

mugju

The voice-activated car sound system
for a shared music experience.

Current Needs

Problem Statement

Multi-user music experiences are limited in the car

- physical buttons limit accessibility depending on seating
- the playlist usually only reflects the driver's taste
- sharing of music between people is inconvenient

Manual control of music in the car can be dangerous

- attention is split between pressing buttons and driving

Mugu at a Glance

Basic Features

Entertainment System

- car voice user interface (VUI) for convenient music listening that all passengers can participate in

Music Sharing Experience

- share music collections between friends through a user profile system

Record of New Music Information

- information for all new music is saved online for future reference

Literature Review

Assorted Topics

Use Specific Vocabulary

- reinforce system keywords through prompts and mindset

Choose the Right Voice

- men are more appropriate for unemotional processes

Spindex & Spearcon

- lists of information can be difficult to navigate aurally

Earcons

- use sounds as confirmation and non-verbal notification to reduce interruption of user action

User Research

Initial Interviews

Users

sex: 4 males, 5 females

age: 21 – 80

own a car

drive regularly

Music Questions

In what format do you listen to music? On what devices?

How often do you listen to music? Where?

How do you find new music? Who do you trust for new music?

Driving Questions

Describe a typical (long/short) distance roadtrip.

What format of music do you listen to in the car?

How do you operate music alone? With Passengers?

User research

Findings

Music Format

mp3

satellite radio

analog radio

bought CDs

mixed CDs

Devices in car

ipods/ mp3 player

car radio

car CD player

satellite radio device

Learning About Music

- from friends and through the internet

Music in Car

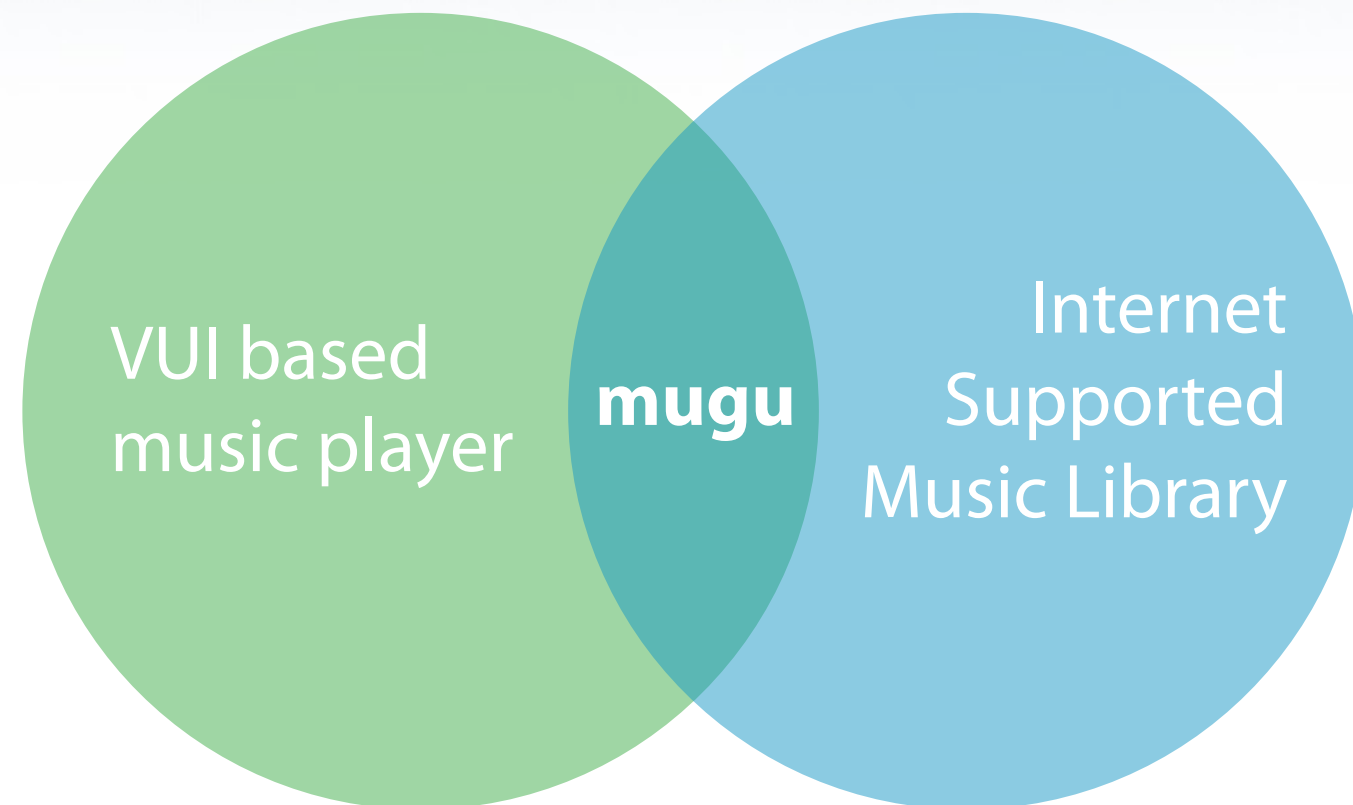
- centerpiece of the experience
- will drive just to listen
- more concerned with available selection on long trips

With Others

- driver will either control music selection or ask for input
- front passenger is responsible for actually changing music

Competitive Analysis

Music Control & VUI



Microsoft SYNC

- voice-activated car system to operate MP3 players, phones and USB drives

iTunes/iPod

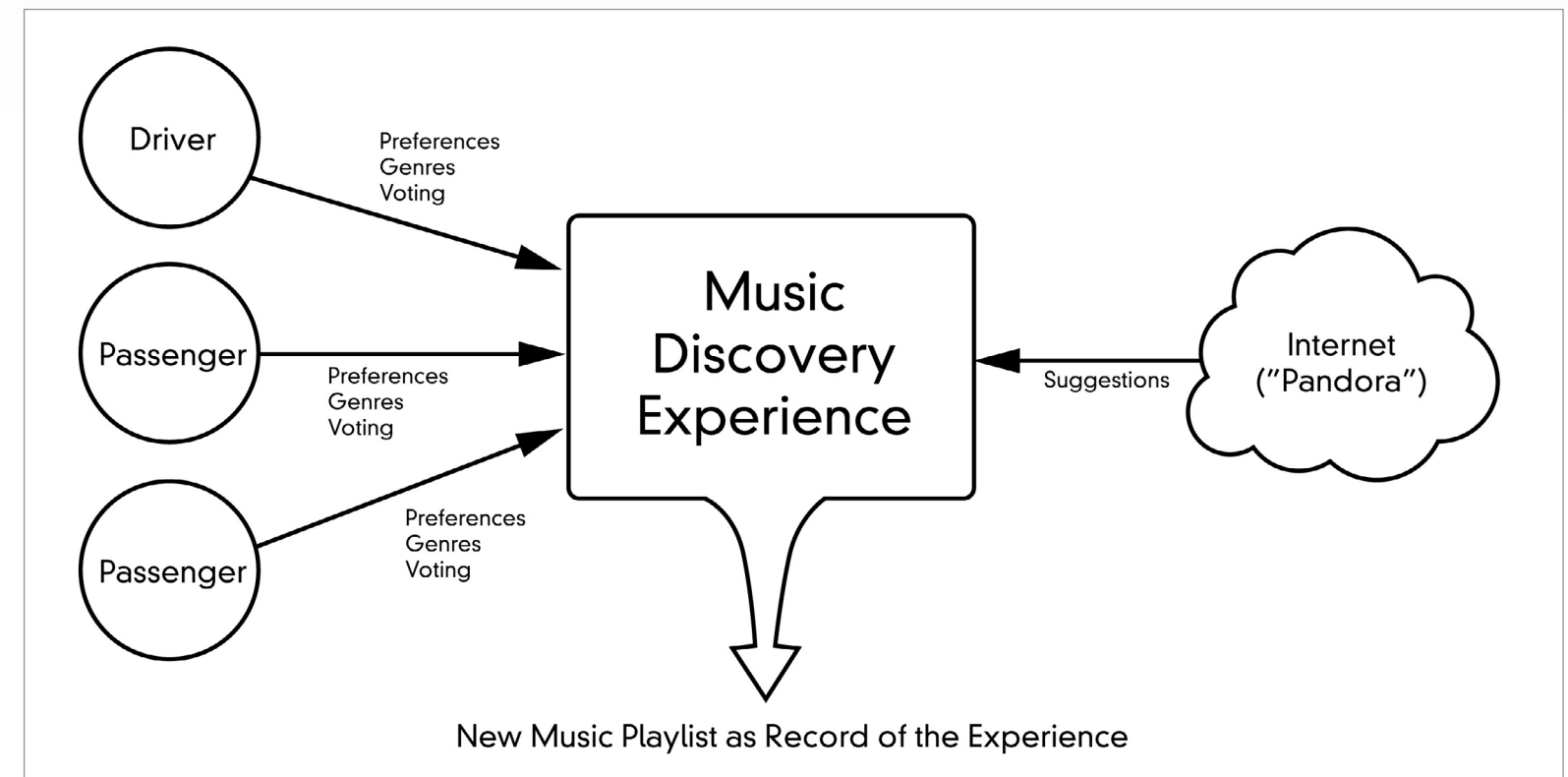
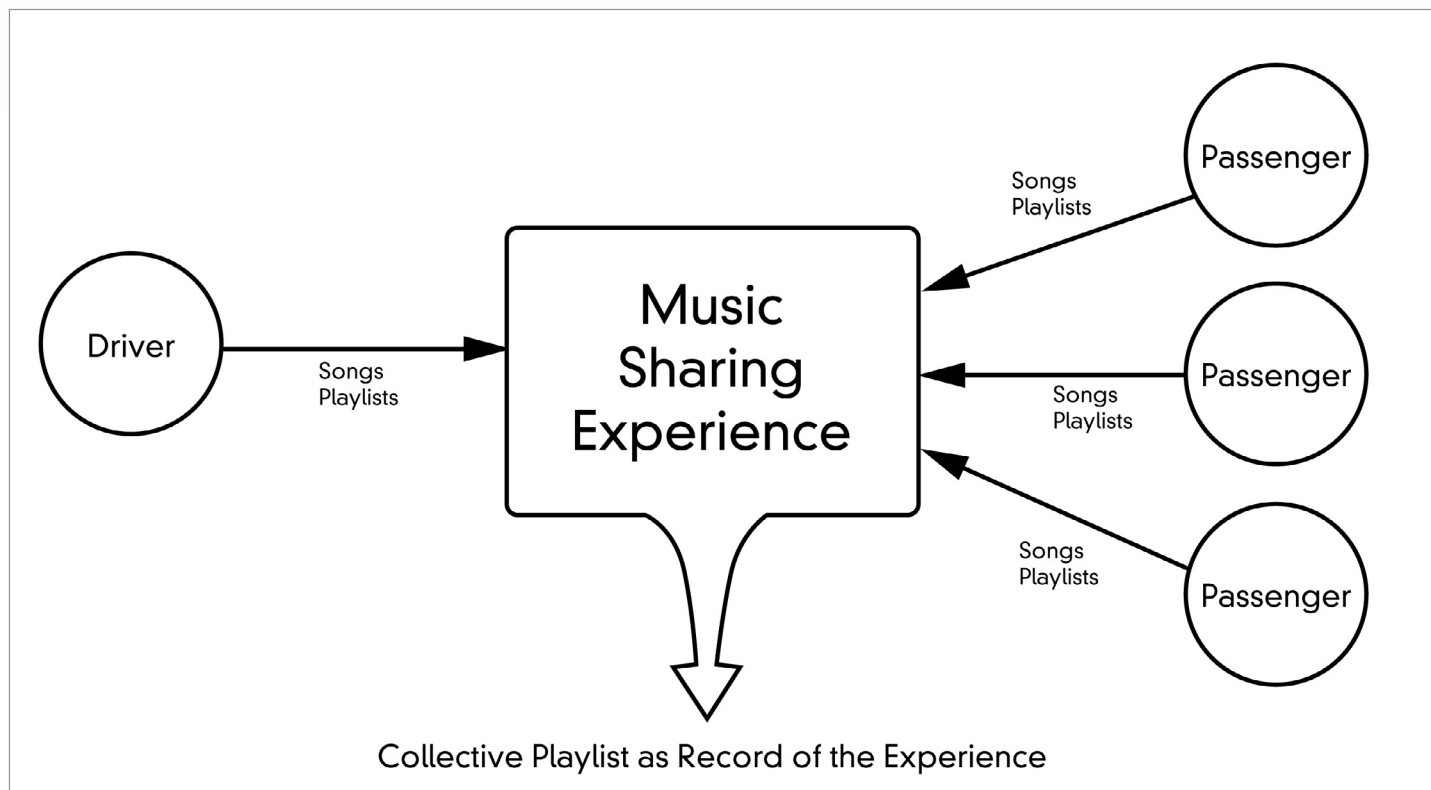
- music library system of owned music

Pandora

- customizable online radio

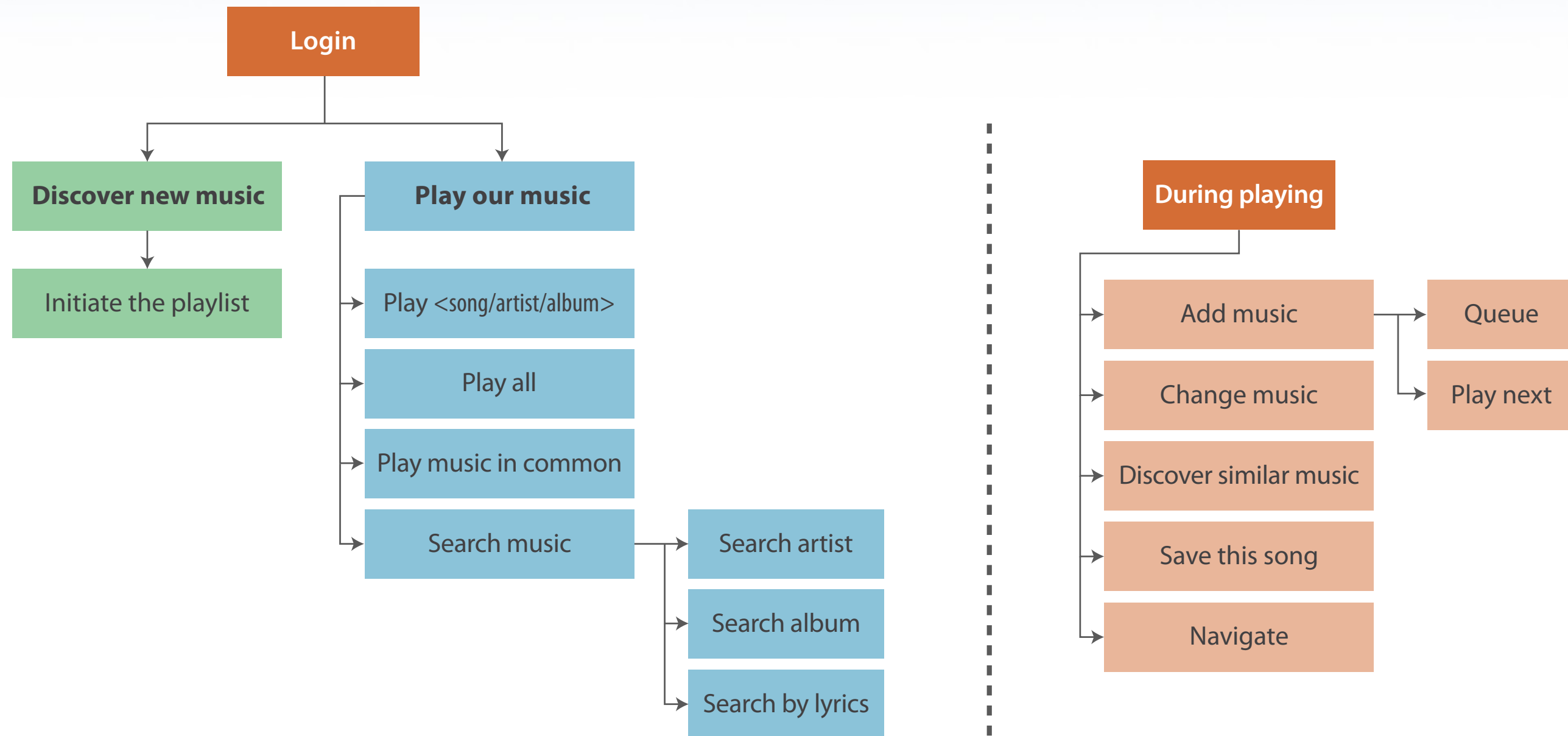
Initial Design

Initial Concept



Initial Design

Initial Flowchart



Speed Dating

User Groups

young married couple
2 undergraduate students
4 graduate students

Process

sat in car configuration
explained system
primed with scenario
walked through script
discussion about scenario
general discussion



Scenario 1

Play Common Music Across Passengers

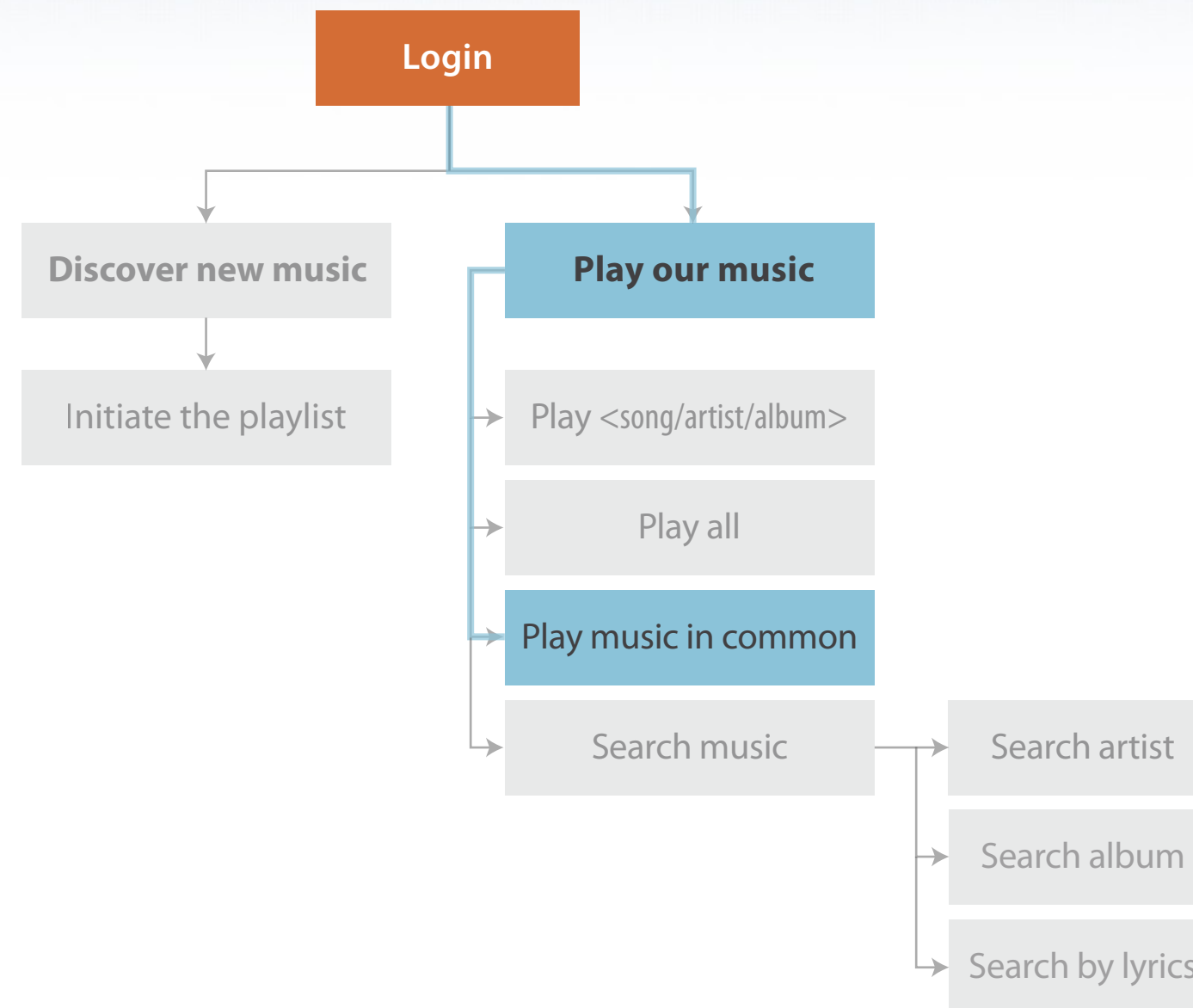
Need

Only play music that everyone knows/owns.

Lead

Have you ever wanted to comfort your passengers by playing music you all own?

Have you ever wanted to find out what music you and others all own?



Scenario 2

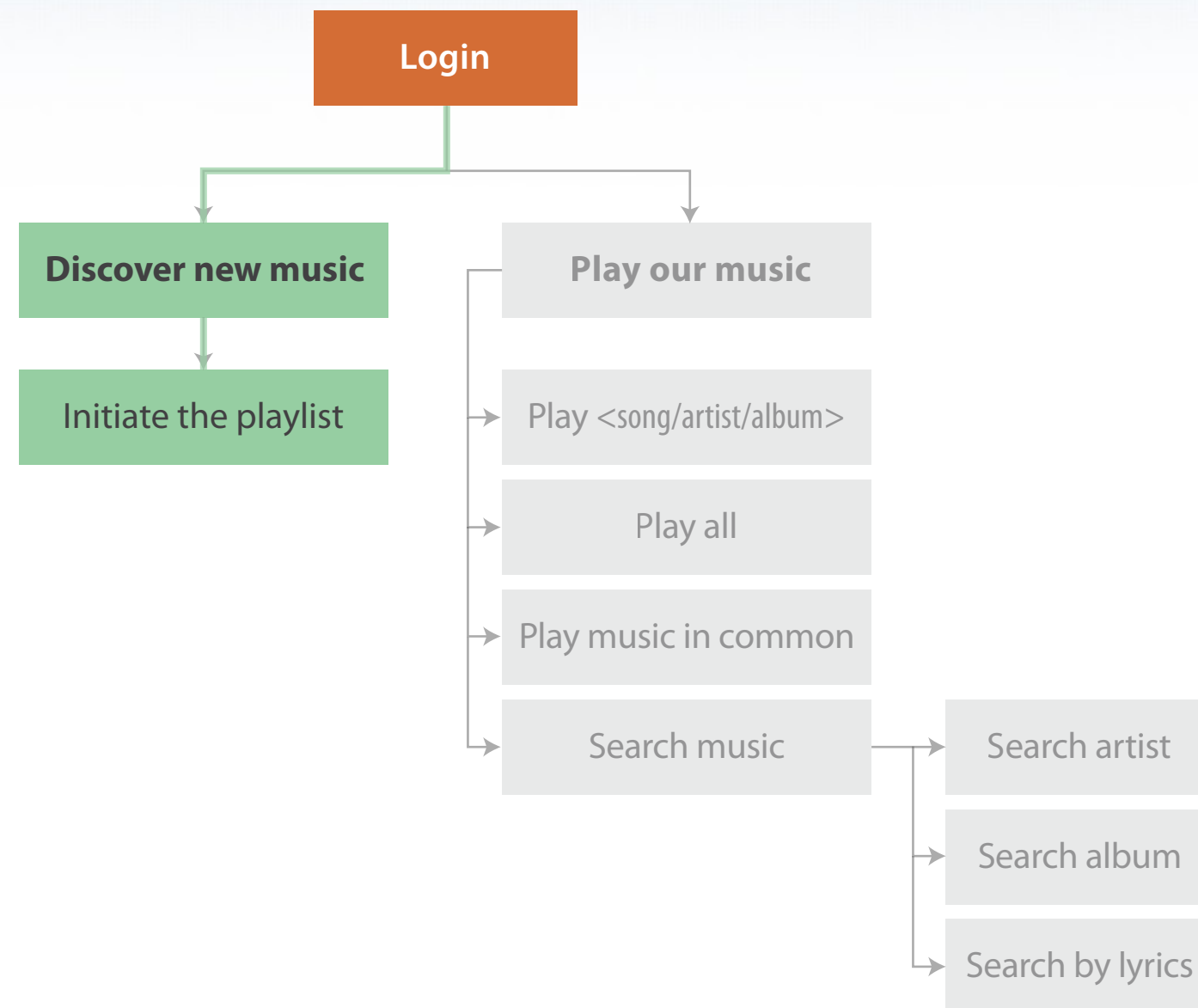
Discover New Music

Need

Find new music based on multiple people's tastes.

Lead

Have you ever been tired of your music selection in the car and want to find more that you like?



Scenario 3

Add Music to Playlist / Save Music to Account

Need

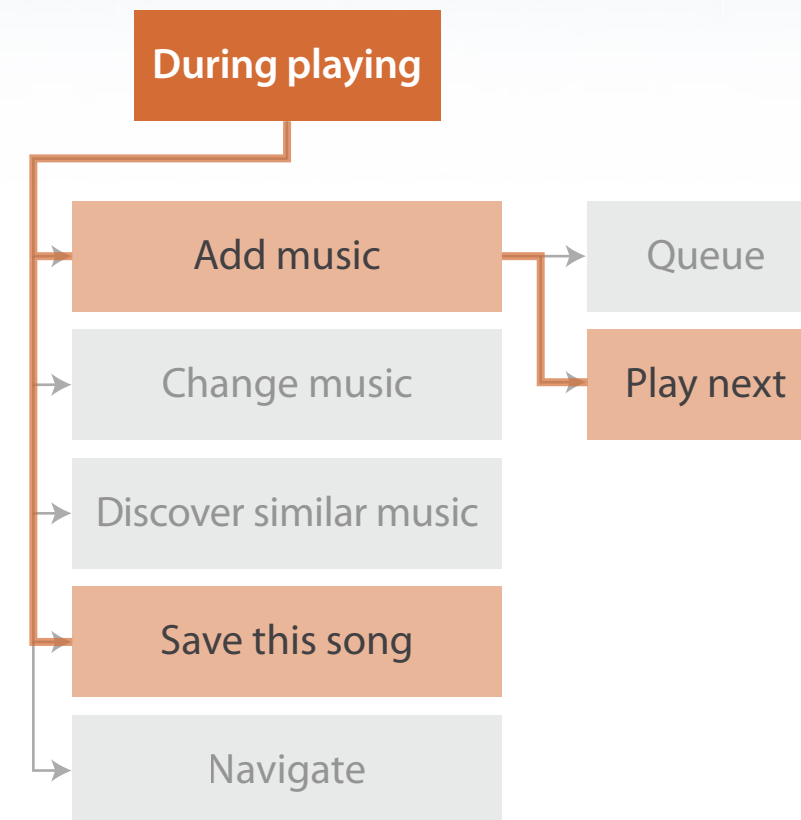
Allow all passengers to add to the current playlist.

Save song information for future reference.

Lead

Have you ever wanted to easily share a song with a friend while driving?

Have you ever want to contribute to the music selection as a passenger in someone else's car?



Scenario 4

Search by lyrics

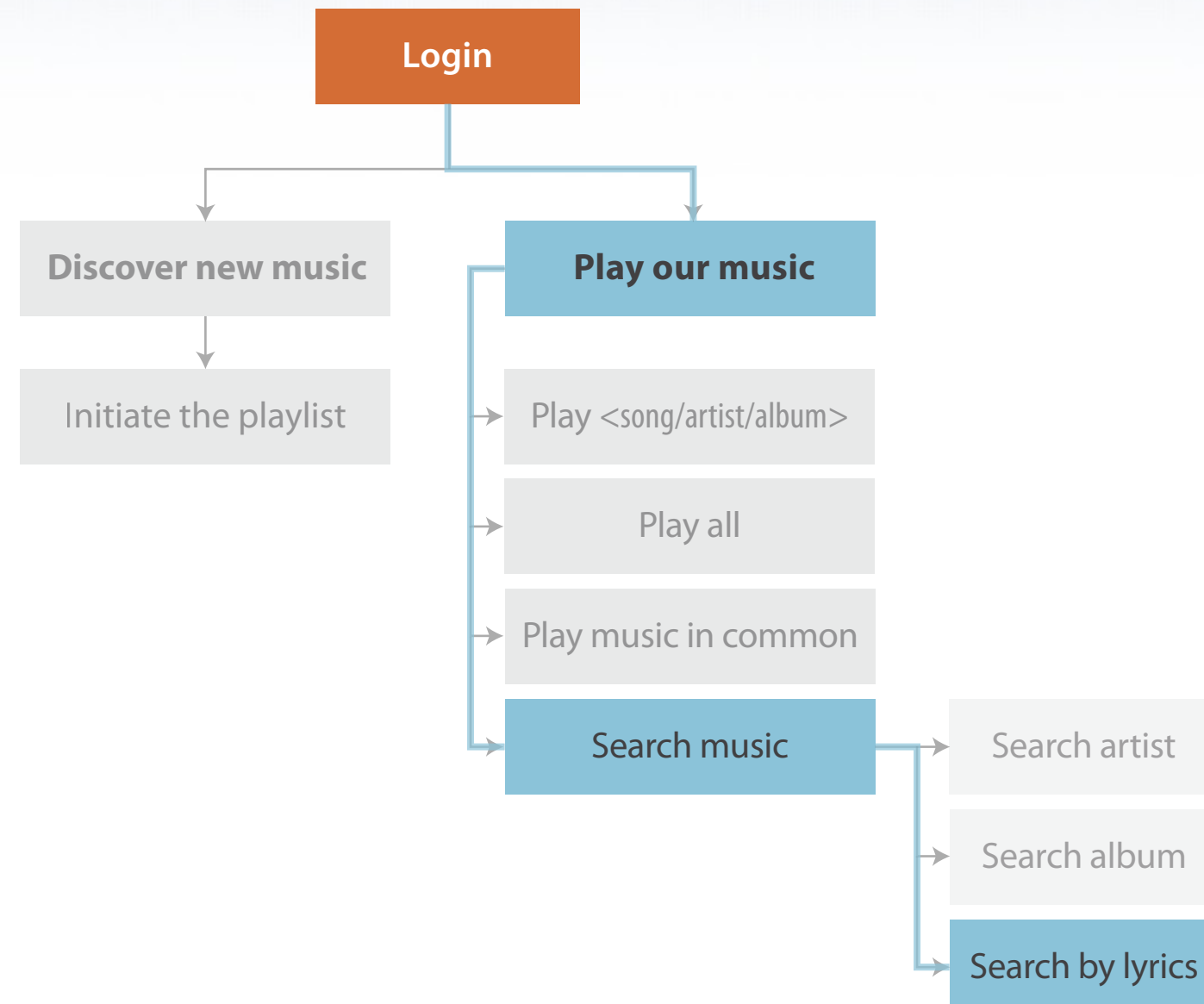
Need

Identify/Play a song when you only know some lyrics

Lead

Have you ever forgotten a song title but wanted to find it in your music library while driving?

Have you ever wanted to browse your music while driving?



Speed Dating

Findings

Prompts Are Too Long

- verbose lists of commands are overwhelming
- limit system conversation to promote user to user interaction

"...it seems like we are talking to the system instead of talking to each other..."

Word Choices

- keywords need to provide more feed-forward
- organization of prompts was sometimes confusing

Add Sound Other Than Prompts

- use sound clips on searching and confirmation earcons

Speed Dating

Changes to the Design

Simplified Prompts

- shortened many prompts to avoid annoying users

Example:

Before

What should I play? You can say “play” followed by a title, artist or album OR say “play all” to play music from everyone’s library OR say “play music in common” to play music you all share OR say “search” to search your music library.

After

What would you like to do? Say “play”, or say “play all”, or say “browse”.

Speed Dating

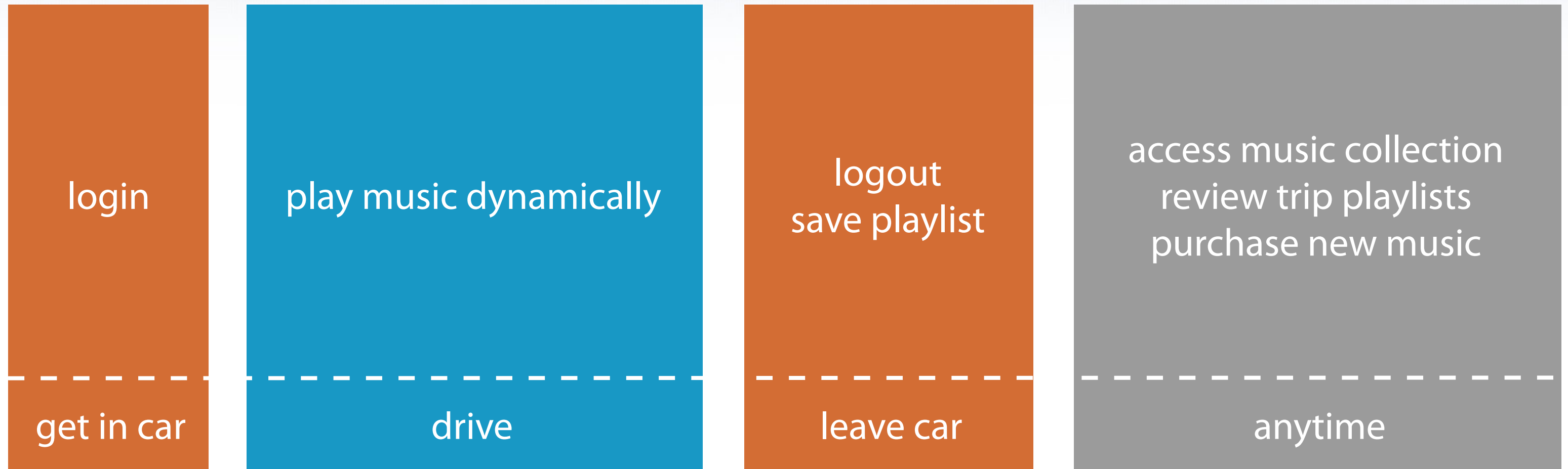
Changes to the Design

Streamlined System

- removed Pandora-style listening - didn't contribute to shared music experience
- removed saving individual song information - not necessary since entire playlist is saved at the end of the trip
- simplified play commands - removed confusing "play next" command

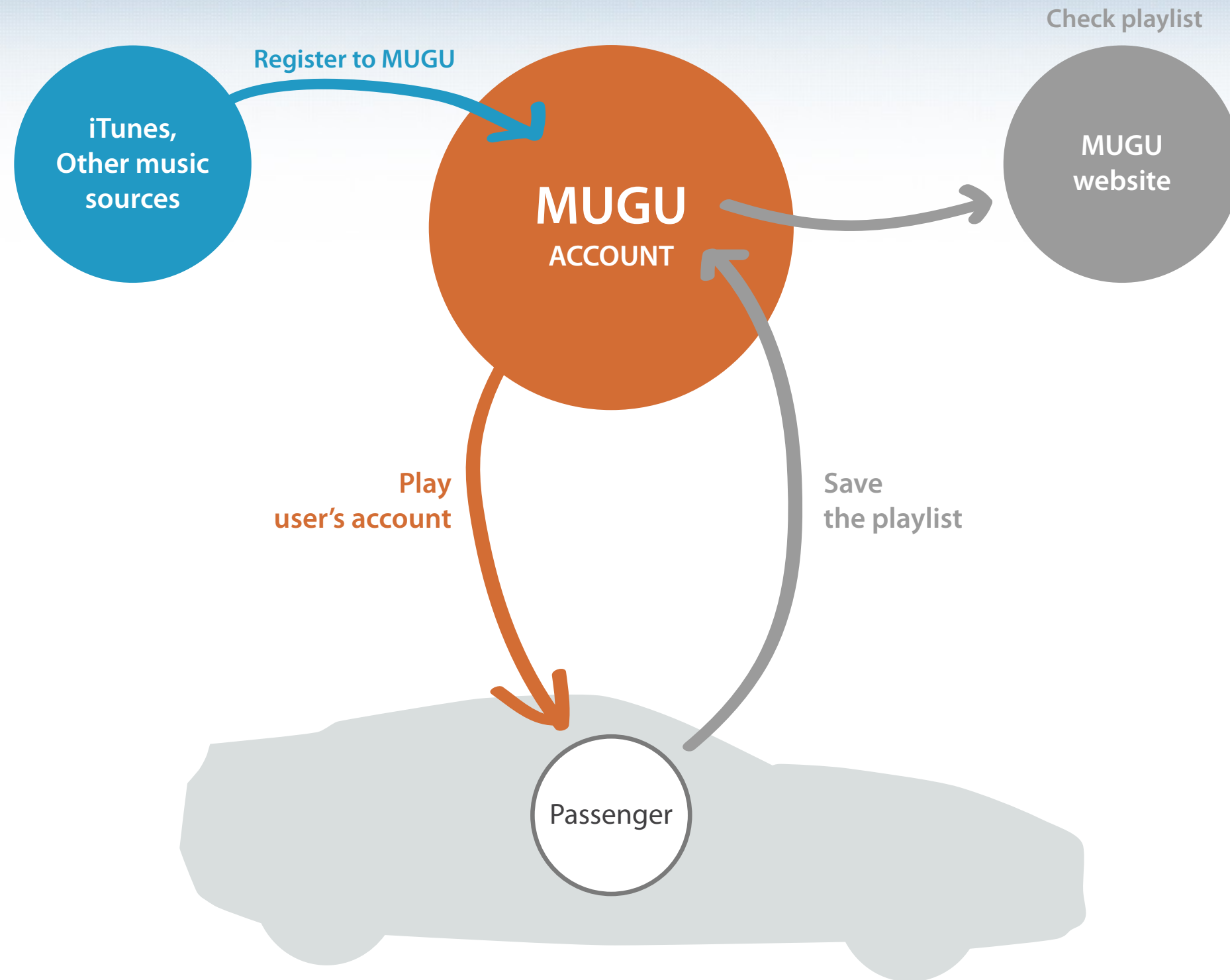
Overview

Basic Experience



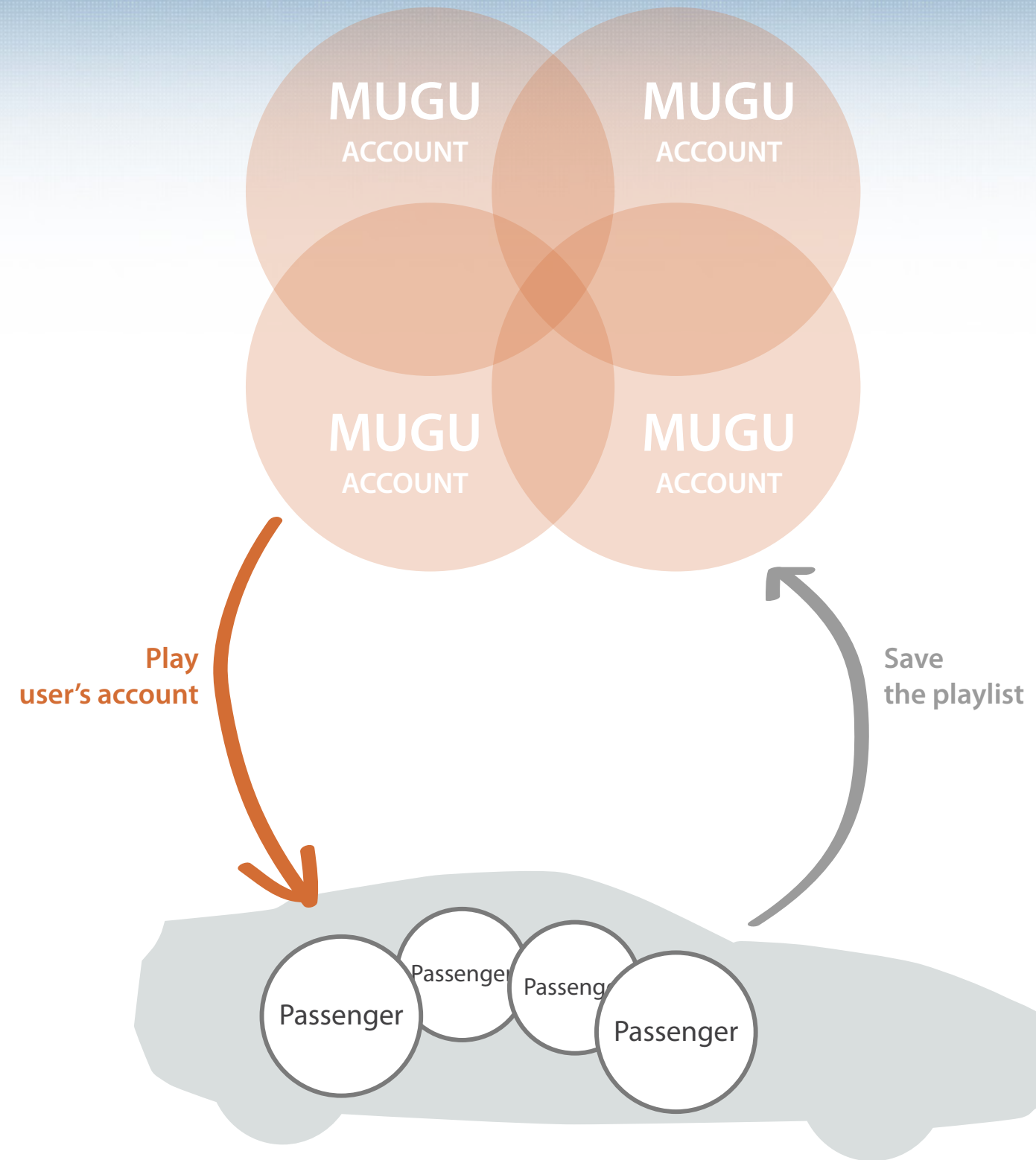
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Basic Structure



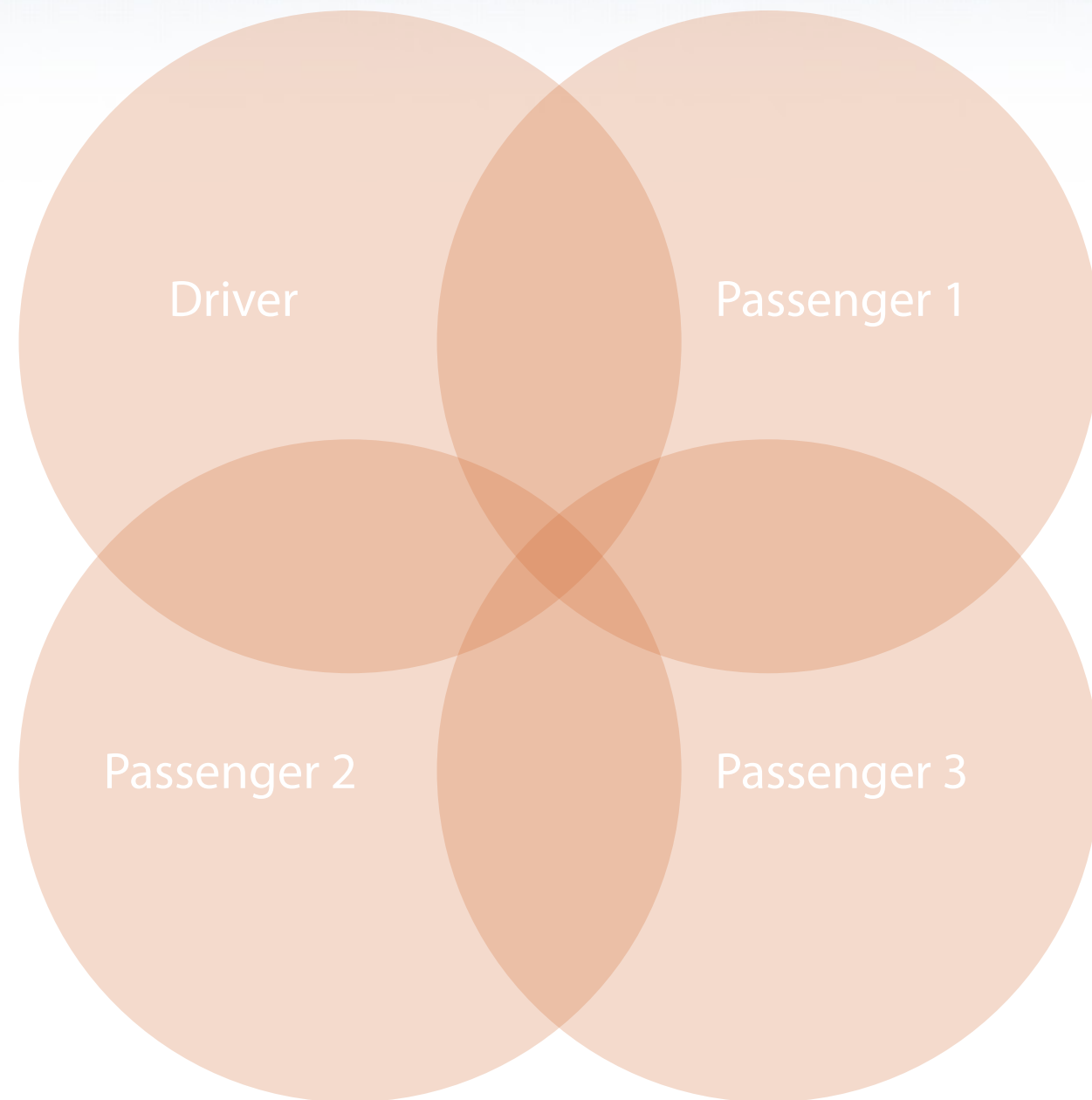
Overview

Basic Structure



Social Experience

Combinations of Music



Play All

- randomly play from all available music

Play Common

- randomly play from mutually owned music

Play <selection> / Add<selection>

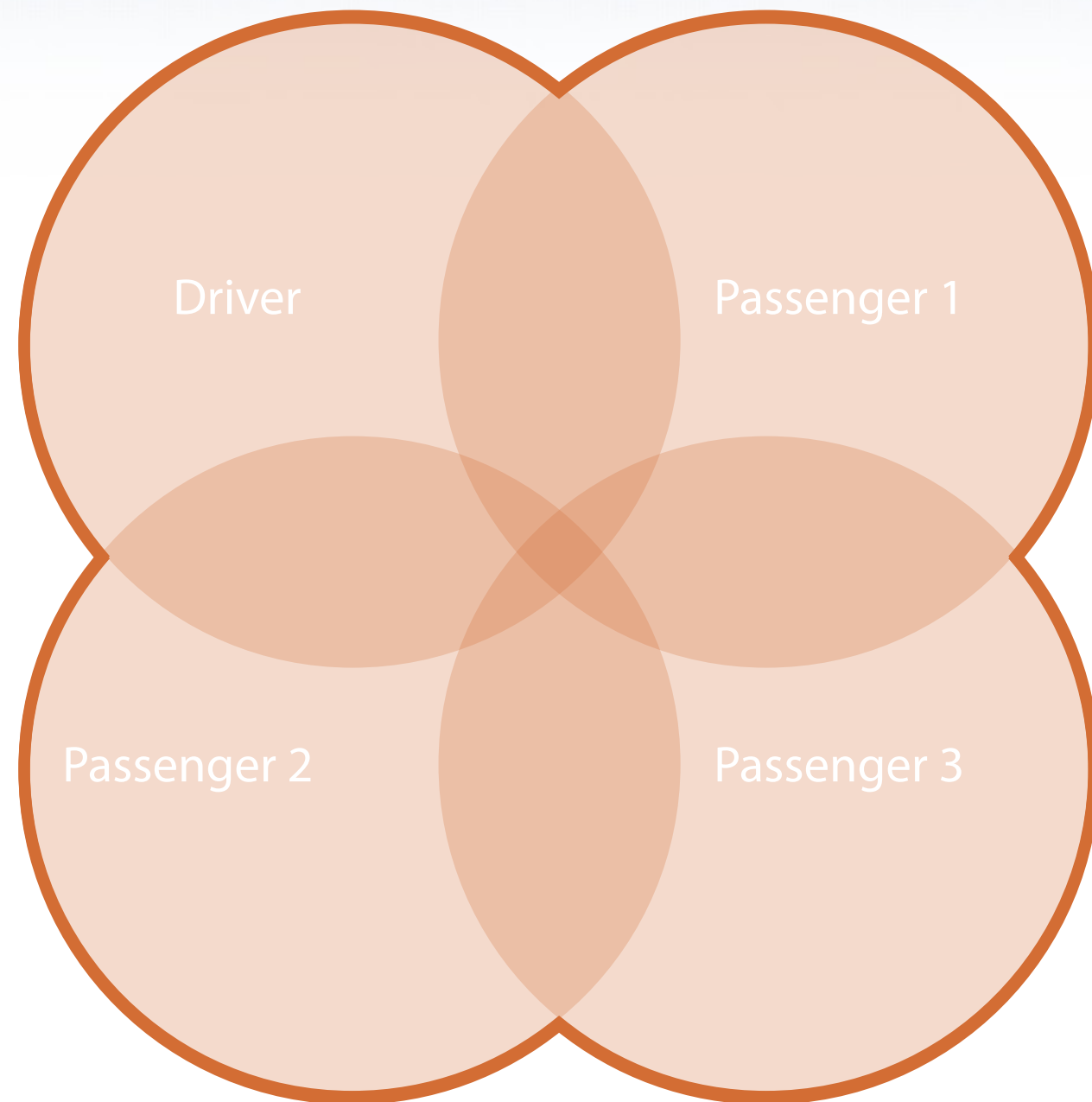
- play music by directly calling out an artist, album, or song

Browse <selection>

- search a collective list of music by artist, album, song, genre, or lyrics

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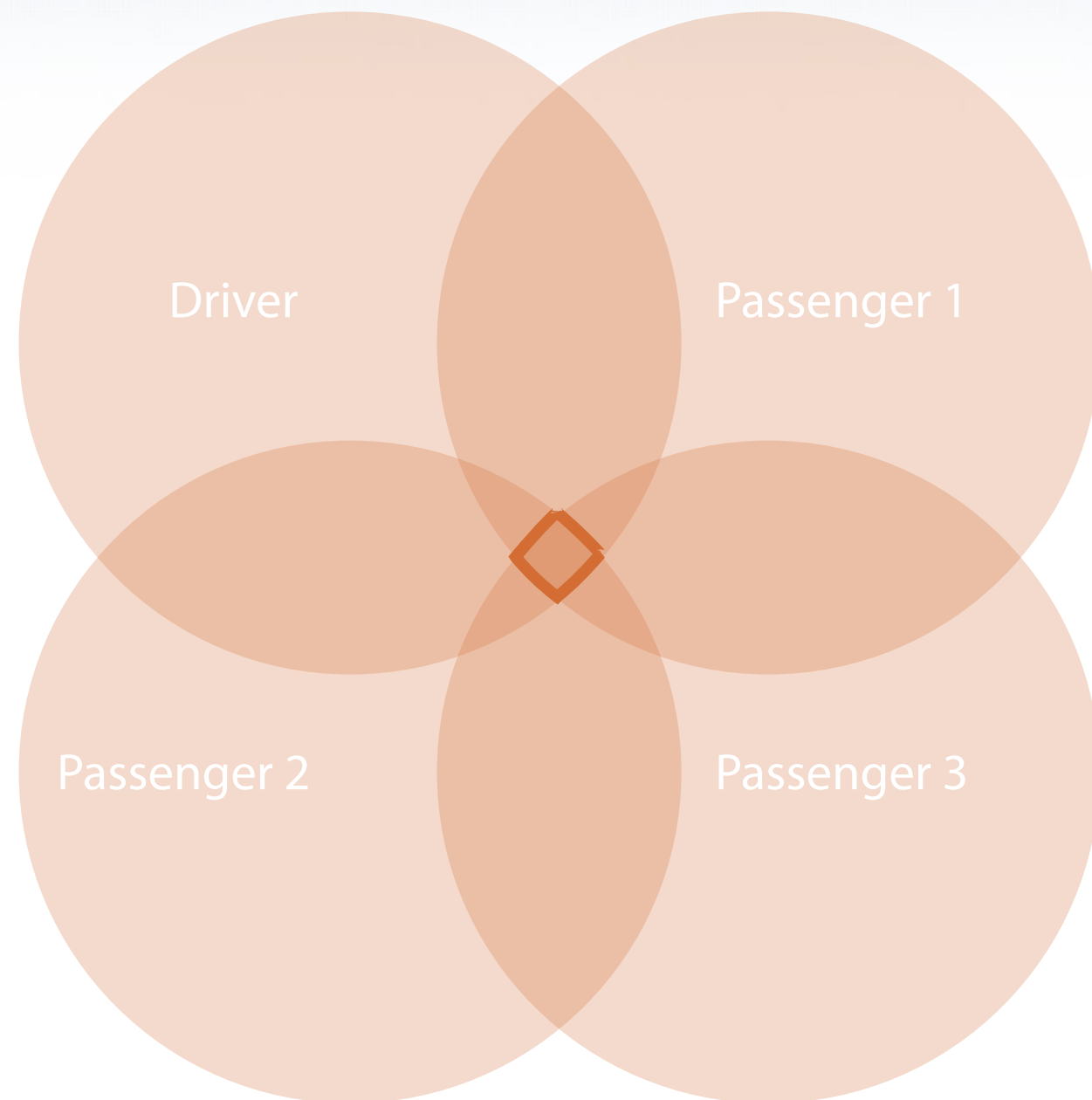
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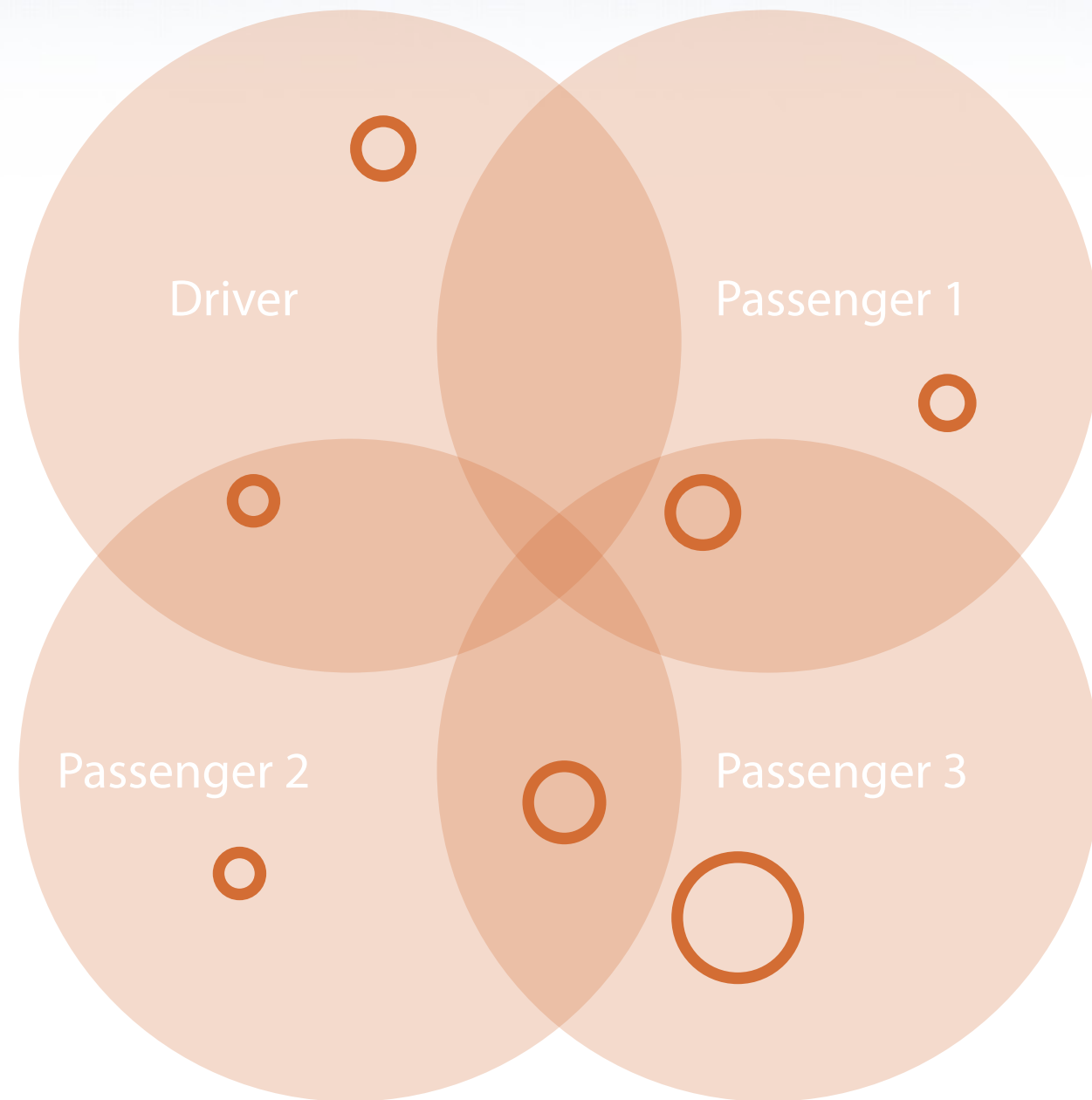
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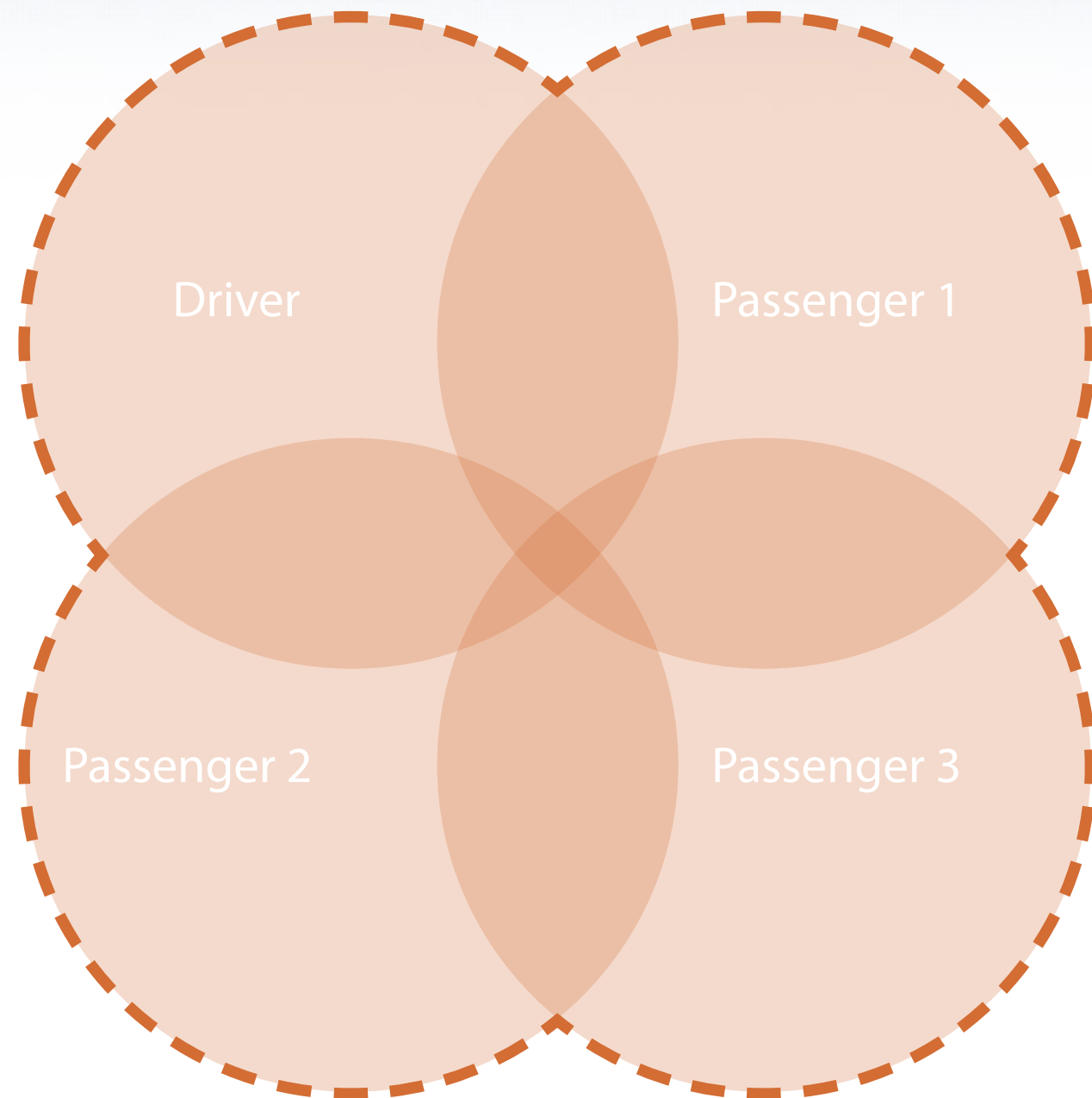
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Managing Lists

Spearcons

What are spearcons?

- spearcons (speech earcons) are produced by speeding up voice clips, creating a sort of aural “fingerprint” of the original clip
- fast enough to use for listing large sets of data

Why do they work?

- human ear is still able to recognize the spearcon and relate it with the original voice clip

How do users control them?

- say “faster” / “slower” to change speed of listing
- can interrupt at any time to stop the listing or play music

Conversation Flow

Novice vs. Expert

Novice

What would you like to do? Say “play”, or say “play all”, or say “browse”.

Play

Please say an artist, album or song that you would like to play.

The Beatles

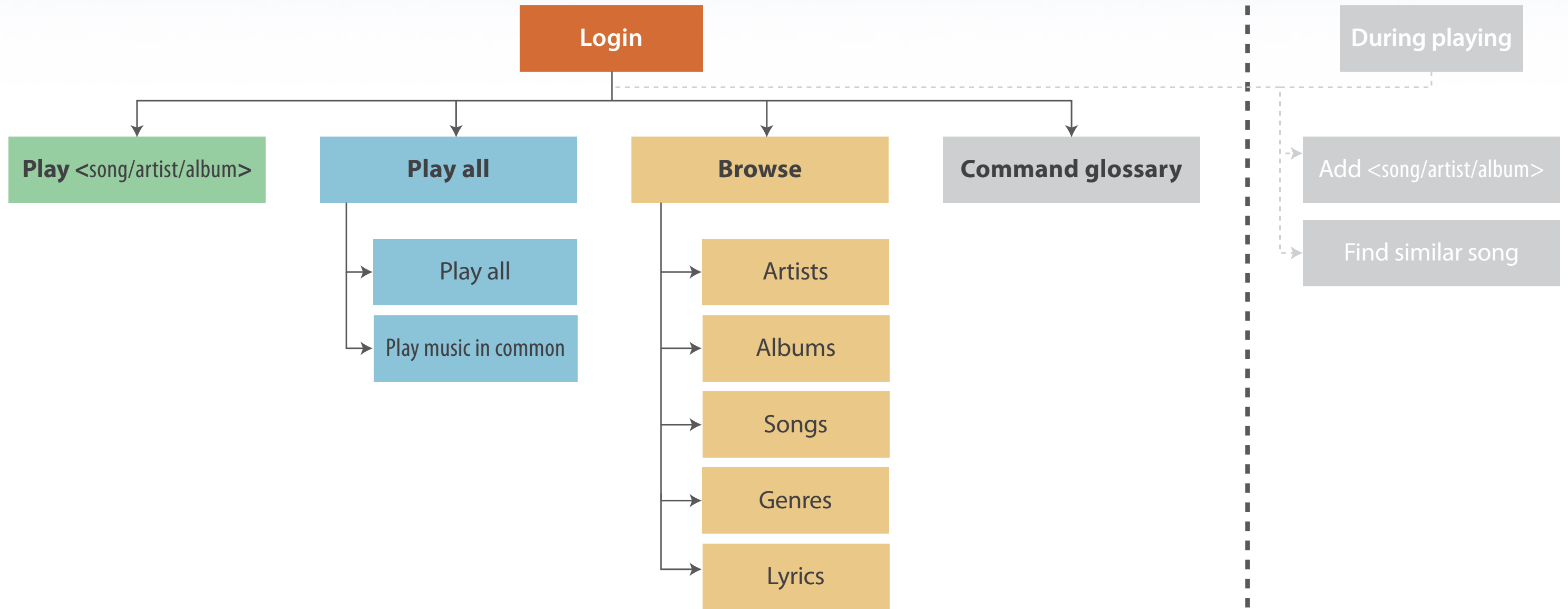
Expert

What would you like to do?

Play The Beatles

Features

Final Flow Chart



Personas

Annie, John, Chad, and Carry

Annie, 20 (*Driver*)

John, 22 (*Passenger 1*)

Chad, 21 (*Passenger 2*)

Carry, 21 (*Passenger 3*)

Group Dynamic

- four friends attending the University of Michigan
- originally from different parts of the country
- love taking spontaneous road trips to other cities (i.e. Cleveland, Chicago, Toronto, etc.)
- each have particular music taste
- collectively enjoy their cross-pollination of music

Life goals

- finish school with their sanity in tact
- remain close friends

Personas

Their Goals

Annie, 20 (*Driver*)

John, 22 (*Passenger 1*)

Chad, 21 (*Passenger 2*)

Carry, 21 (*Passenger 3*)

Experience goals

- feel connected to each others music interests
- feel amusement in finding out what music they all share
- feel excitement of the discovery of new music that they like
- feel comfort of having a music selection at hand

End goals

- share songs and artists with each other
- have conversations about music with their friends
- make long trips enjoyable and create college memorable
- easily navigate their music libraries

Video Demo

Scenario

Annie, John, Chad, and Carrie are driving from the University of Michigan (Detroit) to Chicago for a concert.

After the concert, they take their return trip during which they discuss the great music that they heard.

Lessons Learned

Limit Command Lists

- when designing voice user interfaces, it is very easy to create menus that are too cluttered and complex

Product Differentiation

- make sure the system is truly reaching an un-met need
- constantly re-evaluate if the system is targeting the need

Narrow Your Focus

- don't try to take on too much functionality, simplicity is good

What's Next?

Another Session of User Testing

- test latest version of prompts and system hierarchy

Refine the Spearcons

- create more ease in browsing lists

Develop the Online System/ Internet GUI

- create wireframes and skins for internet component

Re-examine Ideas Left Behind

- re-evaluate need for Pandora functionality and saving individual songs

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