two crystals are the same, no two projects are the same
- E.g. small projects vs. large projects
- Tailor the process to the project



Crystal Clear

Crystal Clear is the lightest member of Crystal family

Similar to eXtreme Programming

Intended for small, collocated teams (1-6 members)

		Crystal Methodologies				
		Clear	Yellow	Orange	Red	Maroon
Criticality of the Project	Life (L)	L6	L20	L40	L80	L200
	Essential Money (E)	E6	E20	E40	E80	E200
	Discretionary Money (D)	D6	D20	D40	D80	D200
	Comfort (C)	C6	C20	C40	C80	C200
		1 to 6	7 to 20	21 to 40	41 to 80	81 to 200
		Number of People involved in the Project				

Source: Crystal Clear: A Human-Powered Methodology for Small Teams

Properties, Strategies, Techniques

Properties

Properties should be true about any project

e.g. Principles in the Agile Manifesto

Strategies

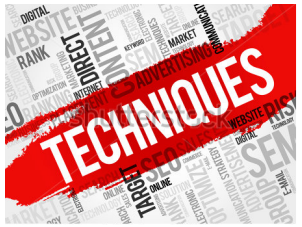
Strategies are a plan to accomplish a goal

Higher level approaches to solving problems

Techniques

Techniques are things you do

Skills that the team can develop and use to solve problems



Properties across all Crystal Methods

Properties

1. Frequent delivery (Clear)
   - Intervals of 2 weeks to 4 months
   - Tune Crystal parameters to your project's needs
2. Reflective improvement (Clear)
   - "Reflection workshop" every few weeks, e.g. after every delivery
   - Review what parts of process worked and what needs to change
   - Analogous to Sprint Retrospective

Properties across all Crystal Methods

Properties

3. Osmotic communication (Clear)

   See, hear, and absorb information in background

   Improves communication across team

   All team members are aware of others' work and can help or take over if needed

   Goal: communications and community

Properties across all Crystal Methods

Properties

4. Personal safety

   Everyone should be comfortable sharing ideas with everyone

   Mutual trust across the team, including the "boss"

   Speak up without fear of ridicule

5. Focus

   Minimize interruptions from calls, email, meetings

      At least two hours per day of uninterrupted time

   Clear direction and priorities for the project

      Everyone knows what to work on

   People have time and peace of mind to work

Properties across all Crystal Methods

Properties

6. Easy access to domain experts
   - Onsite or via regular meetings
   - Analogous to onsite experts from eXtreme Programming
7. Technical environment
   - Automated tests
   - Configuration management
   - Frequent/Continuous integration
8. Collaboration across organizational boundaries

Strategies

1. Exploratory 360°

   Planning at the beginning of the project

   Early requirements and domain model

   Demonstrations of feasibility

2. Early victory

   Focus on an easy first deliverable

   Winning helps the team to bond and feel successful

Strategies

3. Walking skeleton

Tiny end-to-end version of the system's functionality

Provides a simple model for the user to explore

System evolves from this first architecture

4. Incremental re-architecture

Be prepared to change the architecture

Have a fallback or temporary solution (a short term hack)

Evolve to the new architecture through parallel effort

Strategies

5. Information radiators

   Display useful information through osmotic communication

   Updated continuously

   E.g. Burn down chart to display status and progress

How are we doing?

Techniques

1. Methodology shaping to define the process

   Conduct interviews to collect information about the team

   Conduct workshop to define an optimal process for this team

2. Reflection workshop

   Hour-long meeting after each delivery

   What are we doing well?

   What can we do better?

   How can we improve our process?

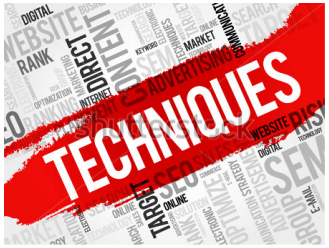
   Analogous to Sprint Retrospective

Keep these	Try these
test lock-down quiet time daily meetings	pair testing fines for interruptions programmers help testers
Problems	
too many interruptions shipping buggy code	

Source: Crystal Clear: A Human-Powered Methodology for Small Teams

Techniques

3. Blitz planning/Planning "Jam Session"



Like XP's Planning Game

Create initial project plan

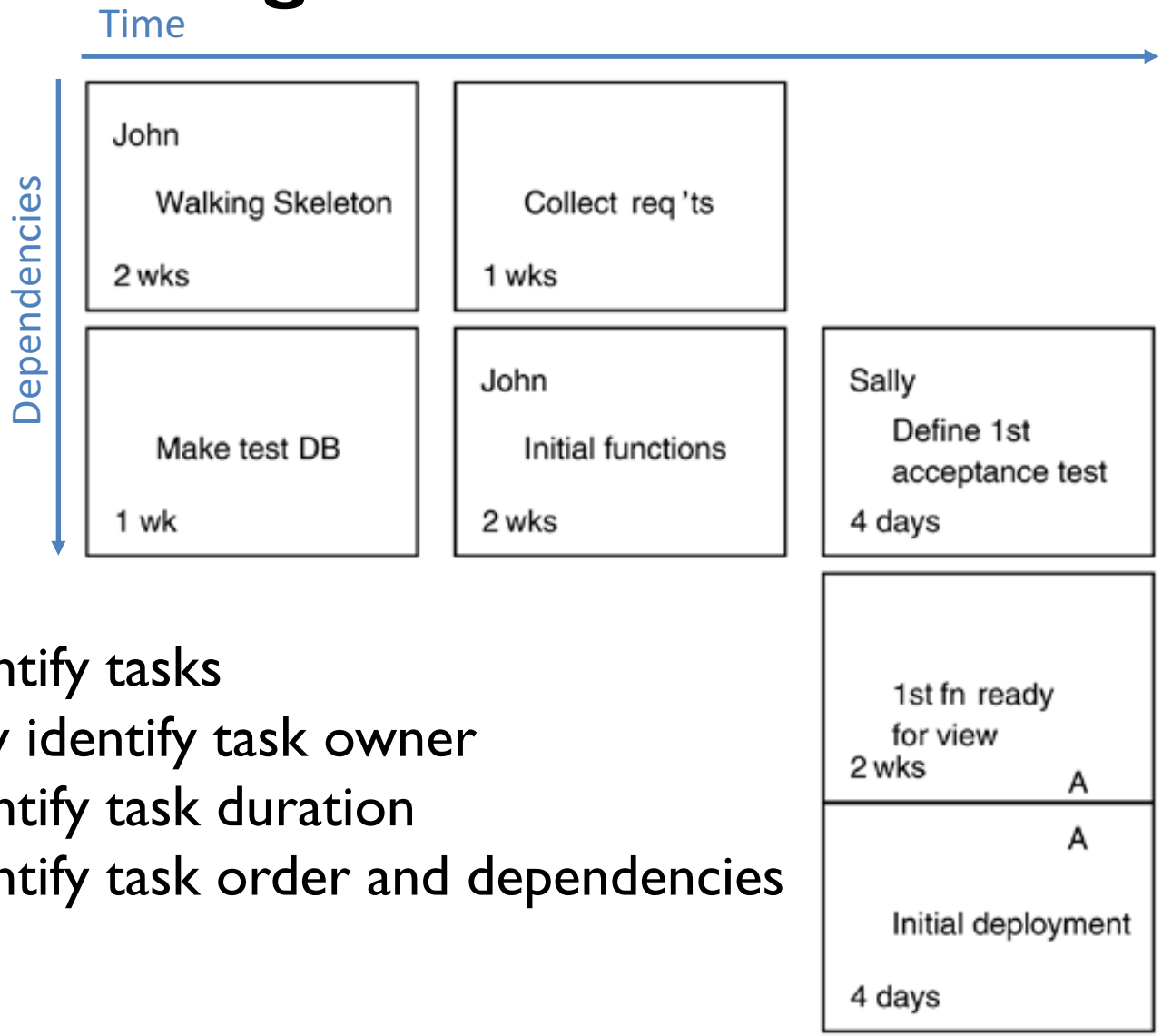
Include all stakeholders

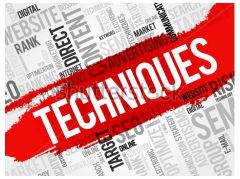
Executive sponsor, users, developers

Planning Game vs Blitz Planning

Planning Game	Blitz Planning
User Stories	Tasks
Assume no dependencies between stories	Explicitly analyze dependencies between tasks
Fixed length sprints	Variable iteration durations

Blitz Planning Cards





- Identify tasks
- May identify task owner
- Identify task duration
- Identify task order and dependencies

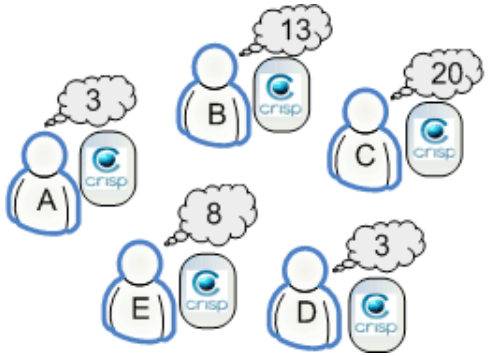
Techniques

4. Delphi estimation

   Iterative estimation by groups of experts

   Achieve convergence through peer pressure

   Planning Poker



5. Daily stand-ups

   Borrowed from Scrum

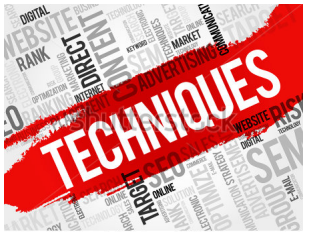
   What did I accomplish since last time?

   What's my goal for today?

   What problems do I have?

Techniques

6. Agile interaction design



User-centered design

What would the user want?

How will the user use the system?

Focus on roles of users

Human Computer Interaction (CS 545)

Usability testing

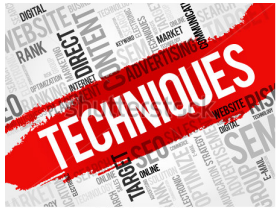
Role modeling session

Each card represents a feature or user story

Specify the goal on the card

Work through a scenario of a user accomplishing a task

Techniques



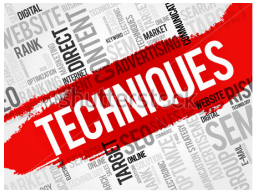
7. Process miniature

Train participants on processes with short exercises

Peter Merel's "Extreme Hour" to learn XP

Walk through all aspects of XP on simple project in 60 minutes

Techniques



8. Side-by-side programming

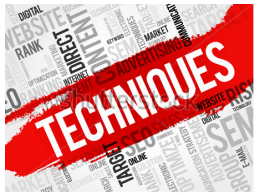
   Sit close enough to see one another's screens

   Not quite pair programming:

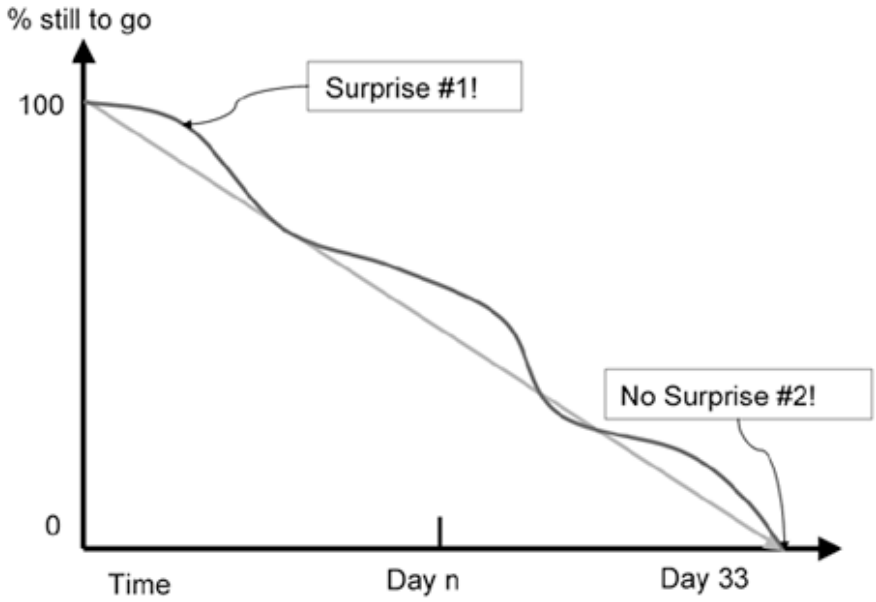
   Help is available when needed, but not constant

   Osmotic communication

Techniques



9. Burn charts
   - Display progress against goals
   - Borrowed from Scrum



Roles and Work Products

Smaller projects require fewer roles

- Executive Sponsor
  - Mission statement
- Team
  - Team structure and conventions
  - Reflection workshop results
- Coordinator/Manager
  - Project map
  - Release plan
  - Project status
  - Risk list
  - Iteration plan and status
  - Viewing schedule

Roles and Work Products

Larger projects require additional roles

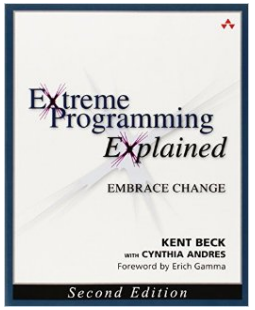
- Business expert and expert user
  - Actor-goal list
  - Use cases and requirements file
  - User role model
- Lead designer
  - Architecture description
- Tester
  - Bug reports
- Designer-programmer
  - Screen drafts
  - Common domain model
  - Design sketches and notes
  - Source code
  - Migration code
  - Tests
  - Packaged system
- Writer
  - User help text

Crystal Clear vs. eXtreme Programming

Criticality of the Project	Crystal Methodologies: Clear	Yellow	Orange	Red	Maroon
Life (L)	L6	L20	L40	L80	L200
Essential Money (E)	E6	E20	E40	E80	E200
Discretionary Money (D)	D6	D20	D40	D80	D200
Comfort (C)	C6	C20	C40	C80	C200
	1 to 6	7 to 20	21 to 40	41 to 80	81 to 200

Number of People involved in the Project

VS



Many similarities, but…

Cockburn claims that:

- XP requires more discipline than Crystal Clear
  - XP has 12 mandatory practices, e.g. Pair Programming, TDD, …
- XP can be more productive than Crystal Clear
- It is easier to start using Crystal Clear
  - Especially for Plan Driven teams
- It is easy to fall back from XP to Crystal Clear
  - Use only the XP practices that work for your project

The family of Crystal Methods

A single process is not likely to work for all projects

Adapt your method according to:

Criticality of the Project	Crystal Methodologies: Clear	Yellow	Orange	Red	Maroon
Life (L)	L6	L20	L40	L80	L200
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Comfort (C)	C6	C20	C40	C80	C200
Number of People involved in the Project	1 to 6	7 to 20	21 to 40	41 to 80	81 to 200

Size in staff

- 1 – 6 (Crystal Clear)
- 7 – 20 (Crystal Yellow)
- 21 – 40 (Crystal Orange)
- 41 – 80 (Crystal Red)

Potential risks for causing damage

- Comfort (C)
- Discretionary money (D) – the company will survive if the project fails
- Essential money (E) – the company may fail if the project fails
- Life (L) – safety critical

Note that Life (safety critical projects) should NOT use Crystal Methods

Source: http://www.devx.com/architect/Article/32836/0/page/2

Crystal Orange

Roles

- Sponsor
- Business expert
- Usage expert
- Technical facilitator
- Business analyst/designer
- Project manager
- Architect
- Design mentor
- Lead designer
- UI designer
- Reuse point
- Writer
- Tester

Work Products

- Requirements document
- Release sequence
- Schedule
- Status reports
- UI design document
- Common object model
- Inter-team specifications
- User manual
- Source code
- Test cases
- Migration code

Crystal Orange teams and sub-teams

System planning

Project Monitoring

Architecture

Technology

Functions (divided into cross-functional groups)

Infrastructure

External test

Questions?