Rain Court Simulation Summary for Nicolas Herrero Cuesta

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**Simulation Summary**

The process involves several different phases, from phase A to G. Phase A to B includes designing the prototype, market research, and obtaining a patent. Phase B to C includes building the prototype. Phase C to D includes to prototype testing and phase D to E includes the redesign of the prototype. While phases C to D and D to E are being completed, obtaining material, facilities, and labor will also be completed. Phase E to F includes consumer testing and phase F to G includes distribution of the product. While phases E to F and F to G are being completed, marketing the product will also be completed. (See Appendix A)

The total time of bringing the product to market ranges from 27 weeks to 45 weeks. Most of the simulations have the completion time closer to 45 weeks rather than 27 weeks with the average being 36.5 weeks. We told the investor that we will be finished with all the tasks in 39 weeks. With this estimation, we are 83.06% confident that we will finish all the tasks in time. (See Appendix B).

The Phase A to B consists of three tasks: market research, obtaining the patent, and designing the prototype. These tasks are being completed at the same time to optimize efficiency. We used a beta distribution for all these tasks. For the market research, the alpha was 3, the beta was 5, the minimum was 3 weeks, and the maximum was 9 weeks. This gave us a distribution that in which most of the completion times were closer to 3 weeks rather than 9 weeks with an average of 5 weeks. For obtaining the patent, the alpha was 2, the beta was 4, the minimum was 2 weeks, and the maximum was 6 weeks. This gave us a distribution that in which most of the completion times were closer to 2 weeks rather than 6 weeks with an average of 3 weeks. For designing the prototype, the alpha was 5, the beta was 3, the minimum was 1 week, and the maximum was 4 weeks. This gave us a distribution that in which most of the completion times were closer to 4 weeks rather than 1 week with an average of 3 weeks. (See Appendix C)

The Phase B to C included only building the prototype. This task was simulated with a beta distribution where the alpha was 4, the beta was 2, the minimum was 6 weeks, and the maximum was 18 weeks. This gave us a distribution that in which most of the completion times were closer to 18 weeks rather than 6 weeks with an average of 16 weeks. (See Appendix D)

The Phase C to E included fives tasks: prototype testing from phase C to D, redesigning the prototype from phase D to E, obtaining materials, obtaining labor, and obtaining facilities. The prototype testing was simulated with a uniform distribution from 2 weeks to 4 weeks with an average of 3 weeks. The redesigning of the prototype was simulated with a beta distribution where the alpha was 5, the beta was 5, the minimum was 1 week, and the maximum was 5 weeks. This gave us a normal distribution where the average was 3 weeks. To simulate obtaining the facilities a beta distribution was used where the alpha was 2, the beta was 4, the minimum was 4 weeks, and the maximum was 8 weeks. This gave us a distribution that in which most of the completion times were closer to 4 weeks rather than 8 weeks with an average of 5 weeks. To simulate obtaining the facilities a beta distribution was used where the alpha was 2, the beta was 4, the minimum was 4 weeks, and the maximum was 8 weeks. Obtaining the materials was simulated with a uniform distribution from 3 weeks to 5 weeks with an average of 4 weeks. Obtaining the labor was simulated with a beta distribution where the alpha was 7, the beta was 7, the minimum was 1 week, and the maximum was 5 weeks. This gave us a normal distribution where the average was 3 weeks. The total time from phase C to E followed a normal distribution from 4 weeks to 8.5 weeks with an average of 6.2 weeks. (See Appendix E)

The Phase E to G includes three tasks: consumer testing from phase E to F, distribution of the product from phase F to G, and marketing the product. Consumer testing was simulated with a beta distribution where the alpha was 4, the beta was 4, the minimum was 2 weeks, and the maximum was 4 weeks. This gave us a normal distribution where the average was 3 weeks. The distribution of the product was simulated with a beta distribution where the alpha was 6, the beta was 3, the minimum was 4 weeks, and the maximum was 10 weeks. This gave us a distribution that in which most of the completion times were closer to 10 weeks rather than 4 weeks with an average of 8.5 weeks. The marketing of the product was simulated with a beta distribution where the alpha was 6, the beta was 6, the minimum was 6 weeks, and the maximum was 10 weeks. This gave us a normal distribution where the average was 8 weeks. The total time from phase E to G ranged from 8.5 weeks to 13.5 weeks. Most of the simulations of the total time of phase E to G are closer to 13.5 weeks than 8.5 weeks with the average being 11.5 weeks. (See Appendix F)

The cost of the product will be $500 each and the price we sell to the customer will be $1,000 giving us a $500 profit for each sale. The cost of bringing the product to market is a total of $975,000. We will spend this money at a constant rate of $25,000 a week over the 39-week period. The profit after the 39-week period will be a constant rate of $50,000 a week. The $975,000 will be paid back within 20 weeks. After the money is repaid, we will give the investor 10% of the company. The profits will remain constant at $50,000 a week and the investor will be gaining a constant profit of $5,000 a week. (See Appendix G)

**Appendix A – Flowchart**

Distribution

Consumer Test

Materials, Labor, and Facilities

Redesign

Prototype Test

Prototype

Patent

Market Research

Design



Marketing

**Appendix B – Total Time**

**Total Time -** The total time of bringing the product to market ranges from 27 weeks to 45 weeks. Most of the simulations of the total time are closer to 45 weeks than 27 weeks with the average time of completion being 36.5 weeks.

**Appendix C - Phase A to B Time**

**Market Research**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Market Research | 3 | 5 | 3 | 9 |

**Market Research –** The market research task ranges from being completed in three weeks to nine weeks. Most of the simulations have the completion time being closer to three weeks than nine weeks, and the average completion time is about five weeks.

**Patent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Patent | 2 | 4 | 2 | 6 |

**Patent –** The task of obtaining the patent ranges from being completed in two weeks to six weeks. Most of the simulations have the completion time being closer to two weeks than six weeks, and the average completion time is about three weeks.

**Design**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Design | 5 | 3 | 1 | 4 |

**Design –** The design task ranges from being completed in one week to four weeks. Most of the simulations have the completion time being closer to four weeks than one week, and the average completion time is about three weeks.

**Phase A to B** – The total time of Phase A to B ranges from 3.5 weeks to 9 weeks. Most of the simulations have the total time of phase A to B being closer to 3.5 weeks than 9 weeks, and the average time is about 5.3 weeks.

**Appendix D - Phase B to C Time**

**Prototype Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Prototype | 4 | 2 | 6 | 18 |

**Phase B to C/ Prototype -** The task of building the prototype ranges from being completed in 6 weeks to 18 weeks. Most of the simulations have the completion time being closer to 18 weeks than 6 weeks, and the average completion time is about 16 weeks. Phase B to C only includes the task of building the prototype.

**Appendix E - Phase C to E Time**

**Phase C to D/ Prototype Testing**

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Distribution | Min (weeks) | Max (weeks) |
| Prototype Test | Uniform | 2 | 4 |

**Phase C to D/ Prototype Testing -** The task of prototype testing ranges from being completed in 2 weeks to 4 weeks. The simulations have the completion time being the same amount from any time in the interval of 2 and 4 weeks, following a uniform distribution. The average completion time is about 3 weeks. Phase C to D only includes the task of prototype testing.

**Phase D to E/ Redesign**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Redesign | 5 | 5 | 1 | 5 |

**Phase D to E/ Redesign -** The task of redesigning the prototype ranges from being completed in 1 week to 5 weeks. The simulations have the completion time being distributed normally with the average completion time being about 3 weeks. Phase D to E only includes the task of prototype testing.

**Facilities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Facilities | 2 | 4 | 4 | 8 |

**Facilities -** The task of obtaining facilities ranges from being completed in 4 weeks to 8 weeks. Most of the simulations have the completion time being closer to 4 weeks than 8 weeks, and the average completion time is about 5 weeks.

**Materials**

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Distribution | Min (weeks) | Max (weeks) |
| Materials | Uniform | 3 | 5 |

**Materials -** The task of obtaining materials ranges from being completed in 3 weeks to 5 weeks. The simulations have the completion time being the same amount from any time in the interval of 3 and 5 weeks, following a uniform distribution. The average completion time is about 4 weeks.

**Labor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Labor | 7 | 7 | 1 | 5 |

**Labor** - The task of obtaining labor ranges from being completed in 1 week to 5 weeks. The simulations have the completion time being distributed normally with the average completion time being about 3 weeks.

**Phase C to E** – The total time of Phase C to E ranges from 4 weeks to 8.5 weeks. The simulations of the total time of phase C to E follow a normal distribution with an average completion time of 6.2 weeks.

**Appendix F – Phase E to G Time**

**Consumer Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Consumer Test | 4 | 4 | 2 | 4 |

**Consumer Test/ Phase E to F** - The task of consumer testing ranges from being completed in 2 weeks to 4 weeks. The simulations have the completion time being distributed normally with the average completion time being about 3 weeks.

**Distribution**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Distribution | 6 | 3 | 4 | 10 |

**Distribution/ Phase F to G -** The task of distributing the product ranges from being completed in 4 weeks to 10 weeks. Most of the simulations have the completion time being closer to 10 weeks than 4 weeks, and the average completion time is about 8.5 weeks.

**Marketing**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Alpha | Beta | Min (weeks) | Max (weeks) |
| Marketing | 6 | 6 | 6 | 10 |

**Marketing -** The task of marketing the product ranges from being completed in 6 weeks to 10 weeks. The simulations have the completion time being distributed normally with the average completion time being about 8 weeks.

**Phase E to G -** The total time of Phase E to G ranges from 8.5 weeks to 13.5 weeks. Most of the simulations of the total time of phase E to G are closer to 13.5 weeks than 8.5 weeks with the average time of completion being 11.5 weeks.

**Appendix G – Cost/ Profit Analysis**

The cost of entire process of making the product will cost $975,000. The cost will be constant for the 39 weeks. The rate of expenditure will be $25,000 per week for the entire 39 weeks. After the product comes to market, the profit will be constant of $50,000 a week and the investor will be repaid in 20 weeks. The company will make $1,000,000 will be made by week 79 week.

The company will be providing Mr. Beaver 10% of the company after the investment is paid back. There will be a constant rate of increased profit at $5,000 a week for the 10% value of the company. The value of 10% stake of the company will be $260,000 after one year and in four years it will be worth over $1,000,000.