ECED3901 Design Methods II

LECTURE #3: PROJECT MANAGEMENT

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What are we covering?

- Project Design moving to Project Management
- Making a realistic schedule
- Issues hampering your project:
  - Legal
  - Compliance

Example: Mailing 500 Items

Q: I need you to mail out 500 boxes. I have a printed list of addresses. The boxes are all uniform size, but you will need to print labels/postage using a web service.

How long will this take?

Solving this…

- Getting box, folding out:
- Getting widget from stores:
- Adding padding:
- Taping box:
- Printing postage / labels:

Total:

Solving this…

- Getting box, folding out: 45 seconds
- Getting widget from stores: 15 seconds
- Adding padding: 45 seconds
- Taping box: 30 seconds
- Printing postage / labels: 120 seconds

Total: 4.25 min/box

4.25 * 500 = 2125 mins

2125 / 60 = 35 hours(!)

Kickstarter Project Management

FreedomCase: Adjustable Stand & Case for Microsoft Surface

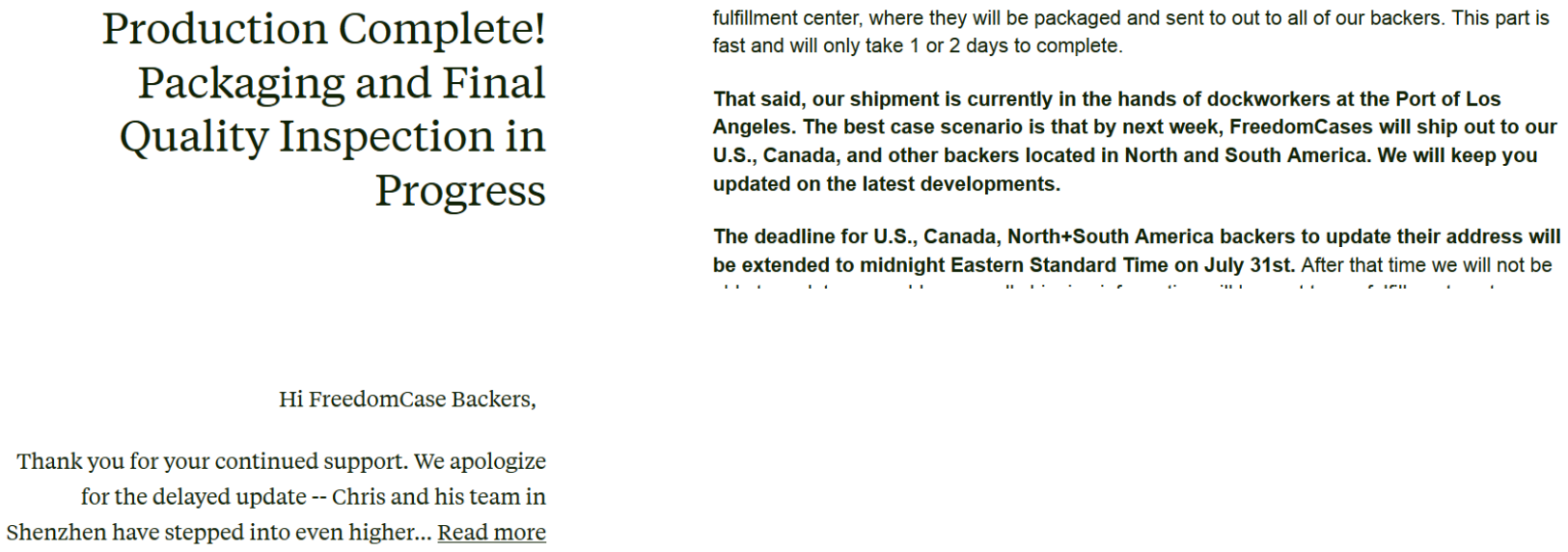
A sleek, low-profile protective case that allows you to use your Surface anywhere, with kickstand and keyboard cover integration.

Created by

Chris Leung and the FreedomCase Team

2,993 backers pledged $144,109 to help bring this project to life.

Kickstarter Project Management



Production Complete! Packaging and Final Quality Inspection in Progress

fulfillment center, where they will be packaged and sent to out to all of our backers. This part is fast and will only take 1 or 2 days to complete.

That said, our shipment is currently in the hands of dockworkers at the Port of Los Angeles. The best case scenario is that by next week, FreedomCases will ship out to our U.S., Canada, and other backers located in North and South America. We will keep you updated on the latest developments.

The deadline for U.S., Canada, North+South America backers to update their address will be extended to midnight Eastern Standard Time on July 31st. After that time we will not be

Hi FreedomCase Backers,

Thank you for your continued support. We apologize for the delayed update -- Chris and his team in Shenzhen have stepped into even higher... Read more

…this one isn't too bad, many more outright failures or huge delays, all due to project management issues

Project Management

Your amazing project WILL FAIL without some form of project management.

Project Management 101

1. Generate a "**Work Breakdown Structure**" (WBS)
    1. WBS breaks down our larger task into manageable chunks (deliverables)
    2. WBS is *not* a schedule
    3. WBS is done recursively until we reach a reasonable level of detail
2. Take WBS, turn it into a **schedule**
    1. Estimate/determine time for each lower-level task
    2. Chain tasks together, determine interconnection
    3. Use graph if you want for this last step (the infamous **Gantt chart**)

Work Breakdown Structure

0.0 Going on a hike

Work Breakdown Structure

0.0 Going on a hike

- 1.0 Scheduling / Planning
- 2.0 Executing the Hike
- 3.0 Finishing the Hike

Work Breakdown Structure

- 0.0 Going on a hike
  - 1.0 Scheduling / Planning
    - 1.1 Confirm when Carl is free
    - 1.2 Print/Buy Maps
    - 1.3 Pack
  - 2.0 Executing the Hike
    - 2.1 Drive to Location
    - 2.2 Hike
    - 2.3 Drive home
  - 3.0 Finishing the Hike
    - 3.1 Shower
    - 3.2 Wash Clothing
    - 3.3 Call mom

→Assign Tasks

0.0 Going on a hike

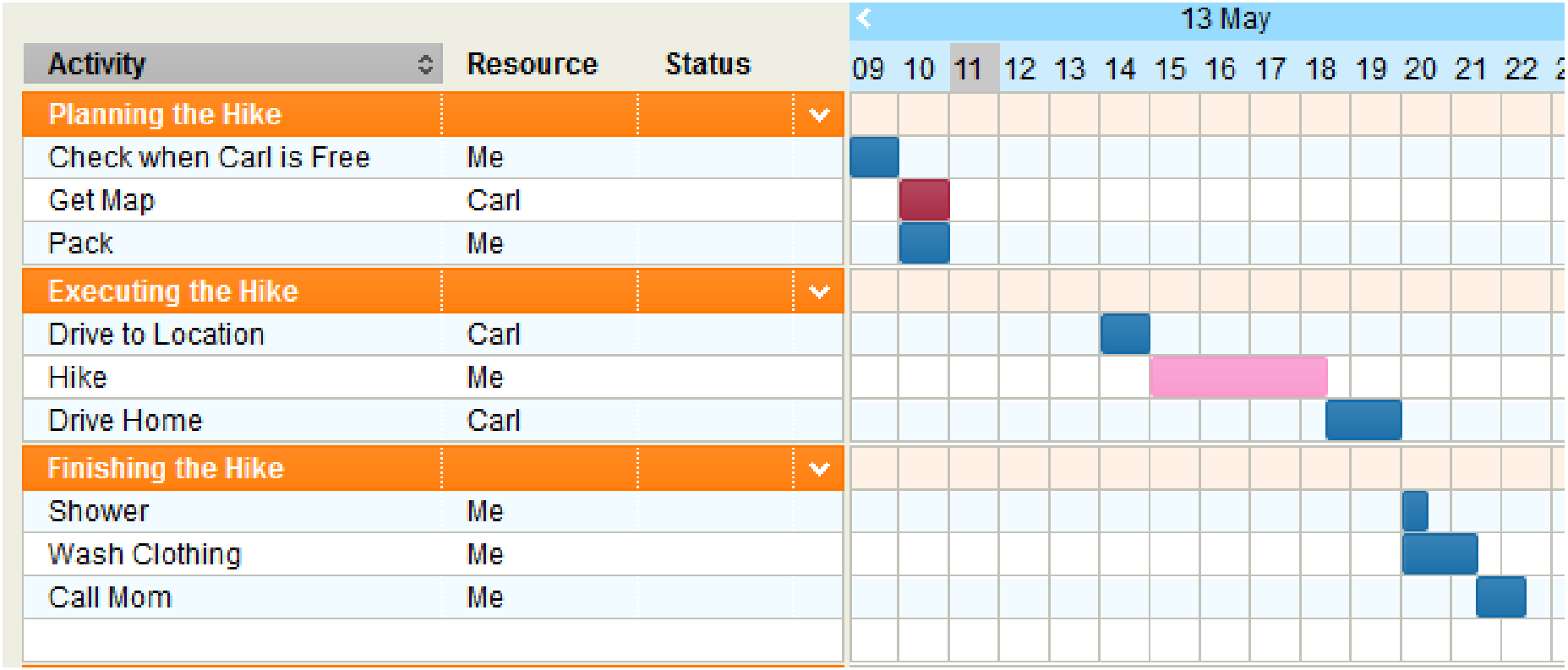
- 1.0 Scheduling / Planning
  - 1.1 Confirm when Carl is free – Me
  - 1.2 Print/Buy Maps – Carl
  - 1.3 Pack – Me
- 2.0 Executing the Hike
  - 2.1 Drive to Location – Carl
  - 2.2 Hike – Me/Carl
  - 2.3 Drive home – Carl
- 3.0 Finishing the Hike
  - 3.1 Shower – Me
  - 3.2 Wash Clothing – Me
  - 3.3 Call mom – Me

→Add Time Estimates

0.0 Going on a hike

- 1.0 Scheduling / Planning
  - 1.1 Confirm when Carl is free – Me – 15 mins
  - 1.2 Print/Buy Maps – Carl – 30 mins
  - 1.3 Pack – Me – 1 hour
- 2.0 Executing the Hike
  - 2.1 Drive to Location – Carl – 1 hour
  - 2.2 Hike – Me/Carl – 3.5 hours
  - 2.3 Drive home – Carl – 1.5 hour
- 3.0 Finishing the Hike
  - 3.1 Shower – Me – 30 mins
  - 3.2 Wash Clothing – Me – 1.5 hours
  - 3.3 Call mom – Me – 1 hour

→Schedule



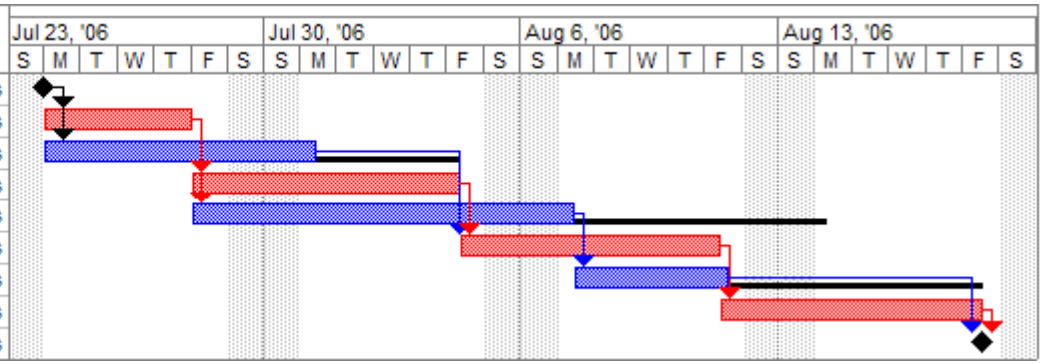
Activity	Resource	Status
Planning the Hike		
Check when Carl is Free	Me	
Get Map	Carl	
Pack	Me	
Executing the Hike		
Drive to Location	Carl	
Hike	Me	
Drive Home	Carl	
Finishing the Hike		
Shower	Me	
Wash Clothing	Me	
Call Mom	Me	

Sidenote on Making Gantt Charts

- Use free option such as OpenProj
- Simple online solutions (I used http://www.tomsplanner.com/ for the previous slides, others available)

Critical Path

ID	Task Name	Predecessors	Duration
1	Start		0 days
2	a	1	4 days
3	b	1	5.33 days
4	c	2	5.17 days
5	d	2	6.33 days
6	e	3,4	5.17 days
7	f	5	4.5 days
8	g	6	5.17 days
9	Finish	7,8	0 days



Source: http://en.wikipedia.org/wiki/Gantt_chart

Scheduling Notes

1. Your first schedules will be *horribly* wrong
2. Accept this, LEARN, and use it to improve future schedules
3. Consider scheduling for your robot – will be a big part of the plan
4. Scheduling will be a *major* part of your progress report and final report – so start thinking about it now!

Risk Management

Common Risks

- Time & Cost estimates incorrect
- Budget Changes
- Change of Scope
- Legal issues
- Supplier issues

Common Risks

- Time & Cost estimates incorrect

  Project is more complicated than expected

- Budget Changes

  Project based on overall budget, then overall budget cut

- Change of Scope

  Not fully defined before starting project

- Legal issues

  We need special certifications, those cost $50k and take 6 months

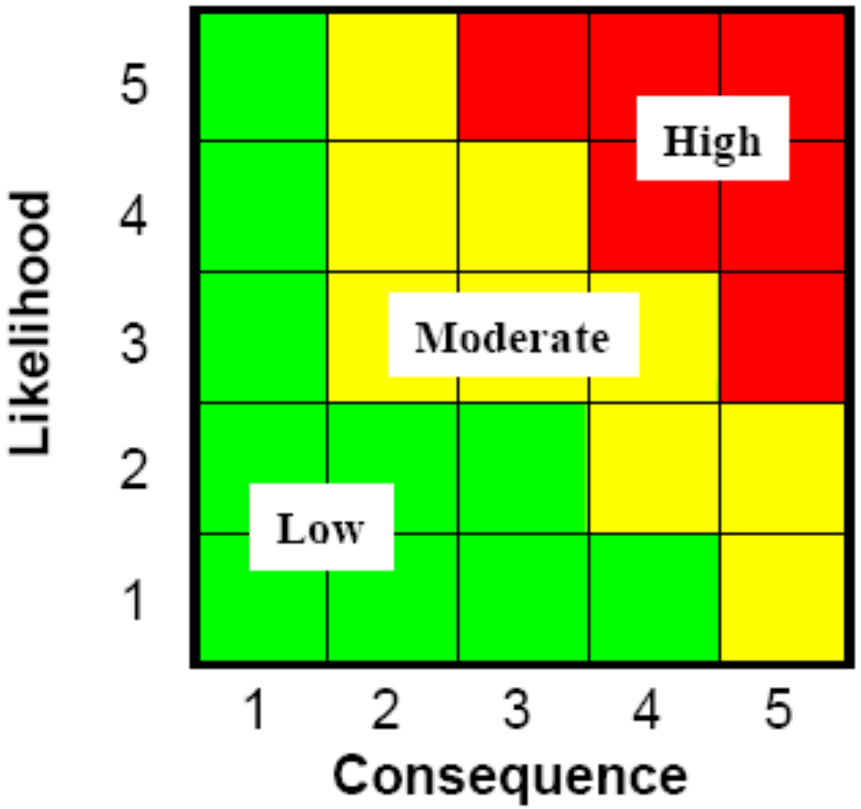
- Supplier issues

  Part is on backorder with 14-week lead time, but when we designed the system it was widely available.

Risk Management

1. Identify Risks
2. Analyze the risks
3. Prioritize the risks
4. Plan a risk response
5. Monitor the risks
6. Control the risks

Risk Management



Example of Risk Management

When Cost-Benefit runs awry..

http://www.autosafety.org/uploads/phpq3mJ7F_FordMemo.pdf

BENEFITS AND COSTS RELATING TO FUEL LEAKAGE ASSOCIATED WITH THE STATIC ROLLOVER TEST PORTION OF FMVSS 208

BENEFITS:

Savings – 180 burn deaths, 180 serious burn injuries, 2100 burned vehicles.

Unit Cost – $200,000 per death, $67,000 per injury, $700 per vehicle.

Total Benefit – 180x($200,000)+180x($67,000)+2100x($700) = $49.5 million.

COSTS:

Sales – 11 million cars, 1.5 million light trucks.

Unit Cost – $11 per car, $11 per truck.

Total Cost – 11,000,000x($11)+1,500,000x($11) = $137 million.

Patents

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Patents

- Prevents someone else from selling a device which ‘infringes’ on your claims
- Is *NOT* a license to sell the device, is possible your device still infringes on someone else's patent
- Only enforceable in geographic area issued in (i.e. US, Canada, UK, China, etc.)
- A patent is effectively **a legal proceeding**
  - The patent office (and later possibly a third party) is using standard legal procedure to reach a ‘verdict’
  - Your initial claims that will be **examined** are your **patent application**

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Reading a Patent

Important Sections:

1) Claims

2) Everything else

The ‘Claims’ is solely what is claimed as the innovative material.

The ‘Specification’ must detail how it works etc., and can restrict the claims. However lots of material written in the specification may be well-known already.

Prior art must read on the claims.

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Patent Application

A patent application IS NOT a patent

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Patent Application

- Patent Application = I have $400 USD. That is all it means.
- A patent application that is *fairly likely to be enforceable* is >$5 000 normally
- Defending a patent can easily cost > $50 000, after which point it has more value
- Failures in the original application might mean someone can easily circumvent your patent, lets see some examples:

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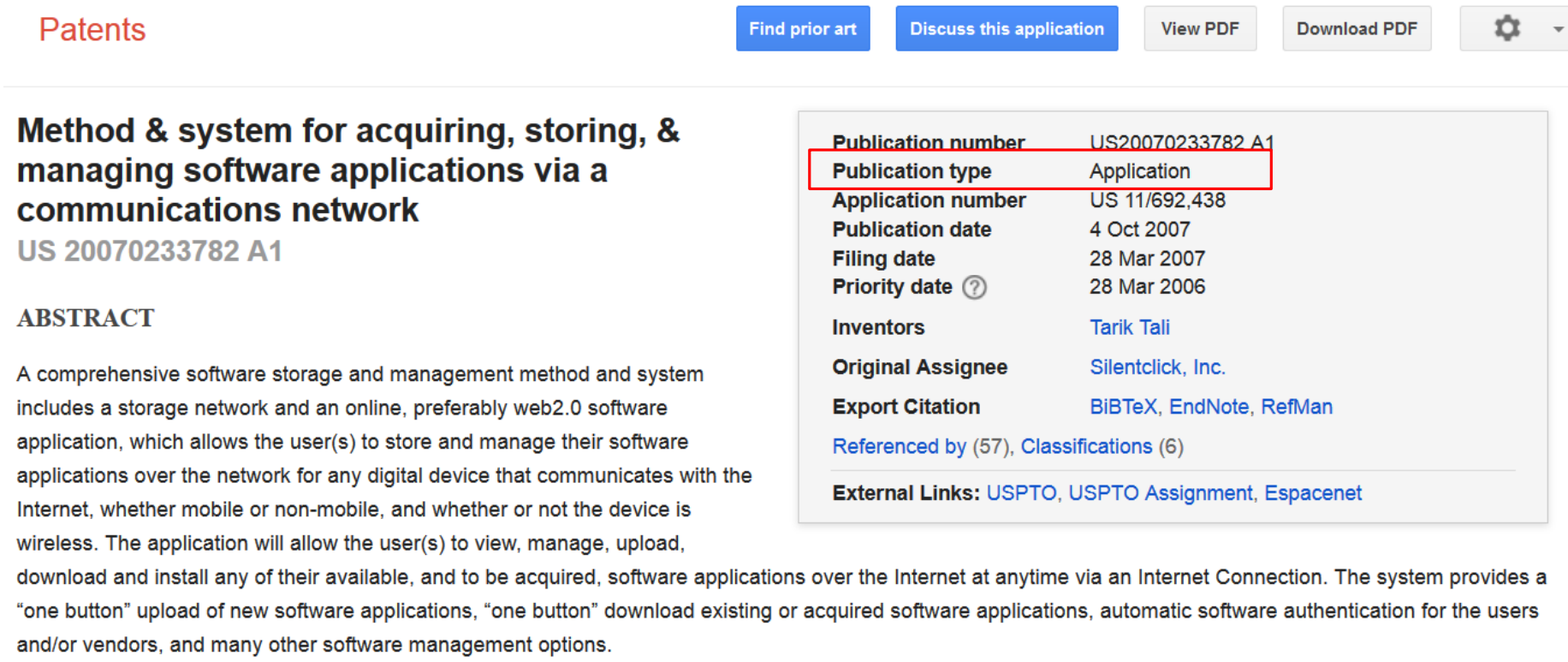
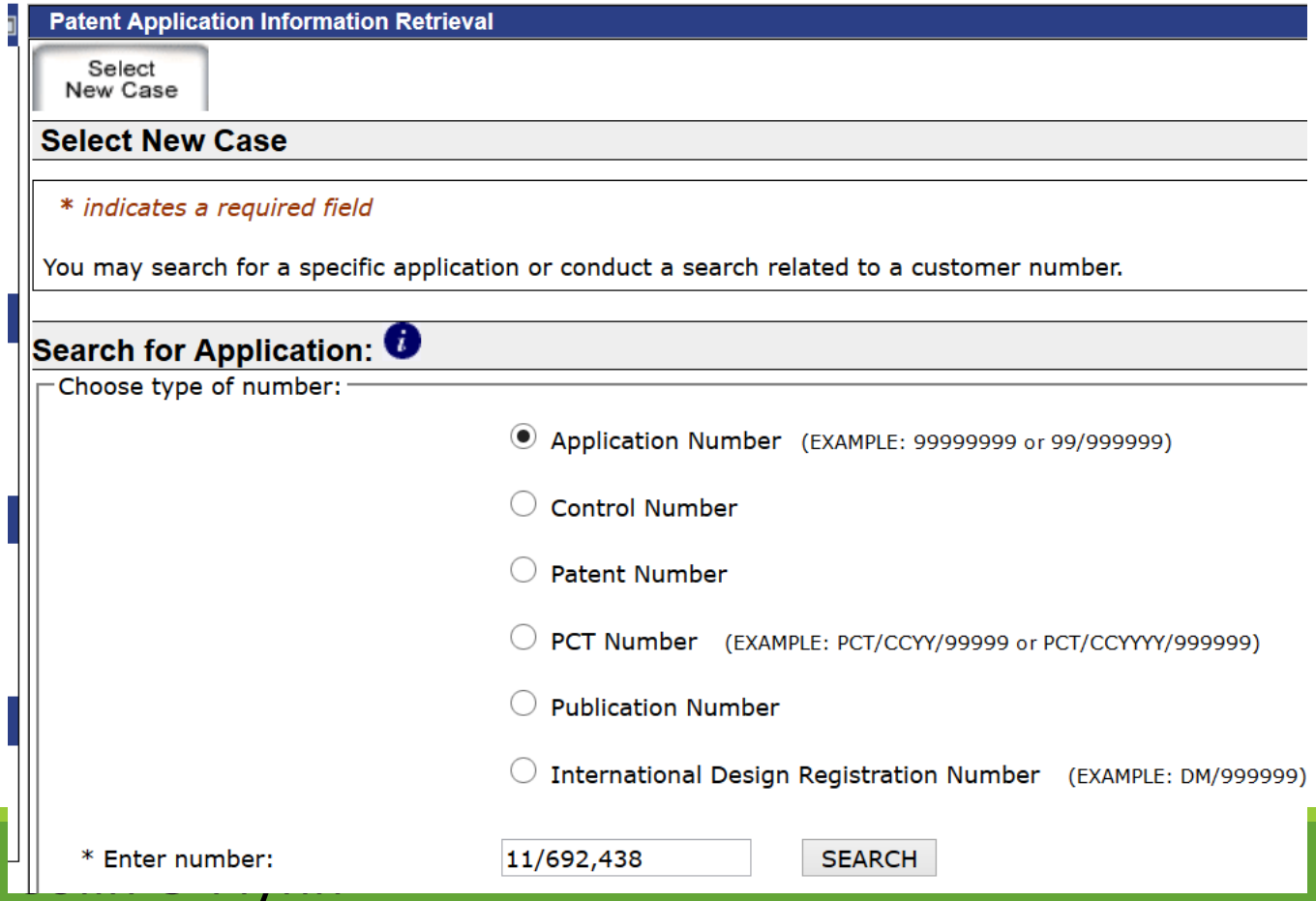
Example: Looking up a Patent



Patents.google.ca

Example: Getting Patent Details

USPTO Public Pair http://portal.uspto.gov/pair/PublicPair



Examples: Getting Patent Details

11/692,438 — **METHOD & SYSTEM FOR ACQUIRING, STORING, & MANAGING SOFTWARE APPLICATIONS VIA A COMMUNICATIONS NETWORK**

Select New Case | Application Data | Transaction History | Image File Wrapper | Continuity Data | Published Documents | Address & Attorney/Agent | Supplemental Content | Assignments | Display References

Bibliographic Data

Application Number:	11/692,438	Correspondence Address Customer Number:	-
Filing or 371 (c) Date:	03-28-2007	Status:	Abandoned -- Failure to Respond to an Office Action
Application Type:	Utility	Status Date:	04-08-2010
Examiner Name:	VU, VIET DUY	Location:	ELECTRONIC
Group Art Unit:	2454	Location Date:	-
Confirmation Number:	7557	Earliest Publication No:	US 2007-0233782 A1
Attorney Docket Number:	-	Earliest Publication Date:	10-04-2007
Class / Subclass:	709/220	Patent Number:	-
First Named Inventor:	Tarik Tali , Emerald Hills, CA (US) all Inventors	Issue Date of Patent:	-
First Named Applicant:	-	International Registration Number (Hague):	-
Entity Status:	Small	International Registration Publication Date:	-
AIA (First Inventor to File):	No		

Title of Invention:	METHOD & SYSTEM FOR ACQUIRING, STORING, & MANAGING SOFTWARE APPLICATIONS VIA A COMMUNICATIONS NETWORK

Examples: Getting Patent Details

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following language lacks proper antecedent basis:

In claim 1, line 4, "the user's digital devices", it is not clear as to which device is being referred.

In claim 15, line 5, "the user's digital devices", it is not clear as to which device is being referred.

EMC/Safety Tests

EMC Testing

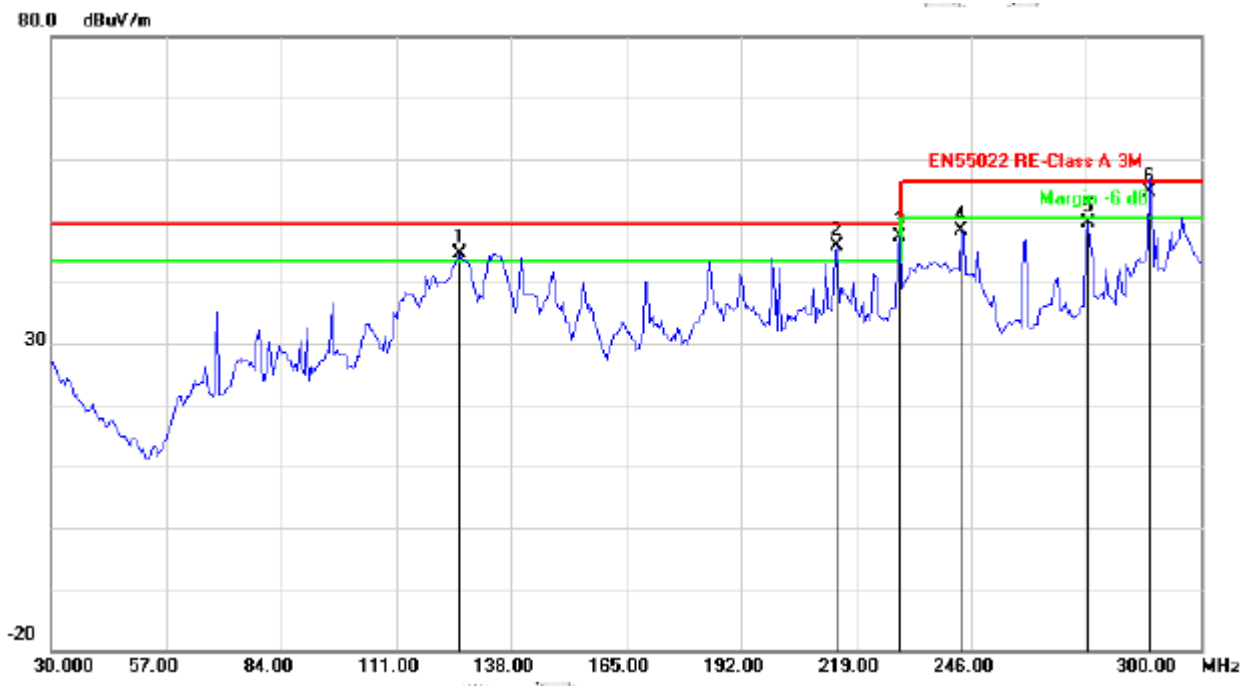
- Lots of these labels on devices:

Testing

- Getting these tests done is fairly expensive for a variety of reasons
- i.e., EMC interference testing:

Source: http://www.fujixerox.co.jp/eng/company/headline/2005/0615_emc.html

Example: Interference Test Report

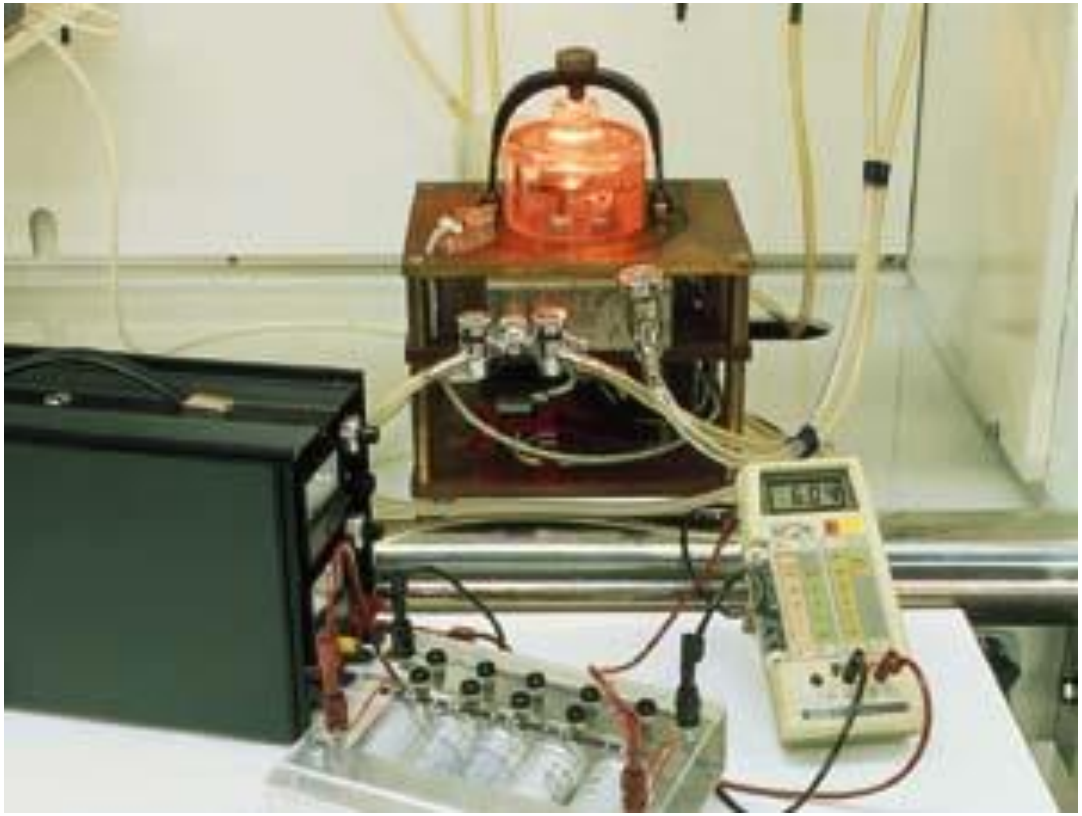


Specialized Tests

Certain environments have additional tests required:

i.e. Aviation, mining, etc.

Example: Spark Test



Source: http://www.offshore-mag.com/articles/print/volume-56/issue-11/news/general-interest/directive-imposes-new-obligations-for-explosive-atmosphere-equipment.html

Summary

- Scheduling a critical part of your project planning
- Doesn't need to be complex!
  - Write your tasks
  - Break them down until you can estimate each task size
  - String those broken down tasks together into a schedule
  - Try to avoid dependency as much as possible… your critical path is that which any delay in one subtask delays your entire project
- Many risks facing your project – better to be prepared!
- Patent Application is not a Patent