TIME MANAGEMENT

PROCESS IMPROVEMENT

Storyboard

Define 1/14/19 - 1/20/19 | Measure 1/05/19 – 3/10/19 | Analyze 3/1/19 - 3/10/19 | Improve 3/11/19 – 3/23/19 | Control 3/24/19 - 3/31/19

Executive Summary

Context: Measure time spent on day-to-day processes to determine time spent vs. delivering quality products for work and school while still meeting fitness and personal goals.

In Scope: Work, School, Fitness, sleep, recreation, chores

Out of Scope: Daily minutiae too small to track will be incorporated into "recreation time."

Team Information

Data Collector: Jo Vivian, Process Owner
Work Quality Evaluator: Mike Whirlow, Manager
School Quality Evaluators:

- MBC638 – Darlene Ryan, Course Facilitator
- IST659 – Chad Harper, Course Facilitator

Quality of Life Evaluator: Jo Vivian

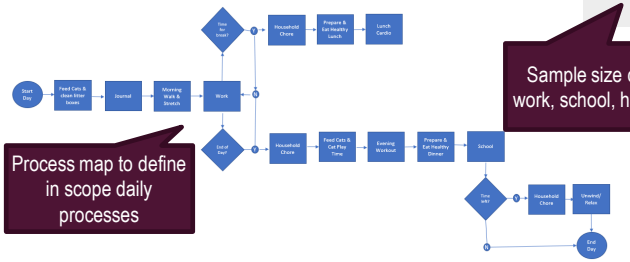
Define

Problem statement: Poor time management creates a weekly imbalance in areas such as work, school, fitness, and recreational activities. **Business Impact**: Employers pay experienced data science project managers $250,000 annually for an approximate 50% pay increase, while improved physical fitness reduces the chances of medical and prescription expenditures for an average savings of $5,000 annually, resulting in a total $125,000 projected income increase.

Success Measure: Y was determined based on weighted best possible results of project goals.

$$n = \left(\frac{z^* \hat{\sigma}}{E}\right)^2$$

Sample size calculated for work, school, health, personal

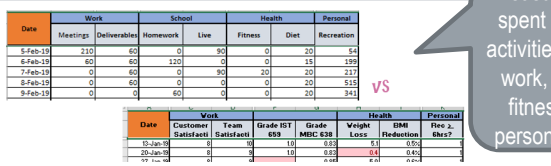


Process map to define in scope daily processes

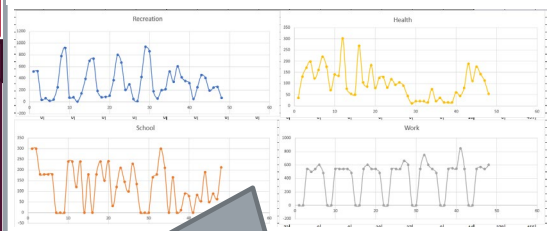
DPMO	S.Q.L.	Yield	DPMO	S.Q.L.	Yield	DPMO	S.Q.L.	Yield
934,000	0	6.60%	308,000	2	69.20%	6,210	4	99.40%
920,000	0.1	8.00%	274,000	2.1	72.60%	4,660	4.1	99.50%
900,000	0.2	10.00%	242,000	2.2	75.80%	3,460	4.2	99.70%
880,000	0.3	12.00%	212,000	2.3	78.80%	2,550	4.3	99.75%
860,000	0.4	14.00%	184,000	2.4	81.60%	1,860	4.4	99.81%
840,000	0.5	16.00%	158,000	2.5	84.20%	1,350	4.5	99.87%
810,000	0.6	19.00%	135,000	2.6	86.50%	960	4.6	99.90%
780,000	0.7	22.00%	115,000	2.7	88.50%	680	4.7	99.93%
750,000	0.8	25.00%	96,800	2.8	90.30%	480	4.8	99.95%
720,000	0.9	28.00%	80,800	2.9	91.90%	340	4.9	99.97%
690,000	1	31.00%	66,800	3	93.30%	233	5	99.98%
650,000	1.1	35.00%	54,800	3.1	94.50%	159	5.1	99.98%
610,000	1.2	39.00%	44,600	3.2	95.50%	108	5.2	99.99%
570,000	1.3	43.00%	35,900	3.3	96.40%	72	5.3	99.99%
540,000	1.4	46.00%	28,700	3.4	97.10%	48	5.4	99.996%
500,000	1.5	50.00%	22,700	3.5	97.70%	30	5.5	99.997%
460,000	1.6	54.00%	17,800	3.6	98.20%	20	5.6	99.998%
420,000	1.7	58.00%	13,900	3.7	98.60%	10	5.7	99.999%
382,000	1.8	61.80%	10,700	3.8	98.90%	8	5.8	99.999%
344,000	1.9	65.60%	8,190	3.9	99.20%	5	5.9	99.9995%
						3.4	6	99.9997%

DPMO = 1111.111
SQL = 4.5

Measure



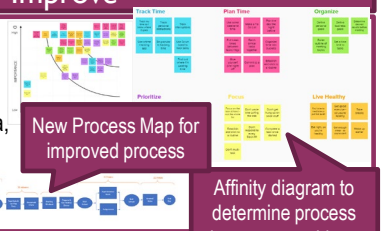
Measured time spent on daily activities against work, school, fitness, and personal goals



Plotted time spent on work, school, fitness, and recreation – note the spikes on weekends in recreation, but not in school or fitness.

Improve

I have had minimal time to implement these ideas to determine if improvement will be made. With this data, only one quality measure needs improving.



New Process Map for improved process

Affinity diagram to determine process improvement ideas

Analyze

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.288537692
R Square	0.083254
Adjusted R Sc	0.036639796
Standard Errc	0.445786134
Observations	63

ANOVA

	df	SS	MS	F	Significance F
Regression	3	1.064783243	0.354927748	1.786022153	0.159667528
Residual	59	11.72479136	0.198725277		
Total	62	12.7895746			

	Coefficients	Standard Erro	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.425462115	0.078409932	5.426125301	1.13193E-06	0.268564204	0.582360026	0.268564204	0.582360026
Cardio	0.001832301	0.00155392	1.179147539	0.243072681	-0.00127709	0.004941689	-0.00127709	0.004941689
Strength	0.003643932	0.002440066	1.493374499	0.140668037	-0.00123863	0.008526493	-0.00123863	0.008526493
Stretching	-0.00193145	0.002321521	-0.83197715	0.408776672	-0.0065768	0.0027139	-0.0065768	0.0027139

Multiple Linear Regression
Is weight loss tied to fitness, or just diet? I.e., can I save time by reducing fitness activities?

Select:	Two-tail test	One-tail test	
	Two-tail	Lower/left-tail	Upper/right-tail
	$H_0: \mu = \mu_0$	$H_0: \mu \geq \mu_0$	$H_0: \mu \leq \mu_0$
	$H_a: \mu \neq \mu_0$	$H_a: \mu < \mu_0$	$H_a: \mu > \mu_0$
Choose:	Sample size		
	Large	Small	
	$n \geq 30$	$n < 30$	
	(or σ known)	(or σ unknown)	
Calculate:	Test statistic		
	$Z = \frac{\bar{x} - \mu_0}{s}$	$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$	
	known	$df = n - 1$	

When population standard deviation is *unknown* and sample size n is *large* (≥ 30)

$$U = \bar{x} + z^* \frac{s}{\sqrt{n}}$$

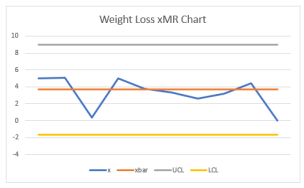
$$L = \bar{x} - z^* \frac{s}{\sqrt{n}}$$

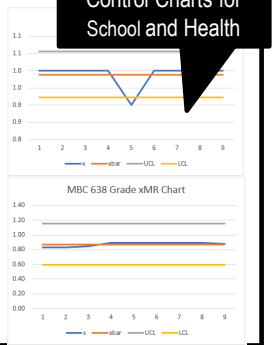
Single sample hypothesis test to see if I'm spending less time on schoolwork in the last half of the term.

Confidence intervals for time spent on tasks

Control

Next Steps: Continue tracking time, but against improved process strategy and re-analyze in 15 weeks.





Control Charts for School and Health

DEFINE

Problem Statement: My time is not being managed well. I'm either working too hard, and long hours, or not at all due to burn out and fatigue. I'm concerned this may impact the quality of my work deliverables and school assignments, and lead to abandoning my fitness goals.

Business Process: The set of activities and tasks that contribute to the goal defined below is:

Work Activities
- Client Meetings
- Manager Meetings
- Internal Meetings
- Work Products
- Client Support

School Activities
- Reading
- Videos
- Classroom Time
- Assignments

Health Activities
- Cardio
- Strength
- Stretching
- Meal Prep
- Research

Personal Activities
- Chores
- Sleep
- Recreation

Goal: Manage time spent during a week such that work, school, fitness, and personal life meet the following goals:

1. Job Goals:
   a) Work products are delivered on time
   b) Internal and External customer satisfaction never drops below a 7 out of a scale of 1- 10, where 10 is the best, and1 is the worst. This rating is measured by IBM direct manager
2. School Goals:
   a) School assignments are delivered on time
   b) School grades do not drop below 80% as measured by Class Facilitators
3. Fitness Goals:
   a) Achieve a weekly weight loss of 1.5lbs
   b) Achieve a weekly BMI reduction of 0.3%
4. Personal Goals:
   a) Weekly chores completed
   b) A minimum of 6 hours sleep per night on average

Business Impact: Total Process Value: $125,000

Completing Degree:
- If successful, completing this degree could result in a 50% or greater pay increase.
- If unsuccessful, pay remains static, and a loss of approximately $30,000 in tuition.

Maintaining full-time job while working on degree:
- If successful, retain current job seniority, thus increasing prospects for future employment opportunity. Additionally, maintain current standard of living.
- If unsuccessful, loss of income and reduction of future job prospects.

Improving Physical Fitness:
- If successful, reduce/eliminate medical symptoms and prevent possible medical expenses approximated at $5,000 annually.
- If unsuccessful, incur additional medical expenses as approximated above, and wardrobe expenses (due to needing clothes that fit) approximated at $3,000.

DEFINE

Data Types

The data measured was time, and thus is continuous. I began measuring my time spent at the beginning of the year, 2019, and recorded the time in minutes for activities and tasks defined in the previous slide (under Business Process). The quality measures which contributed to my weekly success measure was discrete in some instances, and continuous in others, as follows:

Work Category

- On Time Delivery – Yes/No - Discrete
- Customer Satisfaction – Scale 1 – 10 - Discrete*
- Team Satisfaction – Scale 1 – 10 - Discrete*

**Partial Scores not allowed*

School Category

- Class Participation – Yes/No - Discrete
- Grade MBC 638 - Continuous
- Grade IST 659 - Continuous

Health Category

- Weight Loss - Continuous
- BMI Reduction - Continuous

Personal Category

- Chores completed – Yes/No – Discrete
- Average Sleep - Continuous

Success Measure

How was "Y" determined: How do I know if I am managing my time well? To measure this, I identified 10 goals. I then measured these goals on a weekly basis. From these goals, a I determined a "Best Possible" score. And then, I assigned a weight to each goal to define which goals were "more important" than others. Multiplying the weight by "Best Possible" gave me the ***Baseline*** Y. Multiplying the weight by the actual measurement of each goal gave me the ***weekly*** Y.

Date	Work						Health		Personal		Success Factors
	On Time Delivery	Customer Satisfaction	Team Satisfaction	Participation MBC 638	Grade IST 659	Grade MBC 638	Weight Loss	BMI Reduction	Chores Completed	Sleep ≥ 6hrs?	Best Possible Y
Weight	0	10	10	0	20	20	15	15	5	5	367.5
Best Possible	1	10	10	1	1	1	5	0.5	1	8	
6-Jan-19	1	10.0	10.0	N/A	N/A	N/A	5.0	0.5	0.0	8.0	Weekly Y's
13-Jan-19	1	10.0	10.0	1.0	1.0	0.83	5.1	0.5	0.0	7.5	358.3380952
20-Jan-19	1	10.0	10.0	1.0	1.0	0.83	0.4	0.4	1.0	7.6	291.7666667
27-Jan-19	1	10.0	10.0	1.0	1.0	0.85	5.0	0.6	0.0	7.6	358.952381
3-Feb-19	1	10.0	10.0	1.0	1.0	0.89	3.8	0.5	0.0	7.3	338.7270833
10-Feb-19	1	10.0	9.0	1.0	1.0	0.89	3.3	0.5	0.0	7.8	323.7166667
17-Feb-19	1	10.0	9.0	1.0	1.0	0.89	2.6	0.4	0.0	6.9	307.3833333
24-Feb-19	1	10.0	9.0	1.0	1.0	0.89	3.2	0.4	0.0	7.4	318.6333333
3-Mar-19	1	9.0	8.0	1.0	1.0	0.89	4.4	0.2	0.0	7.6	314.8
8-Mar-19	1	10.0	9.0	1.0	1.0	0.89	3.2	0.2	0.0	7.7	317.3

Key:		
Category	Description	Defect
Work:	On Time Delivery: All products (internal and external) delivered by schedule	0
	Customer Satisfaction: On a scale of 1 - 10, where 1 is Very dissatisfied, and	<7
	Team Satisfaction: On a scale of 1 - 10, where 1 is Very dissatisfied, and 10 is	<7
School:	On Time Delivery: All assignments (IST and MBC) delivered by scheduled da	0
	Participation: All live classes (IST and MBC) attended	0
	Grade: On a scale of 0.00 - 1.00	<0.80
Health:	Weight Loss: Measured in pounds	<1.5
	BMI Reduction: Measured in percentages	<0.3%
Personal	Chores: All scheduled chores completed = 1; Else = 0	0
	Sleep: ≥ 6hrs per night = 1; Else = 0	0

DEFINE

SQL

Date	Work						Health		Personal		Success Factors
	On Time Delivery	Customer Satisfaction	Team Satisfaction	Participation MBC 638	Grade IST 659	Grade MBC 638	Weight Loss	BMI Reduction	Chores Completed	Sleep ≥ 6hrs?	Best Possible Y
Weight	0	10	10	0	20	20	15	15	5	5	367.5
t Possible	1	10	10	1	1	1	5	0.5	1	8	
6-Jan-19	1	10.0	10.0	N/A	N/A	N/A	5.0	0.5	0.0	8.0	Weekly Y's
13-Jan-19	1	10.0	10.0	1.0	1.0	0.83	5.1	0.5	0.0	7.5	358.3380952
20-Jan-19	1	10.0	10.0	1.0	1.0	0.83	0.4	0.4	1.0	7.6	291.7666667
	1	10.0	10.0	1.0	1.0	0.85	5.0	0.6	0.0	7.6	358.952381
3-Feb-19	1	10.0	10.0	1.0	1.0	0.89	3.8	0.5	0.0	7.3	338.7270833
10-Feb-19	1	10.0	9.0	1.0	1.0	0.89	3.3	0.5	0.0	7.8	323.7166667
17-Feb-19	1	10.0	9.0	1.0	1.0	0.89	2.6	0.4	0.0	6.9	307.3833333
24-Feb-19	1	10.0	9.0	1.0	1.0	0.89	3.2	0.4	0.0	7.4	318.6333333
3-Mar-19	1	9.0	8.0	1.0	1.0	0.89	4.4	0.2	0.0	7.6	314.8
8-Mar-19	1	10.0	9.0	1.0	1.0	0.89	3.2	0.2	0.0	7.7	317.3

Units per process: 90
(range of numbers in table)

Defect Opportunities: 90
(any one of these could be a defect as defined in the key)

Defects: 9 (numbers identified in red in table)

Total possible defects per process: 8100
Defect per opportunity rate: 0.001111111
DPMO: 1111.11111

SQL = 4.5

Key:		
Category	Description	Defect
Work:	On Time Delivery: All products (internal and external) delivered by schedul	0
	Customer Satisfaction: On a scale of 1 - 10, where 1 is Very dissatisfied, and	<7
	Team Satisfaction: On a scale of 1 - 10, where 1 is Very dissatisfied, and 10 is	<7
School:	On Time Delivery: All assignments (IST and MBC) delivered by scheduled da	0
	Participation: All live classes (IST and MBC) attended	0
	Grade: On a scale of 0.00 - 1.00	<0.80
Health:	Weight Loss: Measured in pounds	<1.5
	BMI Reduction: Measured in percentages	<0.3%
Personal	Chores: All scheduled chores completed = 1; Else = 0	0
	Sleep: ≥ 6hrs per night = 1; Else = 0	0

Sample Size

Std Dev: 23.88867956
Margin of Error: 15
Sample Size: 10

Margin of Error determined because there wasn't a lot of variation in the data for my goals, and I only had time to capture 10 weeks of data, so I had to accept a larger margin of error.

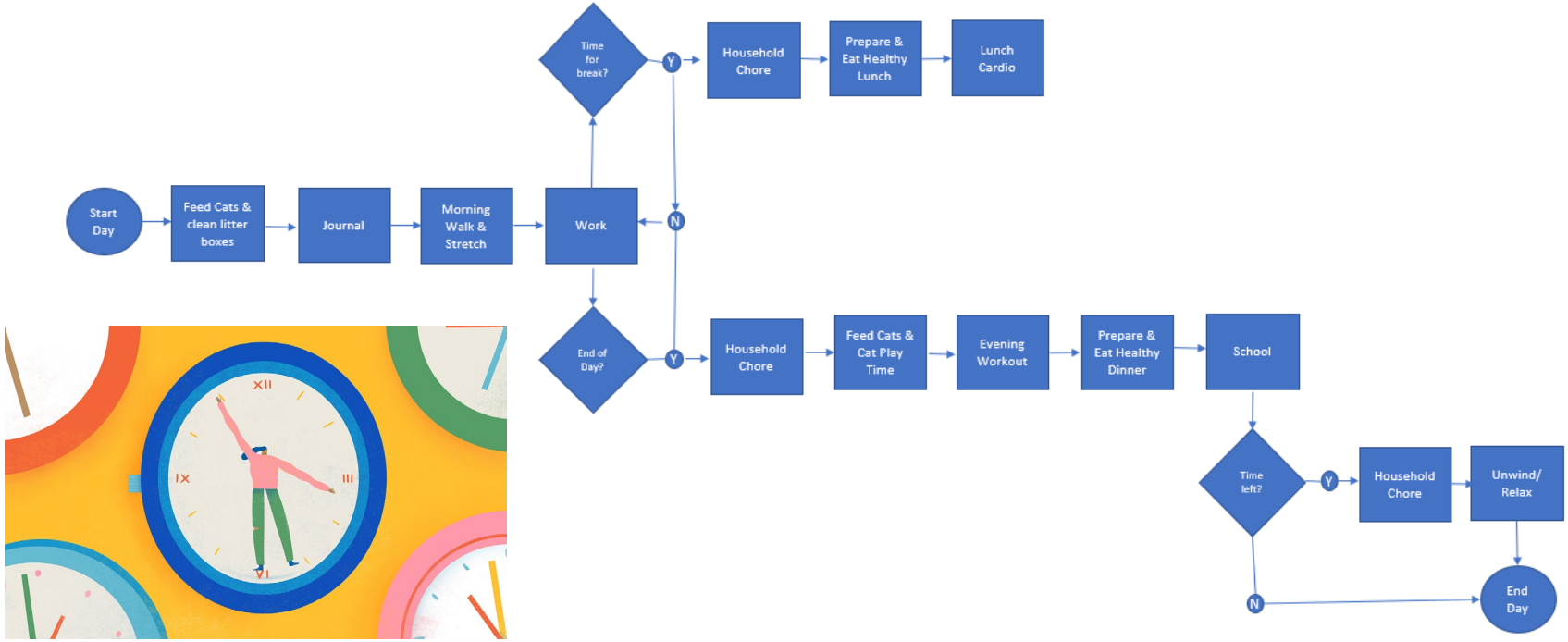
Standard Deviation measured based on Success Factors.

Success Factors
Best Possible Y
367.5
Weekly Y's
358.3380952
291.7666667
358.952381
338.7270833
323.7166667
307.3833333
318.6333333
314.8
317.3

DEFINE

Process Map

I defined my daily process to help determine what I spent my time on, and to define what is in scope and what is not in scope for daily processes. Each day starts, after taking care of the cats, with personal introspection and mapping out the day's activities. This gets my mind in the right place. A short walk gets my body in the right place, and then, I am ready to start work. If work permits, I take a break midday to get some small chores done, go for another short walk, and eat a healthy lunch. If time does not permit, I push through until the end of the work day. At that time, if time permits, I take care of the chores I missed at lunch, prior to taking care of the cats again, and then a brief workout. School, or school work commences right after the workout until I've completed any assignments coming due. If there's time left in the day, I take on any chores I can, and then unwind, reflecting on the day's accomplishments. Outside of scope is getting very granular in tracking activities. So, for example, reading/responding to e-mails, or instant messages falls into a "catch-all" category called "support." Also, interruptions, or distractions during the work day would also fall into support.



Measure: Data Measurement Plan

Performance Measure	Data Source and Location	How will data be collected?	Who will collect data?	When will data be collected	Target Sample Size
Number of minutes spent in meetings each week • Client • Manager • Internal	Manual data collection	Use excel spreadsheet – document in "Work" section	Jo	Daily	10 weeks
Number of minutes spent on client support and deliverables	Manual data collection	Use excel spreadsheet – document in "Work" section	Jo	Daily	10 weeks
Number of minutes spent in training	Manual data collection	Use excel spreadsheet – document in "Work" section	Jo	Daily	10 weeks
Number of minutes spent learning new material for school • Watching videos • Attending Live Sessions • Reading material	Manual data collection	Use excel spreadsheet – document in "School" section	Jo	Daily	10 weeks
Number of minutes spent working on school assignments	Manual data collection	Use excel spreadsheet – document in "School" section	Jo	Daily	10 weeks
Number of minutes spent improving physical health • Fitness • Mental Wellbeing • Diet	Manual data collection	Use excel spreadsheet – document in "Health" section	Jo	Daily	10 weeks
Number of minutes spent on personal activities • Chores • Recreation • Sleep	Manual data collection	Use excel spreadsheet – document in "Personal" section	Jo	Daily	10 weeks
Customer Satisfaction • Internal • External	Manual data collection	Develop rating scale & assess performance	Mike	Weekly	10 weeks
On-Time delivery of Work Products	Manual data collection	Develop rating scale & assess performance	Mike	Weekly	10 weeks
School Grades	Syracuse LMS (2U and 2U Whitman)	Syracuse grading policies and facilitator input	Course Facilitators	Weekly	10 weeks
Fitness Results	Fitbit Application	Smart Scale Measurements	Jo & Fitbit	Weekly	10 weeks
Personal Results	Manual data collection	Binary Model	Jo	Weekly	10 weeks

Measure

Data Collection

Starting 1/1/2019, I used an excel spreadsheet to log my time. I used a Fitness tracking device and application to track time spent on Cardio, Strength, Stretching, and Sleep. This constitutes my baseline data. The operational definitions used in this model are as follows:

- No less than 9 hours, Monday – Thursday will be spent on work related activities.
- No less than 8 hours Fridays will be spent on work related activities.
- No less than 6 hours each night will be spent sleeping
- All work products, and all school assignments will be delivered on time, as defined by the client (work) or the course facilitator (school).
- Attendance for school live sessions will be 100%.
- Regardless of time spent on any single group of activities (work, school, health, personal), customer (internal and external) satisfaction will not fall below a 7 (on a scale of 1 – 10) and school grades will not fall below 80%.
- All household chores, as defined by a pre-defined checklist, will be completed daily.
- Weight loss and BMI reduction will not fall below 1.5 lbs and 0.3% weekly, respectively.

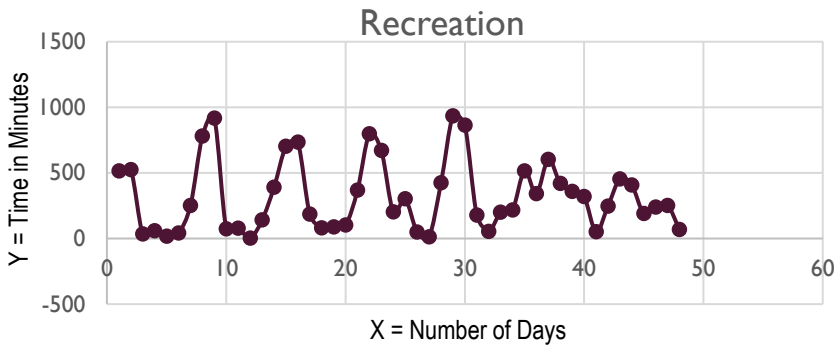
Date	Work						School				Health						Personal		
	Client Meetings	Manager Meetings	Internal Meetings	Support	Training	Work Products	Reading	Videos	Live Sessions or Office Hours	Assignments	Cardio	Strength	Stretching	Meal Prep	Research	Journaling	Chores	Sleep/Bed	Recreation
31-Dec-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	590	850
1-Jan-19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	396	989
2-Jan-19	0	0	180	300	0	0	0	0	0	0	20	0	0	0	0	0	45	348	547
3-Jan-19	0	120	120	120	0	180	0	0	0	0	30	0	0	0	0	0	65	225	580
4-Jan-19	0	0	120	240	0	120	0	0	0	0	25	0	0	0	0	0	70	184	681
5-Jan-19	0	0	0	0	0	0	300	0	0	0	0	0	0	15	0	20	0	590	515
6-Jan-19	0	0	0	0	0	0	300	0	0	0	60	39	2	15	0	15	0	486	523
7-Jan-19	0	0	180	300	0	60	60	120	0	0	58	31	2	60	0	20	60	456	33
8-Jan-19	0	20	180	340	0	0	60	60	0	60	40	28	5	60	45	20	60	444	18
9-Jan-19	60	0	120	360	0	0	0	60	0	120	37	0	25	15	30	15	75	507	16
10-Jan-19	120	0	120	240	0	60	0	0	90	60	61	37	3	15	30	15	75	382	132
11-Jan-19	0	0	180	300	0	0	0	0	0	0	65	28	2	60	45	20	45	444	251
12-Jan-19	0	0	0	0	0	0	0	0	0	0	148	0	2	15	0	10	0	484	781
13-Jan-19	0	0	0	0	0	0	0	0	0	0	0	0	0	55	0	15	0	453	917
14-Jan-19	0	120	120	120	0	180	60	60	0	120	54	52	5	15	0	15	0	447	72
15-Jan-19	0	120	120	180	0	120	0	60	90	60	31	24	5	60	0	15	0	447	108
16-Jan-19	0	0																	
17-Jan-19	60	0																	
18-Jan-19	0	0																	
19-Jan-19	0	0																	
20-Jan-19	0	0																	
21-Jan-19	0	60																	
22-Jan-19	180	60																	
23-Jan-19	0	0																	
24-Jan-19	0	0																	
25-Jan-19	0	60																	
26-Jan-19	0	0																	
27-Jan-19	0	0																	
28-Jan-19	0	0																	
29-Jan-19	0	150																	
30-Jan-19	0	60																	
31-Jan-19	120	0																	
1-Feb-19	60	0																	
2-Feb-19	0	0																	
3-Feb-19	0	0																	
4-Feb-19	0	45																	

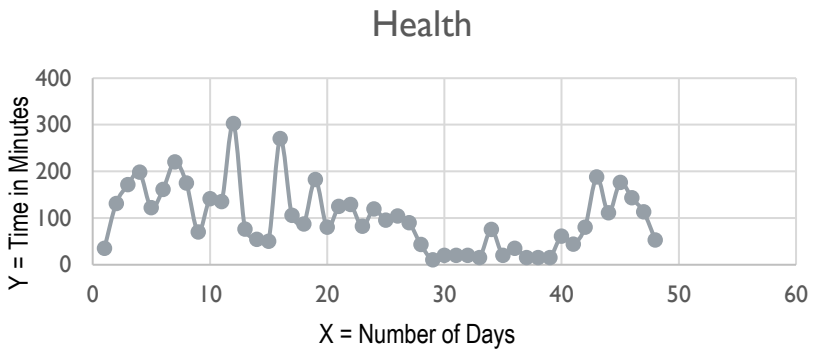
Date	Work						Health		Personal		Success Factors
	On Time Delivery	Customer Satisfaction	Team Satisfaction	Participation MBC 638	Grade IST 659	Grade MBC 638	Weight Loss	BMI Reduction	Chores Completed	Sleep ≥ 6hrs?	Best Possible Y
Weight	0	10	10	0	20	20	15	15	5	5	367.5
Best Possible	1	10	10	1	1	1	5	0.5	1	8	
6-Jan-19	1	10.0	10.0	N/A	N/A	N/A	5.0	0.5	0.0	8.0	Weekly Y's
13-Jan-19	1	10.0	10.0	1.0	1.0	0.83	5.1	0.5	0.0	7.5	358.3380952
20-Jan-19	1	10.0	10.0	1.0	1.0	0.83	0.4	0.4	1.0	7.6	291.7666667
27-Jan-19	1	10.0	10.0	1.0	1.0	0.85	5.0	0.6	0.0	7.6	358.952381
3-Feb-19	1	10.0	10.0	1.0	1.0	0.89	3.8	0.5	0.0	7.3	338.7270833
10-Feb-19	1	10.0	9.0	1.0	1.0	0.89	3.3	0.5	0.0	7.8	323.7166667
17-Feb-19	1	10.0	9.0	1.0	1.0	0.89	2.6	0.4	0.0	6.9	307.3833333
24-Feb-19	1	10.0	9.0	1.0	1.0	0.89	3.2	0.4	0.0	7.4	318.6333333
3-Mar-19	1	9.0	8.0	1.0	1.0	0.89	4.4	0.2	0.0	7.6	314.8
8-Mar-19	1	10.0	9.0	1.0	1.0	0.89	3.2	0.2	0.0	7.7	317.3

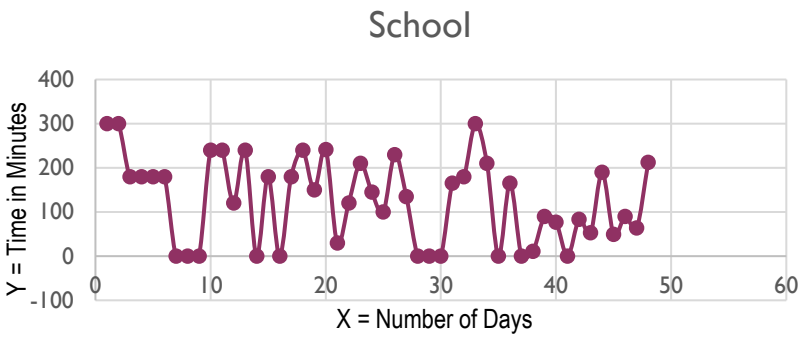
Measure

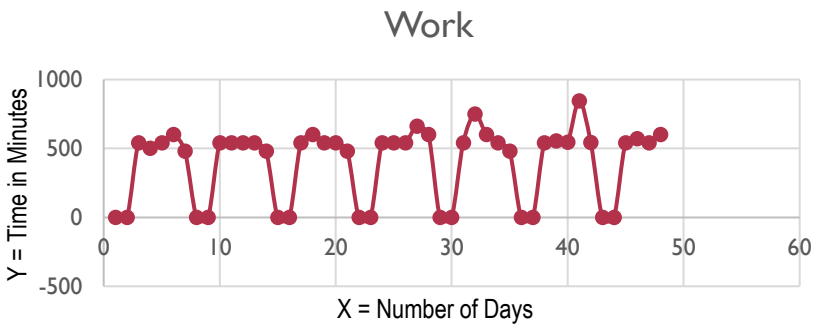
Time Series Plots

The seemingly erratic nature of each of these plots makes sense when you consider the time was measured over the course of 10 weeks, including weekends, when naturally, recreation time increases, and work time decreases. Also, because work is constant at 8-9 hours daily during these 10 weeks, there is little to be learned from either the work or recreation charts. What is more informative are the peaks and valleys in school and the long series of minimal time spent on health. Both of these warrant further investigation and indicate areas in need of improvement.



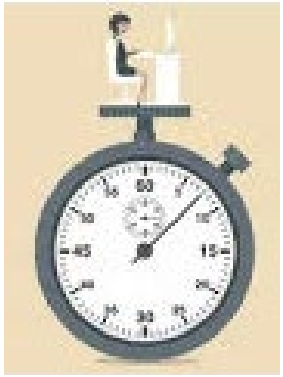






Analyze

One Sample One Tail Hypothesis Test



Hypothesis: I have found the best use of my school time, and am spending less time on schoolwork in the last half of the term.

Ho: $\mu \geq 131$ minutes per day
Ha $\mu < 131$ minutes per day
N = 28 days
Standard Deviation = 110.22 minutes per day
$\bar{x} = 127$ minutes per day
$\alpha = 0.05$

$$Z = \frac{127 - 131}{\frac{110.22}{5.29}}$$

Z = -0.19

p = 0.4247

Drat.
P isn't low.
Gotta keep Ho

Select:	Two-tail test	One-tail test	
	Two-tail	Lower/left-tail	Upper/right-tail
	$H_0: \mu = \mu_0$	$H_0: \mu \geq \mu_0$	$H_0: \mu \leq \mu_0$
	$H_a: \mu \neq \mu_0$	$H_a: \mu < \mu_0$	$H_a: \mu > \mu_0$
Choose:	**Sample size**		
	Large	Small	
	$n \geq 30$	$n < 30$	
	(or σ known)	(or σ unknown)	
Calculate:	**Test statistic**		
	$Z = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$	$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$	
	Can replace s with σ if known	$df = n - 1$	
Identify:	***p*-value**		
	Two-tail	Lower/left-tail	Upper/right-tail
	$p = 2 \times$ area past Z or t	$p =$ area left of Z or t	$p =$ area right of Z or t

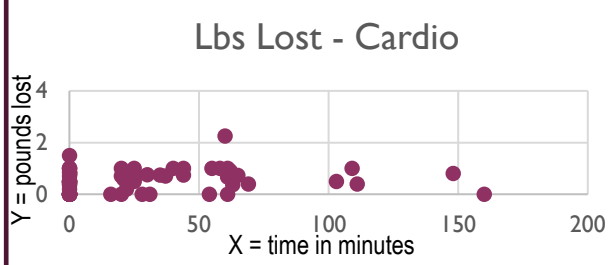
Analyze

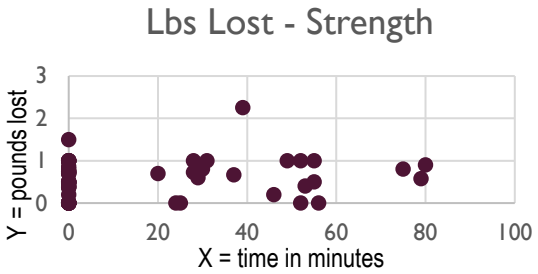
Multiple Linear Regression

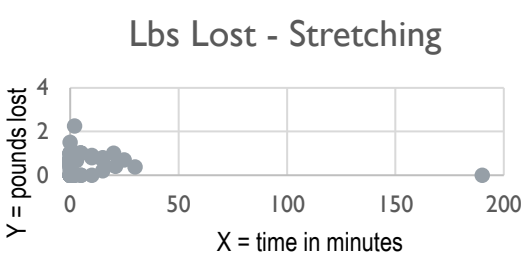
Fine. Maybe my last hypothesis wasn't proven, but surely this one will be!
Hypothesis: The time I spend on physical fitness, i.e., Cardio, Strength, and Flexibility, is a key factor in my weight loss.

Ho: There is no relationship between cardio, strength, and flexibility and weight loss.
Ha: There is a relationship between cardio, strength, and flexibility and weight loss.

1. Practical:
   Q: Are these four variables (Y = Weight Loss, X = Cardio, Strength, Flexibility) practically linked?
   A: Yes. Common philosophy is calories in vs. calories out
2. Graphical







3. Statistical

$\hat{Y} = 0.425 + .002_{Cardio} + .004_{Strength} - .002_{Stretching} = 0.429$

$\alpha = 0.05$

You're kidding right?!
Ho wins again. There is no relationship.
Hmmmmm.
I guess this means I can spend less time working out…..

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.288537692
R Square	0.083254
Adjusted R Sc	0.036639796
Standard Errc	0.445786134
Observations	63

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	1.064783243	0.354927748	1.786022153	0.159667528
Residual	59	11.72479136	0.198725277		
Total	62	12.7895746			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.425462115	0.078409932	5.426125301	0.000	0.268564204	0.582360026	0.268564204	0.582360026
Cardio	0.001832301	0.00155392	1.179147539	0.243	-0.00127709	0.004941689	-0.00127709	0.004941689
Strength	0.003643932	0.002440066	1.493374499	0.141	-0.00123863	0.008526493	-0.00123863	0.008526493
Stretching	-0.00193145	0.002321521	-0.83197715	0.409	-0.0065768	0.0027139	-0.0065768	0.0027139

Analyze

Confidence Intervals

Work

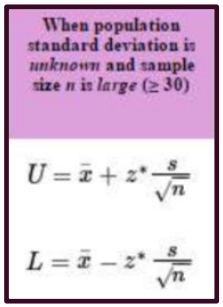
Because work time is generally a constant 9 hours daily, Mon – Thu, and 8 hours on Friday, there is no real need to calculate a confidence interval for the entire population of time spent working. However, it might be interesting to capture the mean for how much time is spent on support. Especially, since support is basically a term for the "catch all work," such as reading and responding to e-mails, instant messages, and phone calls. To calculate this, I deleted weekends, since those will always be zero hours (at least during school terms). Calculating Confidence Interval for time spent on "support" activities Monday through Friday at work, I can say with **95**% confidence that my population mean falls between **177 – 256** minutes each day on minutiae like e-mails, IM's, and phone calls.

School

- I can say with 95% confidence that that my population mean falls between 106 – 157 minutes each day on school work.
- With the same confidence level, I can say I spend
  - 40 – 70 minutes each day on assignments
  - 18 – 36 minutes each day on Asynchronous work

Fitness

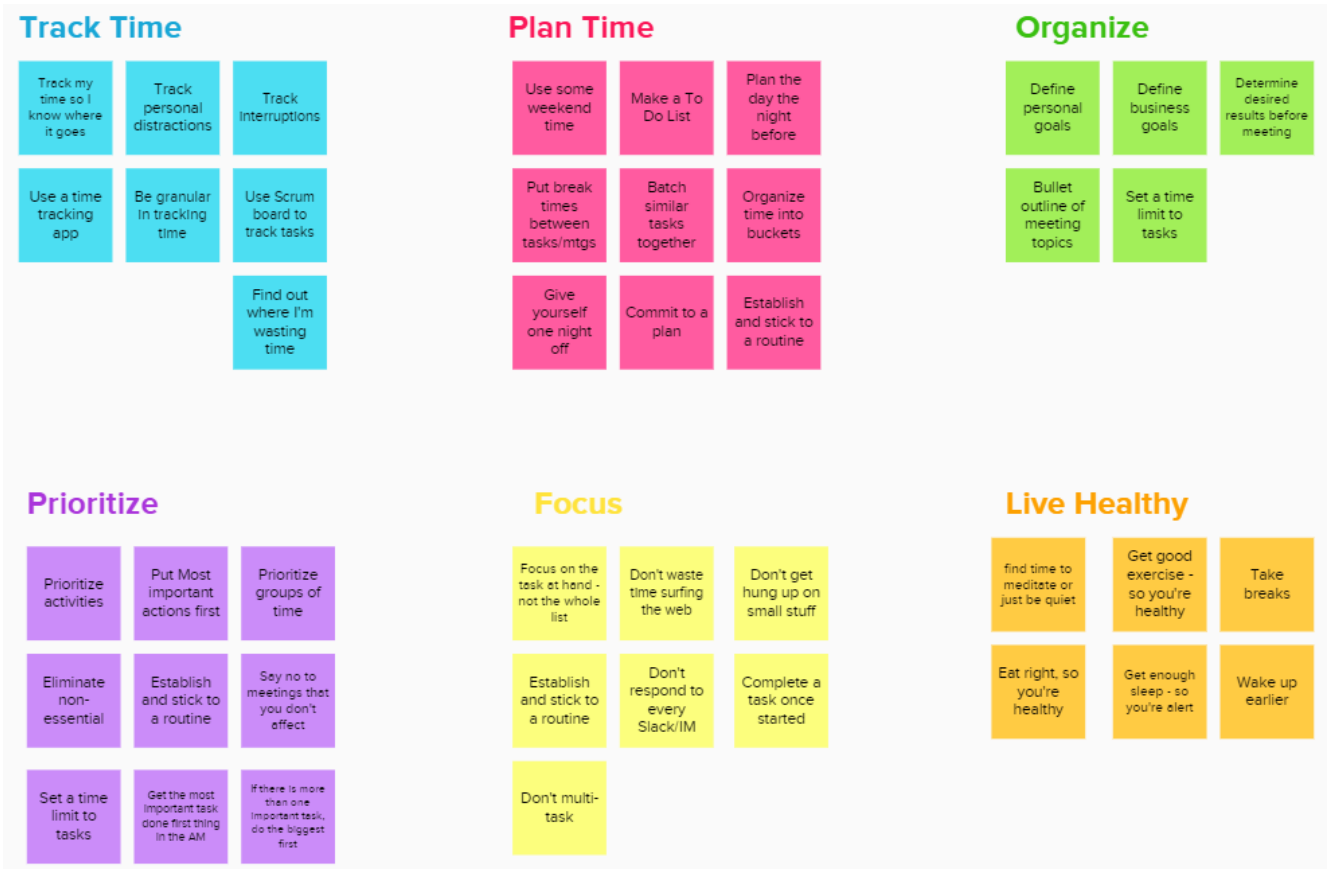
- I can say with 95% confidence that that my population mean falls between 40 – 65 minutes each day on fitness activities.
- With the same confidence level, I can say I spend
  - 21 – 38 minutes each day on Cardio
  - 11 – 23 minutes each day on Strength
  - 0.5 – 12 minutes each day stretching



Improve

Affinity Diagram

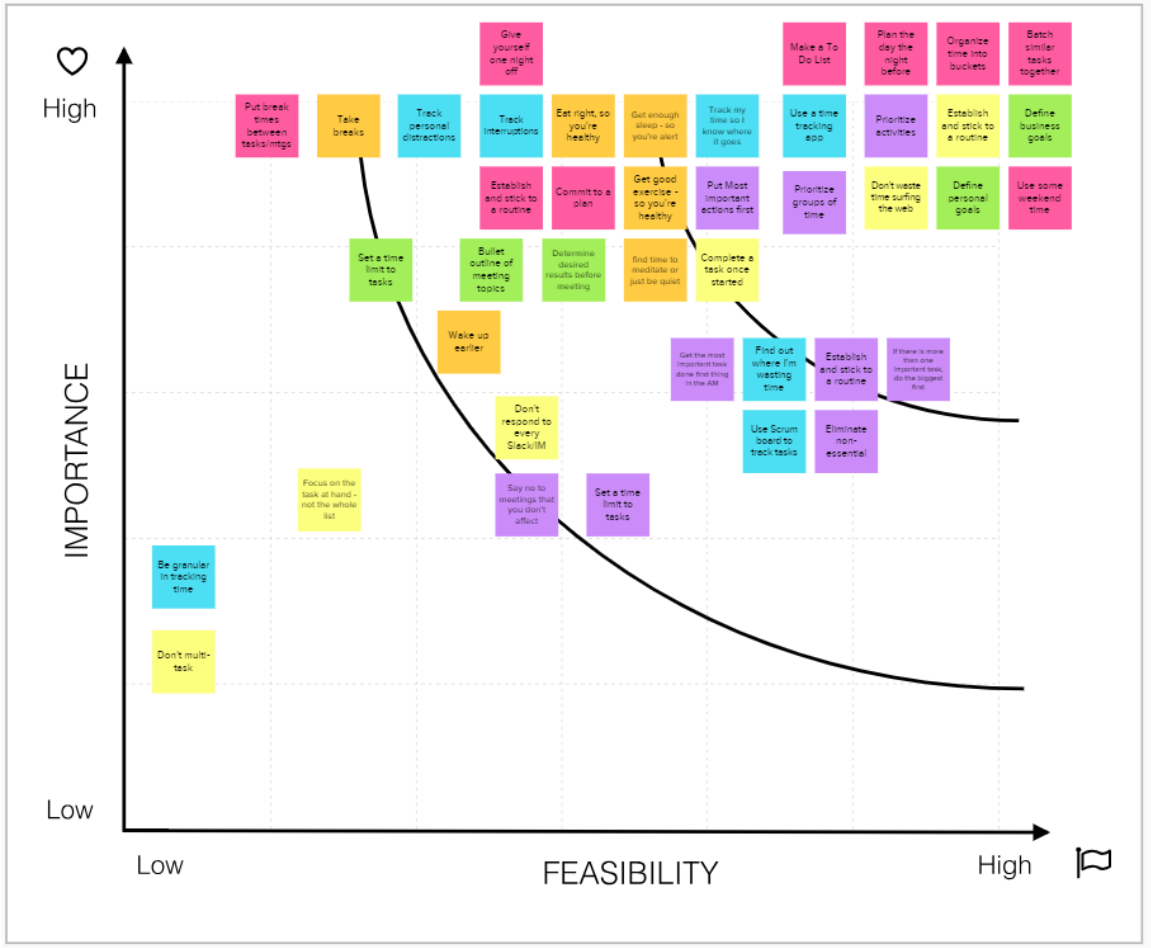
I read articles about time management and then conducted a brain-storming exercise to consider all the various methods I could apply to my personal life to improve how I spend my time. Then, mapped those ideas into groups (Affinity Diagram.



Improve

Prioritizing

Next, I put all brainstorming ideas into a Importance vs. Feasibility matrix to see which of these would most likely fall off, and which I would incorporate into my process improvement plan.

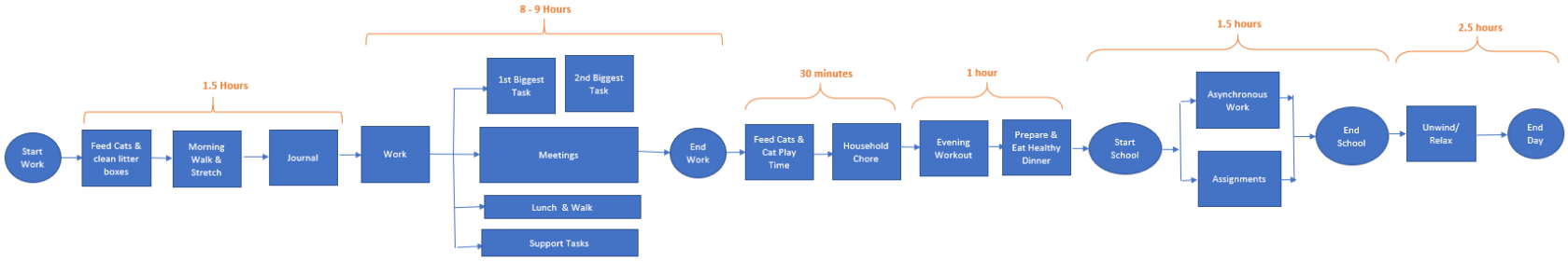


Improve

New Process Map

I then took the ideas with high importance and most feasible and mapped them into a new process map. In this version, there is no If, then options. Instead, the most important tasks are placed at the start of each "section" of the day. New processes include:

- Start the day with morning walk, instead of journaling. Journaling led to too much time sitting without really planning.
- Set aside time for a lunch break where I can take another short walk.
- Instead of allowing distractions for e-mails, IM's, and phone calls, block a time during the day to address those.
- Allot specific time slots for chores
- Prepare meals during the weekend to shorten time during the week for meal prep
- Complete 20% of school work over the weekend to shorten time needed during the work week

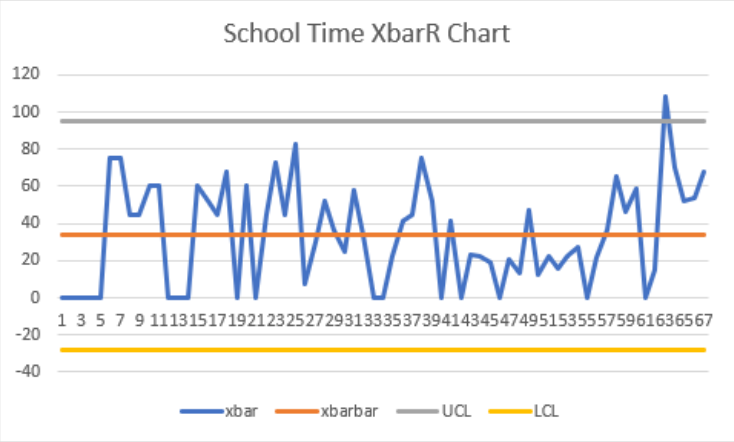


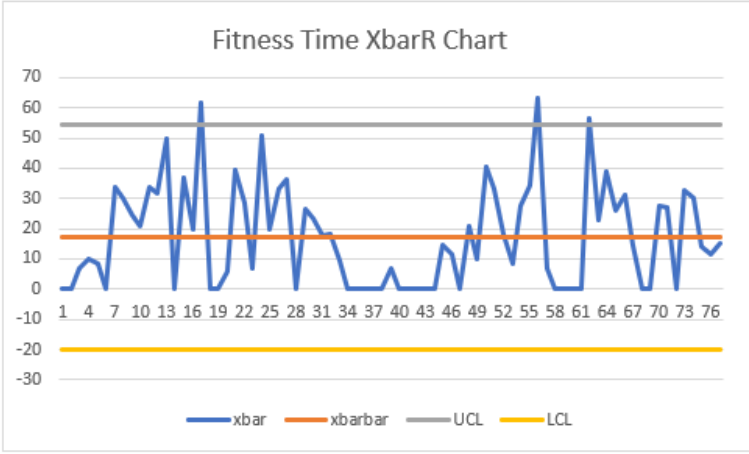
Control

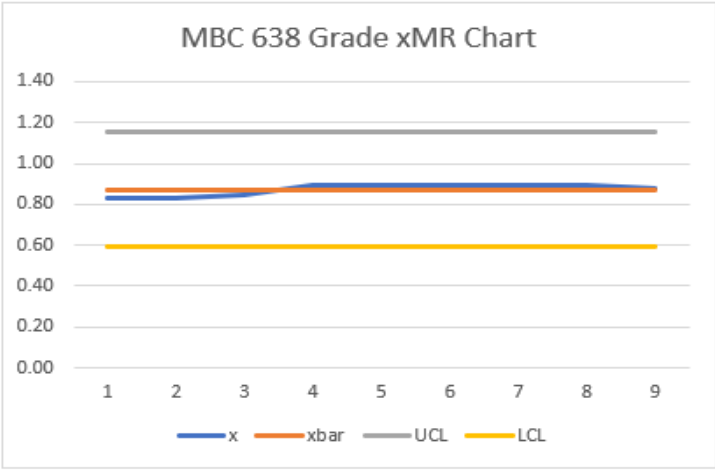
Control Charts

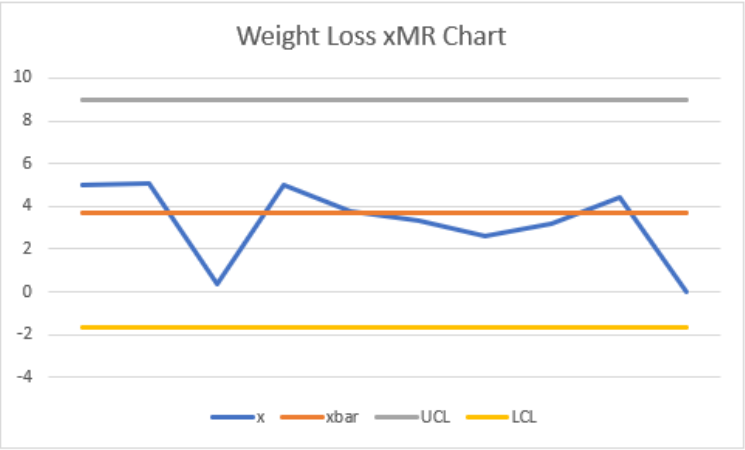
I used an XbarR chart for the time measurement, because I had 4 variables for school, and 3 for Fitness. I used an xMR chart to chart the quality measurements, because I only had one variable for each type of measurement. These charts have a few points that are out of control for the time measurement. This is not something I believe needs to be addressed, as it makes sense for time spent on schoolwork to get a bit out of control close to the end of the term. Also, I have more free time to spend on hiking, or biking on weekends, so, the fitness time may get a little out of control during those periods, without having a negative impact. What's most important, I believe, is the quality measurements are within control.

*Note: I could not accurately measure the quality for my other class, as I am still awaiting multiple grades to be posted.









Conclusion

Final Analysis

The sigma quality level of this process was very high, which might seem to indicate it didn't actually need improvement. However, there are some factors to consider:

1. A close look at the quality indicators show a slight downward trend in customer satisfaction, especially internal customers, who are more likely to notice a decline in performance. Perhaps the most obvious, and easiest improvement is to allot a specific amount of time each day to "support" tasks, reducing time spent there, and increasing time spent on work products.
2. It's very clear (trust me – it's clear here at home as well) that household chores are being neglected. It's easy to put less significance on this right now, because I live alone and the only impact is on me (the cats don't care). But, this trend, over the course of the next 1.5 years, as I continue to pursue my education, could potentially result in bigger issues like appliances breaking down due to poor maintenance, or permanent stains on floors or furniture. This wasn't considered in the business impact during the definition, but I believe it could be now. Replacing kitchen appliances and washer/dryer could run as high as $5,000, and carpet cleaning services as high as $500.
3. Additionally, I believe more time (no pun intended) is need to analyze some factors of this process. For example, can I truly cut back on time spent on fitness and still continue to see weight loss? Or, will I encounter issues when the bulk of the weight loss is not fat, but includes muscle. The only way to determine that is to continue working out, but, perhaps at a reduced rate, and track weight loss over a longer period of time. Not to mention, it's very likely I have seen the level of success with weight loss at this stage, because I have so much I need to lose. As I get closer to my target weight, it's very possible diet alone will no longer provide the same degree of success

Next Steps:

1. The first step is to simply spend more time in the Improve phase. I only had about 2 weeks in this phase, which isn't nearly long enough to make any real determinations. Especially given a sample size of 10 weeks – and that's with a margin of error that was too large to begin with, but necessary given the time I had to measure this process. A margin of error of 5 gives me 88 weeks, which is just too long to wait. A margin of 10 gives 22 weeks. Still a pretty long time. I may have to just accept a large margin of error on this first round of improvements, and reassess in another 10 weeks.
2. Since the two hypothesis tests I ran indicated there wasn't a strong relationship between the activities I measured and the quality controls, I will consider other activities to measure, as well as look at other quality control measures – especially try to find some that have more variation and continuous data.

Final Conclusion:

Of the selected quality controls, there is only one (chores) that needs significant improvement. The rest need monitoring. Additional measurement and analysis are needed to determine if there really is a linear relationship between time spent on selected activities and the defined quality control measures.