Process and Workflow

CIS 322
Feb 23, 2017

From the Dailies

- Well.. no changing table names at before submission for style reasons while looking ahead in the projects. :(Bye 15 points in the name of clarity.
- Postgres is having some issues so I may drop in office hours to get it fixed. Otherwise, Flask and all the other components are slowly beginning to make sense for me.
- Step 8 finished, added links between various function pages and dashboard. For tomorrow, I plan to set up a more structured testing regimen, and run that before Friday.

The new assignment format and grading procedure can be brutal but is needed to get better containment of time spent grading. Debugging code to eek out more partial credit has been a killer. I will strongly advise being careful about pushing untested code to branches that are used for grading.

Grading will continue to be done as soon as practical however the turn around time may increase over the remainder of the term due to other competing priorities. Expect up to a week between submission and grading.

Yes, if you are still having problems with the base tools come to office hours and let’s figure out how to fix it. Also you are in a room full of people who are overcoming the same tool challenges; they can probably help you if you ask.

Early assignment completion is always exciting to see. Early starts give the most time to detect and correct gaps in understanding and provides the hope of a relaxing weekend. Some days I regret the standing extension to Monday morning for assignments since there are several students that lose much of the weekend to implementation. OTOH, a Friday due date would compound the existing time problem with projects for other classes.

We Like Process

- Process
  noun
  a series of actions or steps taken in order to achieve a particular end.
- Processes are everywhere
- Why do we like process?
- Why wouldn't we like bureaucracy? It is full of process…

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I think, in general, we like to know what to do and how to do it. Having a process spelled out for us, especially if it is received at the same time as the task, can be comforting.
One of the big complaints with the early assignments I think boils down to a lack of defined process. Rather than providing a task and sequence together, only a task was provided. The new assignment structure contains much finer subtasks and lays out the assignment strongly as a sequence of specific activities.

Everyone uses processes all the time, even if the processes aren't documented… How to make a sandwich is a common intro programming course object lesson. People have a process for making a sandwich; it's not documented, the steps may not be well defined, and repeated executions may diverge but there is a process. How you submit work for different classes, travel from point A to point B, and search for cat pictures online are all processes.

I think we like process because the universe appears to optimize for lazy (lowest energy state). If I have a process, using the existing process is often less work than trying to invent a new process.

The defining feature of bureaucracy is process… so why don't we like that? Too much process can become cumbersome. Process to address problems we don't have, don't see, or don't think are real creates work that feels counter to our objectives/interests/laziness. Process can also be overly restrictive and squash creativity/individuality.

I hate specification for how to do things since that takes away the value humans bring through applying creativity and reason.

an aside…

- Administrative support staff are the most powerful people in any organization.
- They are generally great people with a really hard and often disrespected job.
- Gate keepers for organizational process
  - Trapped by a maze of maze of often ill-throughout processes/policies
  - May be able to suggest alternative process

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I want to take a minute to mention that admins are the best.

Where does process come from?

There is not some divine source of process out there. Processes are designed by people… some of them are good at making process and some of them are terrible at it.

Computers vs People

- Fast
- Accurate
- Tireless

- Slow
- Imprecise
- Lazy

- Requires explicit direction
- Silently repeats mistakes
- Myopic

- Creative
- Introspective and self correcting
- Can see broader context

When we want to complete a task involving a series of actions, we have a choice for what to use. Depending on what the task is and what the specification looks like, we have two major tools. Make the computer do it or do it ourselves.

Sometimes a short program can do what we need. Sometimes it is better manually make changes. The balance between the two can vary.

CS Teaches Process Superpowers

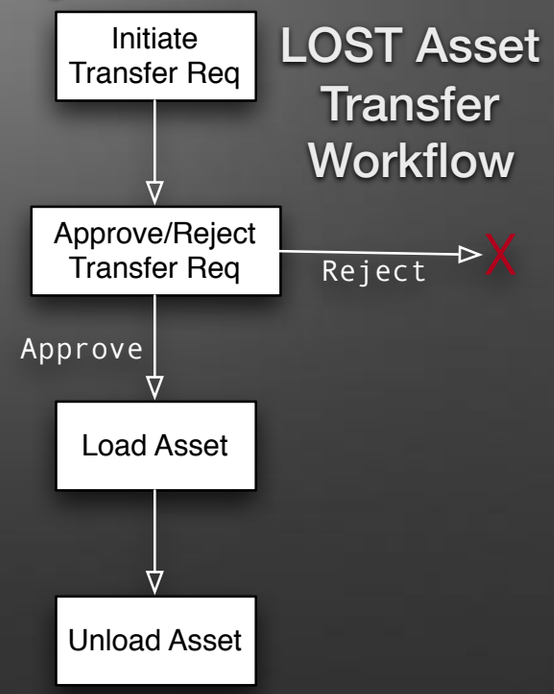
- Programs are processes for computers
- Even simple programs are huge compared to the manual processes most people reason about
- The computer can’t/won’t correct defects in how we articulate our processes
- Computers are fast
  - We can complete more practice per unit time
  - We can practice on larger problems

All the tools we learn in computer science can be applied to processes that exist outside of computer science.
We get more practice at defining and analyzing processes since we don’t need to gather large numbers of people or resources to execute a process and the computer executes processes really fast.
In addition, because of the limitations of computers, we learn how to build processes on hard mode compared to other disciplines where a human can fill in the gaps.

I would encourage you to embrace and apply your CS education outside of programming with computers. Organizations are machines.

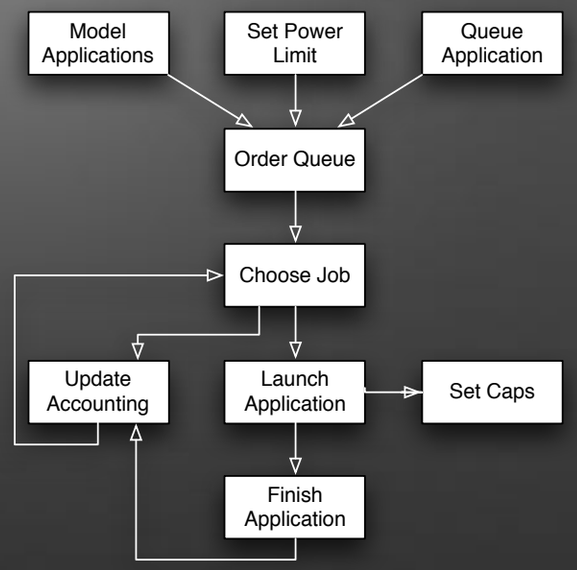
Workflows…
processes of processes

- Each box in a workflow is a process to be completed by an actor
- An actor may be a person or machine
- Each process may contain multiple steps
- Simple workflows are linear Complex workflows may have branches and joins



Process For Systemwide Power Capping

- Most of my competitors have a process that looks like this

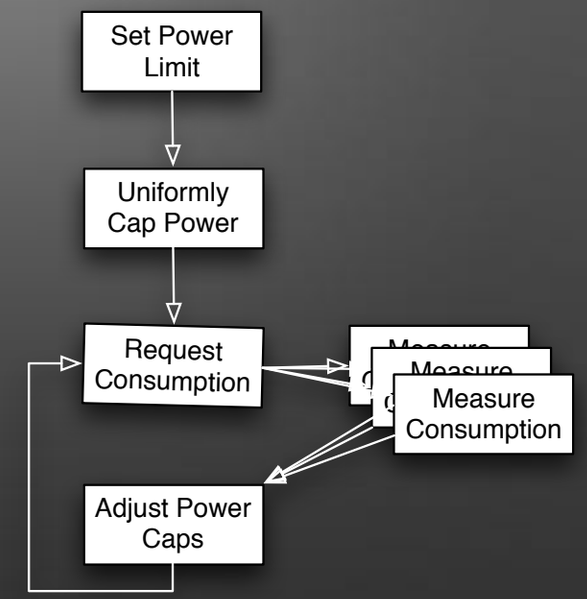


- Developing application models is tricky
- Handling accounting correctly can also be tricky
- Choose the job to run also has challenges
- Variable consumption isn’t accounted for

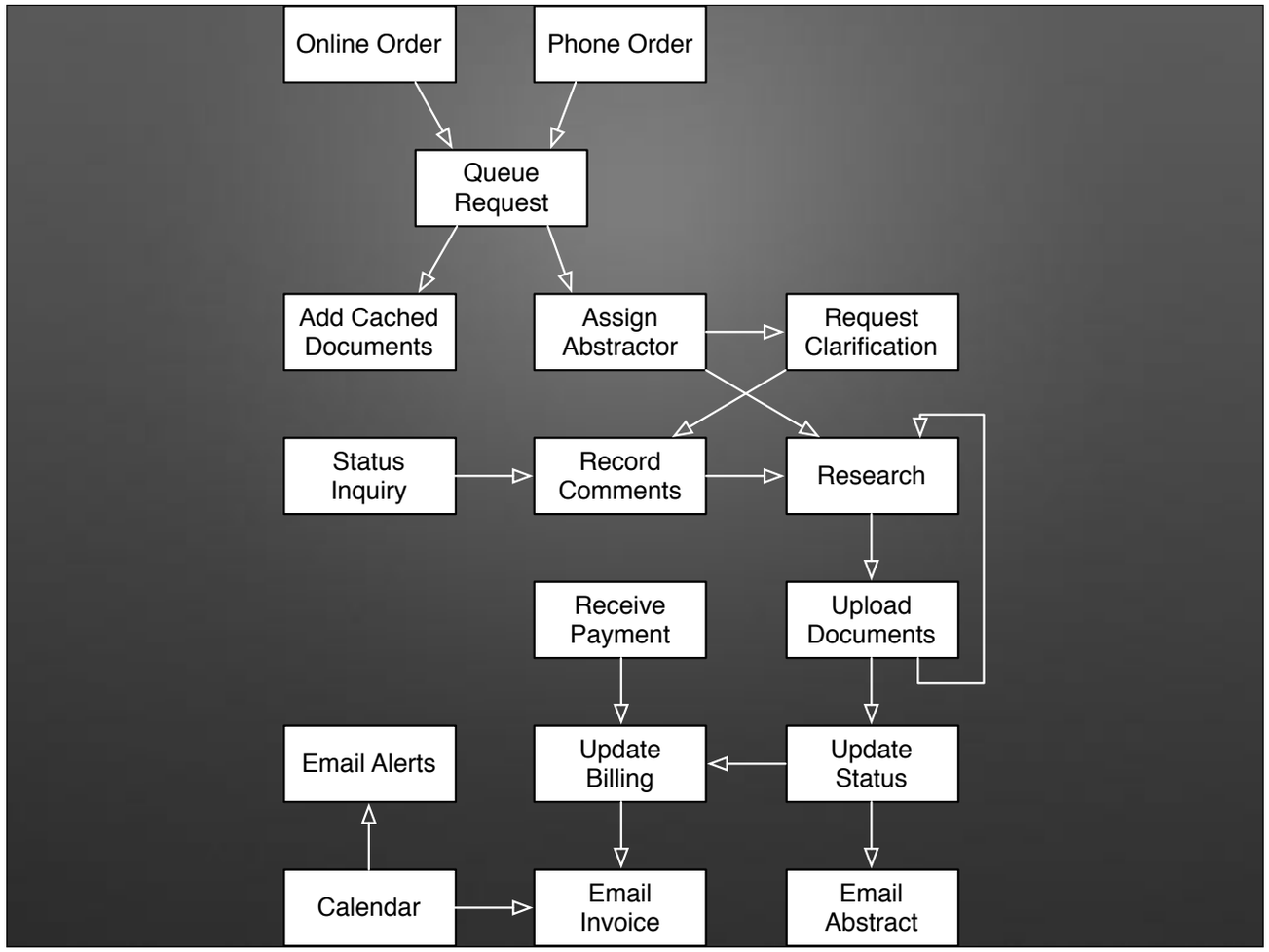
Here’s a diagram for a lot of other research work trying to target the same problem I work on

Process For Systemwide Power Capping

- Here's the workflow for my research project
- The system is stupidly simple
  - If the allocated power was not used, allocate less
  - If the allocated power was used, try to allocate more



Here's a diagram for my research work



Here's what I remember from the workflow of my first customer… The workflow was mostly the same before and after my system was deployed but several of the intermediate process changed. We don't need computers to have processes or workflows.

Which parts of the workflow can be automated? Which parts are manual?

The biggest gain moving to automation ended up being enforcement of the existing processes and timestamped documentation for when things happened and who did them.

What does your development process look like?

Exercises in trying to build some process diagrams