System Request:	Husky Air Reservation System
Project Sponsor:	Unknown
	It is important to establish who the project sponsor will be to provide essential business context, expertise, and guidance to the development team.
Business Need:	Husky Air would like to grow its business by adding additional aircraft to its fleet, including new models with increased piloting restrictions. It would also like to increase its ground and air instruction offerings. The current system, however, is too complicated if scaled up to include more planes, pilots, instructors, and classes. A system is needed that can easily manage these and handle rapid reservation changes. The new plane models also mandate a system that can track additional features, such as pilot classification and ratings, and that can prohibit pilots from renting models for which they are not classified. It also needs to ensure pilots have a checkout session with an instructor before flying a model they are unfamiliar with. Therefore, a more comprehensive pilot and plane records system is needed. Furthermore, instructors must enter logbook endorsements for pilots flying the new plane models with increased restrictions. Coupled with the already cumbersome time requirements for manually checking a pilot in and out, this creates a need for a more efficient flight logbook management system. These requirements can all be handled by a single simple and efficient computerized system (see Appendix A).

System Request:	Husky Air Reservation System

Business Requirements:

The new system must store and manage information on pilots, planes, employees, and classes. For pilots, this includes name, address, phone number, pilot's number, pilot license type, classifications, instrument rated or not, and total flight hours in each model of plane. For planes, this includes type, pilot restrictions, location, fuel level, schedule, and maintenance record. Employees' basic information will be stored, as well as schedules for ground and air lessons.

Pilots must be able to create an account and edit their information. They also need to be able to make, view and edit their plane and/or instructor reservations via the Husky Air website. The system must also allow them to register for ground classes. It should only allow pilots to reserve plane models that they have the necessary classifications to fly. It must prohibit the reservation of a new model of plane without the reservation of an instructor to conduct a checkout lesson.

The system must allow pilots to edit their flightlogs and store flight data including date, pilot name, beginning and ending Hobbs time, and receipt number. The system must also calculate and save the total Hobbs time.

The system needs to allow Husky Air instructors to view their schedules and edit their availability. Their schedules must be automatically updated when pilots reserve them or a ground class is added that they teach. Instructors should also be able to add ground classes and view class rosters.

The system will update plane schedules when they are reserved by pilots. Husky Air mechanics must also be able to edit their schedules, fuel level and location, and reserve them for maintenance.

System Request:	Husky Air Reservation System
	The system will manage the flight log and calculate the rental cost. It will accept payment from a pilot, print a receipt, and save the receipt number to the logbook (See Appendix A).
Business Value:	The new system will permit business growth by allowing Husky Air to safely and efficiently increase the type and number of rental planes offered. It will also allow for the addition of ground classes. This will generate more business, creating increased revenues from current and new pilots (see Appendix C). Because Husky Air only receives payment for the total Hobbs time, the new system will also increase revenue by reducing processing time, allowing pilots to spend more time with the engine running. By tracking planes' information, mechanics will know when a plane needs to be fueled and in the ramp area. The system will manage the flight log book and automatically calculate the total Hobbs time and rental fee, reducing the time needed for cashing out a pilot (see Appendix C). The new system will also increase safety by preventing pilots from reserving and flying planes that they are not certified for. It will also force them to sign up for a checkout session with an instructor before flying a model they are unfamiliar with. Finally, the system will allow for easy, comprehensive record keeping on pilots, planes and flights. With a total cost of $287,300 and total benefits in year one of over $434,000, this project will break even within the first year of operation (see Appendix C).

System Request:	Husky Air Reservation System
Special Issues or Constraints:	For maximum functionality, it is important that the pilot reservation system be available to users via the Husky Air website. This creates a security vulnerability, however, that must be addressed when developing the system.

Feasibility Analysis

Technical Feasibility:

There is a medium risk associated with this project's technical feasibility. This is due to the development team's lack of familiarity with the aviation industry, and Husky Air's lack of previous computer experience.

Husky Air currently utilizes a paper-based system for managing flight reservations and instructor schedules. The new computerized system's interface will mimic the old system in a way that allows users to easily understand and utilize it. This will help mitigate the risk associated with introducing a novel software system to the organization. Because Husky Air has not used a computerized system in the past, introductory training on the new system for employees is also recommended.

Economic Feasibility:

- Total Costs over 5 years: $694,368
- NPV after 5 years: $1,369,606
- ROI after 5 years: 197.24%
  (See Appendix C)

This is a medium-sized project that will take about 1,529 person hours to complete (see Appendix B). With five people working on the development team, it should be completed in about two months.[1]

Intangible Costs and Benefits

- Increased customer satisfaction
- Increased safety
- Comprehensive record keeping

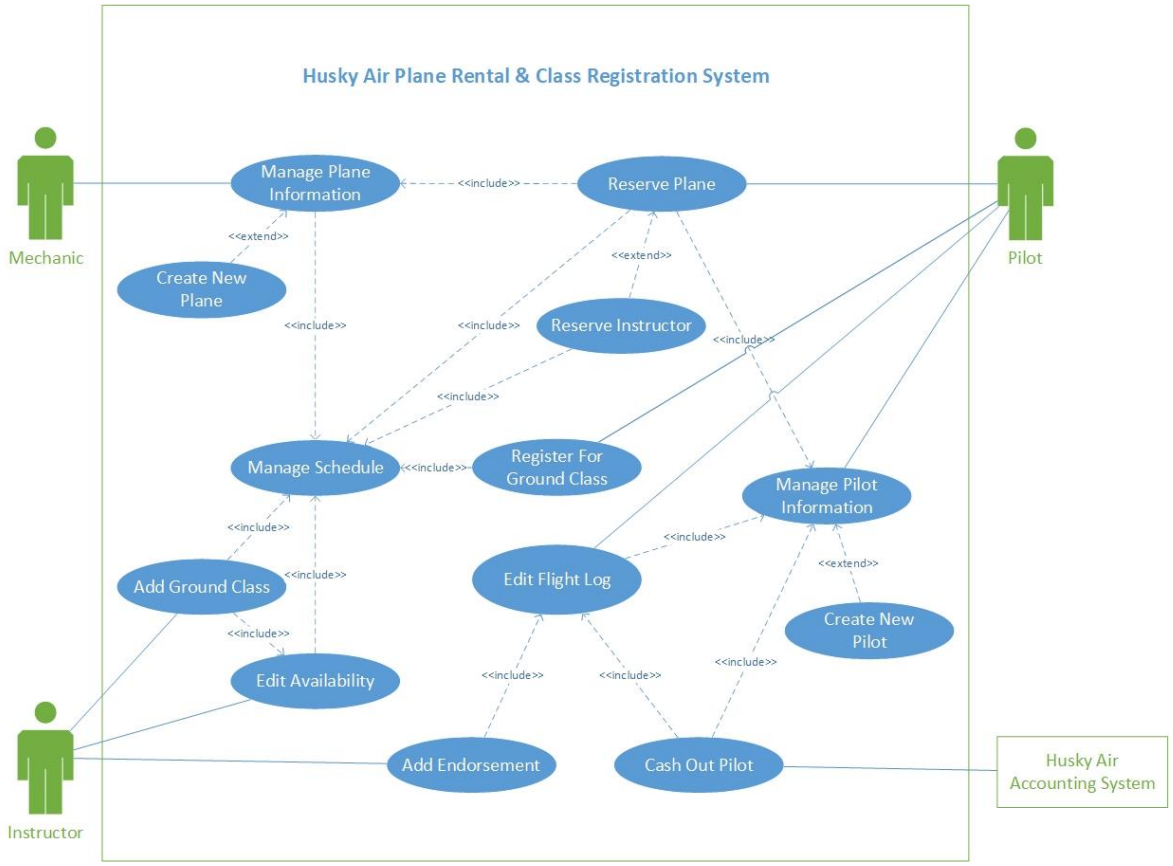
[1] Tom Mochal, "Factor in the productive hours per day when estimating duration", *TechRepublic*, 2006, http://www.techrepublic.com/article/factor-in-the-productive-hours-per-day-when-estimating-duration/

Organizational Feasibility:

This project is highly aligned with Husky Air's business strategy. Its purpose is to allow Husky Air to safely and effectively scale its service to include a greater number and variety of aircrafts and more customers. Therefore, if it has a strong project sponsor and user involvement in the development process, the risk associated with organizational feasibility are low.

Appendix A

Use Case Diagram



Appendix B

Use Case Point Estimation Worksheet

Unadjusted Actor Weighting Table

ACTOR TYPE	DESCRIPTION	WEIGHTING FACTOR	NUMBER	RESULT
Simple	External system with well-defined API	1	0	0
Average	External system using a protocol-based interface, e.g., HTTP, TCT/IP, or a database	2	1	2
Complex	Human	3	3	9
			Unadjusted Actor Weight Total (UAW)	11

Unadjusted Use Case Weighting Table

USE CASE TYPE	DESCRIPTION	WEIGHTING FACTOR	NUMBER	RESULT
Simple	1-3 transactions	5	7	35
Average	4-7 transactions	10	3	30
Complex	> 7 transactions	15	3	45
			Unadjusted Use Case Weight Total (UUCW)	110

Unadjusted Use Case Points (UUCP) = UAW + UUCW 121

Technical Complexity Factors

FACTOR NUMBER	DESCRIPTION	WEIGHT	ASSIGNED VALUE (0-5)	WEIGHTED VALUE
T1	Distributed system	2.0	5	10
T2	Response time or throughput performance objectives	1.0	3	3
T3	End-user online efficiency	1.0	3	3
T4	Complex internal processing	1.0	0	0
T5	Reusability of code	1.0	3	3
T6	Easy to install	0.5	1	0.5
T7	Ease of use	0.5	5	2.5
T8	Portability	2.0	0	0
T9	Ease of change	1.0	5	5
T10	Concurrency	1.0	0	0
T11	Special security objectives included	1.0	3	3
T12	Direct access for third parties	1.0	0	0
T13	Special user training required	1.0	5	5
			Technical Factor Value (TFactor)	35

Technical Complexity Factor (TCF) = 0.6 + (0.01 * TFactor) 0.95

Environmental Factors

FACTOR NUMBER	DESCRIPTION	WEIGHT	ASSIGNED VALUE (0-5)	WEIGHTED VALUE
E1	Familiarity with system development process being used	1.5	5	8
E2	Application experience	0.5	3	2
E3	Object-oriented experience	1.0	5	5
E4	Lead analyst capability	0.5	5	3
E5	Motivation	1.0	4	4
E6	Requirements stability	2.0	2	4
E7	Part time staff	-1.0	0	0
E8	Difficulty of programming language	-1.0	0	0
			Environmental Factor Value (EFactor)	24.5

Environmental Factor (EF) = 1.4 + (-0.03 * EFactor) 0.665

Adjusted Use Case Points (UCP) = UUCP * TCF * ECF 76.44175

PHM 20

Effort in Personal Hours = UCP * PHM 1528.835

Appendix C

Cost Benefit Analysis

	2018	2019	2020	2021	2022	Total
Increased rentals by existing customers	100,000	102,000	108,120	114,607	121,484	
Increased rentals by new customers	250,000	252,000	254,000	256,000	258,000	
Increased Hobbs time per flight	84,000	86,000	88,000	90,000	92,000	
TOTAL BENEFITS:	434,000	440,000	450,120	460,607	471,484	
PV of BENEFITS:	**421,359**	**414,742**	**411,924**	**409,244**	**406,706**	**2,063,974**
PV of ALL BENEFITS:	**421,359**	**836,101**	**1,248,025**	**1,657,269**	**2,063,974**	
Office overhead	10,000	0	0	0	0	
Software licenses	1,000	0	0	0	0	
Server software	1,000	0	0	0	0	
Development Labor	62,500	0	0	0	0	
Employee Training	10,000	0	0	0	0	
TOTAL DEVELOPMENT COSTS:	84,500	0	0	0	0	
Hardware (2 computers and 1 server)	127,400	0	0	130,000	0	
Software	400	410	420	430	440	
Operational Labor	75,000	78,000	81,120	84,365	87,739	
TOTAL OPERATIONAL COSTS:	202,800	78,410	81,540	214,795	88,179	
TOTAL COSTS:	287,300	78,410	81,540	214,795	88,179	
PV of COSTS:	**278,932**	**73,909**	**74,621**	**190,842**	**76,064**	**694,368**
PV of ALL COSTS:	**278,932**	**352,841**	**427,462**	**618,304**	**694,368**	
Total Project Benefits - Costs:	**146,700**	**361,590**	**368,580**	**245,812**	**383,304**	
Yearly NPV:	**142,427**	**340,833**	**337,303**	**218,401**	**330,642**	**1,369,606**
Cumulative NPV:	**142,427**	**483,260**	**820,563**	**1,038,964**	**1,369,606**	
Return on Investment:	**197.24%**					

- Increase rentals by new and existing customers based on an estimate $505,452 annual revenue.[2]
- Increased Hobbs time per flight based on an estimated $505,452 annual revenue[2] and an increase of 10 minutes of Hobbs time per session due to increase efficiency of check in a check out procedures.

[2] Buzzfile Media LLC, "Gateway Aviation Services," *Buzzfile,* 2017 http://www.buzzfile.com/business/Gateway-Aviation-Services-480-988-7700

- Office overhead[3]
- Software licenses based on the cost of Windows 10 Enterprise[4] and IntelliJ IDEA Ultimate[5]
- Server software cost[6]
- Development labor cost based on five developers working for two months (see Appendix B) at $74,823.[7]
- Hardware cost[8]

[3] Patrick Hogan, "Factors that Determine the Cost of Small Business IT Systems," *Tenfold,* 2017, https://www.tenfold.com/it-management/factors-determine-cost-small-business-systems
[4] Mary Jo Foley, "Microsoft prices Windows 10 Enterprise subscription at $84 per user per year," *ZDNet,* 2016, http://www.zdnet.com/article/microsoft-prices-windows-10-enterprise-subscription-at-84-per-user-per-year/
[5]JetBrains, "JetBrains Toolbox Subscription," *JetBrains,* 2017, https://www.jetbrains.com/idea/buy/#edition=commercial
[6] Storage Servers, "How much does a server cost?," *Storage Servers*, 2016, https://storageservers.wordpress.com/2016/04/08/how-much-does-a-server-cost/
[7] Glassdoor, "Java Programmer Analyst Salaries," *Glassdoor*, 2017, https://www.glassdoor.com/Salaries/java-programmer-analyst-salary-SRCH_KO0,23.htm
[8] Gavin Graham, "How To Choose The Best Office Computers For Your Business," FitSmallBusiness, 2017, https://fitsmallbusiness.com/best-office-computers-business-desktop/