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Should Amazon expand its delivery offerings in the United States?

Decision Making in Complex Environments

Final Project

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Table of Contents

1. Executive Summary

With the growth of e-commerce, the cost of shipping has become a point of contention amongst large industry players. For Amazon, 2015 was a year that saw shipping costs reach an all-time high. Pressure has continued to grow to meet both customer and stakeholder demands. Large courier companies have upped their cost to deliver packages. With these three factors, (and billions of dollars available on the balance sheet) Amazon is considering the expanding their services to enter the parcel delivery industry. Amazon has four options: do not enter the industry, create a courier service internally, purchase a small courier company, and purchase a large courier company.

In order to methodically come to a decision on this complex problem, Amazon has constructed an Analytical Hierarchy Process (AHP) model. This model contains six strategic criteria that are measured against the benefits, opportunities, costs, and risks of each alternative. The six strategic criteria are growth, innovation, intermarket synergies, market attractiveness, reputation, and technology. All benefits, opportunities, costs, and risks contain a subnetwork that include economic, operational, and organizational criteria. Each subnetwork contains an Analytical network Process (ANP) model that compares connected clusters. Each connection within the model is pairwise compared to calculate the priority. After each priority is compared, the model is synthesized to calculate the normalized rank of each decision. The final decision is calculated by creating a ratings matrix that compares strategic criteria to the BOCR results. These comparisons are synthesized using both the additive negative and multiplicative formulas. When ran through both formulas, the results suggests that Amazon not enter the industry.

2. Background

2.1 Company Background

In 1994, Amazon.com was formed in, now CEO, Jeff Bezos' garage. The company started off with its major focus being on the sale of books. It later revolutionized the book industry by digitalizing books and giving authors and publishers the ability to promote and sell their books online, digitally. The focus quickly expanded to become an online retail store that could better meet the company's mission, "to be Earth's most customer-centric company, where shoppers everywhere can discover anything they might want to buy online".

As e-commerce continued to grow, Amazon introduced Prime, a free shipping program that helped to increase worldwide customers to over 108 million by 2005. Growth has continued through 2015, but a poor holiday season in 2013 gave Amazon cause to reconsider their current shipping methods. A number of customers did not receive packages that were guaranteed to be delivered prior to Christmas day, as volume of orders grew far more than anticipated and UPS could not handle the volume. The backlash has since led to Amazon testing the waters of creating their own delivery service internally. Amazon's ventures into delivery have been widely publicized as they were featured in 60 minutes discussing their drone delivery initiative. They have also recently tested an Uber-esque delivery service that allows drivers to sign up and deliver packages when they wish. In 2016 they completed the purchase of the French delivery company, Colis Prive. All of this information shows a definite interest in the industry, and with 2015 shipping costs reaching a record high (over $5 billion), they are at a crossroads where the fabric of the company could experience a major shift.

2.2 The Decision Problem

Should Amazon invest towards entering the delivery industry in the US? If the trend of growing e-commerce and shipping costs continues, their margins will begin to diminish. Currently, Amazon ships primarily through UPS, with some volume being delivered by FedEx. With these trends and dependencies, Amazon is trying to determine if entering the delivery industry will provide revenues that will outweigh the entry costs. They want to decide which alternative will give them the most gains. The alternatives are listed below.

1. **Do not enter the courier service industry**

   This option would require FedEx missing out on the potential gains of entering a large and growing industry. They would continue to pay shipping costs, and be dependent on UPS and FedEx to deliver on their commitments. This option provides little to no benefits or opportunities, the costs are minimal, and risks would be the costs of shipping become too exorbitant. This is the "do nothing" option.

2. **Create a courier service internally**

   This option requires large investment into infrastructure, staffing, and knowledge. Amazon would continue to rely on couriers while their service expanded. This option provides some benefits and opportunities in that it enters the industry and can lead to reduced costs and increased revenues. Its costs are quite large and there is the risk that the investment fails, or it delivery companies have a negative reaction to the entry.

3. **Purchase small courier company**

   This option requires a moderate upfront investment to acquire a small courier service. Amazon would continue to rely on other couriers while the business is expanded. This

option provides some benefits and opportunities in that the intellectual property and infrastructure of the courier could be utilized, and it would be a more significant entrance into the industry. This option has similar risks to creating their own courier service, larger couriers could reduce service or increase costs.

4. **Purchase a large courier (UPS or FedEx)**

This option requires a significant upfront investment to acquire a large courier service. Amazon would immediately become a major player in the industry, they would acquire all of the intellectual property and infrastructure of the large courier, and would also be able to have almost all of their volume delivered internally. The risks of this option would be Amazon's focus may shift from their expertise, and have an adverse effect on customer the customer experience.

3. The Model

The AHP model for this decision is below in Figure 1. This figure shows the benefits, opportunities, costs, and risks that are compared against the six strategic criteria. The six strategic criteria used in my decision were growth, innovation, intermarket synergies, market attractiveness, reputation, and technology. From research and experience, these are the nodes that I believe Amazon uses in their decision making process. The BOCR model is not pairwise connected to the goal, it is instead compared using a ratings matrix that compared each ideal decision to the strategic criteria. I will give a detailed assessment of each category below.

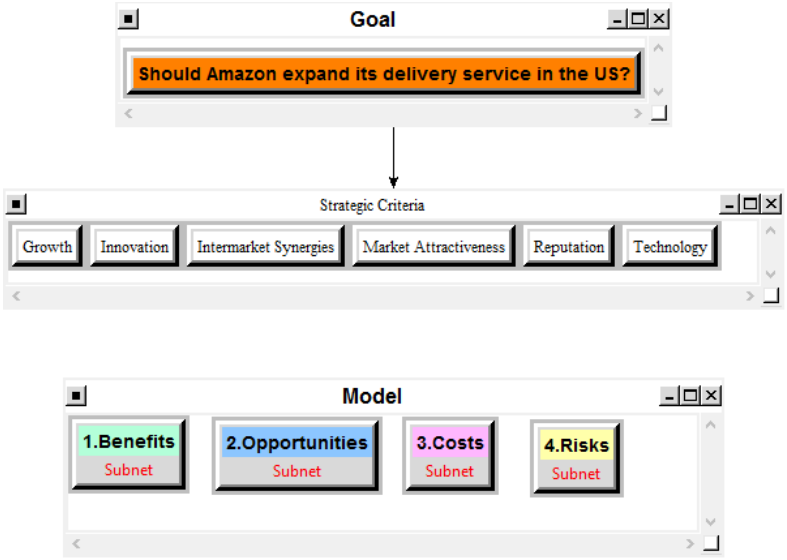


Figure 1: The Amazon AHP Model

3.1 Benefits

The benefits subnetwork portion of my model contained three control criteria: Economic, Operational, and Organizational. Each of these control criteria are areas that are in one way or another impacted as a result of the decision of entering the US delivery industry. These control criteria are not pairwise compared to any other clusters, however they are prioritized with respect to the goal. Subnets were created for each node, with pairwise comparisons made to determine the ideal alternative from each subnet. The full benefits network is in Figure 2 below.

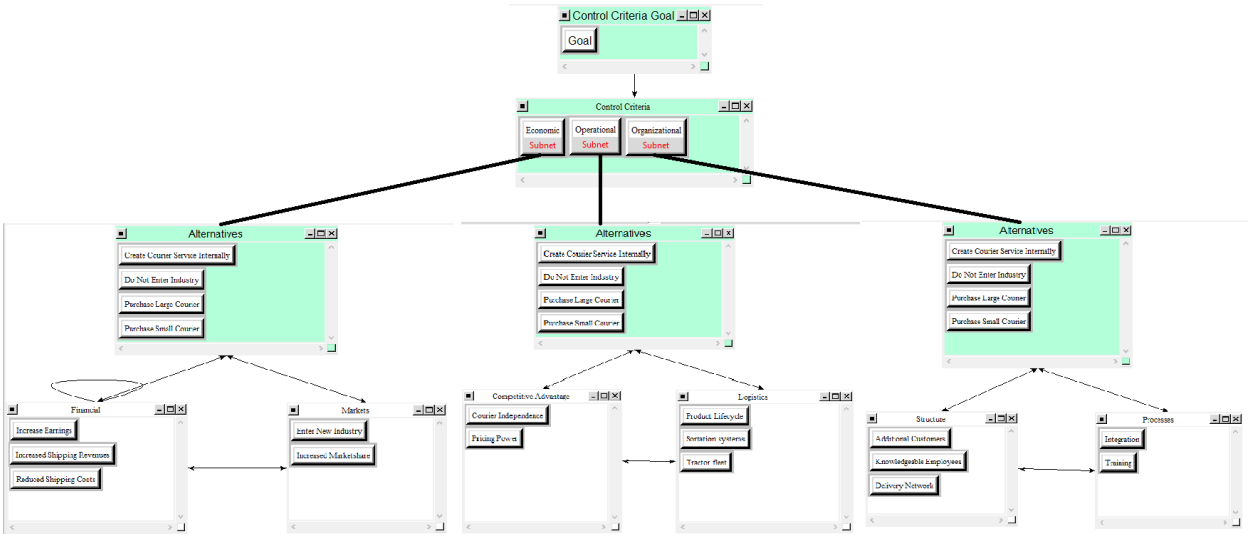


Figure 2: Benefits Model Including Subnets

The economic subnet contains two clusters that are pairwise compared with the alternatives. The financial cluster contains an increase earnings node, increased shipping revenues node, and reduced shipping costs node. The operational subnet contains two clusters that are pairwise compared with the alternatives. The competitive advantage cluster considered courier independence and a pricing power. The logistics cluster considered the product lifecycle, sortation systems, and tractor fleet. The organizational subnet contains two

clusters that are pairwise compared with the alternatives. The structure cluster considered additional customers, knowledgeable employee, and delivery network. The processes cluster considered integration and a training.

3.2 Opportunities

The opportunities subnetwork contains the same control criteria as the benefits. Each of these control criteria are areas that are in one way or another impacted as a result of the decision of entering the US delivery industry. The full opportunities network is in Figure 3 below.

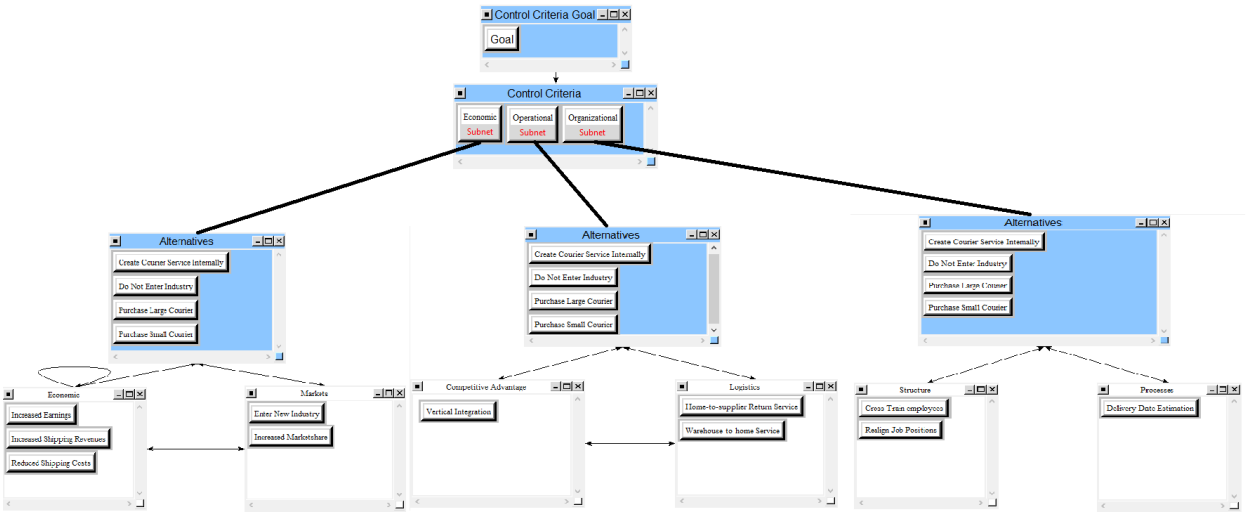


Figure 3: Opportunities Model Including Subnets

The economic subnet contains two clusters that are pairwise compared with the alternatives. The economic cluster contains the same 3 nodes as benefits, because many of the benefits can also be viewed as opportunities. The operational subnet contains two clusters that are pairwise compared with the alternatives. The competitive advantage cluster considered the opportunity resulting from becoming vertically integrated. The logistics cluster considered a

home-to-supplier return service and a warehouse-to-home service. The organizational subnet contains two clusters that are pairwise compared with the alternatives. The structure cluster considered cross training employees and realigning current jobs. The processes cluster considered delivery date estimation.

3.3 Costs

The costs subnetwork contains the same control criteria as the benefits and opportunities. Each of these control criteria are areas that are in one way or another impacted as a result of the decision of entering the US delivery industry. The full opportunities network is in Figure 4 below.

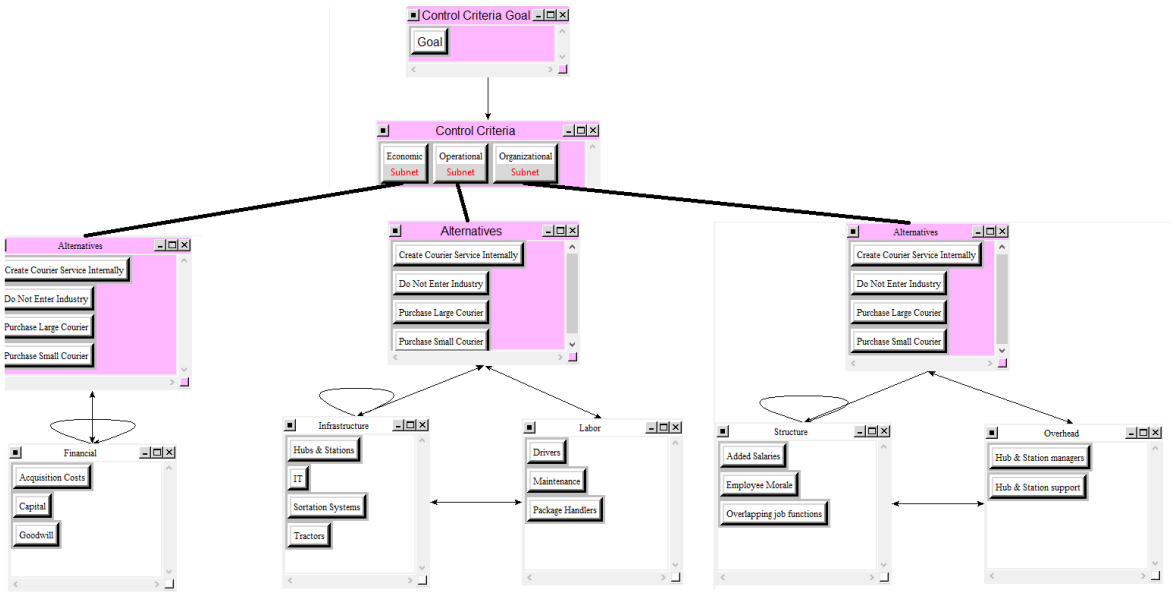


Figure 4: Costs Model Including Subnets

The economic subnet contains one cluster that is pairwise compared with the alternatives. The financial cluster considered the acquisition costs, capital costs, and cost of goodwill. The operational subnet contains two clusters that are pairwise compared with the alternatives. The

infrastructure cluster considered the costs of hubs & stations, the costs of IT, the cost of a sortation system, and the cost of tractors. The labor cluster considered the cost of drivers, maintenance, and package handlers. The organizational subnet contains two clusters that are pairwise compared with the alternatives. The structure cluster considered costs of added salaries, reduced employee morale, and overlapping job functions. The overhead cluster considered the costs of hub and station managers and their support.

3.4 Risks

The risks subnetwork contains the same control criteria as the benefits, opportunities, and costs. Each of these control criteria are areas that are in one way or another impacted as a result of the decision of entering the US delivery industry. The full opportunities network is in Figure 5 below.

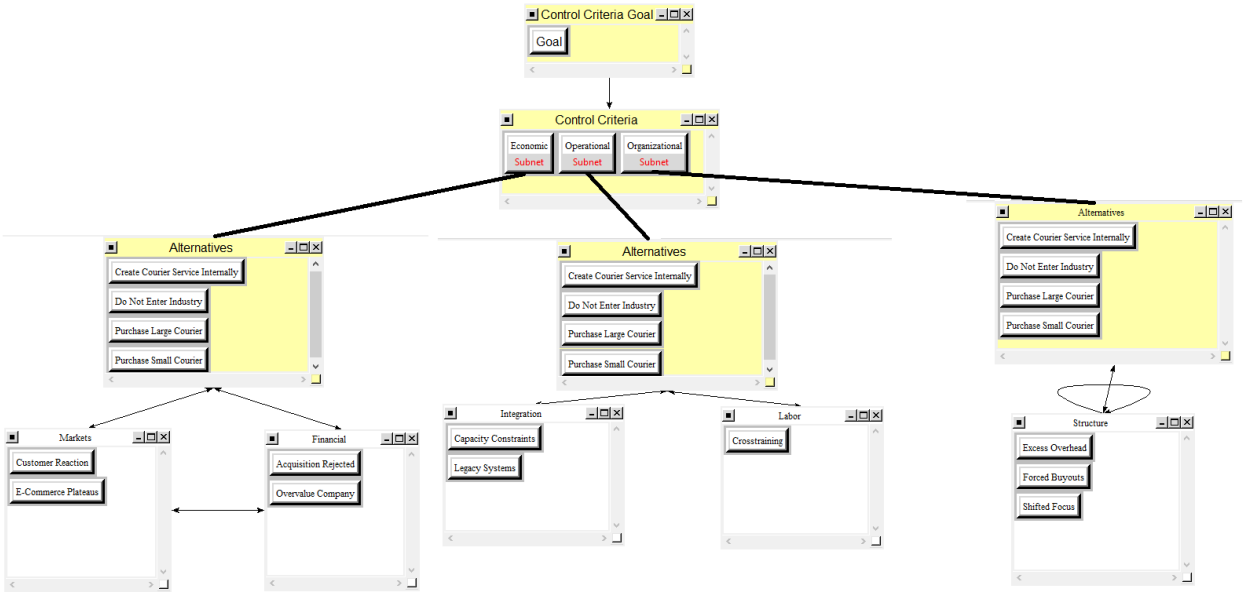


Figure 5: Risks Model Including Subnets

The economic subnet contains two clusters that are pairwise compared with the alternatives. The markets cluster considered the customers reaction, and e-commerce plateauing. The financial cluster considered the acquisition being rejected and a company being overvalued. The operational subnet contains two clusters that are pairwise compared with the alternatives. The integration cluster considered capacity constraints and legacy systems. The labor cluster considered cross training. The organizational subnet contains one cluster that is pairwise compared with the alternatives. The structure cluster considered excess overhead, forced buyouts, and shifted focus.

4. Model Results

In order to come to a decision, the strategic criteria first had to be pair-wise compared for each of the six strategic criteria. Figure 6 shows the normalized breakdown of each criteria's priority. The consistency of this model is 0.07717 which is below the suggested 0.1 limit. The results show that Amazon highly prioritizes their reputation, and this is apparent by their wide array of products and services. The second highest priority of the criteria is innovation which is followed closely by technology. Growth is valued, though not as importantly as the top 3. Finally, the attractiveness of the delivery industry was not valued, neither was the synergies between the delivery industry and the retail industry that Amazon currently operates in. If Amazon were to decide to enter the delivery industry, there is the possibility that these priorities would shift.

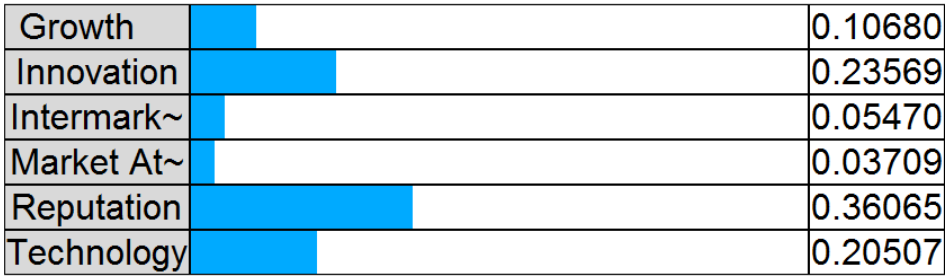


Figure 6: Priorities for Strategic Criteria

After determining the priorities of strategic criteria, the next step was to determine the weight benefits, opportunities, risks and costs factored into the decision. Each subnetwork was synthesized to produce an ideal alternative. The synthesized results of the BOCR subnetworks are provided in Figure 7.

The benefits subnetwork results show that purchasing a large courier was the best choice, followed by purchasing a small courier, then creating a courier service internally,

and doing nothing showed to have the least benefit. Purchasing a large carrier provides a great deal of benefit in that it removes the dependency on couriers, and gives Amazon a new service offering. The opportunities subnetwork results follow the same order as the benefits, this makes sense since many of the benefits are also opportunities. The costs subnetwork show that purchasing a large courier is the most costly, followed by purchasing a small courier, then creating a courier service internally, and finally doing nothing. In the case of costs doing nothing is beneficial in that the costs are minimal. The risks subnetwork results show that purchasing a small courier is the most risky. This makes sense because Amazon doing this would send a message to the big players they are a threat in the industry, which would most likely be reacted to. Purchasing a large courier is the second most risky, followed by creating a courier service internally, and doing nothing rounding out the results.

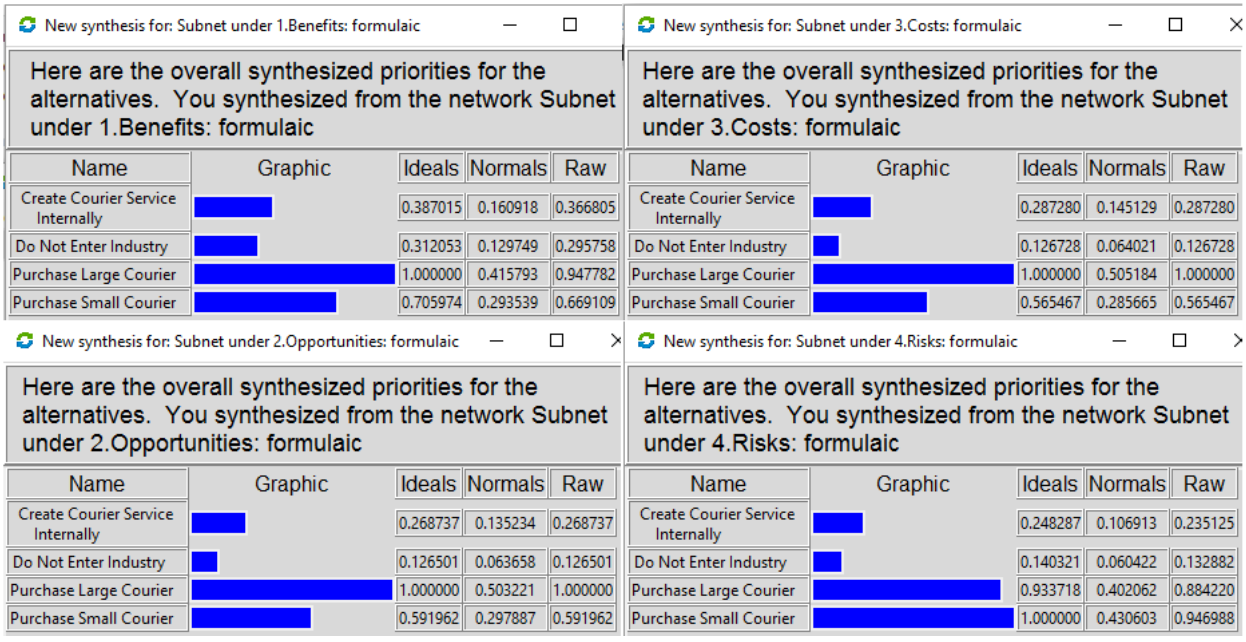


Figure 7: BOCR Priorities

These BOCR priorities are next compared against the strategic criteria priorities in a ratings matrix. The six strategic criterion line the columns of the matrix with their priority and the BOCR priorities line the rows. The importance of the BOCR were then rated against the strategic criteria using a 5 point system. I chose to have the possible selections be "Excellent", "Above Average", "Average", "Below Average", and "Poor". These ratings were used to come up with the Eigen value solution that provides the optimal decision of the model. In this decision, the costs are the highest priority against the strategic criteria. The second highest priority is opportunities, followed by benefits, and risks were prioritized the least. An example of the comparisons that were made would be the benefits of purchasing a large courier would be excellent towards the growth of Amazon.

Super Decisions Ratings

	Priorities	Totals	Growth 0.106803	Innovation 0.235687	Technology 0.205065	Reputation 0.360652	Market Attractivene 0.037093	Intermarket Synergi 0.054700
1.Benefits	0.221343	0.413127	Excellent	Average	Average	Average	Above Average	Above Average
2.Opportunities	0.264229	0.493170	Above Average	Average	Average	Above Average	Average	Above Average
3.Costs	0.322790	0.602472	Excellent	Average	Above Average	Above Average	Average	Above Average
4.Risks	0.191638	0.357683	Above Average	Average	Average	Average	Above Average	Average

Figure 8: Super Decisions Ratings Matrix

After the ratings matrix is constructed, the final step to the decision model is to synthesize the entire model. The model was synthesized using both the additive (negative) and multiplicative formulas. The results can be seen in Figure 9 below.

The additive (negative) model shoes that Amazon should not enter the industry. The second choice is Amazon should continue their path of creating a delivery service internally. Purchasing either a large or small courier shows to be not optimum decisions. These results make sense because the costs and risks associated to entering the industry are very high for

acquisitions. Maintaining the status quo or ducking out of the industry has lesser benefits, but is wiser in the long run.

The multiplicative model follow the same results as the additive (negative) model, the only change being the gap between purchasing a large or small courier has shrunk. Considering the short term impacts of the acquisition decisions, it makes sense that the choices would be closer. Competitor reaction and failure of investment are more long term impacts.

Name	Graphic	Ideals	Normals	Raw
Create Courier Service Internally		0.242194	0.115596	0.014408
Do Not Enter Industry		0.546605	0.260887	0.032517
Purchase Large Courier		-0.306379	-0.146230	-0.018226
Purchase Small Courier		-1.000000	-0.477286	-0.059490

Additive (Negative) Model

Name	Graphic	Ideals	Normals	Raw
Create Courier Service Internally		0.656854	0.265692	1.459350
Do Not Enter Industry		1.000000	0.404492	2.221727
Purchase Large Courier		0.482455	0.195149	1.071884
Purchase Small Courier		0.332926	0.134666	0.739672

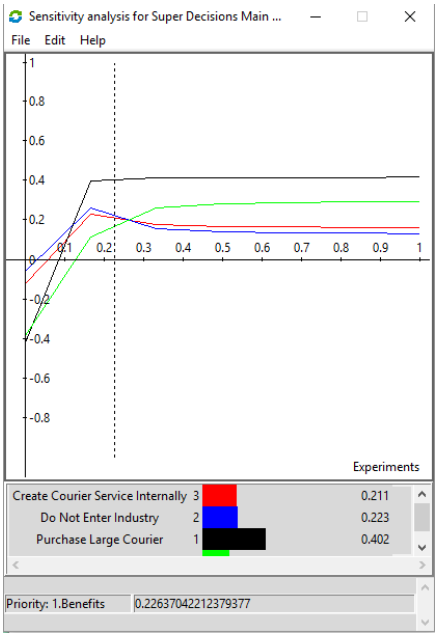
Multiplicative Model

Figure 9: Synthesized Additive Negative and Multiplicative Models

5. Sensitivity Analysis

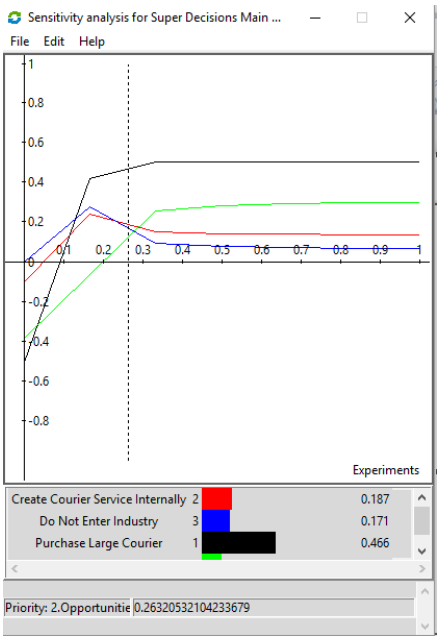
To get an idea of the relationships within the model, I next performed a sensitivity analysis for the benefits, opportunities, costs, and risks, and their impact on the final decision ("The Goal"). Knowing that Amazon is a large company with expansive resources, I chose to perform the sensitivity analysis using the additive (negative) model.

Figure 10: Sensitivity Analysis for Benefits Node (Additive Negative Model)



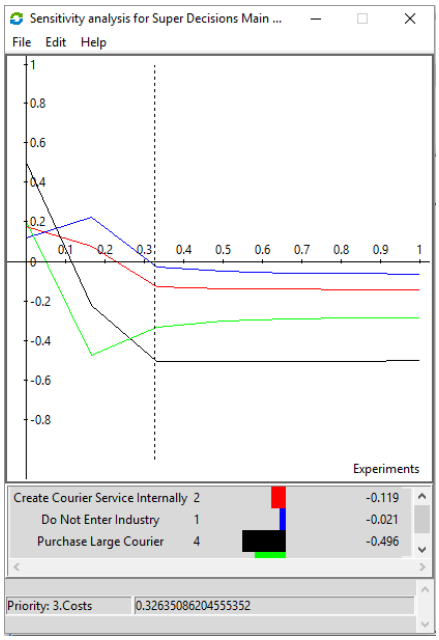
In my ratings model the benefits priority is 0.221, at that priority the ideal decision is to purchase the large carrier. The large carrier purchase is the ideal solution as long as the benefits priority is above 0.1. At that point the ideal choice would be to not enter the industry.

Figure 11: Sensitivity Analysis for Opportunities Node (Additive Negative Model)



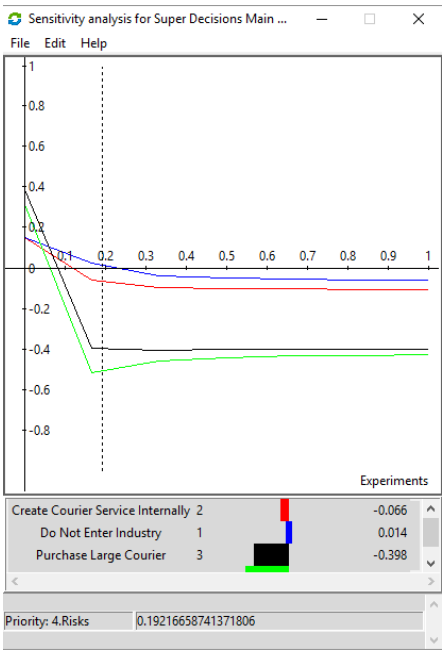
In my ratings model the benefits priority is 0.264, at that priority the ideal decision is to purchase the large carrier. The large courier purchase is the ideal solution as long as the benefits priority is above 0.1. At that point the ideal choice would be to not enter the industry. This follows the same trend as the benefits sensitivity.

Figure 12: Sensitivity Analysis for Costs Node (Additive Negative Model)



In my ratings model the benefits priority is 0.323, at that priority the ideal decision is to purchase the large carrier. The large courier purchase is the ideal solution as long as the benefits priority is above 0.25. At that point the ideal choice would be to purchase the smaller courier.

Figure 13: Sensitivity Analysis for Risks Node (Additive Negative Model)



In my ratings model the benefits priority is 0.191, at that priority the ideal decision is to purchase the small courier. The small courier purchase is the ideal solution as long as the benefits priority is above 0.05. At that point the ideal choice would be to create a courier service internally.

6. Conclusion

Based on my model, I recommend Amazon refrain from entering the delivery service industry. Using both the additive (negative) model and the multiplicative model show that not entering the industry proves to be ideal when performing an analysis comparing BOCR against the strategic pillars of the company. This decision is fairly solid, with little reason to waver. The priority shift of priorities would have to shift rather dramatically (~10%) to alter the decision of any of the BOCR ideals. The benefits and opportunities of entering the industry are high, however the risks and costs cancel out these gains, resulting in maintain the status quo, or dropping out entirely being the two “best” options.

This model could be improved by selecting a specific couriers and splitting the internally service into multiple options. The validity could also be improved by performing more extensive research pertaining to economic benefits, and the risks associated with entering an industry while Amazon is still dependent.

7. References

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