



TAKE HOME QUIZ #2

FALL 2008

ALASKAN AIRCRAFT EXPEDITIONS (AAE)

Introduction

At the Northeast corner of Alaska's Inner Passage sits the city of Skagway, an old gold-rush boom-town whose once bustling population has been reduced to a wintertime size of less than 1,000. About the only time Skagway becomes bustling these days is when a big cruise ship works its way up from Seattle or Vancouver during the summer to deposit thousands of tourists in town with lots of money and time to burn. These tourists want to be taken quickly and comfortably to see many of Alaska's famous natural wonders - such as its mountains, glaciers, rivers, islands, and various types of wildlife (bears, seals, whales, elk, etc.). The demand for tourist services in this regard has been growing gradually throughout the last 30 years with no let-up in sight. To meet this growing demand, Alex Mostyn, a native Alaskan and UD graduate, has founded an aircraft expedition company called AAE (Alaskan Aircraft Expeditions). AAE is doing well and Alex is interested in having a world-class AIS. He asks you for help! The interview with Alex below describes the business events that need to be captured by the AIS.

Interview with Alex

Q. Alex, could you tell us a little more about your aircraft. Do you buy them or do you lease them?

A. AAE acquires its aircraft through leases that last 1-3 years. When a lease expires, management decides which of the multiple aircraft on the lease are still desirable and negotiates a new lease for them (usually at much lower per-plane rates of course since the planes are much older). Aircraft are identified by engine#, and they are not inserted into the database until they have been leased for the first time. At least one aircraft is recorded for each lease. AAE aircraft are grouped by aircraft type, and the company uses 15-17 different types, each of which has a unique name. Individual aircraft (AAE usually

has 100-125 leased at any particular time) are named after famous native Alaskans, and their seating and fuel capacities are determined solely by their type. Exactly one aircraft type is recorded for each aircraft. It is possible to have aircraft types in our database for which we currently don't have aircraft.

Q. Are there other acquisitions you would like to record in your AIS?

A. Yes, supply items are acquired via purchases. Each supply item has a unique code. A purchase transaction must be recorded for each supply item. There is at least one supply item for each purchase. For marketing analysis purposes, supply items are grouped by category. For example, boots, parkas, etc. are grouped into a clothing category. Exactly one category is recorded for each supply item. A category can be added to the database before an item for that category exists.

Q. What about vendors?

A. Well, supply item vendors and aircraft vendors don't overlap at all. However, we would like to record all vendors in the same table. Vendors are not added to the database until a transaction (lease or purchase) with them occurs. There is exactly one vendor per lease transaction and exactly one vendor per purchase transaction. We currently have numerous lease contracts with CesLease (a vendor). We purchase clothes from AlasFashion at least once per month. We always assign one employee as a contact person to an aircraft vendor. The same employee can serve as contact for multiple vendors. Only a small number of employees (i.e., not all employees) can be used as contact for aircraft vendors. AAE also records which employee is responsible for each of the purchase transactions. There is exactly one employee per purchase transaction. The same employee can be involved in many purchase transactions. Most employees that are recorded as a contact person for an aircraft vendor don't participate in purchase transactions.

Q. Could you tell us more about your expeditions?

A. Sure, AAE generates revenues by offering various types of expeditions (tours) to its customers (or clients as they are called by the company). Clients can choose from a standard menu of tours (such as "*The Glacier Bay Extravaganza*" which includes a helicopter ride to six different places and takes eight hours, or the "*Gold Rush Trek*" which takes an airplane ride from Skagway out to Dawson and back, or the "*Bear Watch*" which takes a seaplane out to some islands and drops the clients off for five days of camping and then picks them up). In total, AAE offers a menu of 80 + tours, each of which has a standard set of aircraft types which can be used and a standard itinerary of locations (places) to be visited in a certain order. The database should only include locations that are part of at least one tour (expedition type). The Cessna 404 Titan is currently used in seven different tours. The database also contains the distances between locations; this information is recorded for all locations. If we had three locations in our database – A, B and C –, then we would record the following distances: the distance between A and B, the distance the between A and C, and the distance between B and C.

Q. Do you record information about the actual expeditions?

A. Yes, expeditions are identified by a unique code, and they always involve one pilot, at least one client and at least one guide. Pilots and guides are employees. Most expeditions contain groups of people who don't know each other, and each client pays an actual expedition fee. We need to explicitly record individual expedition fees since they are often different from the standard tour fee because of cruise-ship deals and on-the-spot bargaining. We record exactly one expedition type for each expedition. Pilots don't serve as guides and vice versa. The same pilot can participate in many expeditions. The same employee can be a guide for many expeditions. We have a frequent flier program for clients that participate in many expeditions. We do NOT record potential clients. There has been no interest thus far in the "Bear Watch" tour; i.e. we haven't organized any actual "Bear Watch" expeditions yet. However, the "Gold Rush Trek" tour has been extremely popular and we organized 15 "Gold Rush Trek" expeditions last month. We explicitly record the aircraft (one or more) used in each expedition – we use at least one aircraft in each expedition. The same aircraft can be used in more than one expedition. Not all of our current aircraft have been used in an expedition.

Q. Do you have other sources of profit?

A. Yes, on about 25% of the expeditions, AAE is able to get clients to buy some of their expedition supply items. This is a very lucrative part of their practice, because the markup on these items is quite high. When clients buy supply items in conjunction with an expedition, their "item surcharge" is calculated on the spot and added to their individual tour fee for payment. Supply items are linked to the expedition, but never directly to clients. Yesterday, during an expedition, we sold two jackets we bought ourselves (from a vendor) last month.

Assignment

1. Define an **E-R diagram**.

Define all entities, relationships, relationship attributes and cardinalities.

Note: You do NOT have to define the attributes.

2. Define the **Relational Database Structure**.

Attributes

Aircraft-Lease-fee

Lease-contract-#

SupplyItem-code

Location-name

Client-Expedition-actual-fee

AircraftType-fuel-capacity

Expedition-code

ExpeditionType-name

AircraftType-name

Purchase-invoice-#

SupplyItemCategory-name

Location-map-coordinates

Aircraft-Expedition-time

Client-code

Client-address

ExpeditionType-Location-sequence

SupplyItem-cost
Lease-contract-date
Vendor-name
SupplyItemCategory-ytd(year-to-date)-\$purchase
Employee-name
Aircraft-manufacturing-day
Purchase-date
ExpeditionType-expected-time-length
ExpeditionType-standard-fee
Client-name

Vendor-code
Aircraft-engine-#
SupplyItem-sale-price
Employee-code
SupplyItemCategory-ytd-\$sale
AircraftType-seating-capacity
SupplyItemCategory-description
Location-Location-distance
Expedition-item-surcharge