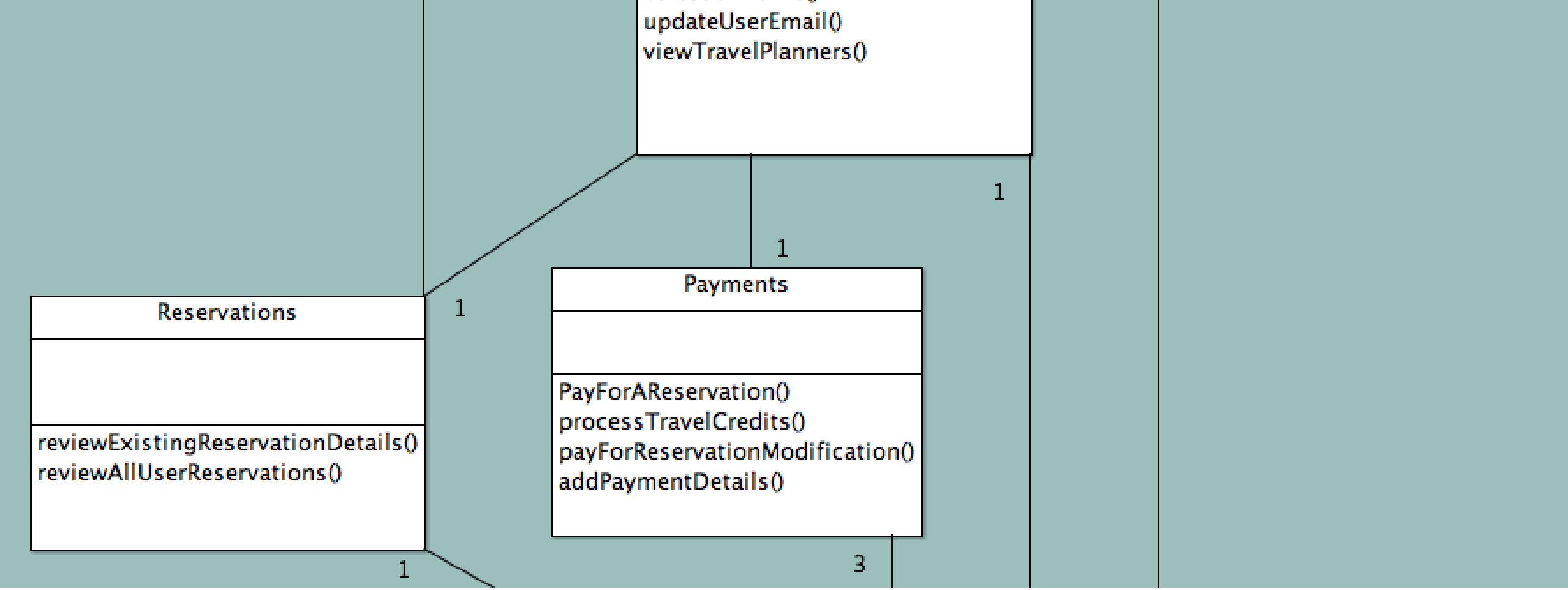


FLIGHT RESERVATION ARCHITECTURE

Beth Richardson and Gabe Eapen

DOMAIN

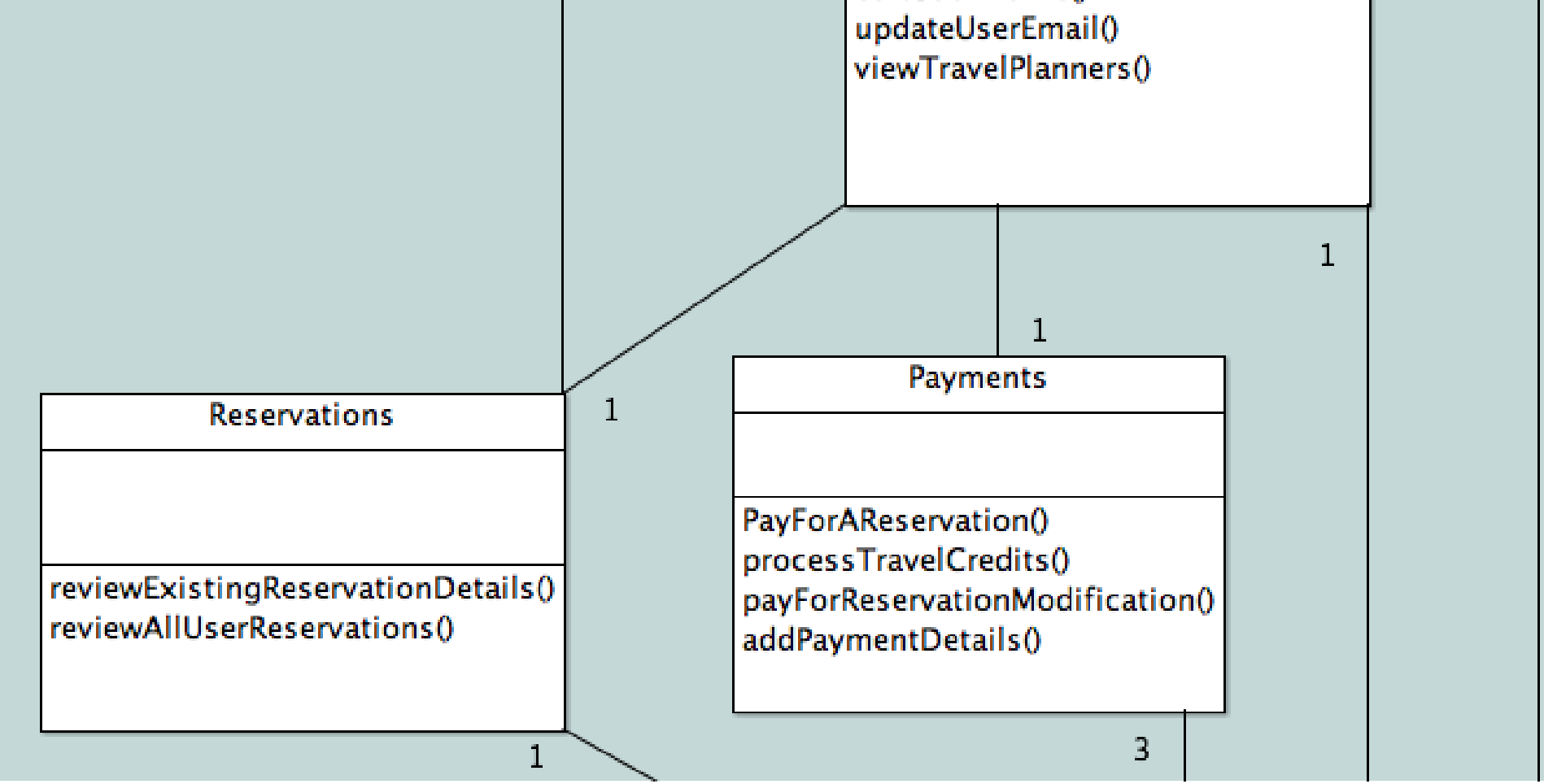
- Flight reservation system interacts with external carrier API
- Users can search for and reserve flights, watch fares, and share travel itinerary with friends
- It is cross-carrier like Orbitz or Google Flights

PRIORITIZED GOALS

- Availability
- Usability
- Performance
- Security
- Scalability
- Extensibility
- Data backup and recovery
- Maintainability
- Project Schedule
- Project Cost

WHY USABILITY AND AVAILABILITY?

- Must be approachable and understandable by all users
- Must not lead to costly errors through misjudgment
- To compete in a saturated market, must always be available to provide travel information and the ability to book flights as required

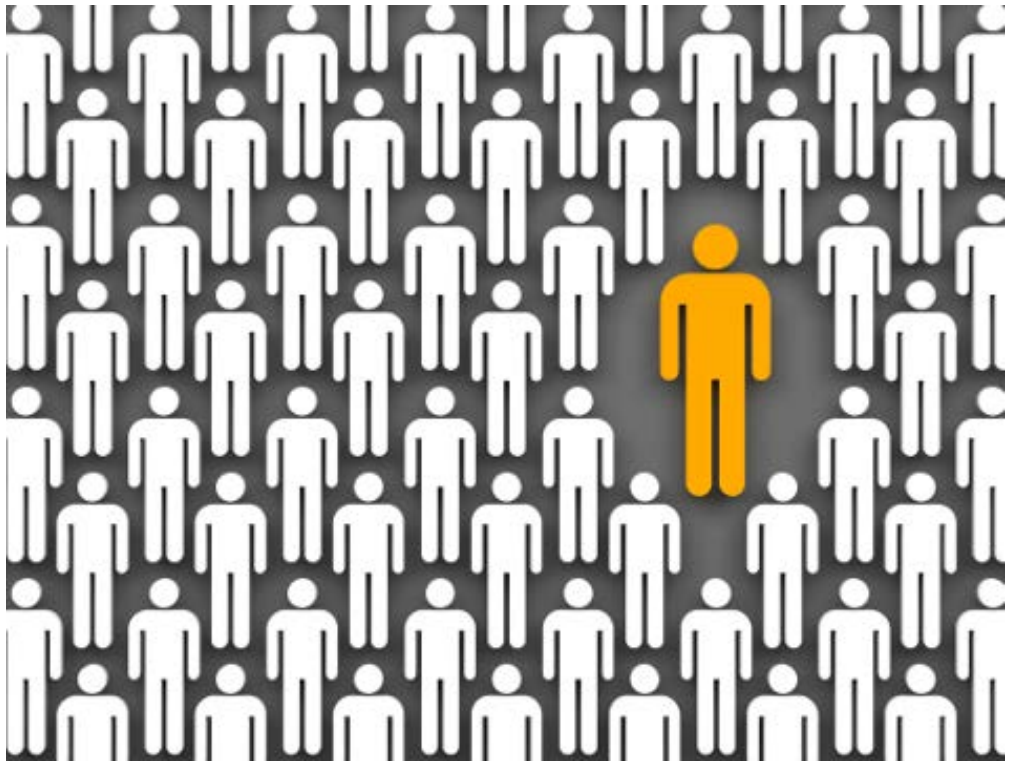


BOOTSTRAP

Business Blueprint Part 1

COMPONENTS: USER PROFILE

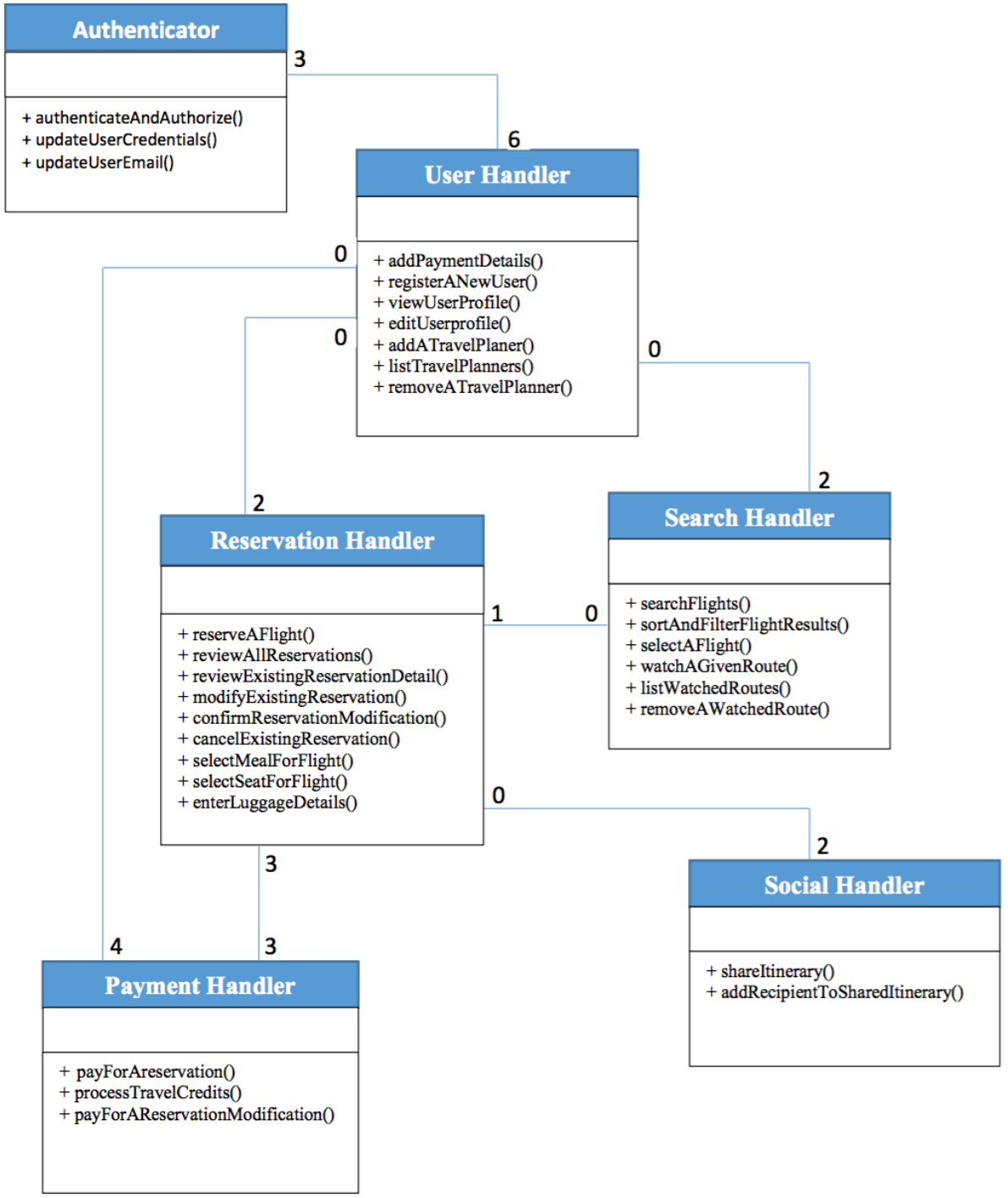
- **User:** Register, View, and Update Saved User Profiles
- **Authenticator:** Login and Update Credentials
- **Social:** Share Itineraries

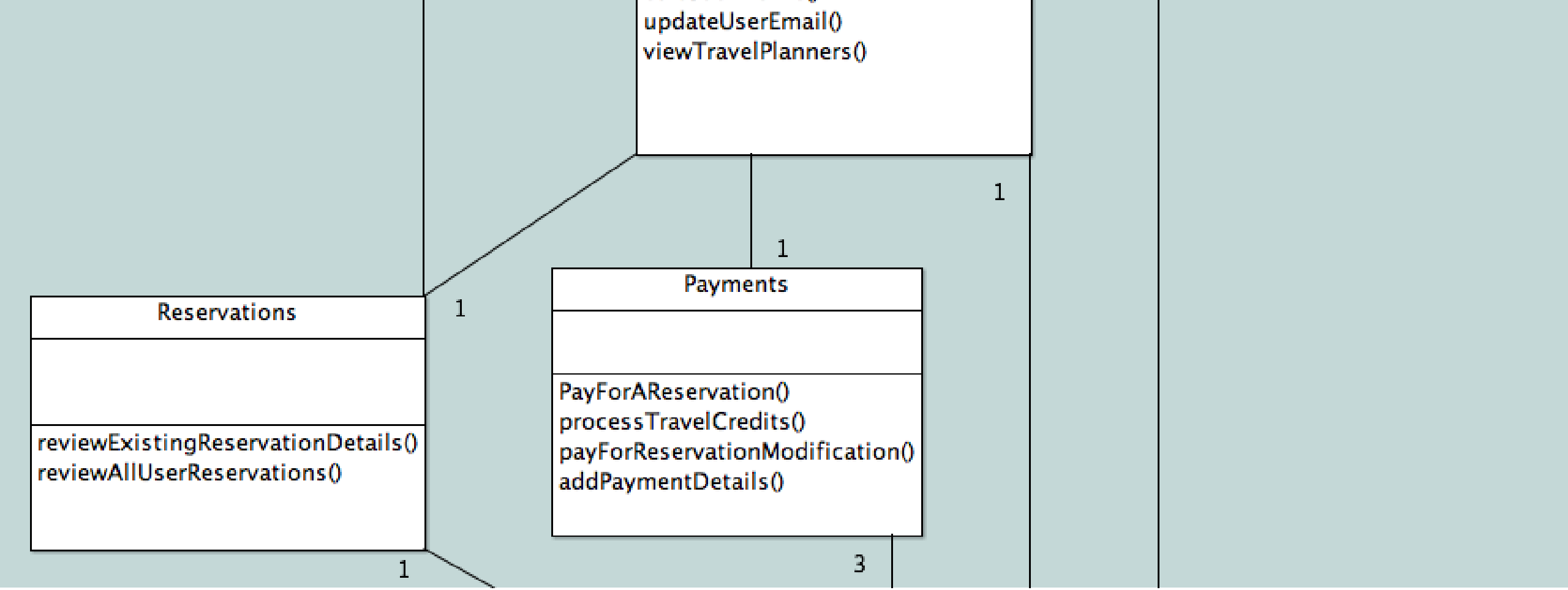


COMPONENTS: RESERVATIONS AND BOOKING

- **Search:** Search flights and watch routes
- **Reservations:** Reserve a flight, make modifications, or view existing reservations
- **Payments:** Pay for reservations or services

BOOTSTRAP


Authenticator
+ authenticateAndAuthorize()
+ updateUserCredentials()
+ updateUserEmail()
3
6
User Handler
+ addPaymentDetails()
+ registerANewUser()
+ viewUserProfile()
+ editUserprofile()
+ addATravelPlaner()
+ listTravelPlanners()
+ removeATravelPlanner()
0
0
0
2
2
Reservation Handler
+ reserveAFlight()
+ reviewAllReservations()
+ reviewExistingReservationDetail()
+ modifyExistingReservation()
+ confirmReservationModification()
+ cancelExistingReservation()
+ selectMealForFlight()
+ selectSeatForFlight()
+ enterLuggageDetails()
1
0
Search Handler
+ searchFlights()
+ sortAndFilterFlightResults()
+ selectAFlight()
+ watchAGivenRoute()
+ listWatchedRoutes()
+ removeAWatchedRoute()
0
2
Social Handler
+ shareItinerary()
+ addRecipientToSharedItinerary()
3
4
3
Payment Handler
+ payForAreservation()
+ processTravelCredits()
+ payForAReservationModification()

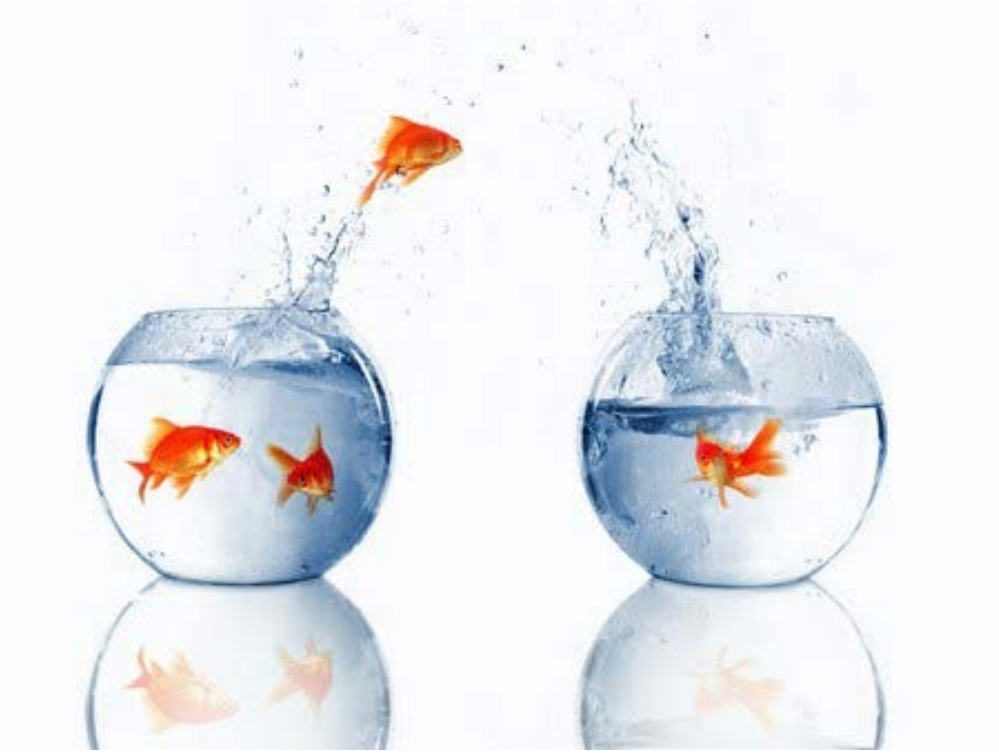


REFINED BLUEPRINT

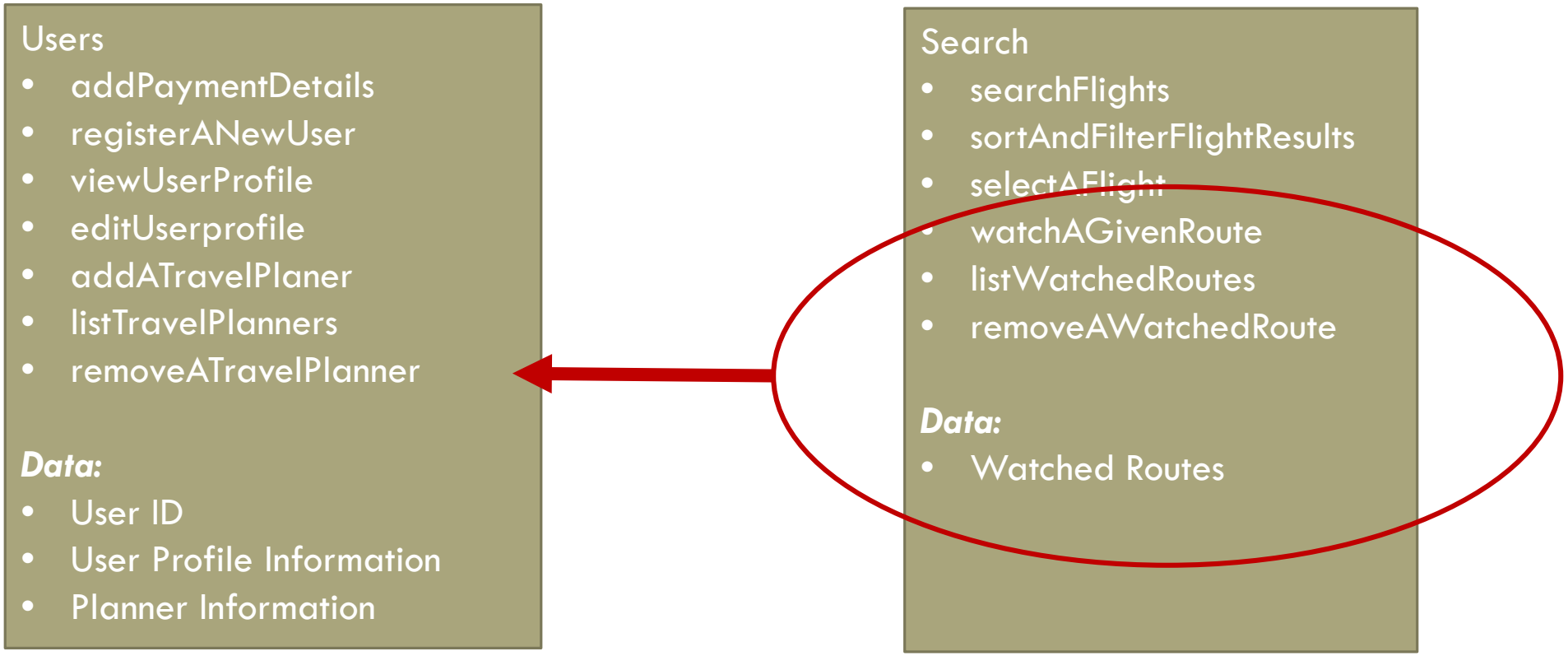
Business Blueprint Part 2

RECOMMENDED REFINEMENT

- Focus on improving Availability of our primary Search functions, which are in the Search Handler
- Move Watched Routes functions and data to the User Handler
- Search is the building block for reservations, is the first function a user will see and use, and will be consistently compared to our competitors



BOOTSTRAP

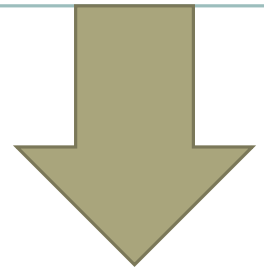

Users
addPaymentDetails
registerANewUser
viewUserProfile
editUserprofile
addATravelPlaner
listTravelPlanners
removeATravelPlanner
Data:
User ID
User Profile Information
Planner Information
Search
searchFlights
sortAndFilterFlightResults
selectAFlight
watchAGivenRoute
listWatchedRoutes
removeAWatchedRoute
Data:
Watched Routes

REFINEMENT

Users
- addPaymentDetails
- registerANewUser
- viewUserProfile
- editUserprofile
- addATravelPlaner
- listTravelPlanners
- removeATravelPlanner
- watchAGivenRoute
- listWatchedRoutes
- removeAWatchedRoute

Data:
- User ID
- User Profile Information
- Planner Information
- Watched Routes

Main component is streamlined and nimble!



Search
- searchFlights
- sortAndFilterFlightResults
- selectAFlight

Data:
- ***NONE***

QUANTITATIVE JUSTIFICATION

Search Handler:

- Reduced complexity rating from 22 to 9
- Reduced I/O by 50%
- Doubled the cohesion rating (66%)
- 50% less functions
- Almost no external dependencies and no internal data

User Handler:

- Slightly less dependent on other services
- Doubled the cohesion rating (30%)

QUALITATIVE JUSTIFICATION

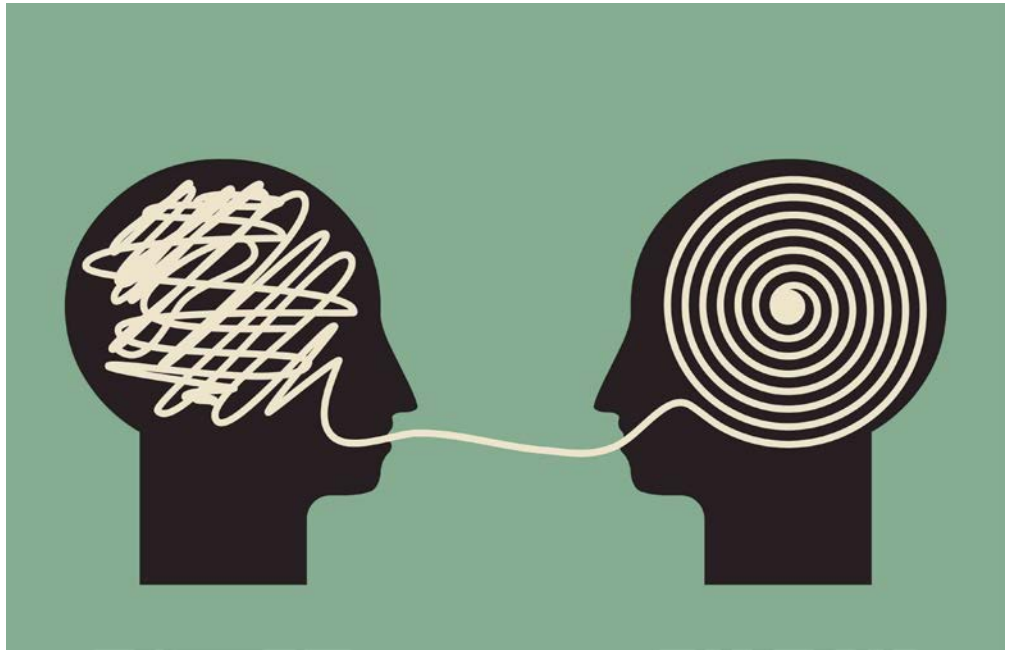
- By reducing coupling, we reduce potential dependency failure
- By limiting the size of the component, it is easier to scale independently, cluster, provide redundancy.
- By reducing complexity, we can avoid disruptive misconfigurations, resource over-utilization, and software errors.

TRADEOFFS

User Handler:

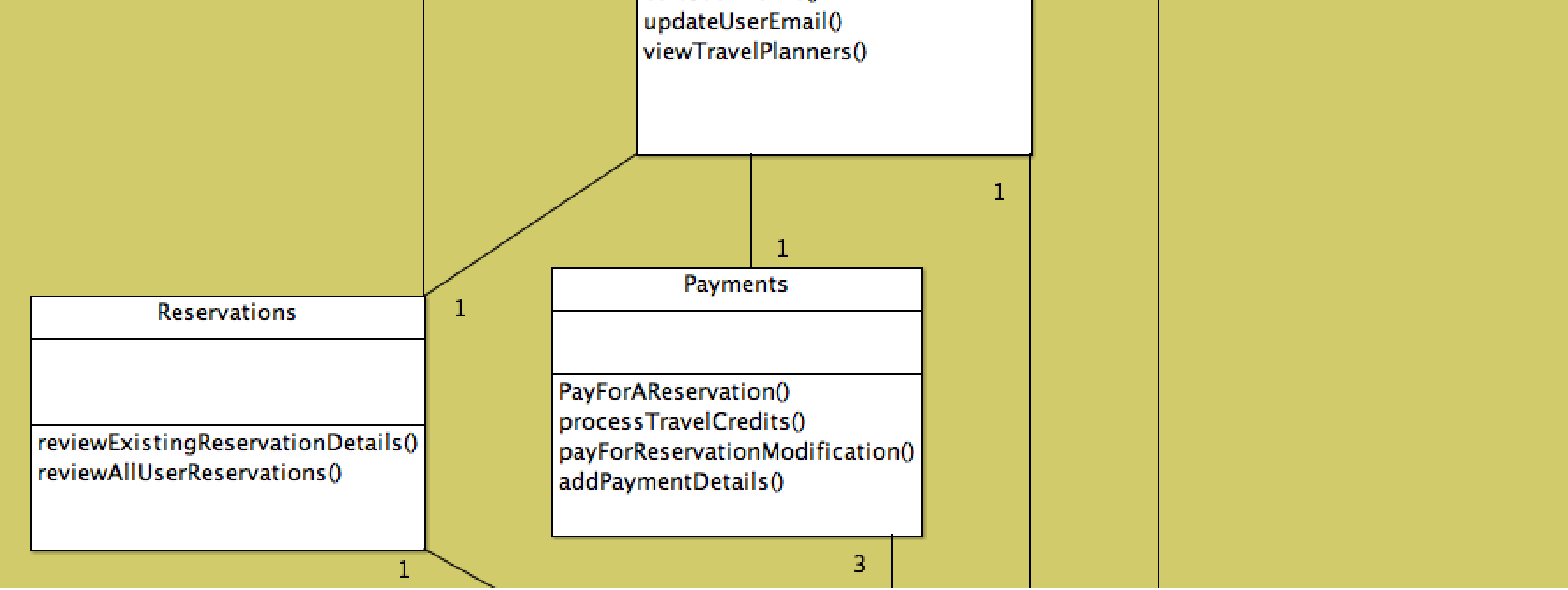
- Complexity goes up by 37%

- Potentially harder to provide Maintainability for this component.
- However, this is mitigated by the increased cohesion and decreased coupling for the component.



TRADEOFFS

Regardless, the User Handler does not affect the basic ability of a user to search for a flight and to make a reservation, which are the two primary functions on the site.



END

Questions?