

Jonathan Kaiser
SELP 695 Integrative Project
Advisor: Dr. Fred Brown

APPLYING SYSTEMS ENGINEERING TO LIFE

Return to Dr. Fred S. Brown

Project Objective

- Life is one of the best examples of a System of Systems
- Apply the knowledge gained from SE coursework to simplify and organize day to day activities of my life
- Architecture and Work Breakdown Structures will provide organization.
- Quality and Lean Thinking will provide the methods to improve my life.
- Bottom Line – I want to free up time to spend on hobbies and nurturing family.

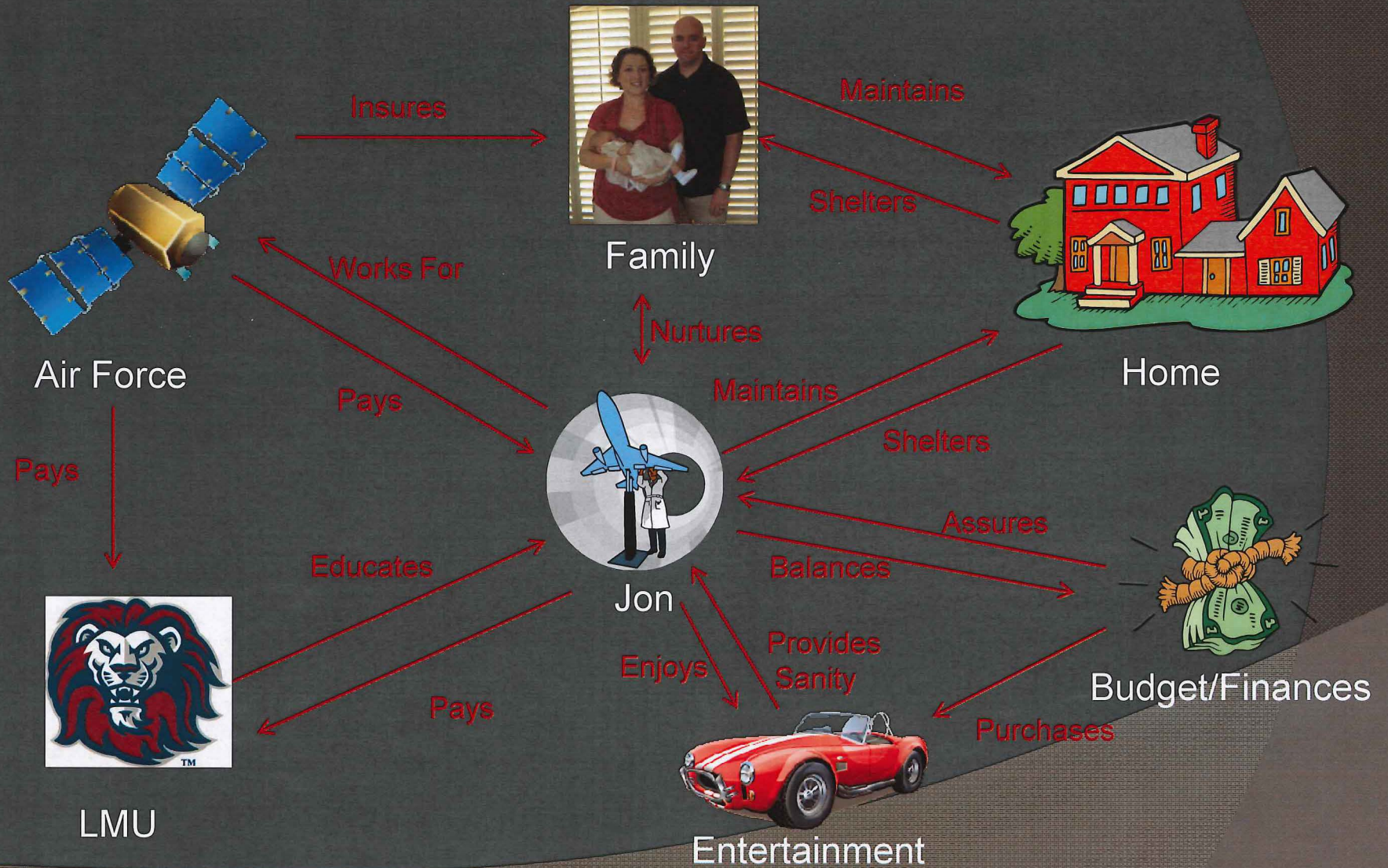
Stakeholders

- Me – I am the primary stakeholder
- Spouse – Of course she gets a say
- Daughter – She doesn't say but still has requirements
- Air Force – Wants me to do work for them
- LMU – Wants my money
- Many others but these have the most impact on my requirements

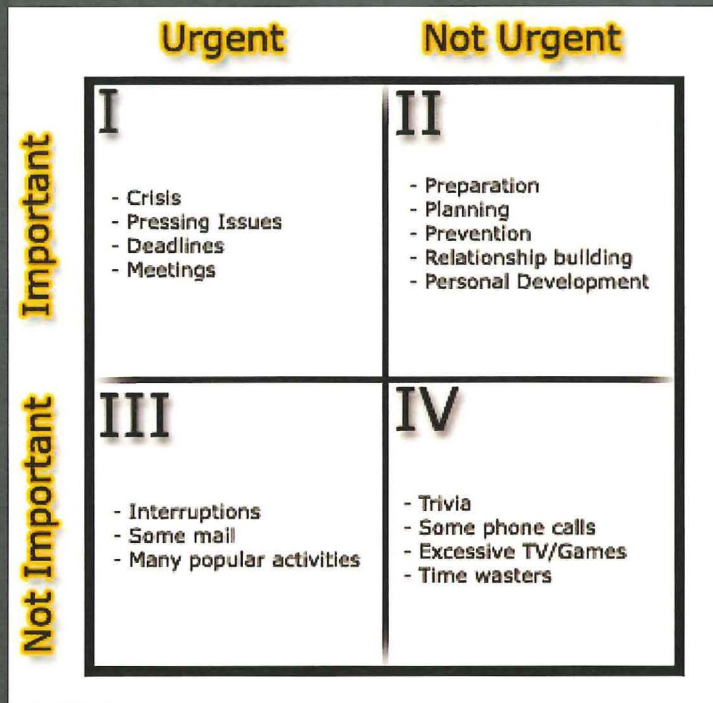
Stakeholder Requirements

- ◉ Mine
 - The system shall provide adequate levels of necessities for life to include food, water, and shelter.
 - Secondary Requirement - The system should maximize time spent on entertaining and nurturing family.
- ◉ Spouse and Daughter
 - Similar to mine
 - Additional requirements in the form of a Honey Do list
 - Their requirements affect my derivative requirements
- ◉ Air Force
 - Perform the work that is given
 - Continuously improve through education
- ◉ LMU
 - Pay tuition
 - Maintain a passing GPA
 - Fulfill stated requirements for degree
- ◉ Detailed requirements document in backup

Architecture



Prioritizing Tasks



<http://www.lifetrainingonline.com/blog/first-things-first-chapters-1-5.htm>

- Franklin Covey introduced this concept for prioritizing tasks
- Very useful in our busy daily lives

Work Breakdown Structure

Jon's Life

Job

Education

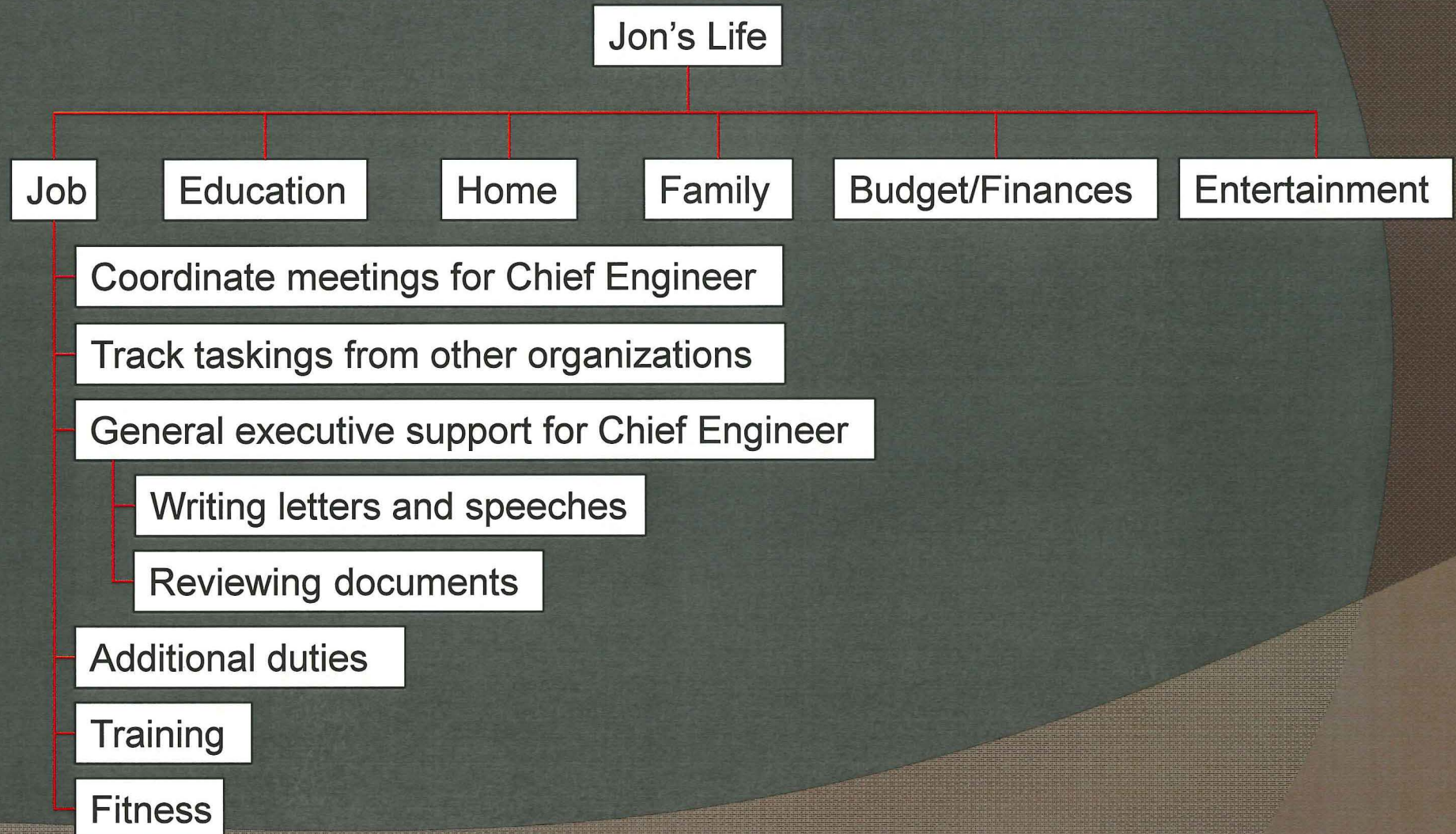
Home

Family

Budget/Finances

Entertainment

Work Breakdown Structure



Work Breakdown Structure

Jon's Life

Job

Education

Home

Family

Budget/Finances

Entertainment

MS in Systems Engineering

Integrative Project Research

Integrative Project Report

Integrative Project Presentation

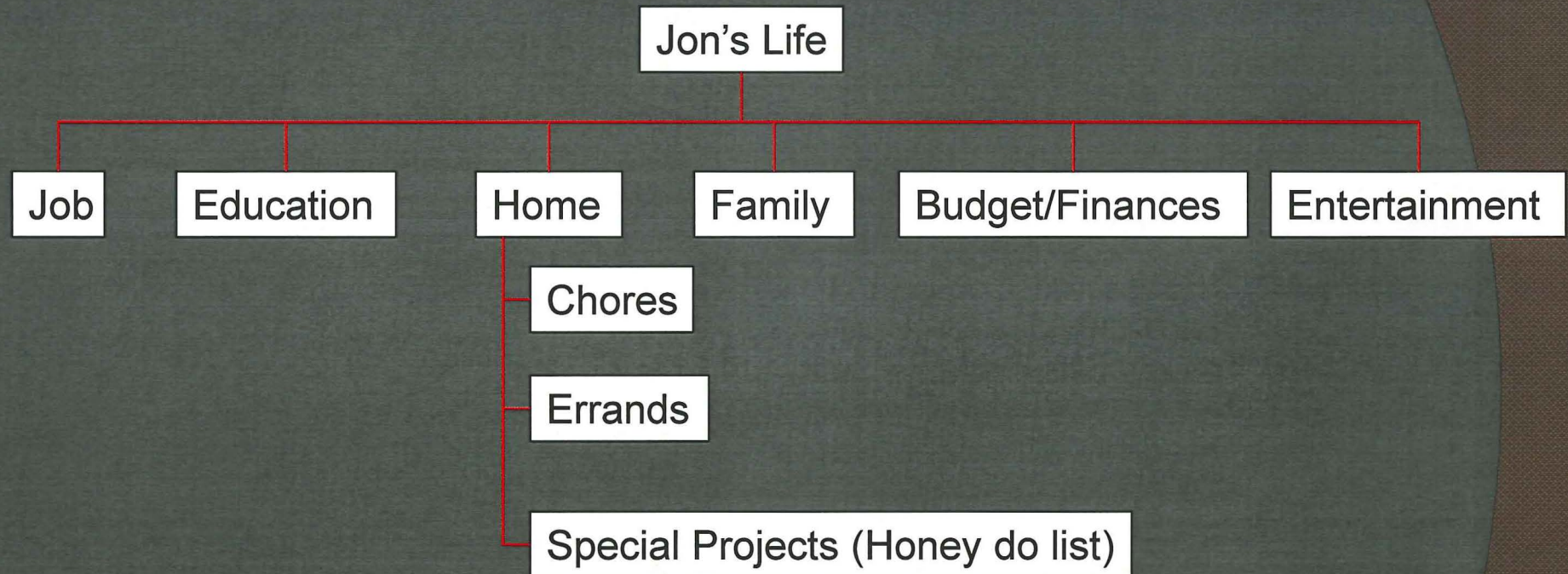
Graduation

Professional Military Education

Squadron Officer School by correspondence

Squadron Officer School in residence

Work Breakdown Structure



Work Breakdown Structure

Jon's Life

Job

Education

Home

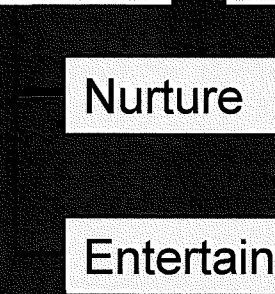
Family

Budget/Finances

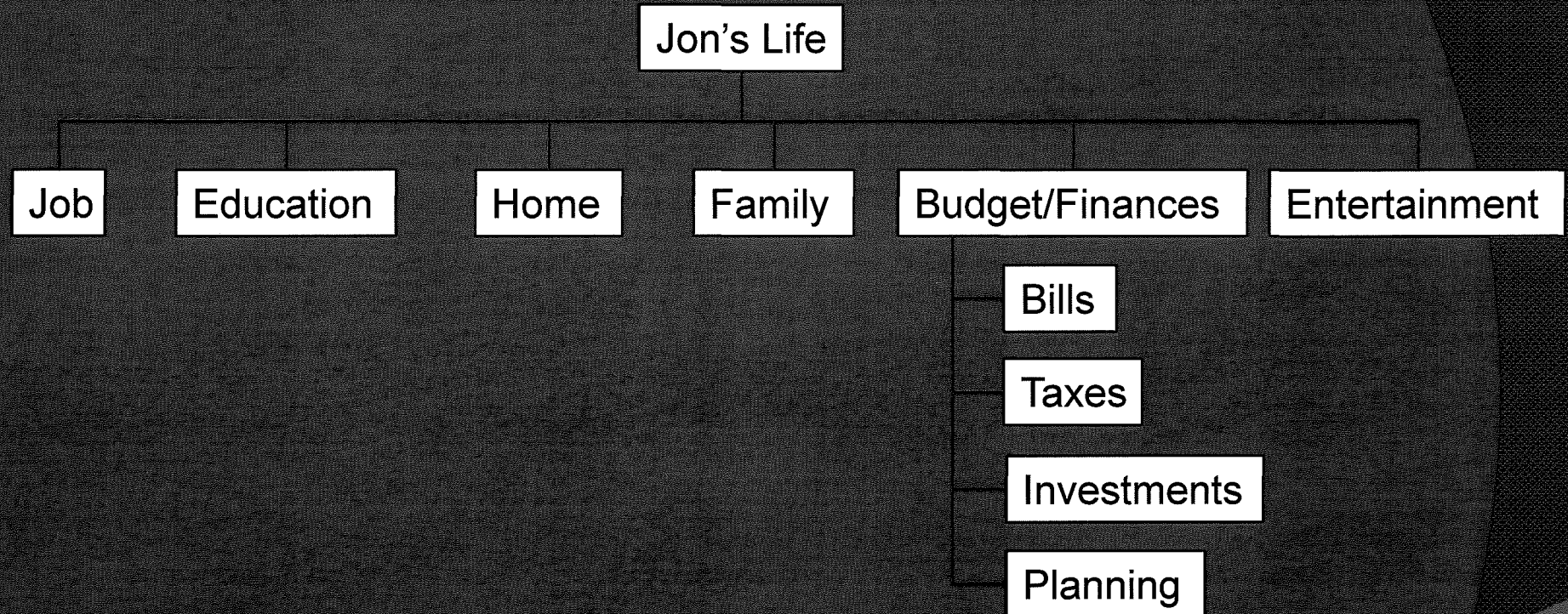
Entertainment

Nurture

Entertain



Work Breakdown Structure



Work Breakdown Structure

Jon's Life

Job

Education

Home

Family

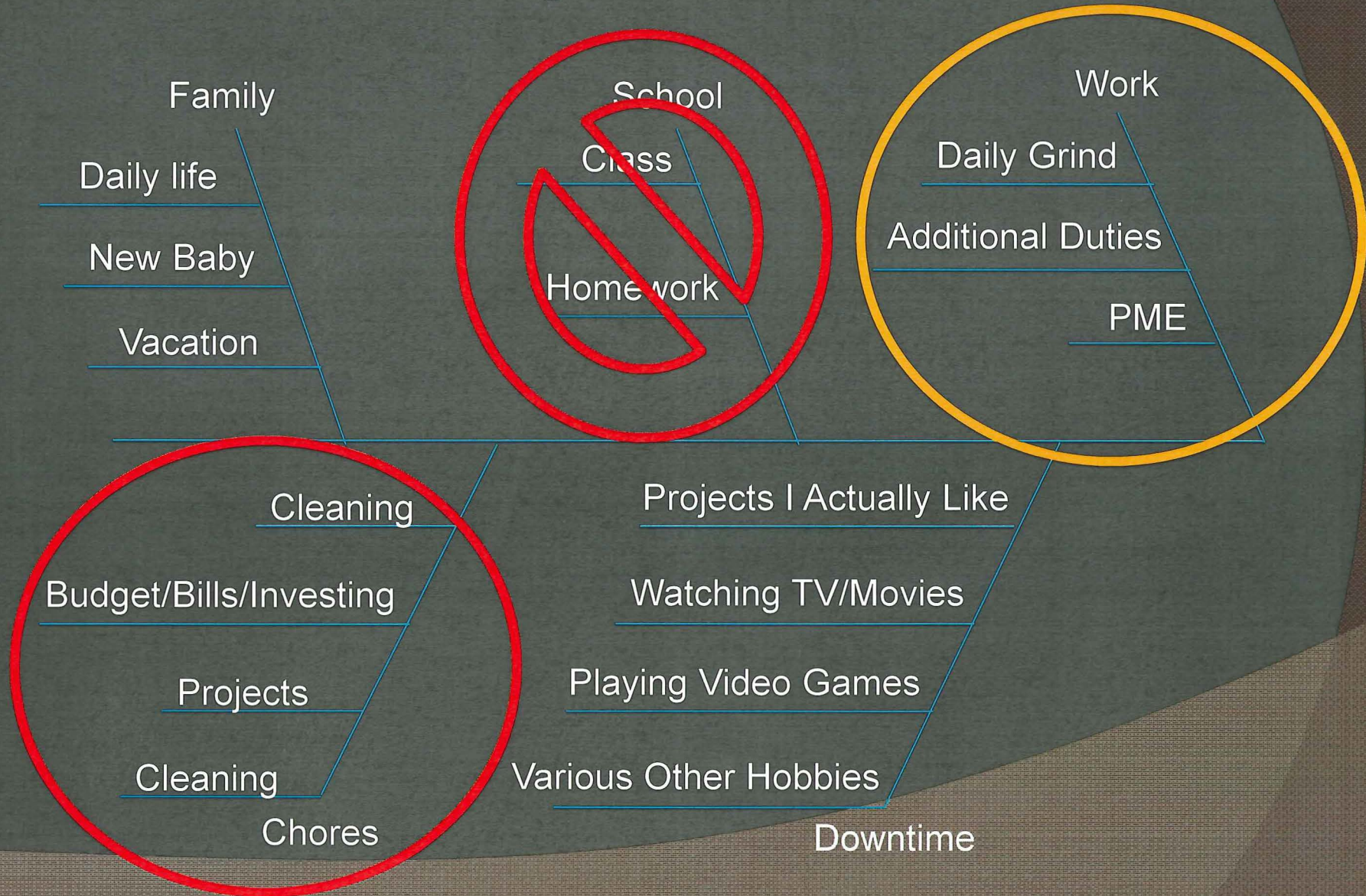
Budget/Finances

Entertainment

Hobbies

Brain Dead Time

What is taking up all my time?



Lean Initiative

- Measure and Reduce time spent on chores
 - My wife and I spent about 20 hours each a week on chores and errands
 - Started automating the home
 - Automatic cat feeder
 - Roomba automatic vacuum
 - Decided to outsource processes and get a housekeeper to clean 2x a month

Old Chore Schedule

	Jon	Time (min)	Jen	Time (min)
Monday	Empty Litterboxes	15	Water plants	15
	Class	180	Dinner	60
			Vacuum floors	60
			Vacuum couches & stairs (2x/month)	5
			Classwork & Homework	180
Tuesday	Do laundry	60	Food shopping	60
	Fold/put away laundry	30	Meal planning	15
	Wash/Put away dishes	30	Errands	60
	Water lawn	20	Fold/put away laundry	30
Wednesday	Take out garbage & recycling	10	Dinner	60
	Wash cars (1x/month)	30	Project	60
	Wash cats (1x/month)	8		
	Pay & file bills (1x/month)	8		
	Clean fishtank (1x/month)	15		
Thursday	Empty Litterboxes	15	Acupuncture	60
	Class	180	Clean toilets	15
			Clean bathrooms & showers (2x/month)	30
			Sweep floors	10
			Steam clean floors & counters (2x/month)	60
Friday	Refill Cat food (2x/month)	5	Dinner	60
	Clean Cat water dish (2x/month)	10	Bunco (1x/month)	-
	Water lawn	20	Sweep porch (1x/month)	5
	Dishes	60	Dust, clean tables (2x/month)	10
Saturday	Empty Litterboxes	15	Water plants	15
	Clean litterboxes (2x/month)	30	Errands	60
	Downtime	-	Downtime	-
Sunday	Church	-	Church	-
	Project	300	Project	120
	Classwork & Homework	180	Classwork & Homework	180
Total Time		1221		1230
Per Week		20 hrs		20 hrs

Caveats:

- No baby
- Jon taking 2 classes
- Jen taking 1 class
- Jon project example: build something
- Jen project example: patch holes in clothing

New Chore Schedule

	Jon	Time (min)	Jen	Time (min)
Monday	Empty Litterboxes	15	Prep Baby Stuff	30
	Dishes	30	Dinner	60
	Budget/Investing/Bills	90	Make Lunch	15
	Filing/Shredding	15		
Tuesday	Empty Roomba	10	Food shopping	60
	Project	60	Water plants	15
			Make Lunch	15
			Prep Baby Stuff	30
Wednesday	Dishes	30	Dinner	60
	Take out garbage & recycling	10	Make Lunch	15
	Empty Litterboxes	15	Prep Baby Stuff	30
Thursday	Empty Roomba	10	Water plants	15
	Prep for Cleaning Lady	60	Make Lunch	15
			Prep Baby Stuff	30
Friday	Dishes	30	Dinner	60
	Refill cat food (2x/month)	5	Bunco (1x/month)	-
	Clean kitty water dish	10		
	Empty Litterboxes	15		
Saturday	Downtime	-	Downtime	-
Sunday	Church	-	Church	-
	Project	300	Project	120
	Wash Cars (1x/month)	30	Classwork & Homework	360
	Wash Cats (1x/month)	8	Water plants	15
	Clean Litterboxes (1x/month)	15	Make Lunch	15
	Clean Fishtanks (2x/month)	30	Prep Baby Stuff	30
	Errands	120	Meal Plans	15
	Total Time Per Week	908		1005
		15 hrs		17 hrs

Caveats:

- New Baby
- Baby nurturing not included
- Jon no longer in class
- Jen taking 1 class
- Jon project example: build something
- Jen project example: patch holes in clothing

Project Management

- ⦿ Jen is always after me because I'm not working on our Honey Do list
- ⦿ Come up with project schedule to get it done during the summer
- ⦿ Then I work on my personal To Do list

Current Honey Do List

- Sell Stuff on Ebay - Jon
- Clean/Org Garage - Jon
- Install Kitchen Blinds - Jon
- Clean House Windows – Jon/Jen
- Build Hydroponic Garden - Jon
- Fix Fabric Toys – Jen
- Reupholster Pillow – Jen
- Repair Sewing Machine – Jen
- Take Swordtails to Fish Store – Jon/Jen
- Plan Vacations – Jon/Jen
- Fix Remote Control Car – Jen
- Move Files from Laptop to Desktop PC – Jen
- Discard Old Files in Filing Cabinet – Jon/Jen
- Investing – Jon
- Go Through School Notes – Jen
- Fix Marble Mugs - Jon

- Longer Lead Items: Can't be completed in less than a day

Overall Schedule for Honey Do

Task Name	Duration	Start	Finish	Predecessors	Rel	May 15, '11				May 29, '11				Jun 12, '11				Jun 26, '11				Jul 10, '11									
						S	W	S	T	M	F	T	S	W	S	T	M	F	T	S	W	S									
- Honey Do List	55 days	Sun 5/15/11	Fri 7/8/11																												
+ Sell Stuff on Ebay	13 days	Sun 5/15/11	Fri 5/27/11																												
+ Plan Vacations	19 days	Sat 5/28/11	Wed 6/15/11																												
+ Clean/Org Garage	6 days	Thu 6/16/11	Tue 6/21/11																												
+ Build Hydroponic Garden	4 days	Wed 6/22/11	Sat 6/25/11																												
+ Investing	13 days	Sun 6/26/11	Fri 7/8/11																												

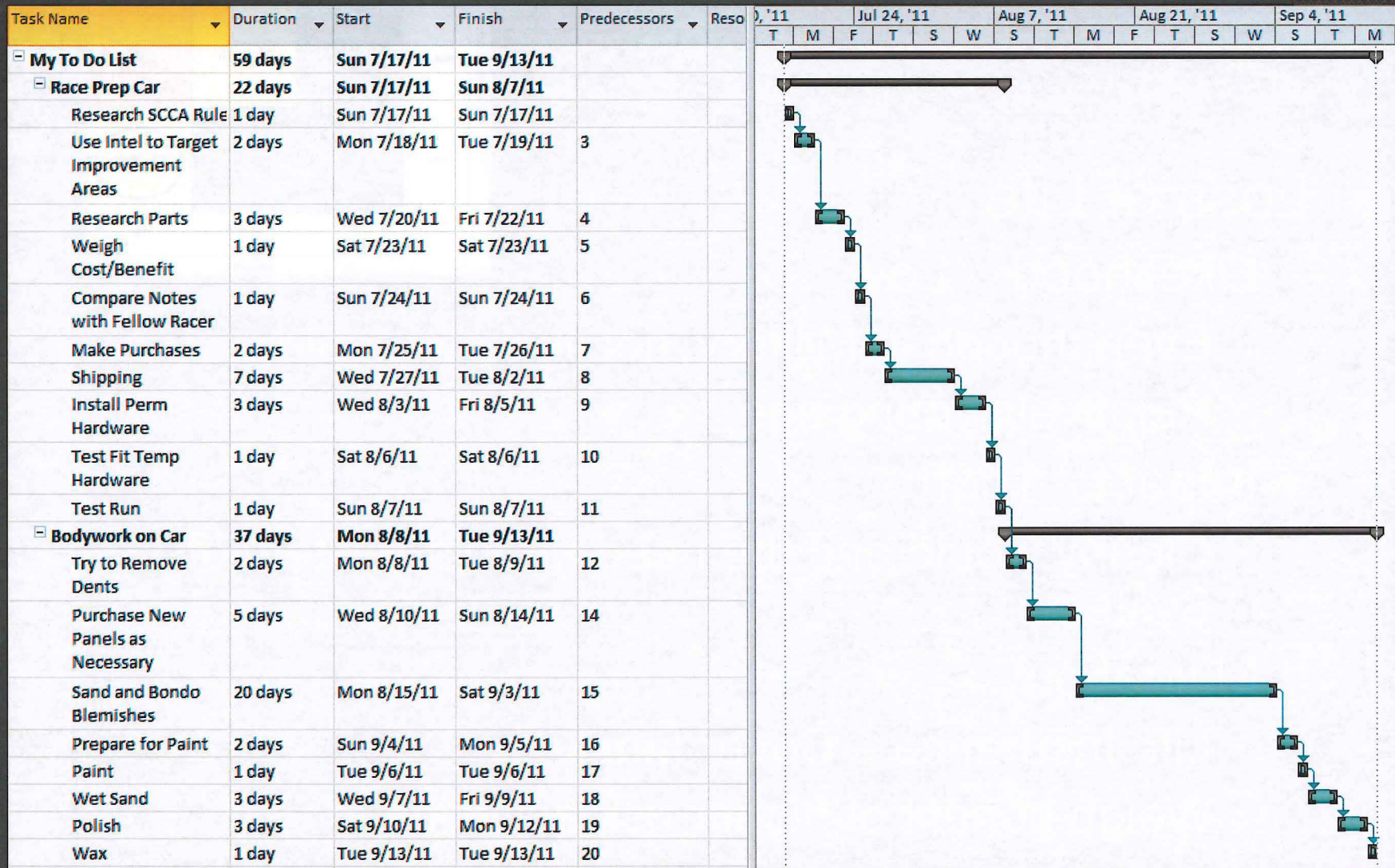
Expanded Schedule for Honey Do

Task Name	Duration	Start	Finish	Predecessors
Honey Do List	55 days	Sun 5/15/11	Fri 7/8/11	
- Sell Stuff on Ebay	13 days	Sun 5/15/11	Fri 5/27/11	
Package / Weigh / Catalog Items	1 day	Sun 5/15/11	Sun 5/15/11	
List Items	1 day	Mon 5/16/11	Mon 5/16/11	3
Wait for Bids	10 days	Tue 5/17/11	Thu 5/26/11	4
Ship Items	1 day	Fri 5/27/11	Fri 5/27/11	5
- Plan Vacations	19 days	Sat 5/28/11	Wed 6/15/11	
Gather Requirements	1 day	Sat 5/28/11	Sat 5/28/11	6
Coordinate Childcare as Needed	2 days	Wed 6/8/11	Thu 6/9/11	8
Book Details for Cruise	2 days	Fri 6/10/11	Sat 6/11/11	9
Book Details for N. CA Tour	4 days	Sun 6/12/11	Wed 6/15/11	10
- Clean/Org Garage	6 days	Thu 6/16/11	Tue 6/21/11	
Throw Out Garbage	1 day	Thu 6/16/11	Thu 6/16/11	11
Finish Tire Rack	2 days	Fri 6/17/11	Sat 6/18/11	13
Organize Workbench	1 day	Sun 6/19/11	Sun 6/19/11	14
Organize Loft	1 day	Mon 6/20/11	Mon 6/20/11	15
Hang Remaining Large Equip	1 day	Tue 6/21/11	Tue 6/21/11	16
+ Build Hydroponic Garden	4 days	Wed 6/22/11	Sat 6/25/11	
+ Investing	13 days	Sun 6/26/11	Fri 7/8/11	

Expanded Schedule for Honey Do

Task Name	Duration	Start	Finish	Predecessors	Re	May 15, '11					May 29, '11			Jun 12, '11			Jun 26, '11				
						S	W	S	T	M	F	T	S	W	S	T	M	F	T	S	W
Honey Do List	55 days	Sun 5/15/11	Fri 7/8/11																		
+ Sell Stuff on Ebay	13 days	Sun 5/15/11	Fri 5/27/11																		
+ Plan Vacations	19 days	Sat 5/28/11	Wed 6/15/11																		
+ Clean/Org Garage	6 days	Thu 6/16/11	Tue 6/21/11																		
Build Hydroponic Garden	4 days	Wed 6/22/11	Sat 6/25/11																		
Find Original Plans	1 day	Wed 6/22/11	Wed 6/22/11	17																	
Complete Housing	1 day	Thu 6/23/11	Thu 6/23/11	19																	
Complete Plumbing	1 day	Fri 6/24/11	Fri 6/24/11	20																	
Integrate, Test, Deliver	1 day	Sat 6/25/11	Sat 6/25/11	21																	
Investing	13 days	Sun 6/26/11	Fri 7/8/11																		
Review Notes for Financial Advisor	1 day	Sun 6/26/11	Sun 6/26/11	22																	
Move Funds Around in Existing Accounts	2 days	Mon 6/27/11	Tue 6/28/11	24																	
Create Any Unexisting Accounts	3 days	Wed 6/29/11	Fri 7/1/11	25																	
Research Mutuals, etc	5 days	Sat 7/2/11	Wed 7/6/11	26																	
Make Purchases	2 days	Thu 7/7/11	Fri 7/8/11	27																	

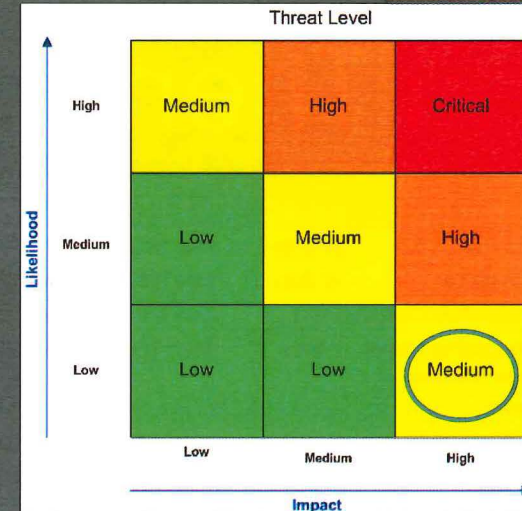
And Then It's My Turn



Risk Management

Loss of Life

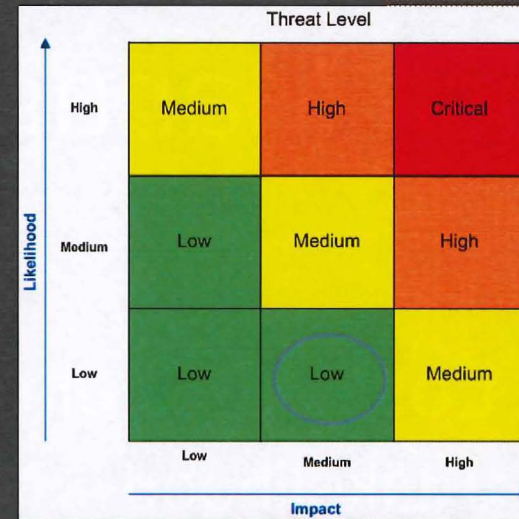
- Likelihood – Low
 - Even though in Military, not likely to deploy
 - Relatively young age
- Impact – High
 - Clearly would end the need for this System of Systems
- Mitigation
 - Life Insurance – Cover family
 - Weigh benefit of higher risk activities



Risk Management

● Loss of Job

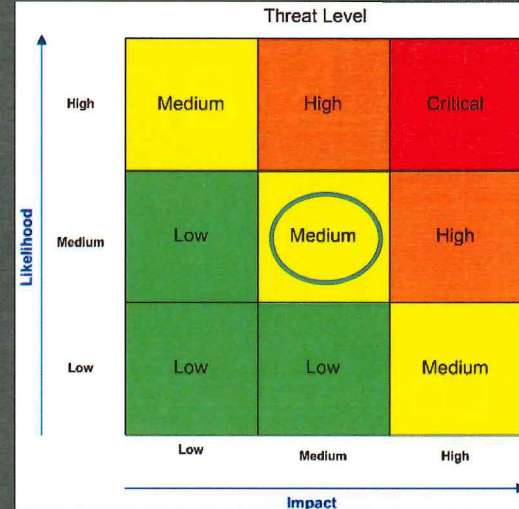
- Likelihood – Low
 - Not too many people get laid off from government work
- Impact – Medium
 - Immediate loss of income would hinder functions of the system
 - Marketability would likely result in quick recovery
- Mitigation – None Necessary



Risk Management

Loss of Shelter

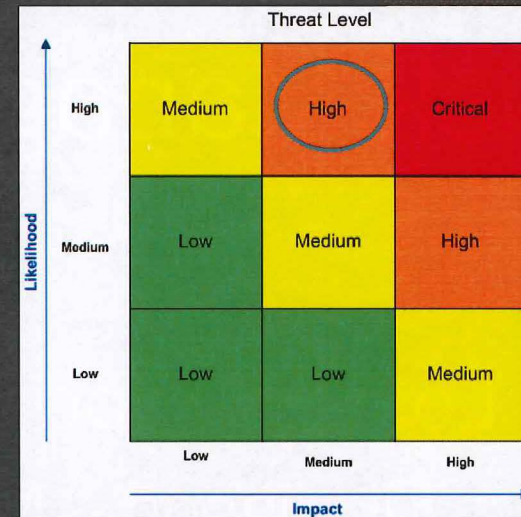
- Likelihood – Medium
 - Natural disasters in CA
- Impact – Medium
 - Shelter is one of the basic necessities
 - Could always live in car or like the guy on “The Road”
- Mitigation
 - Insurance
 - Emergency Plan



Risk Management

Loss of Water

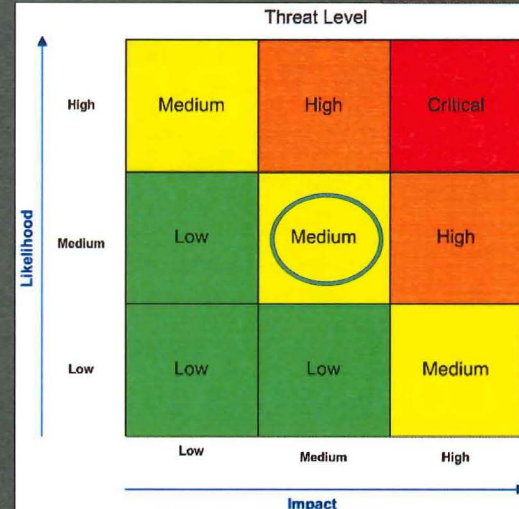
- Likelihood – Medium
 - Natural disasters in CA
- Impact – High
 - Water is one of the basic necessities
 - Can't live without it for more than a day
- Mitigation
 - Keep water in an emergency kit
 - Could always resort to recycling



Risk Management

● Loss of Food

- Likelihood – Medium
 - Natural disasters in CA
- Impact – Medium
 - Food is one of the basic necessities
 - Can survive without for a few weeks
- Mitigation
 - Keep food in an emergency kit



Verification of Stakeholder Requirements

● Mine

- The system shall provide adequate levels of necessities for life to include food, water, and shelter.
 - I currently maintain a job that is stable and provides ample income to cover the basic necessities
 - I have sought out higher education to stay marketable and increase my income as my family grows
- Secondary Requirement - The system should maximize time spent on entertaining and nurturing family.
 - Through the identification of time sinks, I have been able to apply lean concepts to allocate more time to entertainment and nurturing.

● Spouse and Daughter

- Similar to mine
 - Same as above
- Additional requirements in the form of a Honey Do list
 - I have addressed the current Honey Do list with the project schedule
 - I will adjust fire as I receive requirements creep. Of course there will be significant impact to cost and schedule.
- Her requirements affect my derivative requirements

Verification of Stakeholder Requirements

◉ Air Force

- Perform the work that is given
 - Loose requirements from supervisor difficult to verify
 - Only verification I can offer – good performance reports
- Continuously improve through education
 - Attaining Masters
 - Signed up for PME

◉ LMU

- Pay tuition
 - Verified through bank statements and my student accounts status
- Maintain a passing GPA
 - Verified through registrar and reports at the end of the semester
- Fulfill stated requirements for degree
 - Verified through student course book, faculty advisor, and registrar

Summary

- Applied many principles learned in SE to an intricate System of Systems – Life
- My life is left better organized
- Tasks don't seem unachievable anymore
- I have more free time



BACKUP

Mission Requirements

- 1.0 The system shall provide adequate levels of necessities for life to include food, water, and shelter.
- 2.0 Secondary Requirement - The system should maximize time spent on entertaining and nurturing family.

Originating Requirements

- ◎ 1.1 The system shall provide an adequate level of income to provide food, water, and shelter for a family of three living in Los Angeles, CA for the next two years.
- ◎ 1.2 The system shall provide an adequate level of income to provide food, water, and shelter for a family of four living in an unknown location within the contiguous United States after the year 2013.
- ◎ 2.1 The system should allot at least $\frac{1}{8}$ of time to entertaining and nurturing a family.

System Requirements

- 1.1.1 The system shall provide a job that has a source of income that will cover all expenses for the family of three living in Los Angeles for the next two years.
- 1.1.1.1 The system shall provide education that yields a job that will cover the expenses of a family of three living in Los Angeles for the next two years.
- 1.1.1.2 The job shall be within five miles vicinity to the family home.
- 1.1.1.3 The job shall provide full health coverage of medical, dental, and optometry expenses or provide income to cover expenses incurred from private health insurance.
- 1.1.1.4 The job shall provide childcare for the child or provide income to cover expenses incurred from private childcare.
- 1.1.1.5 The job shall provide adequate time and income to cover expenses incurred from continuing education in the form of attaining a Master's Degree.
- 1.1.1.6 The system shall provide a means of travel between the job and the family home.

System Requirements

- 1.1.2 The system shall provide a home of adequate size to support a family of three in Los Angeles for the next two years.
- 1.1.2.1 The system shall provide a home that is at least 1300 square feet with at least two bedrooms, two baths, and a kitchen.
- 1.1.2.2 The home shall be temporary and allow movement to another location in the contiguous United States after the year 2013.
- 1.1.2.3 The home shall have adequate access to utilities such as gas, water, electricity, and internet access.
- 1.1.2.4 The home shall be within two miles of a grocery store for sustaining the dietary needs of a family of three.
- 1.1.2.5 The home shall be within five miles of a shopping district that can provide any necessary supplies for the home.
- 1.1.2.6 The system shall provide a means of travel between the home, grocery store, and shopping district.
- 1.1.2.7 The home should have a garage that is capable of housing at least one car.
- 1.1.2.8 The home should have a dining room that is capable of housing a table with six chairs.
- 1.1.2.9 The home should have a living room or family room for entertaining the family.
- 1.1.2.10 The home should be furnished with at least two beds, a table with six chairs, a couch, a love seat, a coffee table, a computer, a computer desk, and a computer chair.
- 1.1.2.11 The home should be cleaned and maintained according to a schedule.
- 1.1.2.11.1 The laundry, dishes and floors should be cleaned at least once per week.
- 1.1.2.11.2 The garbage and recycling should be disposed of at least once per week.
- 1.1.2.11.3 The pantries and refrigerator should be restocked at least once every two weeks.
- 1.1.2.11.4 The bathrooms and furniture should be cleaned at least once every two weeks.
- 1.1.2.11.5 The bills should be paid and finances assessed at least once per month.
- 1.1.2.11.6 The home should be resupplied with consumable items such as cleaning supplies at least once per month.

System Requirements

- 1.2.1 The system shall provide a job that has a source of income that will cover all expenses for the family of four living in an unknown location within the contiguous United States after the year 2013.
- 1.2.1.1 The system shall provide education that yields a job that will cover the expenses of a family of four living in an unknown location within the contiguous United States after the year 2013.
- 1.2.1.2 The job shall be within five miles vicinity to the family home.
- 1.2.1.3 The job shall provide full health coverage of medical, dental, and optometry expenses or provide income to cover expenses incurred from private health insurance.
- 1.2.1.4 The job shall provide childcare for the two children or provide income to cover expenses incurred from private childcare.
- 1.2.1.5 The job shall provide adequate time and income to cover expenses incurred from continuing education.
- 1.2.1.6 The system shall provide a means of travel between the job and the family home.

System Requirements

- 1.2.2 The system shall provide a home of adequate size to support a family of four living in an unknown location within the contiguous United States after the year 2013
- 1.2.2.1 The system shall provide a home that is at least 1500 square feet with at least three bedrooms, two baths, and a kitchen.
- 1.2.2.2 The home shall be temporary and allow movement to another location in the contiguous United States after the year 2017.
- 1.2.2.3 The home shall have adequate access to utilities such as gas, water, electricity, and internet access.
- 1.2.2.4 The home shall be within two miles of a grocery store for sustaining the dietary needs of a family of three.
- 1.2.2.5 The home shall be within five miles of a shopping district that can provide any necessary supplies for the home.
- 1.2.2.6 The system shall provide a means of travel between the home, grocery store, and shopping district.
- 1.2.2.7 The home should have a garage that is capable of housing at least one car.
- 1.2.2.8 The home should have a dining room that is capable of housing a table with six chairs.
- 1.2.2.9 The home should have a living room or family room for entertaining the family.
- 1.2.2.10 The home should be furnished with at least two beds, a table with six chairs, a couch, a love seat, a coffee table, a computer, a computer desk, and a computer chair.
- 1.2.2.11 The home should be cleaned and maintained according to a schedule.
- 1.2.2.11.1 The laundry, dishes and floors should be cleaned at least once per week.
- 1.2.2.11.2 The garbage and recycling should be disposed of at least once per week.
- 1.2.2.11.3 The pantries and refrigerator should be restocked at least once every two weeks.
- 1.2.2.11.4 The bathrooms and furniture should be cleaned at least once every two weeks.
- 1.2.2.11.5 The bills should be paid and finances assessed at least once per month.
- 1.2.2.11.6 The home should be resupplied with consumable items such as cleaning supplies at least once per month.

System Requirements

- ◎ 2.1.1 The system should allot at least 21 hours per week to entertaining and nurturing the family.
- ◎ 2.1.1.1 The system should limit time spent on the job, education, sleeping, and cleaning/maintaining the home.
- ◎ 2.1.1.1.1 The system should limit time spent on a job to a maximum of 50 hours per week.
- ◎ 2.1.1.1.2 The system should limit time spent on an education to a maximum of 10 hours per week.
- ◎ 2.1.1.1.3 The system should limit time spent on sleep to a maximum of 56 hours per week.
- ◎ 2.1.1.1.4 The system should limit time spent on cleaning and maintaining the home to a maximum of 15 hours per week.
- ◎ 2.1.1.2 The system should allot at least 14 hours per week to nurturing the family (feeding, clothing, educating, and entertaining as a group).
- ◎ 2.1.1.3 The system should allot at least 7 hours per week for individual entertainment.