SSW-555: Agile Methods for Software Development

Crystal

Instructor: Prof Zhongyuan Yu

School of Systems and Enterprises

Stevens Institute of Technology

This Lecture is based on material from Prof Jim Rowland

Today's topic

Crystal Clear

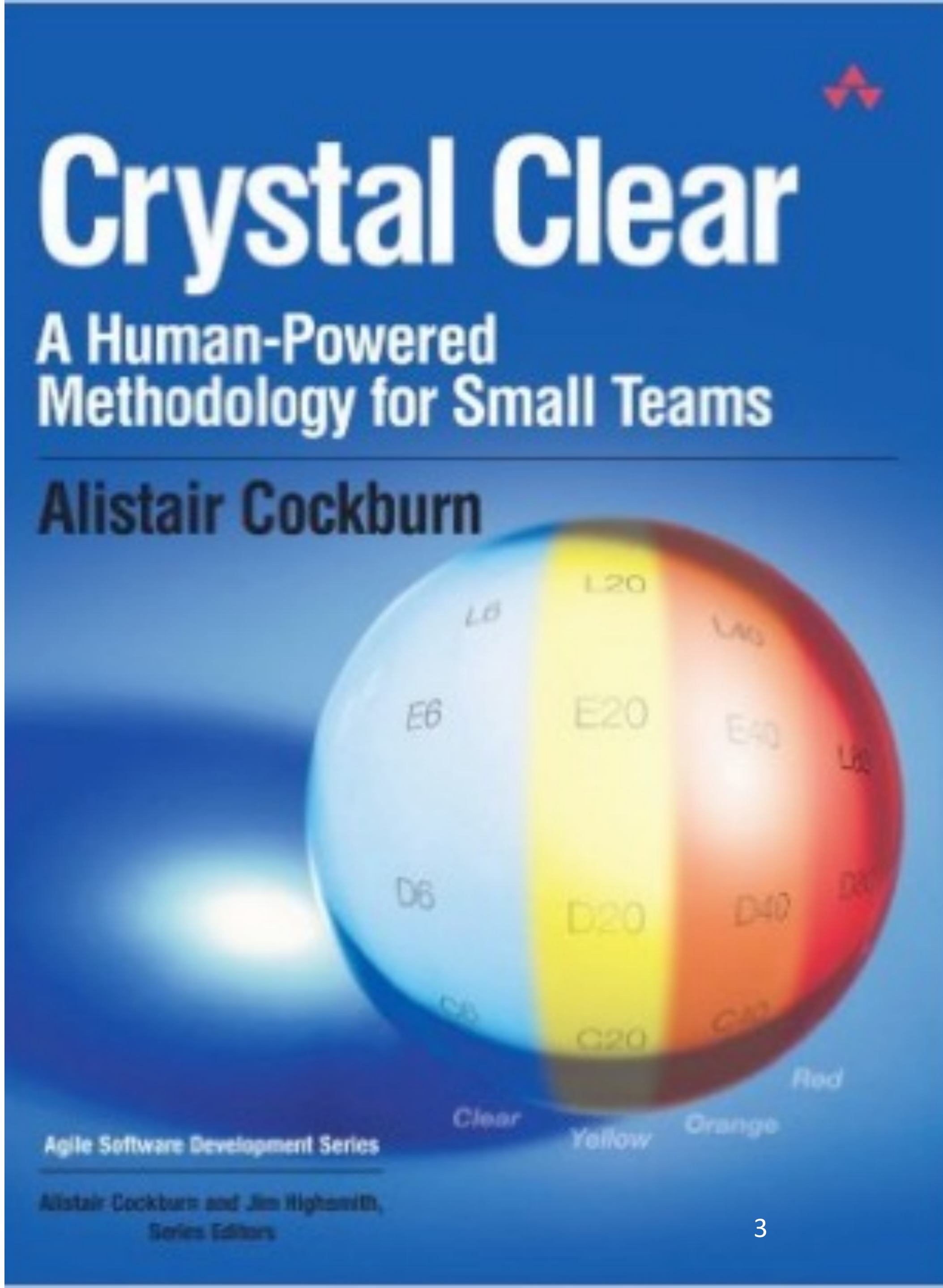
- Properties
- Strategies
- Techniques
- Roles and work products

Crystal Clear vs XP

Crystal Family of Methods

Acknowledgements

- *Agile Software Development* by Alistair Cockburn
- *Crystal Clear: A Human-Powered Methodology for Small Teams* by Alistair Cockburn


Crystal Clear
A Human-Powered Methodology for Small Teams
Alistair Cockburn
L6
L20
L40
E6
E20
E40
D6
D20
D40
C20
Clear
Yellow
Orange
Red
Agile Software Development Series
Alistair Cockburn and Jim Highsmith, Series Editors

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)

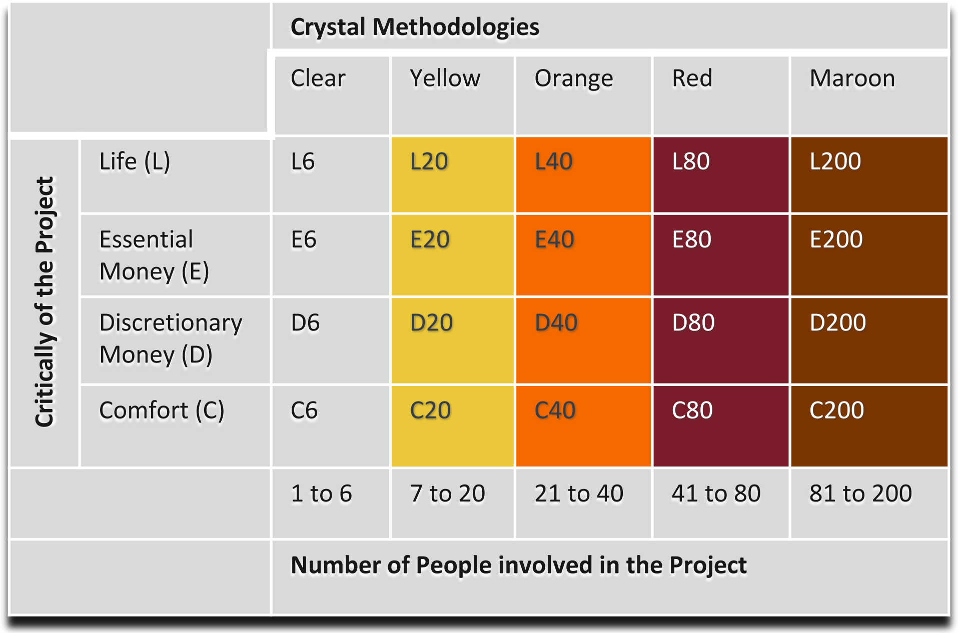
- Alistair Cockburn interviewed successful projects and extracted the processes that helped lead to success
  - Teams were succeeding without traditional formal methods

- 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 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
Critically 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

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

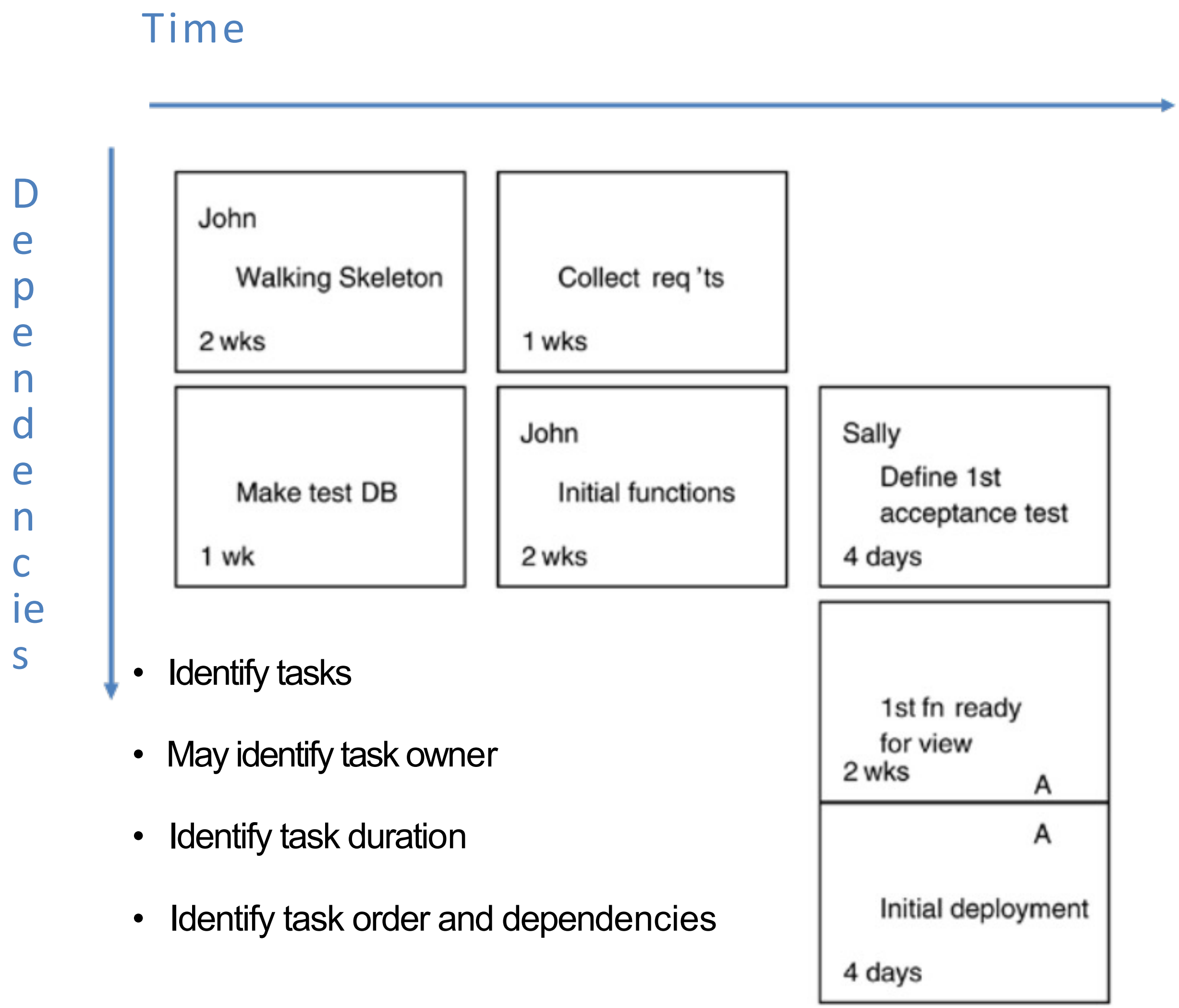
Techniques

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	Explicity analyze dependencies between tasks
Fixed length sprints	Variable iteration durations

Blitz Planning Cards



Time

Dependencies

John
Walking Skeleton
2 wks

Collect req 'ts
1 wks

Make test DB
1 wk

John
Initial functions
2 wks

Sally
Define 1st acceptance test
4 days

1st fn ready for view
2 wks
A

A
Initial deployment
4 days

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

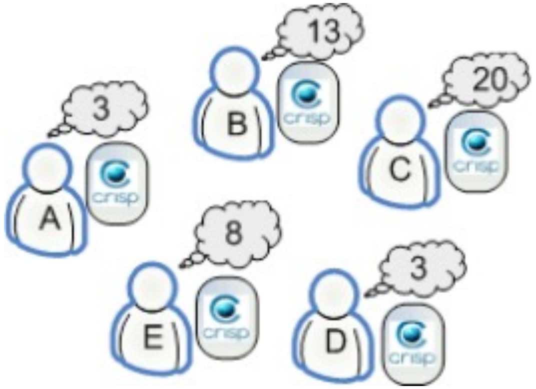
Techniques

4 Delphi estimation

- Iterative estimation by groups
- Achieve convergence through
- 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

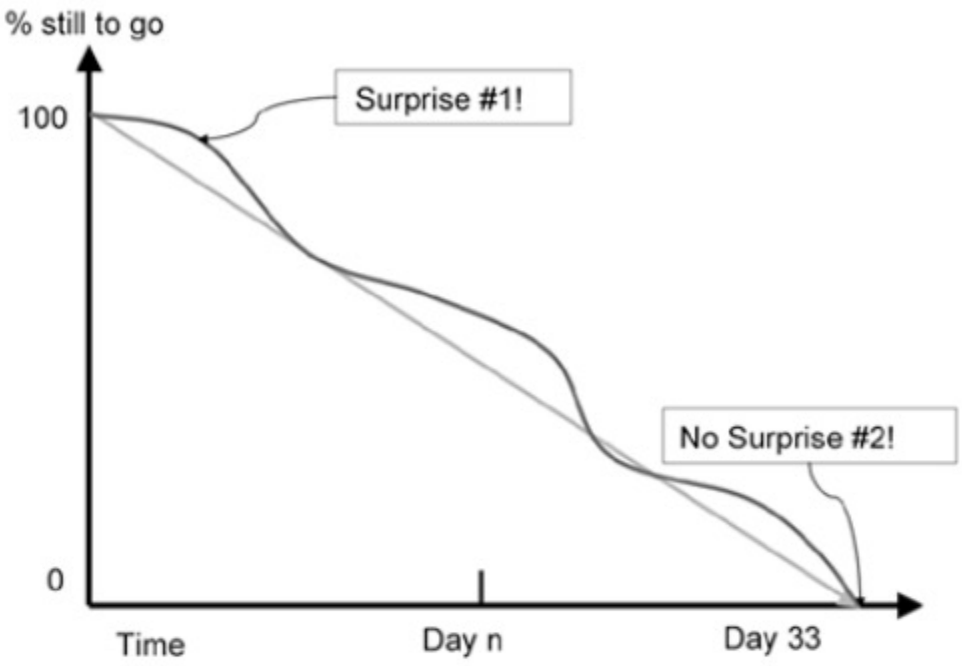
8 Side-by-side programming

- 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

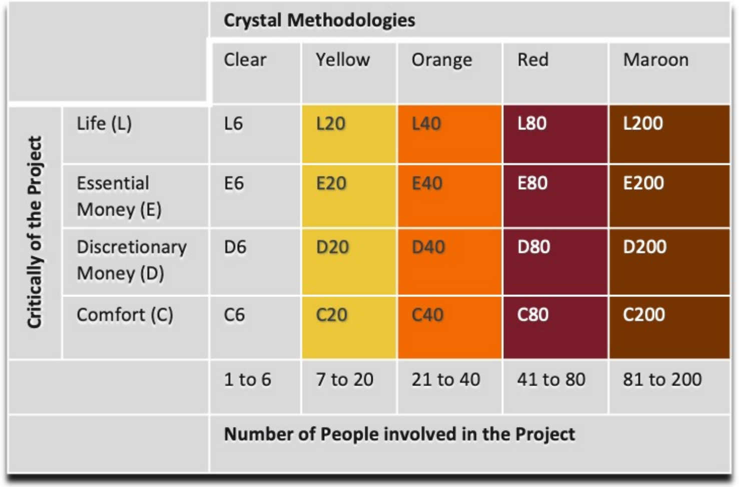
Crystal Clear vs eXtreme Programming

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



		Crystal Methodologies				
		Clear	Yellow	Orange	Red	Maroon
Critically 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				

The family of Crystal Methods

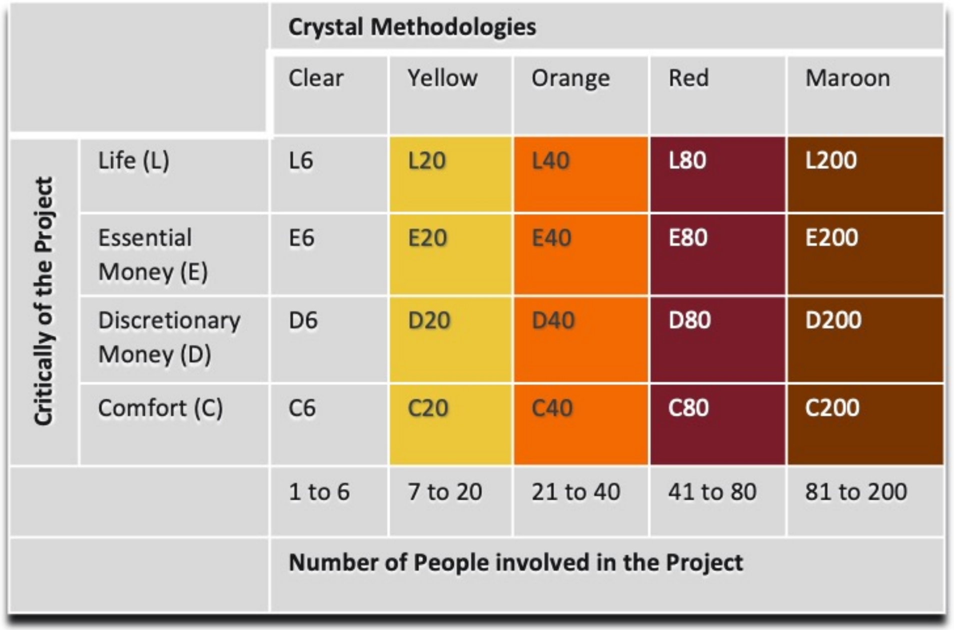
- A single process is not likely to work for all projects
- Adapt your method according to:

  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



		Crystal Methodologies				
		Clear	Yellow	Orange	Red	Maroon
Critically 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				

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

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

Team and sub-team:

System planning
Project Monitoring
Architecture
Technology
Functions (divided into cross-functional groups)
Infrastructure
External test

STEVENS
INSTITUTE OF TECHNOLOGY
1870

THANK **YOU**

Stevens Institute of Technology
1 Castle Point Terrace, Hoboken, NJ 07030