The Perfect Brew

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Introduction

For this project, our team decided to analyze the process of creating the perfect cappuccino. This report aims to explicitly outline the tasks that must be performed and analyze the process of brewing the perfect cup of coffee. We will do this by discussing each task that must be completed in our process, investigating the results, and offering the next steps by using the project management tools that have been discussed throughout this course.

Literature Review

Since being hired as a barista at Starbucks in November 2015, Gus has never stopped learning about making coffee and is well on his way to attaining his coffee master certification after earning his barista trainer certification two years ago.

Because cappuccinos are 90% milk, it is of the utmost importance that the milk, or in this case, oat milk, used is the right consistency and temperature. Blending the oat milk to the perfect viscosity requires an exact ratio of oats and water, which is highly dependent on the kinds of oats used and any mineral content in the water, although a baseline recipe is possible. However, blending the oat milk will also heat it. If the oat milk is too hot when the barista begins steaming, it will not have enough time to properly aerate and get the right amount of foam and velvety milk texture.

When brewing coffee, it is essential to keep in mind the four fundamentals: freshness, ratio, grind, and water [7]. If the beans are not fresh, the coffee will taste stale and possibly more bitter and leave a foul taste in the mouth. The same goes for ratio and grind. If the proportion of water to coffee grinds is wrong, the coffee will taste week or too bitter. By changing the grind, the barista changes the surface area of the ground coffee that comes into contact with the water, which subsequently affects how much coffee is absorbed by the water. This changes the coffee in

the same way as changing the ratio. Lastly, the water should be pure and relatively free of minerals, as while you cannot see the minerals, it will affect the flavor of the coffee.

After the oat milk is adequately cooled, it can be steamed. No matter the quantity of milk, the steps are the same. One should bring the tip of the steam wand to just below the surface of the milk and begin to aerate it. Moving the pitcher around, the barista should aim for the milk to make a sound similar to that of tearing paper while angling the pitcher so that the milk is swirling in a clockwise or counterclockwise motion. Once the milk has reached 95°F, the steam wand's tip should be brought just above the bottom of the pitcher and steamed to 140°F. When pouring the steamed milk, the side of the pitcher should be used so that the milk and foam move together and maintain the integrity of the beverage.

The first step to any coffee tasting is to smell the coffee and appreciate its aroma [8]. Taste and smell are closely linked, which means that one’s first taste of coffee is actually when it is first smelled [8]. The next step is to slurp the coffee [8]. While this may be considered rude in many contexts, not so in coffee tasting. Slurping allows for a thin layer of coffee to be spread around your mouth and allowing you to taste all of the coffee’s subtleties and its acidity [8]. The third step is to locate the coffee's different tastes on your tongue and how the coffee sits in your mouth [8]. The flavor location is characterized by the coffee's weight, how quickly the flavor leaves the palette. Describing is the last step [8]. This means telling the people you are with about everything you experienced when smelling, slurping, and locating.

Tasks

The tasks for this process have been broken up into four major categories: making the oat milk, making the coffee, making the steamed milk, and serving and tasting the cappuccino. The first set of tasks is creating the oat milk. Oat milk is a popular non-dairy alternative made up of

steel-cut oats that are soaked in water, blended, and then strained with a cheesecloth. The process of making oat milk contains four steps: (1) Gather Resources, (2) Blend, (3) Strain, and (4) Refrigerate.

The next task is to make the espresso for the coffee. Espresso is a robust and concentrated type of coffee, often served in "shots." It is made by concentrating hot pressurized water through finely-ground coffee beans with an espresso machine. This section of the process contains seven major tasks: cleaning the espresso machine, measuring the coffee beans, grinding the coffee beans, leveling off the excess grinds, flushing the grinds with some water, catching, and finally brewing the coffee.

Next, let's take a look at the task involved in making the steamed milk. Steamed milk is an essential part of a cappuccino to create the elegant signature foam on top of the finished beverage. To prepare the milk, we complete the following tasks: Pour into the pitcher, purge the steam wand to clean it, aerate the milk, steam, and swirl it. For the last yet most exciting section of our coffee-making process, we finally serve the finished drink. We begin by pouring shots of the espresso and pouring the milk. According to Starbucks's official coffee tasting guide, the proper way to taste the cappuccino is to smell, slurp, locate, and describe it. Overall, this process gives us a total of 22 tasks to create the perfect brew. With these tasks in mind, we can now take a close look at the implications of these tasks on the project as a whole.

Analysis

To better understand the process of brewing the perfect cappuccino, we utilized the project management software Microsoft Project. Using this technology enables us to generate diagrams and visualize our project data precisely and efficiently. To delve into the charts generated by our analysis of Microsoft project, let's begin by discussing each chart referenced.

First is the work breakdown structure, or WBS. For this process, our WBS is comprised of level one elements. That is, the entire scope of the project is captured in the initial summary of the tasks listed. As illustrated in Figure 1, the WBS clearly displays the relationship between the tasks, results, and the project scope.

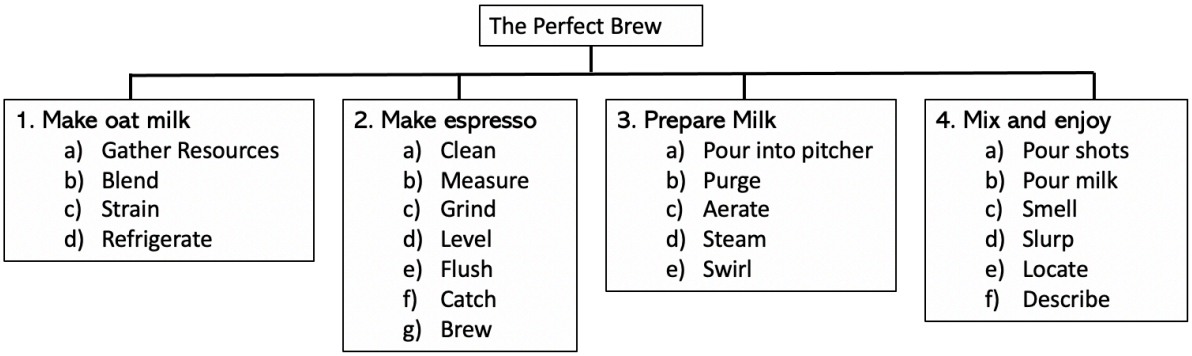

Figure 1: Work Breakdown Structure (WBS)

Gantt Chart

The Gantt chart is an effective tool to visualize the time layout and durations of a process. In this case, each of our tasks is in minute units. The entirety of our coffee making process lasts for about one hour. The critical path highlighted on this Gantt Chart is {2 3 4 5 6 7 8 9 10 11 12 13 14 21 22 23 24 25 26}. As you can see, this is nearly all of the activities listed. This is because the critical path is essentially a specified sequence of tasks that determine the minimum time required to operate. Since all of these tasks are within a relatively short time frame and equally necessary for creating the perfect brew, they lie along the critical path on the Gantt Chart. If the project was expanded to include making more than one cappuccino, the critical path would change slightly as the next beverage can be started before the current one is finished.

Resources

The resources are most easily divided into two main categories: work and material. The only work needed for this project is an all-star barista who is willing to work for a standard rate

of $10/hr with overtime of 1.5*$10 = $15/hr. From there, materials are needed. For this analysis, it is assumed that the necessary materials for making coffee are already owned: blender, filter, scale, grinder, espresso machine, milk steamer, cups, refrigerator, and shot glasses. The prices for these objects were assumed to be zero for two reasons; one, without this assumption, the cup of coffee would be thousands of dollars, which is misrepresentative of the cost of production, and two, most coffee shops will have these initial purchase costs spread out over thousands of beverages which brings the per beverage cost to near zero. The resources with expenses for this project were: cheese cloths ($8), coffee beans ($15), oats ($4), and water ($1).

Project Statistics

After obtaining resources and building the Gantt Chart, the "Project Statistics" tab in Microsoft Project is used to offer insight on start and finish dates, as well as variance in the entire project timeline. The statistics in Figure 2 show the project's duration and work and the percentage of project completion once a baseline is set. The full duration for the perfect brew is

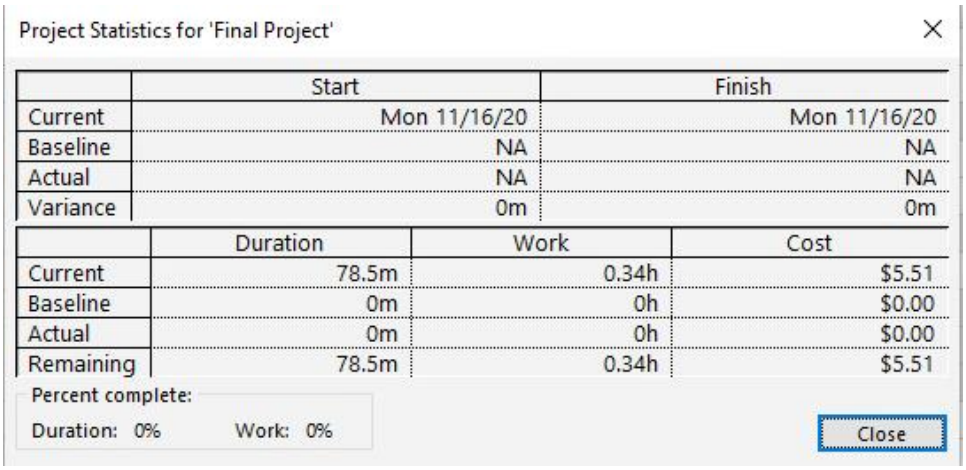

Figure 2: Project Statistics

78.5 minutes with 20.5 minutes of work from the barista, which means there is no variance to the start and end date. Because this project is so short, no baseline was set for analysis. The total cost of this project is $5.51, which is not surprisingly similar to the price of a Starbucks cappuccino.

Next Steps

There are many ways this project could be extended. One idea could be to build out project guides for not just cappuccinos, but also americanos, mochas, or even the entire Starbucks menu to optimize machine usage and have faster order-to-delivery times for customers. However, if a person would instead choose a more vertical approach in focusing solely on cappuccinos, another option would be to add more options to the perfect brew; this could offer recipes different flavored syrups or even an iced cappuccino for warm days. If neither of these options interest you, simply sit back, relax, and sip coffee with a friend!

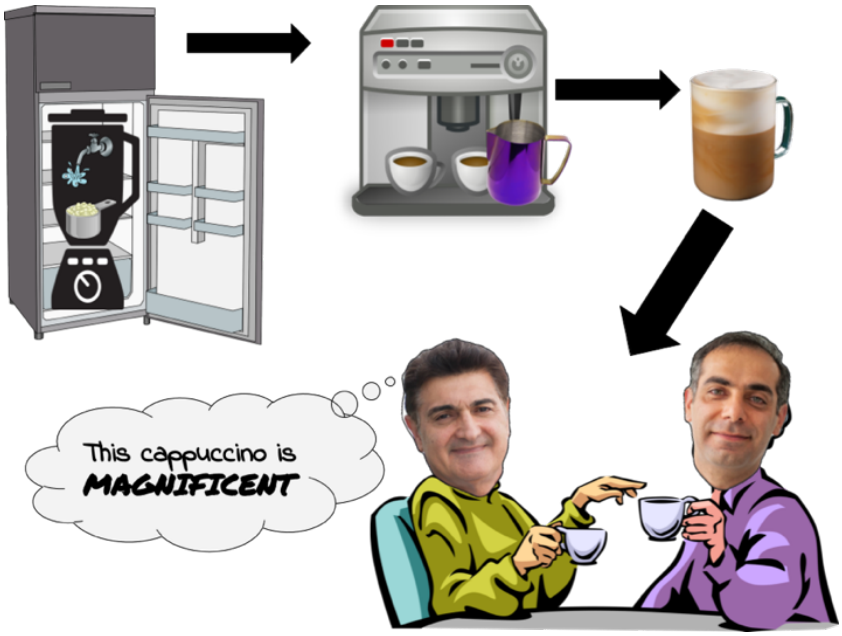

Figure 2: Activity Diagram

Appendix

Resources

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base	Code	Cost
1	Barista	Work		B		100%	$10.00/hr	$15.00/hr	$0.00	Prorated	Standard		$3.38
2	Blender	Material		B			$0.00		$0.00	Prorated			$0.00
3	CheeseCloth	Material		C			$8.00		$0.00	Prorated			$1.04
4	Filter	Material		F			$0.00		$0.00	Prorated			$0.00
5	Scale	Material		S			$0.00		$0.00	Prorated			$0.00
6	Grinder	Material		G			$0.00		$0.00	Prorated			$0.00
7	EspressoMachine	Material		E			$0.00		$0.00	Prorated			$0.00
8	MilkSteamer	Material		M			$0.00		$0.00	Prorated			$0.00
9	DisposableCup	Material		D			$0.00		$0.00	Prorated			$0.00
10	Refrigerator	Material		R			$0.00		$0.00	Prorated			$0.00
11	ShotGlass	Material		S			$0.00		$0.00	Prorated			$0.00
12	Pitcher	Material		P			$0.00		$0.00	Prorated			$0.00
13	Beans	Material		B			$15.00		$0.00	Prorated			$0.60
14	Oats	Material		O			$4.00		$0.00	Prorated			$0.24
15	Water	Material		W			$1.00		$0.00	Prorated			$0.25

Gantt Chart

GANTT CHART

	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Oatmilk**	**66.5 mins**	**Mon 11/16/20**	**Mon 11/16/20**		
2		GatherResources	5 mins	Mon 11/16/20	Mon 11/16/20		Barista,Oats[0.06],Wate
3		Blend	1 min	Mon 11/16/20	Mon 11/16/20	2	Barista,Blender[1]
4		Strain	0.5 mins	Mon 11/16/20	Mon 11/16/20	3	Barista,CheeseCloth[0.
5		Refrigerate	60 mins	Mon 11/16/20	Mon 11/16/20	4	Refrigerator[1]
6		**Coffee**	**12 mins**	**Mon 11/16/20**	**Mon 11/16/20**	**5**	
7		**Espresso**	**3.5 mins**	**Mon 11/16/20**	**Mon 11/16/20**	**5**	
8		Clean	0.5 mins	Mon 11/16/20	Mon 11/16/20	5	Barista,Filter[1]
9		Measure	0.5 mins	Mon 11/16/20	Mon 11/16/20	8	Barista,Scale[1],Beans[
10		Grind	0.5 mins	Mon 11/16/20	Mon 11/16/20	9	Barista,Grinder[1]
11		Level	0.5 mins	Mon 11/16/20	Mon 11/16/20	10	Barista,Filter[1]
12		Flush	0.5 mins	Mon 11/16/20	Mon 11/16/20	11	Barista,EspressoMachir
13		Catch	0.5 mins	Mon 11/16/20	Mon 11/16/20	12	Barista,ShotGlass[1]
14		Brew	0.5 mins	Mon 11/16/20	Mon 11/16/20	13,18	ShotGlass[1],EspressoM
15		**SteamMilk**	**2.5 mins**	**Mon 11/16/20**	**Mon 11/16/20**	**5**	
16		PourIntoPitcher	0.5 mins	Mon 11/16/20	Mon 11/16/20	5	Barista,Pitcher[1]
17		Purge	0.5 mins	Mon 11/16/20	Mon 11/16/20	16	Barista,MilkSteamer[1]
18		Aerate	0.5 mins	Mon 11/16/20	Mon 11/16/20	17	Barista,MilkSteamer[1]
19		Steam	0.5 mins	Mon 11/16/20	Mon 11/16/20	18	MilkSteamer[1],Pitcher
20		Swirl	0.5 mins	Mon 11/16/20	Mon 11/16/20	19	Barista,Pitcher[1]
21		PourShots	0.5 mins	Mon 11/16/20	Mon 11/16/20	14	Barista,DisposableCup[
22		PourMilk	0.5 mins	Mon 11/16/20	Mon 11/16/20	21,20	Barista,DisposableCup[
23		Smell	1 min	Mon 11/16/20	Mon 11/16/20	22	Barista
24		Slurp	0.5 mins	Mon 11/16/20	Mon 11/16/20	23	Barista
25		Locate	1 min	Mon 11/16/20	Mon 11/16/20	24	Barista
26		Describe	5 mins	Mon 11/16/20	Mon 11/16/20	25	Barista

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