Software Process and Project Management

Sommerville, Chapters 4, 17
Pressman

Instructor: Peter Baumann

email: pbaumann@constructor.university
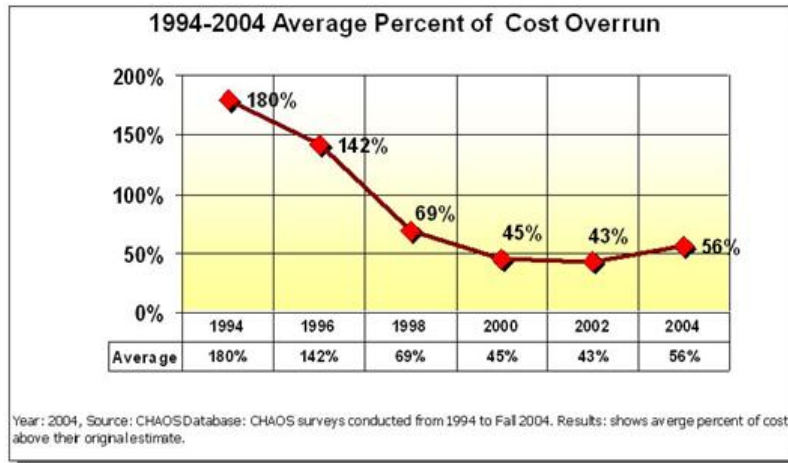tel: -3178

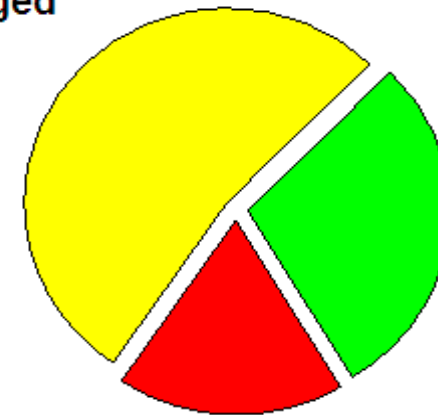office: room 88, Research 1

Everyone knew exactly what had to be done until someone wrote it down!

Project Sucess/Failure Rate

1994-2004 Average Percent of Cost Overrun

	1994	1996	1998	2000	2002	2004
Average	180%	142%	69%	45%	43%	56%

Year: 2004, Source: CHAOS Database: CHAOS surveys conducted from 1994 to Fall 2004. Results: shows averge percent of cost above their original estimate.

1994-2004 Average Percent of Time Overrun

	1994	1996	1998	2000	2002	2004
Average	164%	131%	79%	63%	82%	84%

Year: 2004, Source: CHAOS Database: CHAOS surveys conducted from 1994 to Fall 2004, Results: shows averge percent of time above their original estimate.

[CHAOS Report, Standish Group]

Challenged 53%
Succeeded 29%
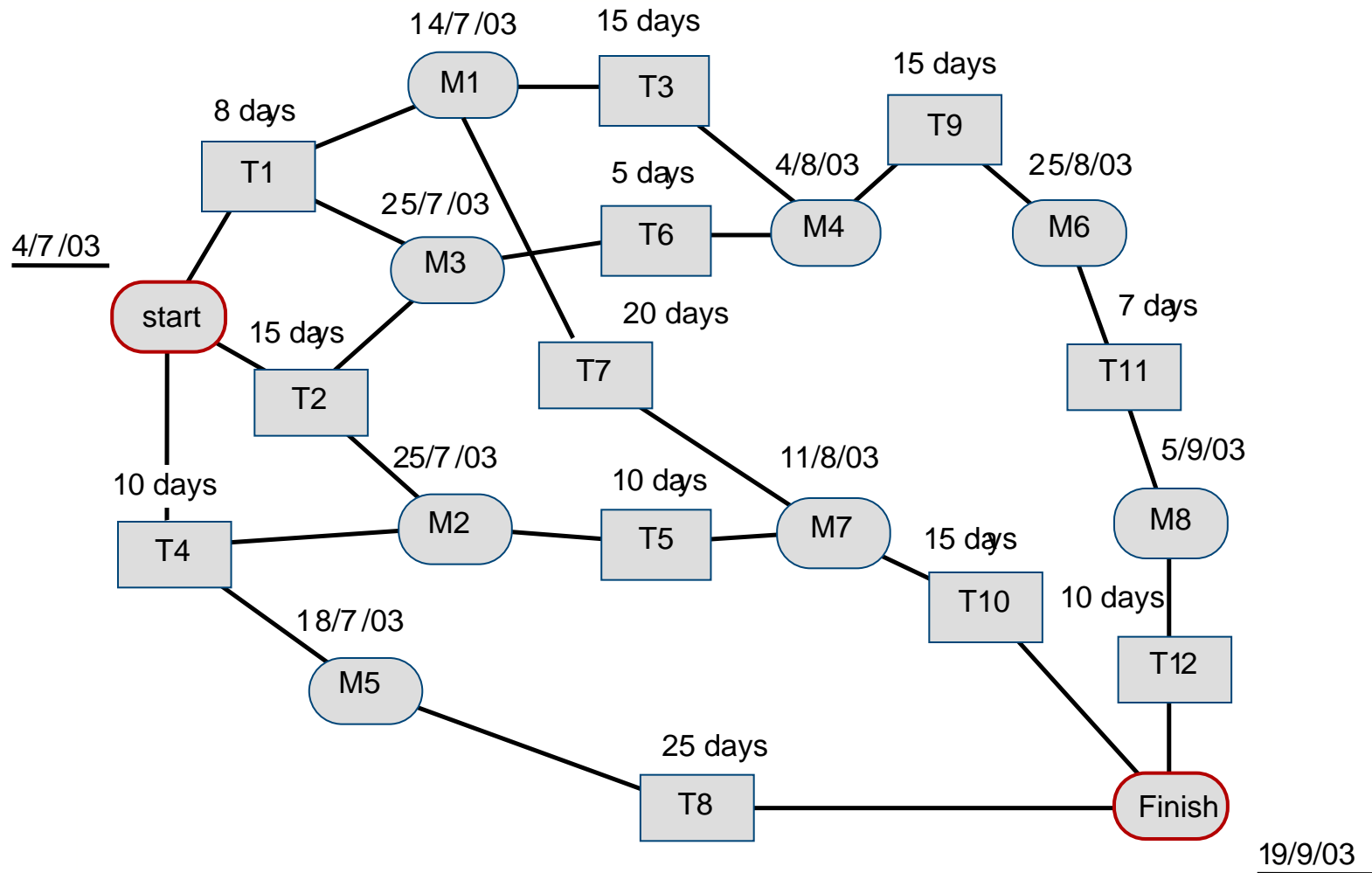Failed 18%

Erfolgreich abgeschlossen
Mit Veränderungen abgeschlossen
Abgebrochen

2,69%
44,35%
52,96%
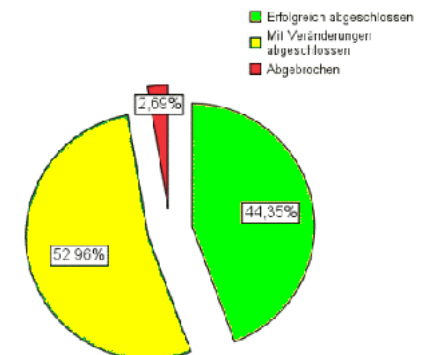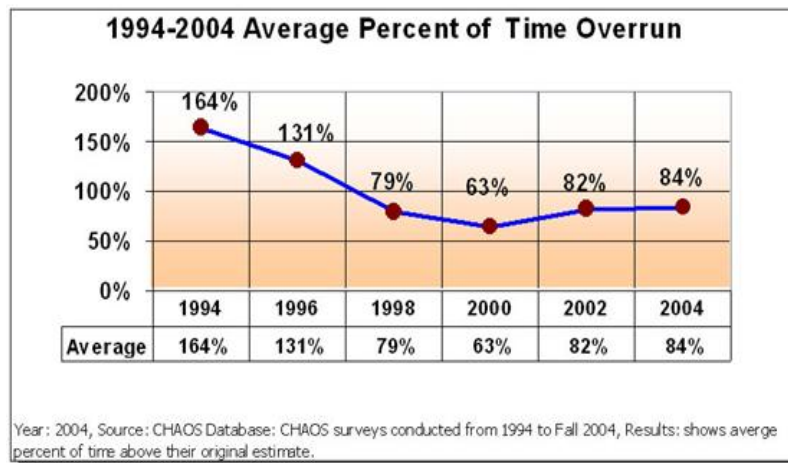
Where Time Really Is Spent In Practice

design
10%

implementation
15%

documentation
10%

Testing
5%

Struggling to
understand
requirements
30%

Technical
difficulties
30%
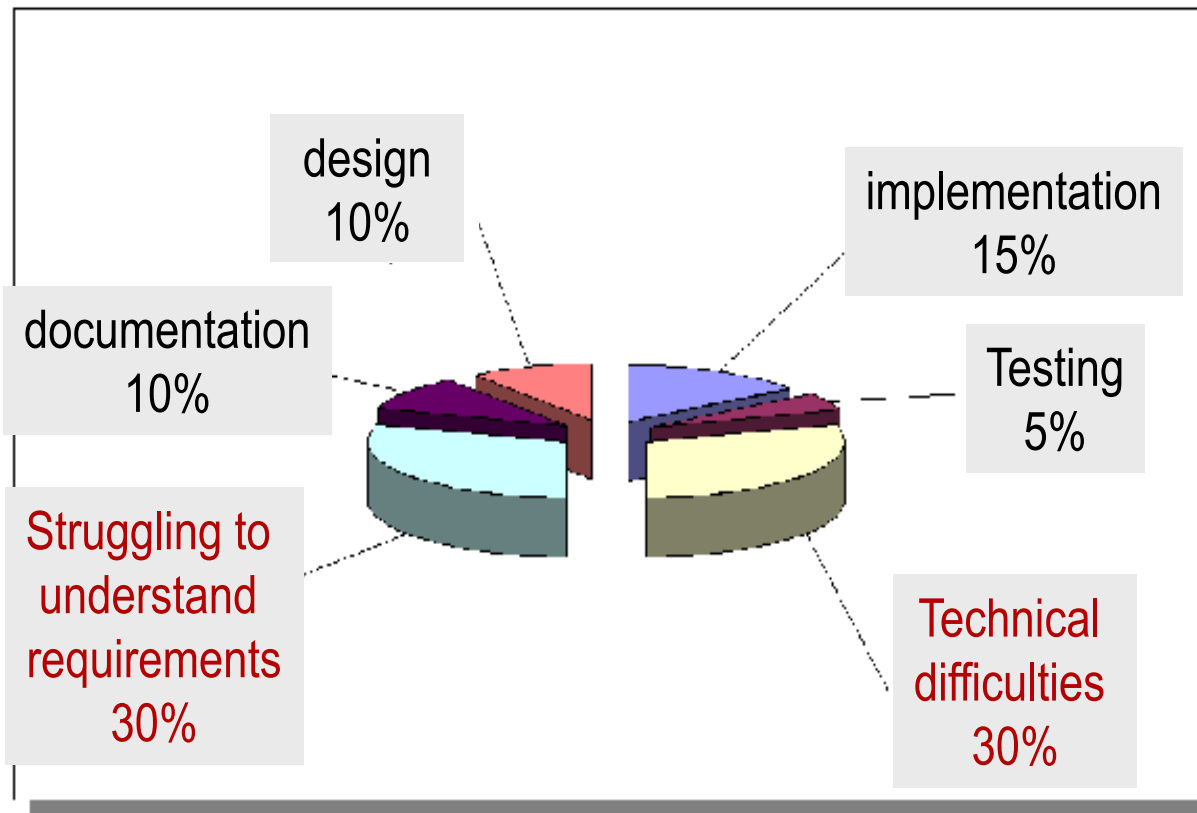
Source: unknown

Activity Network

File Edit View Insert Format Tools Project Window Help

Activity Timeline (aka Gantt Chart)

Henry L. Gantt (1861-1919)

124	1.2.2	⊞ Level 1 Calorimeter Track Matching	590 d	Thu 8/1/02	Tue 12/14/04
180	1.2.3	⊟ Level 1 Tracking	604 d?	Thu 11/7/02	Wed 4/20/05
181	1.2.3.1	Prototype L1 Central Track Trigger Algor	0 w	Thu 11/7/02	Thu 11/7/02	220SF,228SF,219SF
182	1.2.3.2	⊞ Develop Target CTT Algorithm	154 d	Thu 11/7/02	Wed 6/25/03	191,185,197
185	1.2.3.3	Target L1 Central Track Trigger Algorithm	0 w	Wed 6/25/03	Wed 6/25/03	187,188
186	1.2.3.4	⊞ Develop Test Procedures	140 d	Thu 6/26/03	Fri 1/23/04	
189	1.2.3.5	⊞ DFEA Preproduction I	184 d	Thu 6/26/03	Thu 3/25/04	
201	1.2.3.6	⊞ DFEA Preproduction II	80 d	Mon 2/2/04	Fri 5/21/04	
217	1.2.3.7	⊞ DFEA Production	225 d	Mon 5/24/04	Wed 4/20/05	
239	1.2.3.8	⊟ DFEA Backplane (BP)	183 d?	Fri 1/2/04	Mon 9/20/04	
240	1.2.3.8.1	hardware spec	21 d	Wed 1/14/04	Thu 2/12/04	
			14 d	Tue 1/27/04	Fri 2/13/04	242
		(...ing)	1 d?	Mon 2/16/04	Mon 2/16/04	
			4 mons	Fri 1/2/04	Fri 4/23/04	244
			1 d?	Mon 4/26/04	Mon 4/26/04	245
245	1.2.3.8.6	production + vendor checkout	3 mons	Tue 4/27/04	Wed 7/21/04	246
246	1.2.3.8.7	first BP received	1 d?	Thu 7/22/04	Thu 7/22/04	247
247	1.2.3.8.8	FNAL checkout	2 w	Fri 7/23/04	Thu 8/5/04	248
248	1.2.3.8.9	crate assembly + bench test	2 w	Fri 8/6/04	Thu 8/19/04	249
249	1.2.3.8.10	test with CC	2 w	Fri 8/20/04	Thu 9/2/04	250
		test with CC + DFEA	2 w	Fri 9/3/04	Fri 9/17/04	251
		delivered to Boston	1 d?	Mon 9/20/04	Mon 9/20/04	
		⊟ DFEA Crate Controller (CC)	297 d?	Mon 12/1/03	Wed 2/16/05	
		interface specs	1 mon	Mon 12/1/03	Tue 1/6/04	254
254	1.2.3.9.2	schematic + layout; order long leadtime p	3 mons	Wed 1/14/04	Wed 4/7/04	255
255	1.2.3.9.3	PCB production + vendor testing	1 mon	Thu 4/8/04	Wed 5/5/04	256
256	1.2.3.9.4	assembly (vendor)	2 mons	Thu 5/6/04	Thu 7/1/04	257
257	1.2.3.9.5	checkout	2 w	Mon 7/5/04	Fri 7/16/04	261
258	1.2.3.9.6	optical Serial Command Link Receiver pro	2 mons	Mon 3/1/04	Fri 4/23/04	261
		test software/firmware	4 mons	Mon 3/1/04	Mon 6/21/04	260,261
		finish software/firmware	8 mons	Tue 6/22/04	Wed 2/16/05	
		bench test	2 w	Mon 7/19/04	Fri 7/30/04	262
		CC ready	1 d?	Mon 8/2/04	Mon 8/2/04	249
263	1.2.3.10	⊟ optical Download and Control Link (DCL)	160 d?	Thu 2/12/04	Mon 9/27/04	
		interface specs	1 mon	Thu 2/12/04	Wed 3/10/04	265,270
		hardware specs	1 mon	Thu 3/11/04	Wed 4/7/04	266,268
		specs done	1 d?	Thu 4/8/04	Thu 4/8/04	267
		hardware procurement	1 mon	Fri 4/9/04	Thu 5/6/04	271
268	1.2.3.10.5	software: Linux driver	3 mons	Thu 4/8/04	Thu 7/1/04	271,269SS+1.5 mons
269	1.2.3.10.6	software: EPICS driver + integration	3 mons	Thu 5/20/04	Fri 8/13/04	270SS+1.5 mons
270	1.2.3.10.7	software: dfe_ware integration	3 mons	Mon 7/5/04	Mon 9/27/04	
271	1.2.3.10.8	bench test PC - CC	2 w	Mon 7/5/04	Fri 7/16/04	261
272						
273	1.2.9	L1 Trigger Upgrade Production and Testing Co	0 w	Thu 5/12/05	Thu 5/12/05	
274	1.2.4	⊞ Level 2 Beta Processor	305 d	Mon 12/1/03	Mon 2/28/05	
315	1.2.5	⊞ Silicon Track Trigger Upgrade	504 d	Tue 1/21/03	Mon 1/31/05	
399	1.2.8	L2 Trigger Upgrade Production and Testing Co	0 w	Mon 2/28/05	Mon 2/28/05	
		Trigger Simulation	827 d	Thu 11/1/01	Wed 3/9/05	
		Administration	520 d	Mon 2/3/03	Mon 3/7/05	

Task (Work package)

Subtask

Progress

Dependency

Milestone

Jamieson Olsen[20%]
InKind[14,000]
InKind[7,500]
Jamieson Olsen[5%],InKind[625]
Jamieson Olsen[50%]
Jamieson Olsen[10%],InKind[1,000]
Ron Rechenmacher or eqv.[30%]
Geoff Savage or eqv.[30%]
Yurii Maravin replacement[50%]
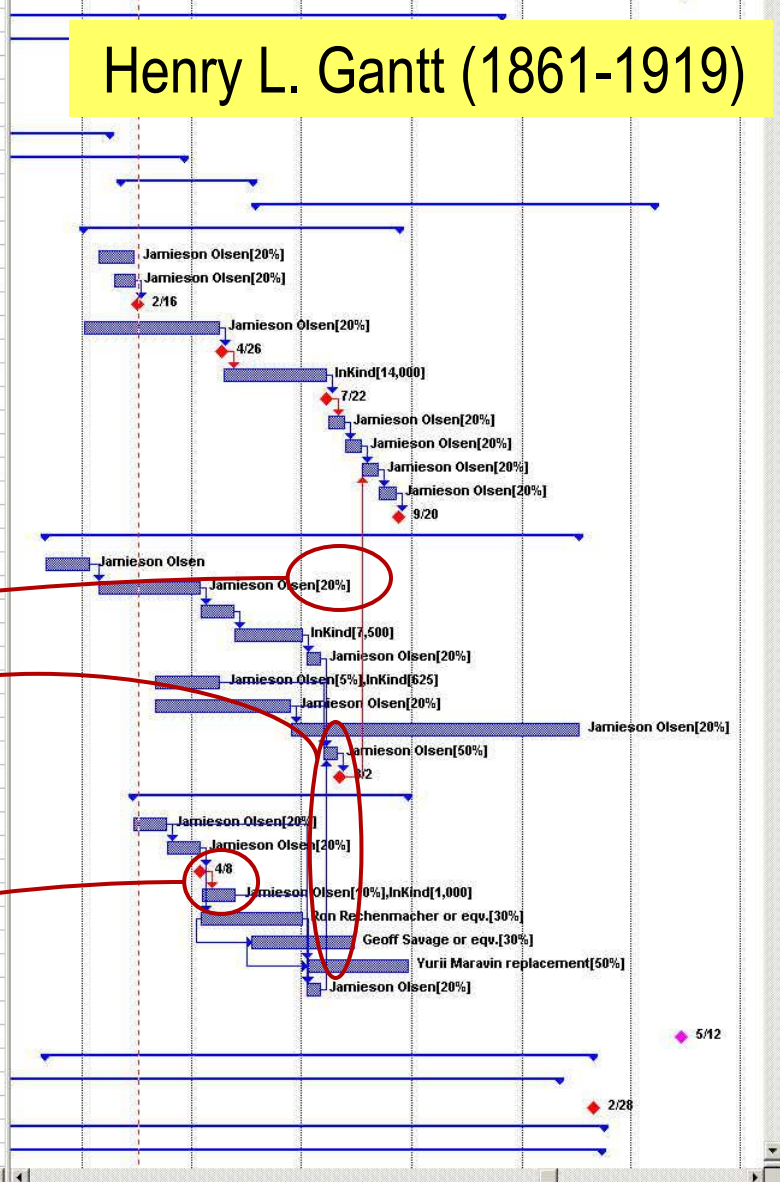
Potential Scheduling Problems

- Estimating difficulty of problems (hence, costs)

- Productivity !~ #people working on a task

- The unexpected always happens →contingency

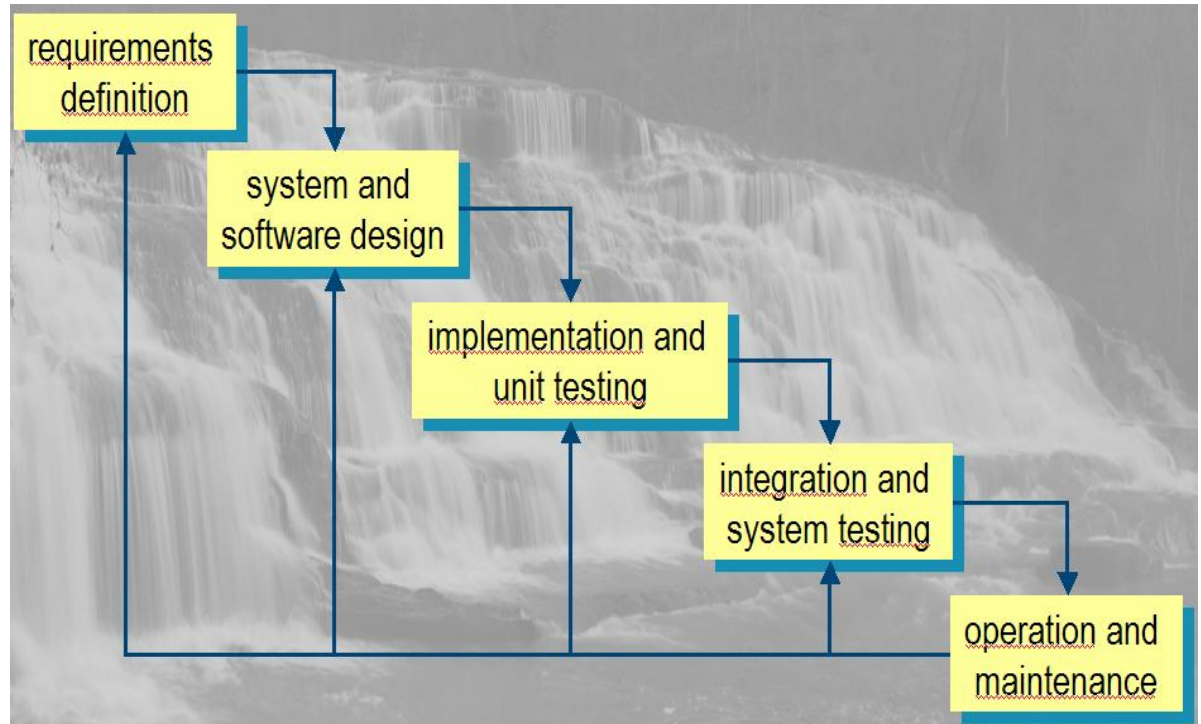- Adding people to a late project makes it later
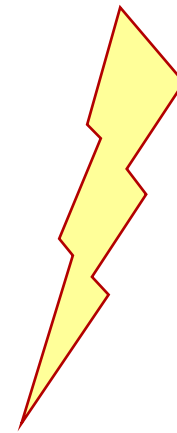
Waterfall Model

- Process model
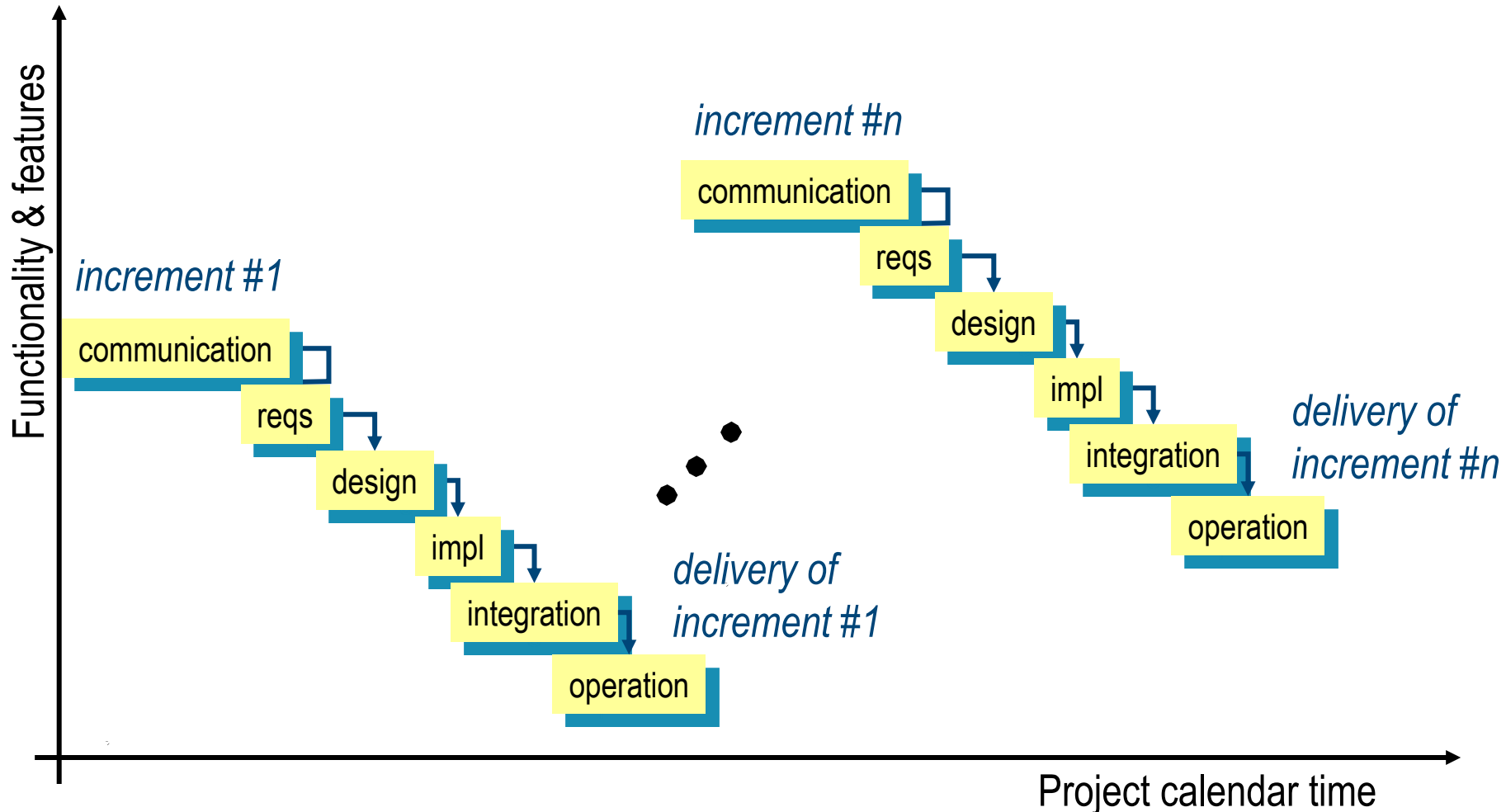 = Software life cycle

- Challenge:
  Difficult to accommodate change → Inflexible

  - Lack of stable requirements

  - Changing requirements

  - Increased understanding

  - Unforeseen difficulties

The Incremental Model

Agile Methods

- **Customer** involvement
  - ...to provide & prioritise new system requirements + to evaluate iterations

- **Incremental** delivery
  - Priorities from customer

- **People**, not process
  - team to develop own ways of working

- Embrace **change**
  - Expect requirements to change
  - design to accommodate change

- Maintain **simplicity**
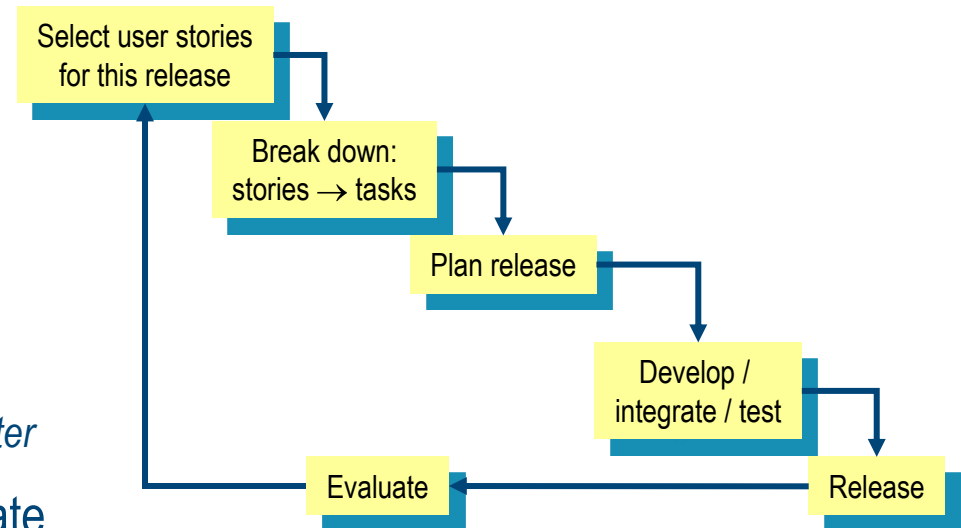 - software and development process
  - actively eliminate complexity

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Extreme Programming

- XP = 'extreme' variation of iterative development, very small increments

    - New versions may be built several times per day

    - Increments ~every 2 weeks

    - All tests for every build;
      only accepted if all successful

- Rationale:

    - Conventional: design for change
        - *anticipating changes reduces costs later*
    - XP: not worthwhile, cannot anticipate
        - *constant code improvement*
        - *user involvement in dev team*

Select user stories for this release → Break down: stories → tasks → Plan release → Develop / integrate / test → Release → Evaluate →

Agile methods: Appraisal

- Team members may be unsuited to intense involvement of agile methods

- Developers need to be experienced, not too different in expertise

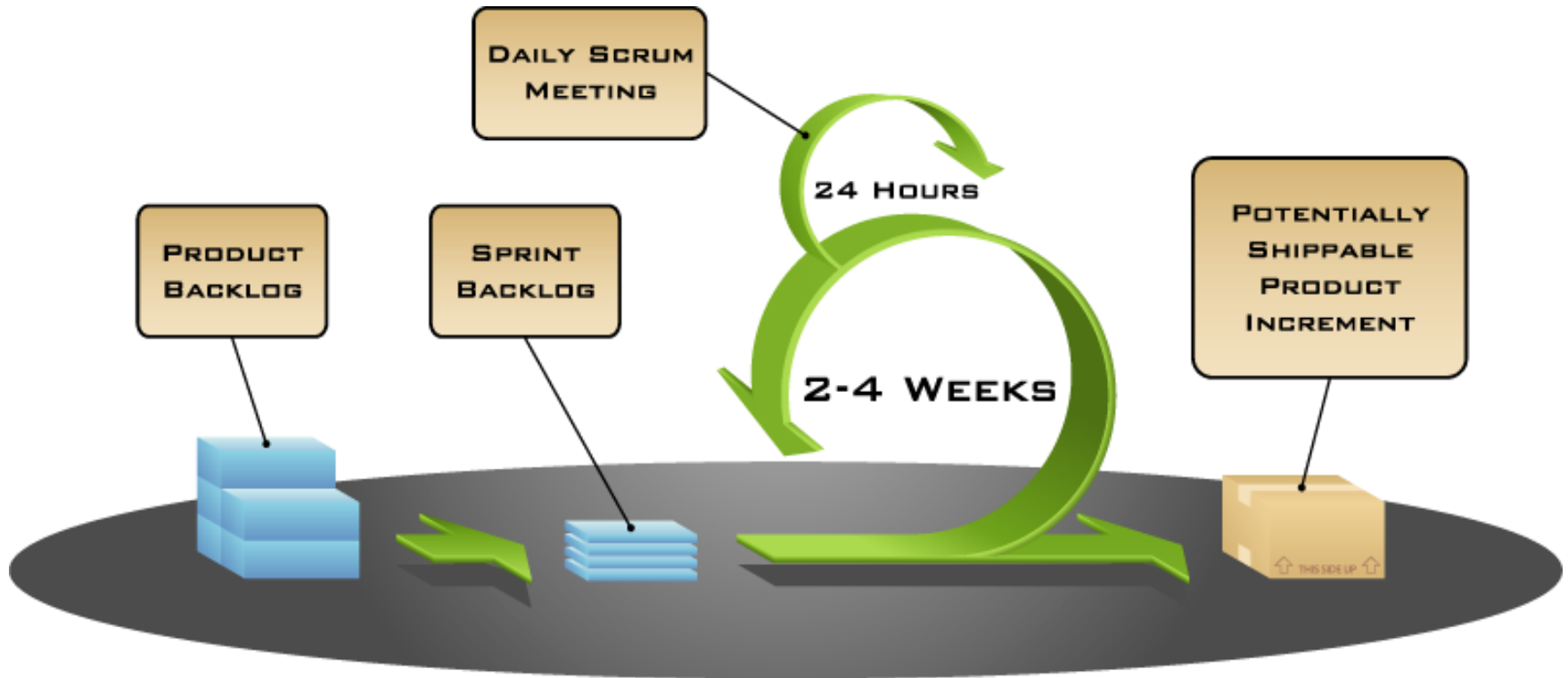- can be difficult to keep interest of customers involved in process

EXTREME PROGRAMMING
I CAN'T GIVE YOU ALL OF THESE FEATURES IN THE FIRST VERSION.

AND EACH FEATURE NEEDS TO HAVE WHAT WE CALL A "USER STORY."

OKAY, HERE'S A STORY: YOU GIVE ME ALL OF MY FEATURES OR I'LL RUIN YOUR LIFE.

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Scrum

[PierreSelim / Wikipedia]

DAILY SCRUM MEETING

PRODUCT BACKLOG

SPRINT BACKLOG

24 HOURS

2-4 WEEKS

POTENTIALLY SHIPPABLE PRODUCT INCREMENT

THIS SIDE UP

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Wrap-Up: Project Management

- Planning + coordination + monitoring is a must, even though change happens

  - common activities: specification, design, implementation, testing/validation, evolution

  - Gantt chart: Work packages, tasks, deliverables, milestones

- Different Management approaches

  - Classical „plan ahead" vs Agile „embrace change"

- Project Manager = first management level

  - Deep technical knowledge + leadership qualifications

  - Core personal assets: Multitasking, nonlinear, self-motivated