PMP Projects and Teams

CSCI 5040: Professional Master's Project (1 of 2)

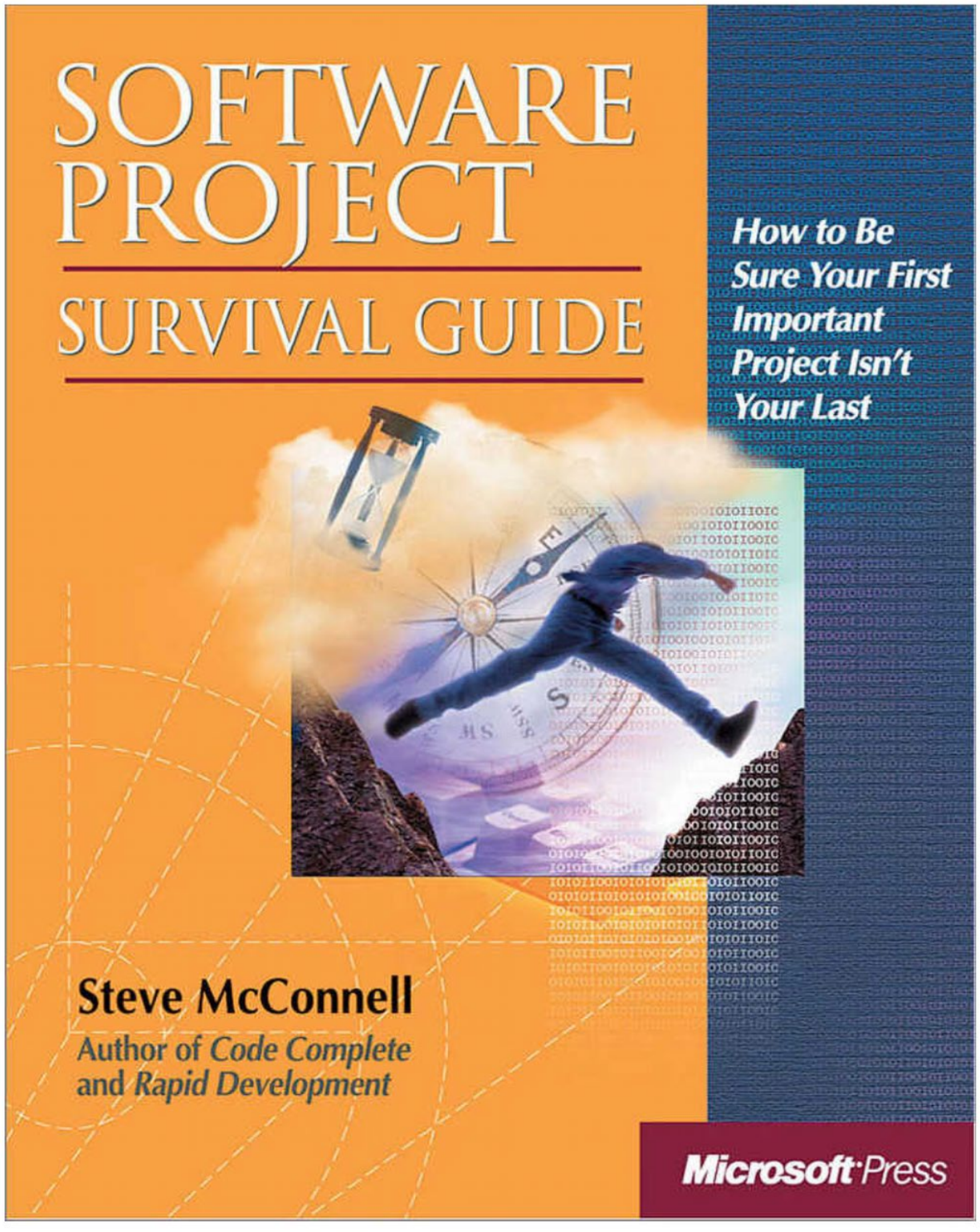
Lecture 4

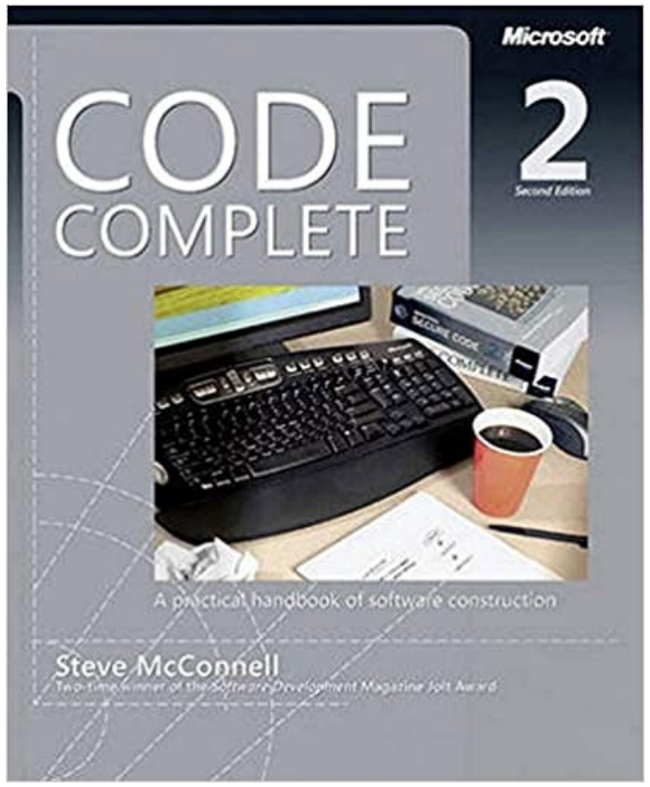
Learning Objectives

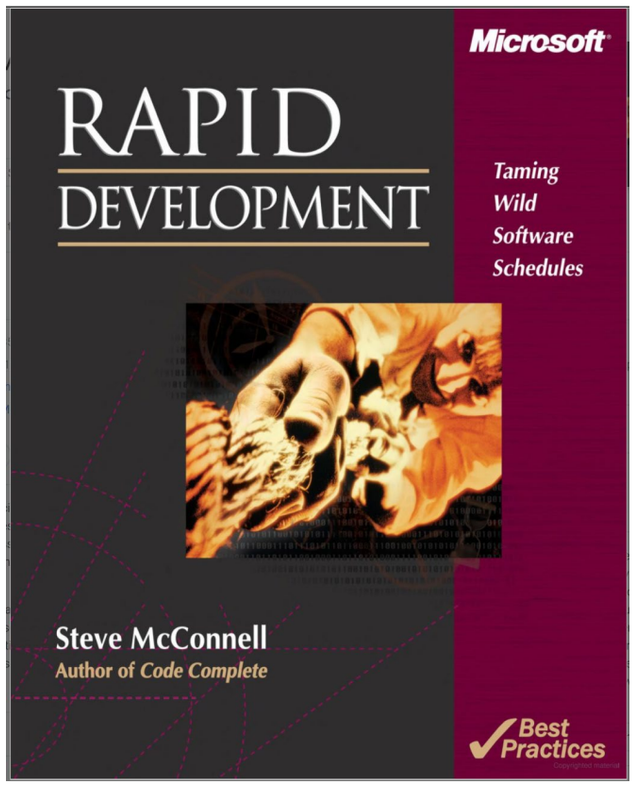
- Review software project management for PMP
- Talk about teams and sponsors
- Plan for the two project fair meetings

Once, there was a new software manager…

He needed guidance, he bought books







Rights of a Customer

- To set objectives for the project and have them followed
- To know how long the software project will take and how much it will cost
- To decide which features are in and which are out of the software
- To make reasonable changes to requirements throughout the course of the project and to know the costs of making those changes
- To know the project's status clearly and confidently
- To be apprised regularly of risks that could affect cost, schedule, or quality, and to be provided with options for addressing potential problems
- To have ready access to project deliverables throughout the project

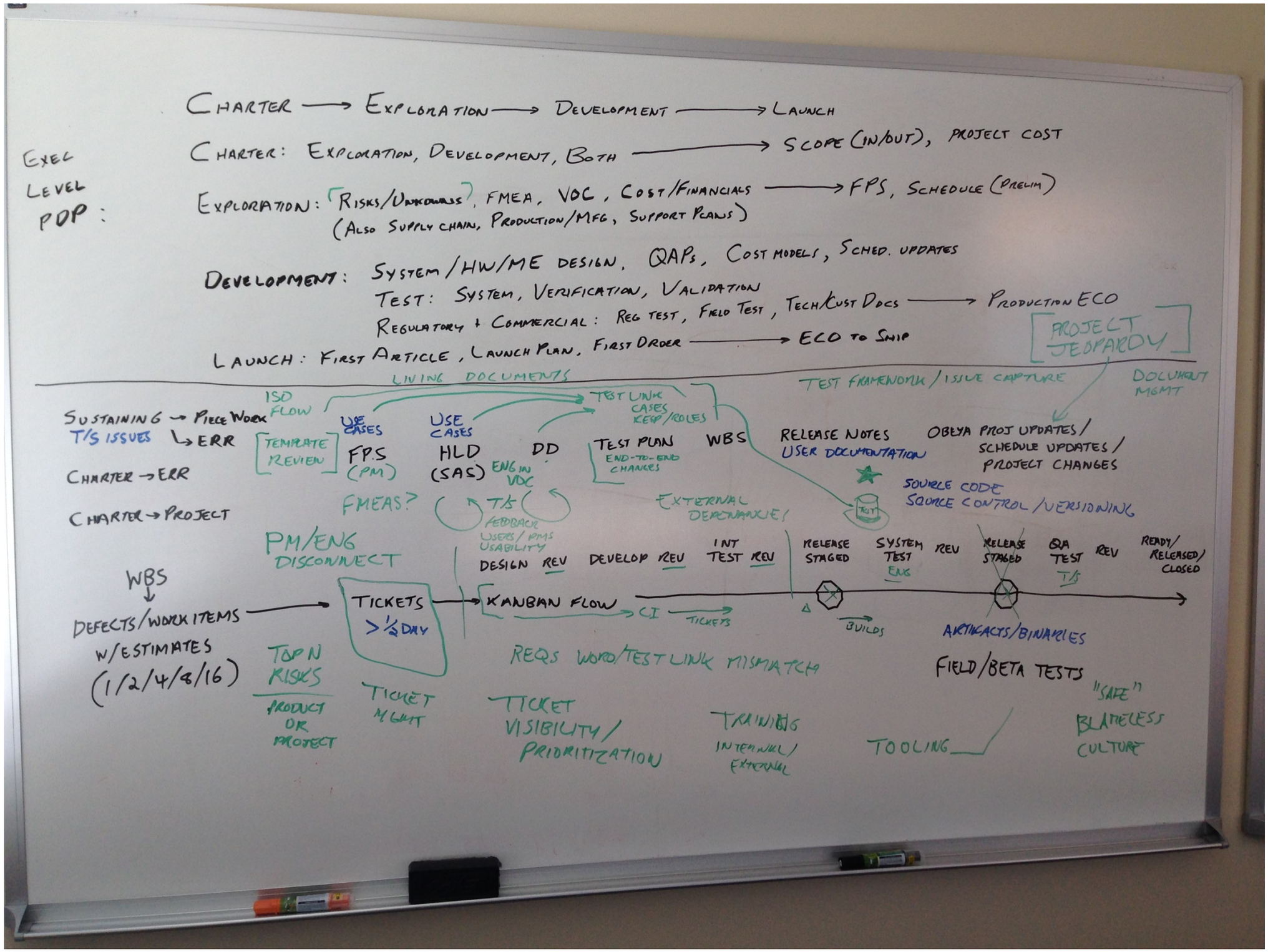
  - McConnell, Steve. Software Project Survival Guide, 1997

Rights of a Developer

- To know the project objectives and to clarify priorities.
- To know in detail what product I'm supposed to build and to clarify the product definition if it is unclear.
- To have ready access to the customer, manager, marketer, or other person responsible for making decisions about the software's functionality.
- To work each phase of the project in a technically responsible way, especially to not be forced to start coding too early in the project.
- To approve effort and schedule estimates for any work that I will be asked to perform. This includes the right to provide only the kinds of cost and schedule estimates that are theoretically possible at each stage of the project; to take the time needed to create meaningful estimates; and to revise estimates whenever the project's requirements change.
- To have my project's status reported accurately to customers and upper management.
- To work in a productive environment free from frequent interruptions and distractions, especially during critical parts of the project.

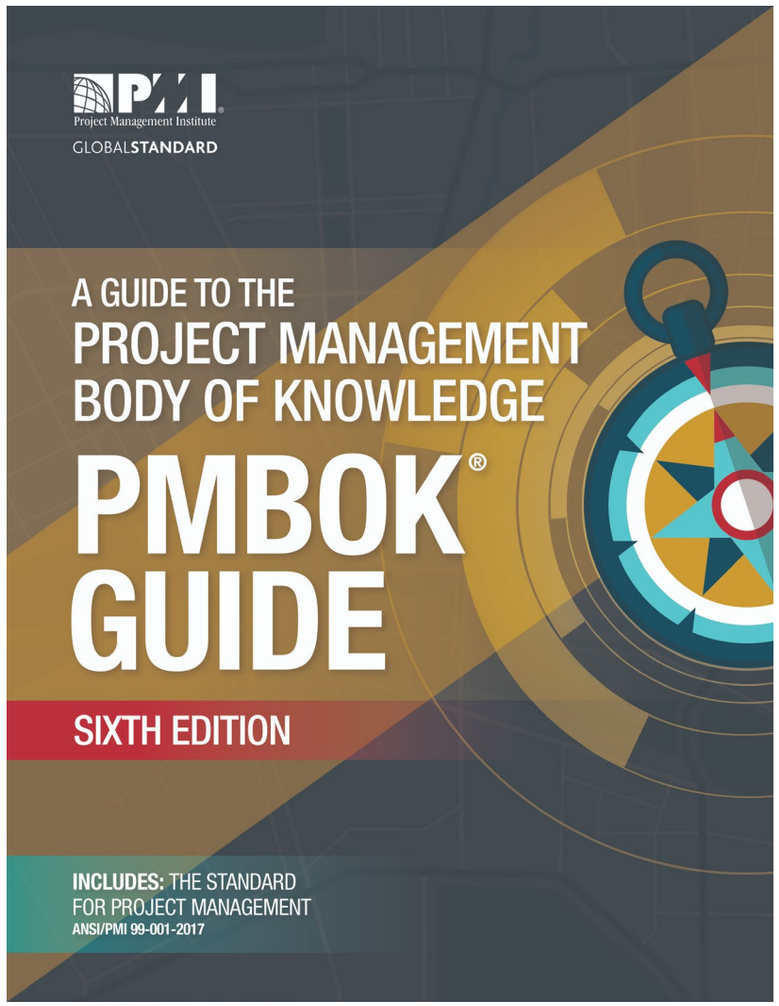
  - McConnell, Steve. Software Project Survival Guide, 1997

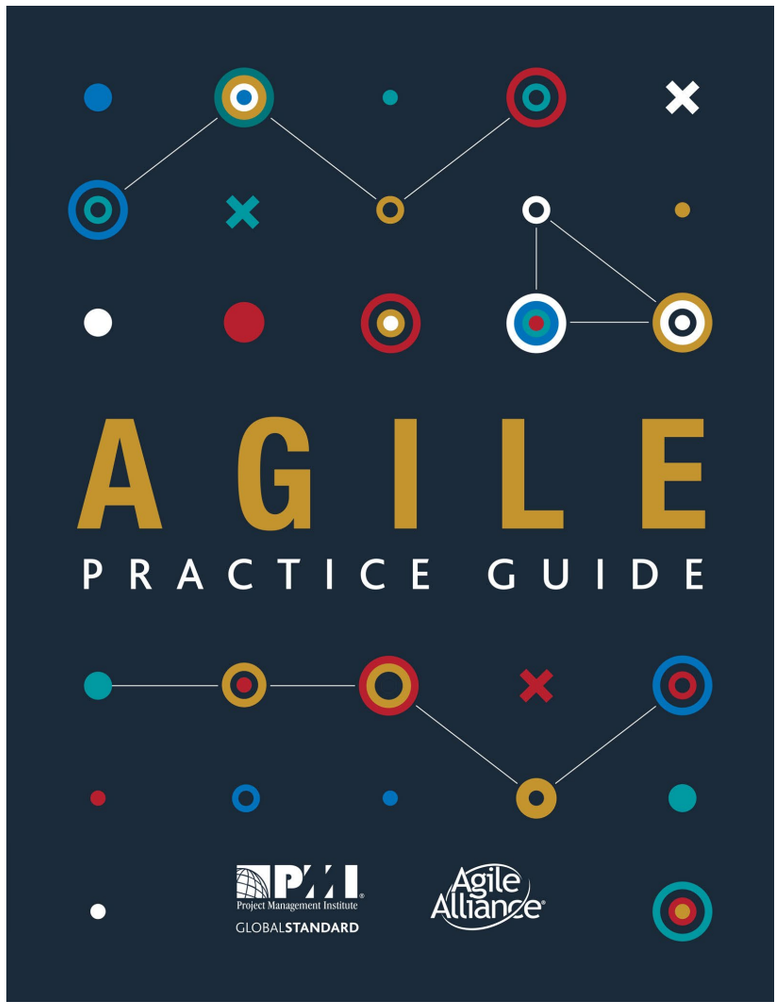
Software Project Management: The Struggle is Real…



Two Sides of Project Management

- The PMI (Project Management Institute) certifies individuals who specialize in the two primary project management approaches: Waterfall and Agile (aka Incremental vs. Adaptive)
- Guides to each from PMI (both available on O'Reilly-Safari ebooks)





Waterfall Project Management: PMI

- Exemplified by PMI's PMP certification
- 10 Knowledge Areas
  - Scope
  - Schedule
  - Cost
  - Quality
  - Resource
  - Communications
  - Risk
  - Procurement
  - Stakeholder
  - Integration
- From PMI's PMBOK (6th edition)

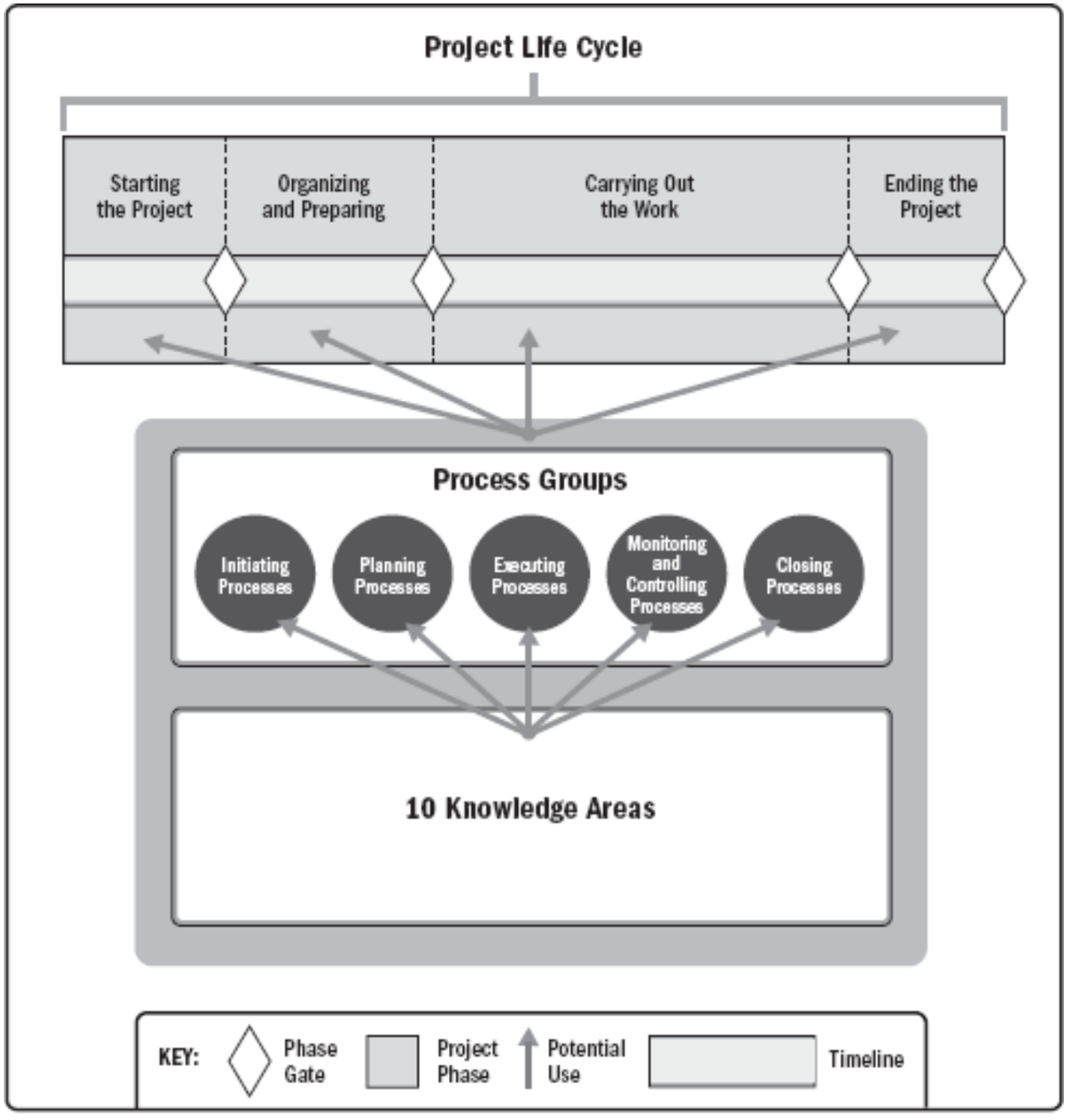


Figure 1-5. Interrelationship of *PMBOK® Guide* Key Components in Projects

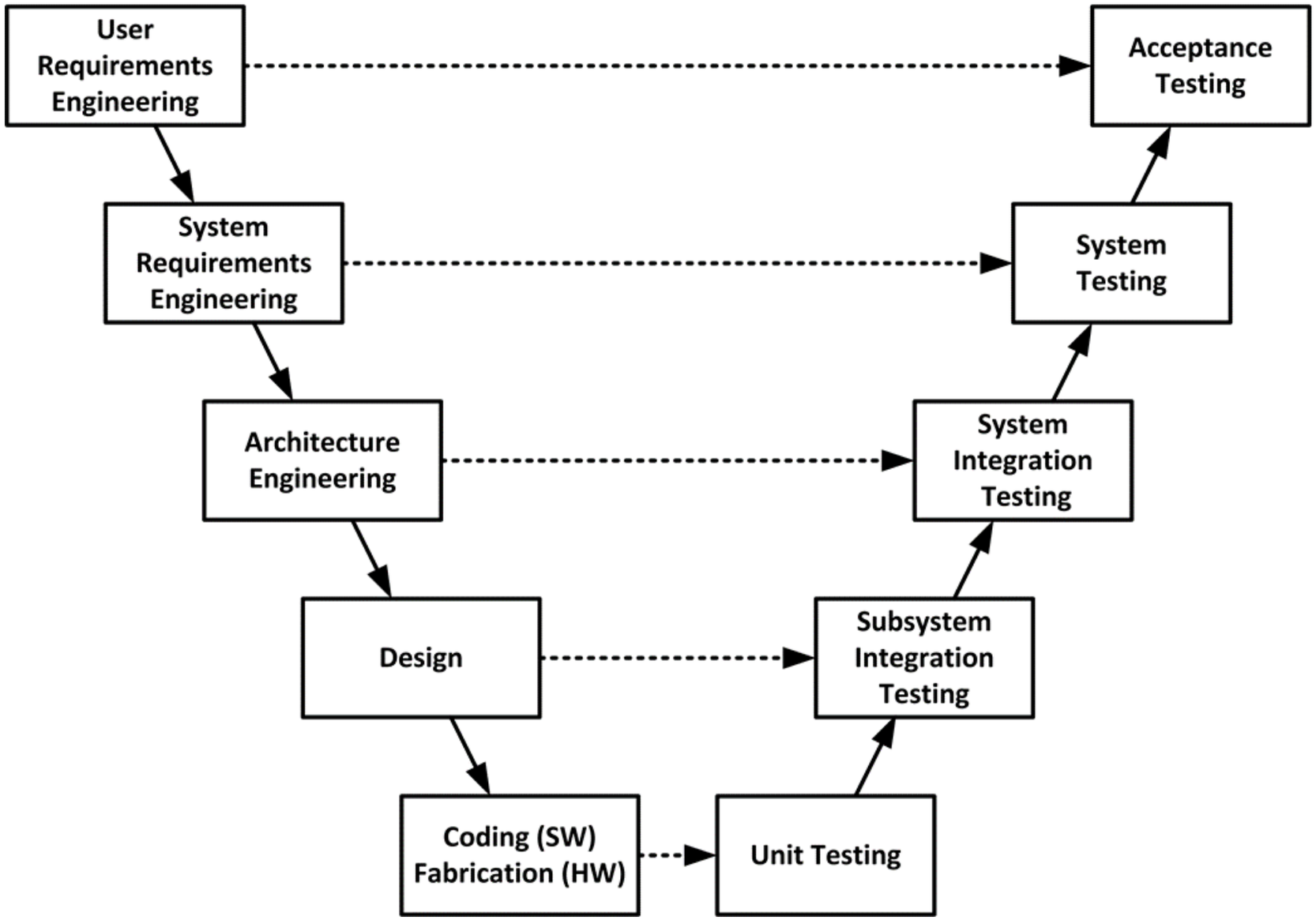
Many Potential Project Deliverables

- PMI Project Management
  - Project Charter
  - Project Management Plan
  - Work Breakdown Structure (scope)
  - Schedule (Gantt chart, etc.) (schedule)
- Budget (cost)
- Quality plan
- Risk register
- Issue list
- Change register
- Status and Review Records
- Lessons Learned
- Etc.

- Plus
  - Requirements
  - Designs (at various levels)
  - Test Plans
  - Documentation
  - Etc.
- And CODE!

Levels of Requirements (“The V”)

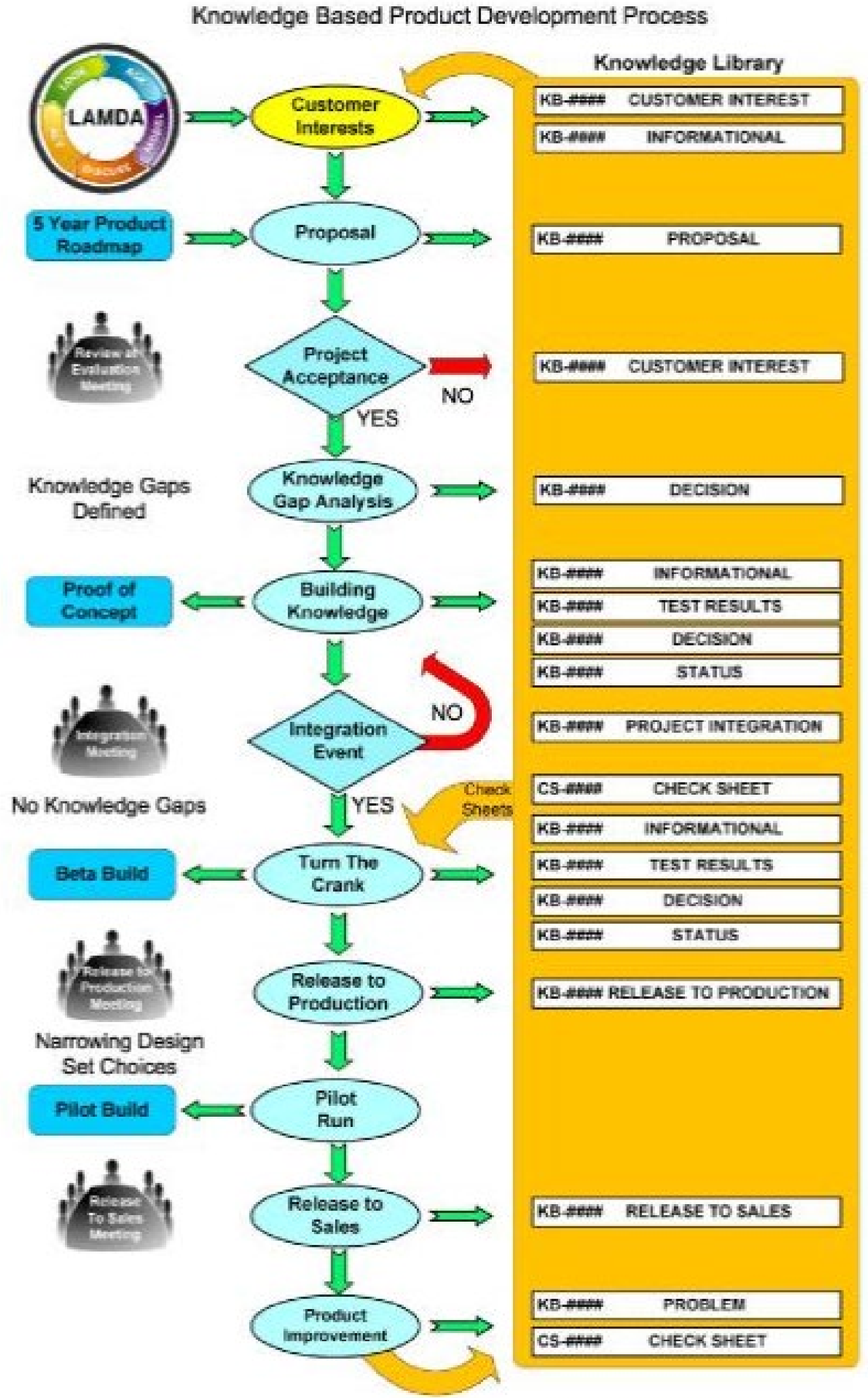
- Progressive elaboration…
- Deeper levels of design requirements for more discrete elements of the application
- Best Practices for Requirements
  - **Specific** and distinct requirements
  - **Complete** and well thought out
  - **Consistent and prioritized** based on the objectives
  - **Able to be verified** during testing
- A road of good intentions…



https://insights.sei.cmu.edu/sei_blog/2013/11/using-v-models-for-testing.html

Alternative Waterfall Processes

- Many companies will have their own processes based on their business goals and customers
- Military and health care companies often have rigorous project management flows
- The PMI flow isn't the only approach, it really highlights areas that should be addressed
- To the right is a process called KBPD, a well thought-out water-fall style development process



Minimal Project Management – What you “can’t not” do

- Charter – establish sponsor, governance, validity
- Definition – objective, context, goals, deliverables, scope (in vs. out)
- Staffing – roles & responsibilities
  - RACI chart – Responsible, Accountable, Consulted, Informed
- Work Breakdown Structure (scope) & Timeline (schedule)
- Launch meeting
- Weekly status – task status, risks & issues, changes, new information
- Planning to end the project
  - From Bob Lewis’ “Bare Bones Project Management” 2006

- Also “Project Jeopardy” clarity
  - Thanks to Russ Miles

Agile Project Management

- Many potential processes in agile project management
- The image is from the PMI Agile Practice Guide
- For this class as we move into technical activities, we'll use Scrum and Kanban
- More about those later…

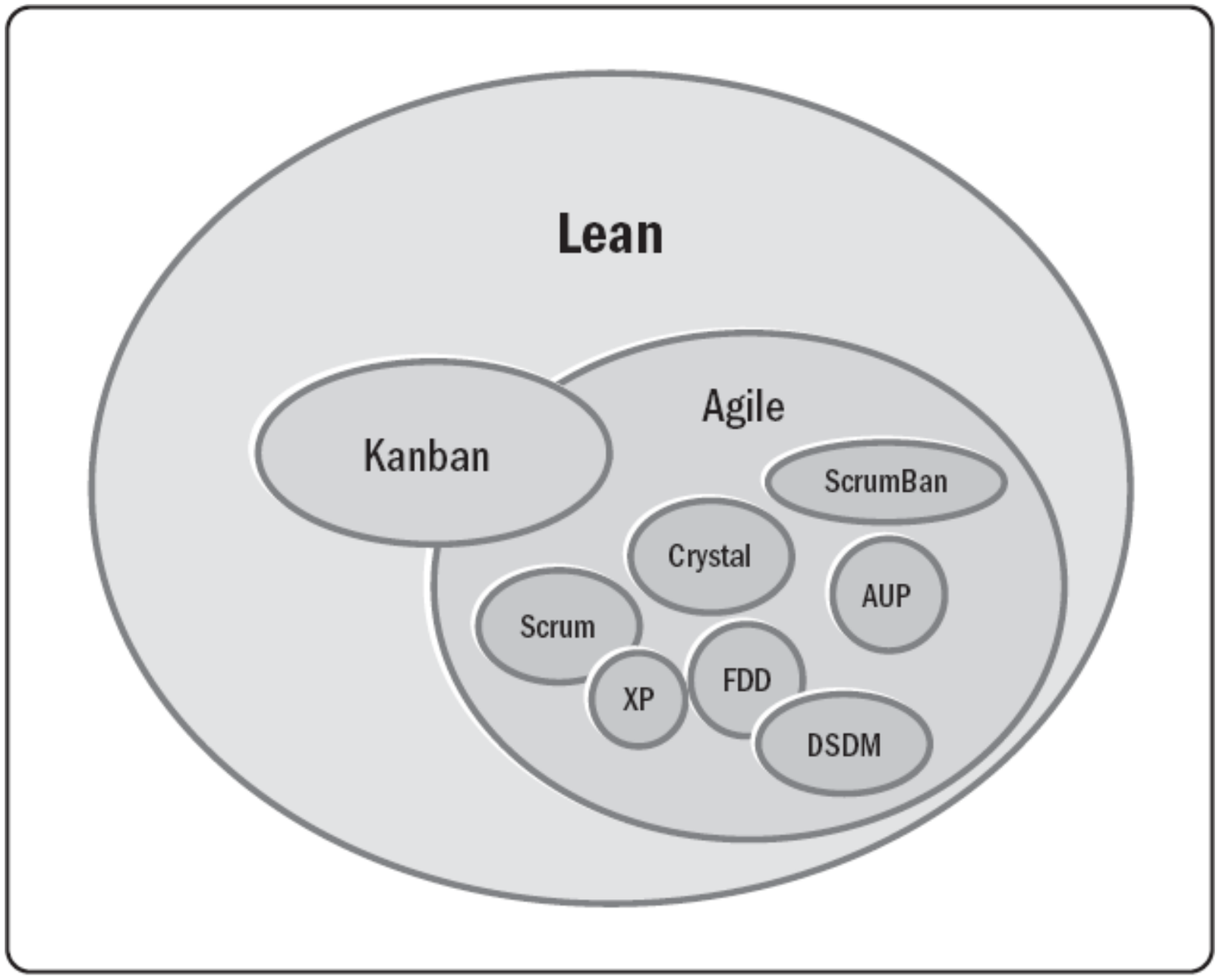
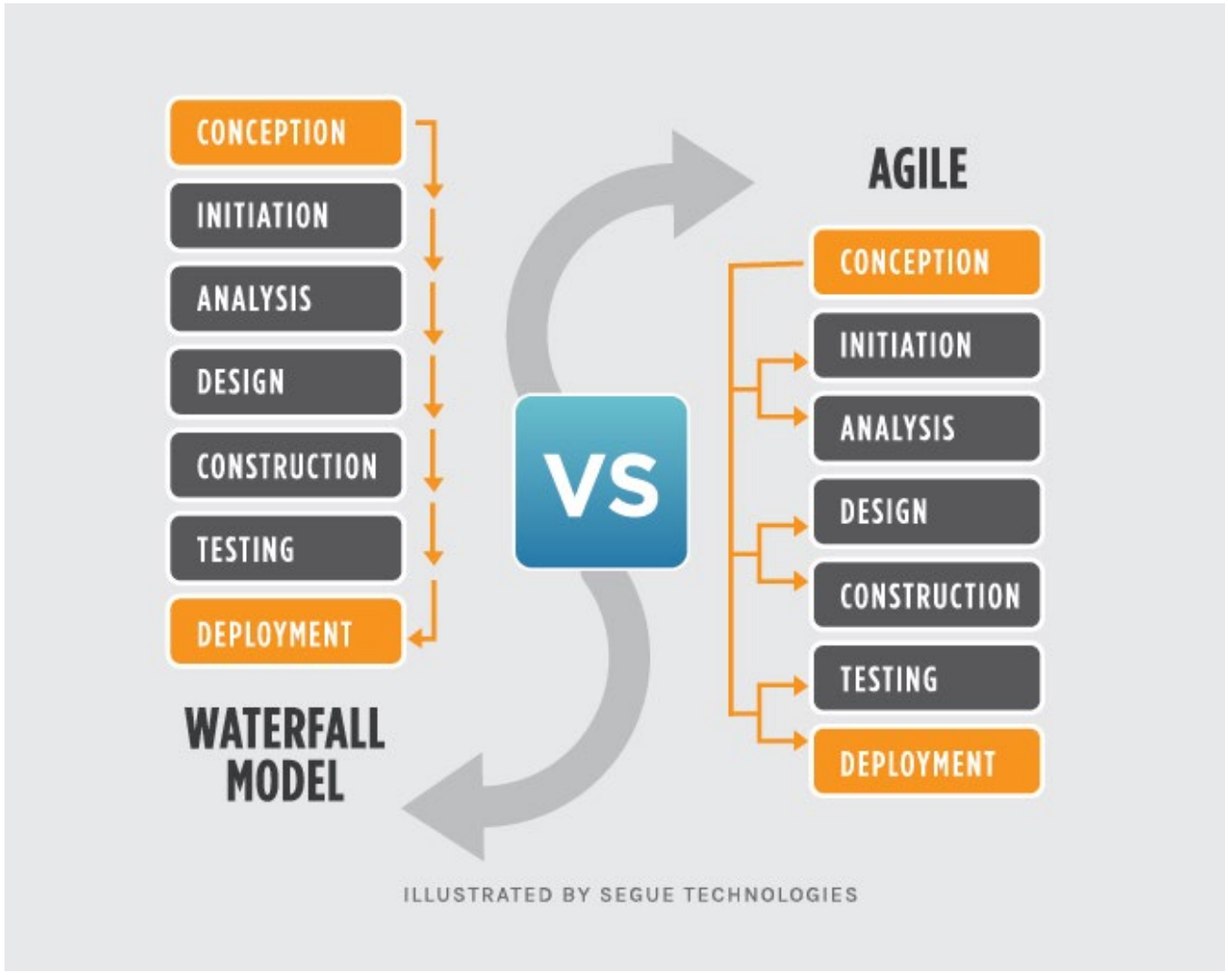


Figure 2-4. Agile Is a Blanket Term for Many Approaches

Project Management Comparison/Selection

- Nice comparison, why to pick one over the other:
  - https://www.seguetech.com/waterfall-vs-agile-methodology/



ALIGNING PROJECT TRAITS *with* DEVELOPMENT METHODOLOGIES

PROJECT TRAIT/FACTOR	AGILE	PLAN - DRIVEN (WATERFALL)	COMMENTS
CUSTOMER AVAILABILITY	Prefers customer available throughout project.	Requires customer involvement only at milestones.	Customer involvement reduces risk in either model.
SCOPE/ FEATURES	Welcomes changes, but changes come at the expensive of Cost, Schedule, or other Features. Works well when scope is not known in advance.	Works well when scope is known in advance, or when contract terms limit changes.	Change is a reality so we should prefer adaptability where possible. Contract terms sometimes restrict it.
FEATURE PRIORITIZATION	Prioritization by value ensures the most valuable features are implemented first, thus reducing risk of having an unusable product once funding runs out. Funding efficiency is maximized. Decreases risk of complete failure by allowing "partial" success.	"Do everything we agreed on" approach ensures the customer gets everything they asked for; "all or nothing" approach increases risk of failure.	Contract terms may not permit partial success and may require "do everything".
TEAM	Prefers smaller, dedicated teams with a high degree of coordination and synchronization.	Team coordionation/ synchronization is limited to handoff points	Teams that work together work better, but when contracts are issued to different vendors for different aspects of the project, high degrees of synchronization may not work.
FUNDING	Works extremely well with Time & Materials or other non-fixed funding, may increase stress in fixed-price scenarios.	Reduces risk in Firm Fixed Price contracts by getting agreement up-front.	Fixed price is tough when scope is not known in advance, but many government contracts require it.
SUMMARY	Agile is better, where it is feasible.	Plan-Driven may reduce risk in the face of certain constraints in a contract between a vendor and external customer such as the government.	Through educating our customers about the strengths and weaknesses of each model, we hope to steer them towards a more Agile approach. This may require changes to how our customers, particualarly the government, approach software development projects.

Program Management for PMP class

Fall	Fall Weeks 1 – 8: Waterfall, fixed deliverables, focus on alignment and requirements
Fall	Fall Weeks 9 – 14: Agile, 3 Scrum-based 2-week sprints, focus on design
Spring	Spring Weeks 1 – 8: Agile, 4 Scrum-based 2-week sprints, focus on development
Spring	Spring Weeks 9 – 15: Agile, Kanban flow, focus on driving to closure

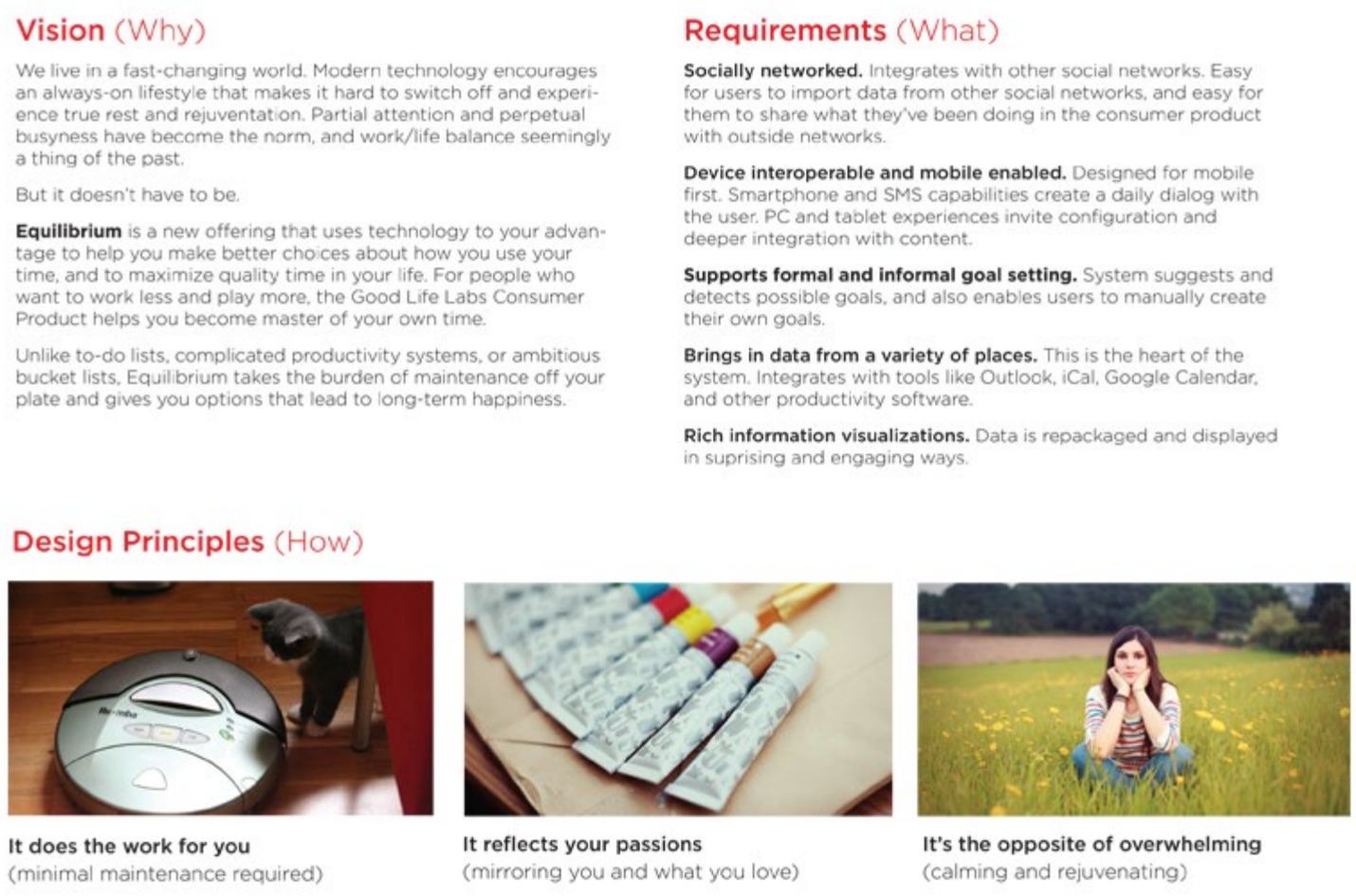
PMP Project Deliverables – 1st Semester

- Waterfall
  - Charter – extended to agree on sponsors needs for specific tools, communications, or deliverables (project or product)
  - Project Brief
  - Sponsor signoff/phase gate
  - WBS (2 passes)
  - Requirements (2 passes)
  - Sponsor signoff/phase gate
  - Weekly status updates for class staff, tbd for sponsor
- Scrum (3 two-week sprints)
  - Design activities (architecture, design, test planning, etc.)
  - Proof of concepts (ensure tools or components work/understood)
  - Prototypes (early aspects of design)

- NOTE: Deliverables may change as project is structured with the sponsor

Project Brief

- Time: A few hours
- Goal: communications
- Summary of overall project plan – even simpler than a project overview
- A poster sized graphic with selected topic sections
  - What are you doing? (Requirements)
  - Why are you doing it? (Vision)
  - Key design elements
  - Constraints and outcomes expected
  - Anything you feel should be shared
- Posted publicly, it allows for visibility and discussion on project focus and goals
  - https://rosenfeldmedia.com/ux-team-of-one/3641/



Vision (Why)

We live in a fast-changing world. Modern technology encourages an always-on lifestyle that makes it hard to switch off and experience true rest and rejuventation. Partial attention and perpetual busyness have become the norm, and work/life balance seemingly a thing of the past.

But it doesn't have to be.

Equilibrium is a new offering that uses technology to your advantage to help you make better choices about how you use your time, and to maximize quality time in your life. For people who want to work less and play more, the Good Life Labs Consumer Product helps you become master of your own time.

Unlike to-do lists, complicated productivity systems, or ambitious bucket lists, Equilibrium takes the burden of maintenance off your plate and gives you options that lead to long-term happiness.

Requirements (What)

Socially networked. Integrates with other social networks. Easy for users to import data from other social networks, and easy for them to share what they've been doing in the consumer product with outside networks.

Device interoperable and mobile enabled. Designed for mobile first. Smartphone and SMS capabilities create a daily dialog with the user. PC and tablet experiences invite configuration and deeper integration with content.

Supports formal and informal goal setting. System suggests and detects possible goals, and also enables users to manually create their own goals.

Brings in data from a variety of places. This is the heart of the system. Integrates with tools like Outlook, iCal, Google Calendar, and other productivity software.

Rich information visualizations. Data is repackaged and displayed in suprising and engaging ways.

Design Principles (How)

It does the work for you
(minimal maintenance required)

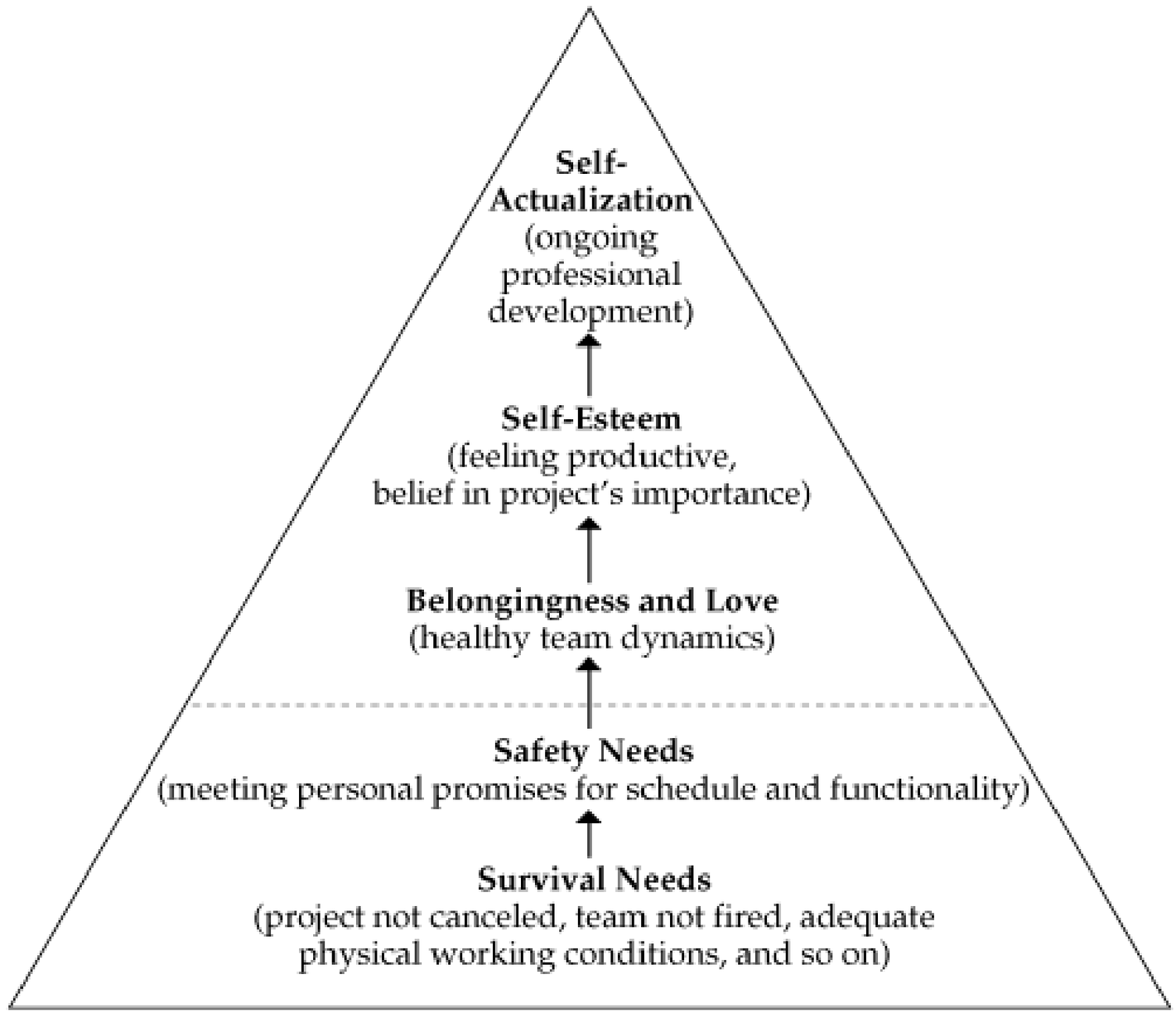
It reflects your passions
(mirroring you and what you love)

It's the opposite of overwhelming
(calming and rejuvenating)

Team?

- There’s no “I” in team…
- A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable (from The Wisdom of Teams)
- Key requirements
  - Clear objective
  - People with right skills
  - Mutual accountability
  - Right number of people
    - https://www.pmi.org/learning/library/team-working-group-collocated-collection-9296
- Effective teams
  - Committed
  - Open, honest, consistent communication
  - Interdependent
  - Autonomy
  - Fun

Maslow's Hierarchy of Needs (for a team)



- From Software Project Survival Guide, Steve McConnell, 1997

What is your PMP class team responsible for?

- Meeting sponsor expectations
- Managing sponsor expectations
- Maintaining team dynamics
- Keep everyone responsible and involved
- Learning software life cycle/project management rhythms
- Maintain goals and timelines
- Communications
- Project delivery – documentation, testing, code, deployment(?)
- Representing CU, Graduate CS, your team, and yourselves

Team Roles

- You can adjust this
  - It may be individuals wear a couple of role hats
  - It may be your team doesn’t need the role
- Everyone should be responsible for some code development
- Potential roles:
  - Team lead – point of contact for the sponsor and class staff
  - Source control lead – merging, code reviews
  - Testing lead – TDD, unit test, integration/system test, test plans
  - Documentation lead
  - Deploy/install lead
  - Architectural lead
  - Communications lead
  - Requirements lead
  - Etc.

Evaluation by Peers

- Productive: produces a good volume of quality deliverables
- Creative: contributes solutions to issues
- Reliable: tasks on time and correct
- Responsive: timely responses and communications
- Helpful: supports others
- Motivated: wants to do the best
- Proactive: finds what needs to be done and does it
- Knowledgeable: technical, research, or project skills
- Organized: knows what the team is doing and when
- Pleasant: interacts well with others

Project Sponsors

- Your sponsors brought us real problems they'd like solved
  - Their expectations of graduate CS students are higher
- Every sponsor is different
- Some are technologists, some are not
- Will exhibit different communication styles
- Will have different project expectations
- Don't set YOUR expectations too high
- Like most things, you'll get out of this experience what you put in…

Communicating with Project Sponsors

- Once the teams are formed, you'll set up a communications plan with your sponsors
- Please remember, if you communicate via e-mail, cc both Bruce and Preethi, so monitor written communications between teams and sponsors
- For our projects, the sponsor owns all Intellectual Property (IP) rights resulting from the master's project
- Do not discuss, reveal, or distribute project materials outside of your team, sponsor, and the class staff without express permission from your sponsor

More on Sponsors

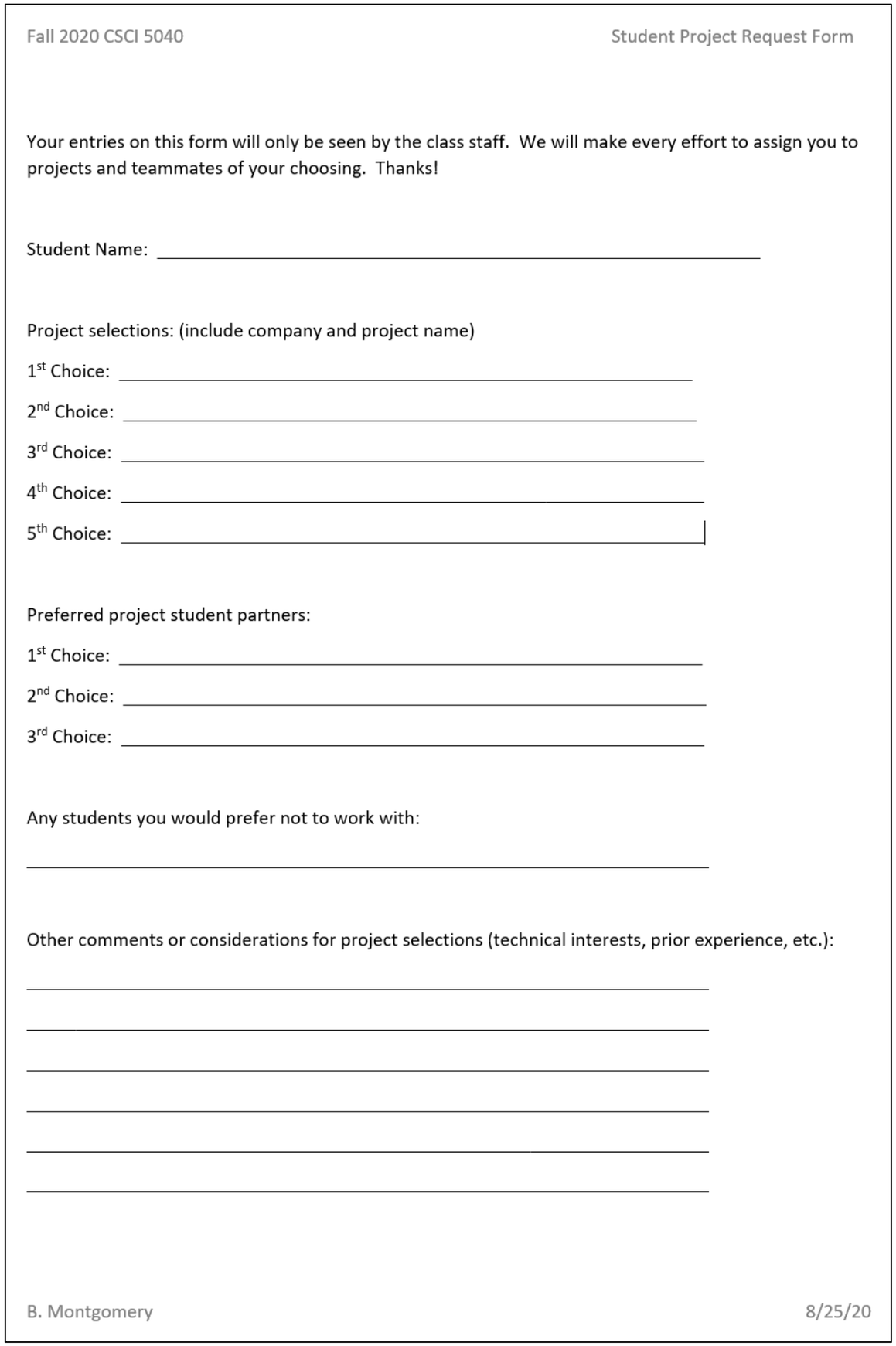
- What sponsors want:
  - Working product
  - Regular progress updates – clear, succinct communications – don’t waste time
  - Questions that are on point and on time
  - Input on scope and direction – be ready to say “yes” or “no”
  - Enthusiasm from the team!
- Watch out for
  - Estimates on tasks – if you miss, reduce the amount in tasks to make better estimates
  - Don’t claim to know or be able to do something you can’t
  - Protect your schedule if need be

Project Fair Meetings – Prepare!

- During class hours: 5:30 PM to 7 PM on Tuesday 9/1 and Thursday 9/3
- You must attend both sessions and meet with all sponsors
  - You will be assigned to groups that will move to meeting rooms to meet the individual sponsors for brief conversations
- Have a brief introduction ready (just a couple sentences – elevator speech)
  - Name, interests
- Have some questions ready about each project
- Please represent yourselves and CU well for these first impressions and contacts
- Let me know if you have any questions or concerns

Project Request Form

- Name
- Top 5 choices
- Preferred teammates
- Anyone you don't want to work with
- Other technical interests or experience to consider



Fall 2020 CSCI 5040 Student Project Request Form

Your entries on this form will only be seen by the class staff. We will make every effort to assign you to projects and teammates of your choosing. Thanks!

Student Name: _____

Project selections: (include company and project name)

1st Choice: _____

2nd Choice: _____

3rd Choice: _____

4th Choice: _____

5th Choice: _____

Preferred project student partners:

1st Choice: _____

2nd Choice: _____

3rd Choice: _____

Any students you would prefer not to work with:

_____

Other comments or considerations for project selections (technical interests, prior experience, etc.):

_____

_____

_____

_____

_____

_____

B. Montgomery 8/25/20

Next Steps

- Discussion topic up on Piazza
- If you haven't, turn in your resume, CV, or info sheet by Monday
- Review the project book and prepare questions
  - Password for project book: buff&csci&5040
  - Do not distribute that information
- Prepare your introduction elevator speech
- Next week, prepare for and attend both project fair meetings (9/1, 9/3) at the normal class Zoom link and time
- Next week, submit your Project Request Form PDF by Friday evening (I'll add a Canvas link)
- Initial project assignments will be presented by the following Tuesday
- Lecture 9/8 – Project Charters and Briefs
  - Your first team deliverable will be development of the charter and brief with your sponsor contact
- Speaker 9/10 – Amy & Rae on Career Services (attendance!)
- Lecture 9/15 – More Project Management, Status Reporting
- Preethi and I are available for questions