2017 Fall
Integration of Systems
and Business Informatics
Final Project

Big Data Marketing : KJ Rental

Team 5
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계지연 김가연 박보연
최용승 허주연

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Executive Summary of the Project

2 Project Objective
Maximizing the Profit of KJ Rental

3 Environmental Analysis
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4 Suggestion
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5 Data Modeling
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6 Prototypes
Smartphone Applications

7 Conclusion
Wrap-up

1 Summary

Executive Summary of the Project

Goal

Maximize the Profit in Long-term Rent Business

Strategies

Differentiation – Business Model

Environment

Mobility: Car Sharing

Suggestion

A New Business Model: Long-term Rent + Short-term Car Sharing

Small Businesses	• Select a Car Model • Make a Reservation	• Fixed Rental Fee • Variable Rental Costs
Prediction Model	App & Web Page	

2 Project Objective

Maximizing the Profit of KJ Rental

Cost

AJ Rent-a-car

Account	2016 Operating Expense	Percentage
Used Car Sales Cost	197,867,004	32.18%
Insurance	40,477,680	6.58%
Fee	30,175,839	4.91%
Vehicle Maintenance	40,201,358	6.54%
Depreciation Cost	229,335,403	37.29%
...	...	...
Sum	614,922,935	100.00%

“ Cost Reduction ”

Revenue

Maintenance

Dash Camera

Gas Support

“ Service Differentiation ”

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“ Cost Reduction ”

Not Feasible

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“ Cost Reduction ”

Not Feasible

Revenue

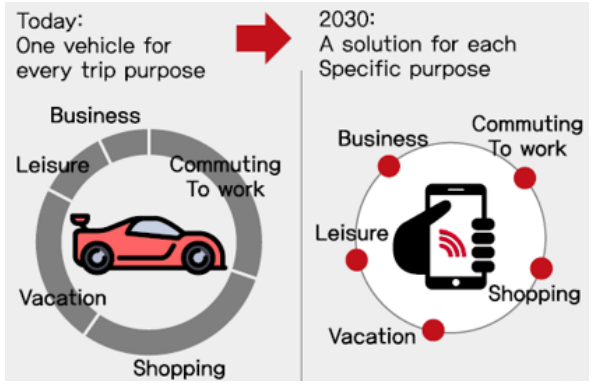
“ Business Model Differentiation ”

3 Trend in Car Rental Market

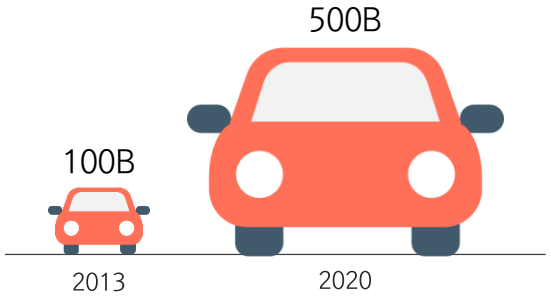
Environmental Analysis for New Business

Prospect of Car Sharing Market

Mckinsey



KPMG Research



Market Size (KRW)

Companies Focusing on Car Sharing Business

Car Manufacturing

KIA Motors

BMW

General Motors

Mercedes-Benz

New Companies

SOCAR

green car
대한민국 No.1 카셰어링

Other Business Sectors

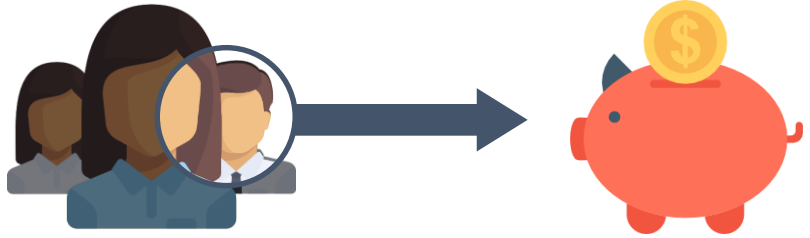
Hyundai Capital

GS Caltex

3 Customer & Competitor Analysis

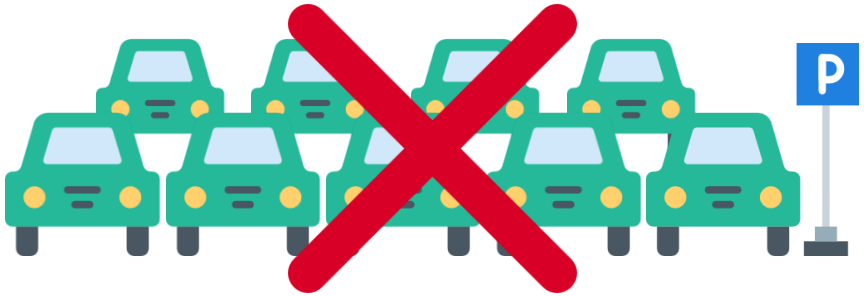
Environmental Analysis for New Business

Customer Analysis



Small Businesses

Cost Sensitive



Competitor Analysis

롯데렌터카

SK 렌터카

AJ 렌터카

Rent-a-car Companies

Car Sharing Market

4 Suggestion

Business Model Explanation

Fixed Earning

Variable Earning

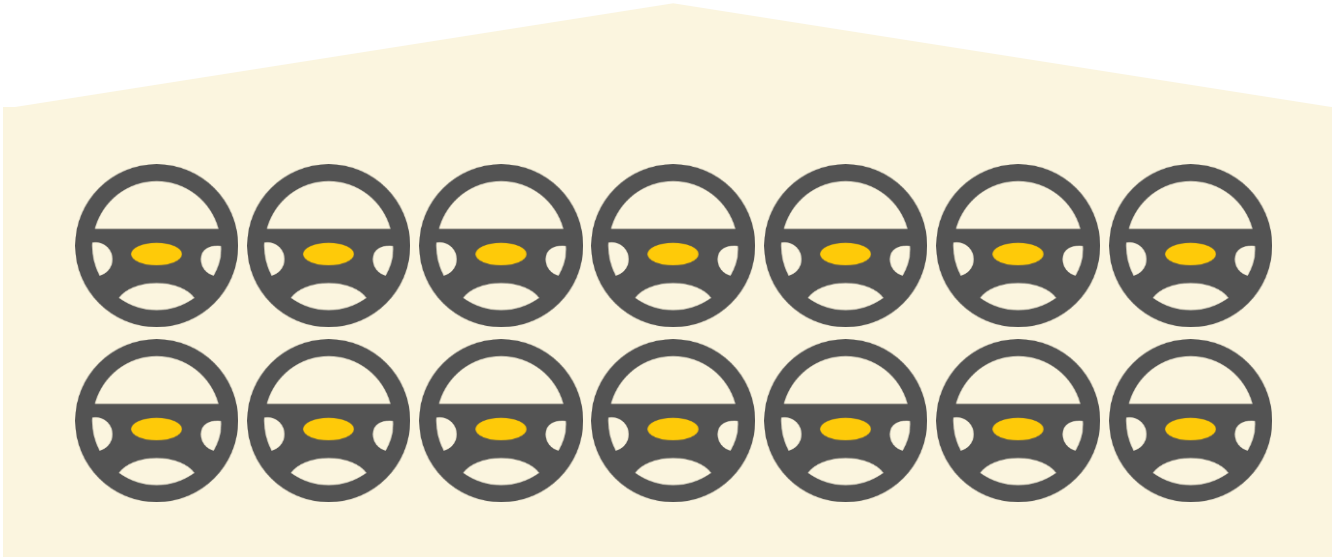
Select a car model

Make a reservation

4 Suggestion
Business Model Explanation

Fixed Earning

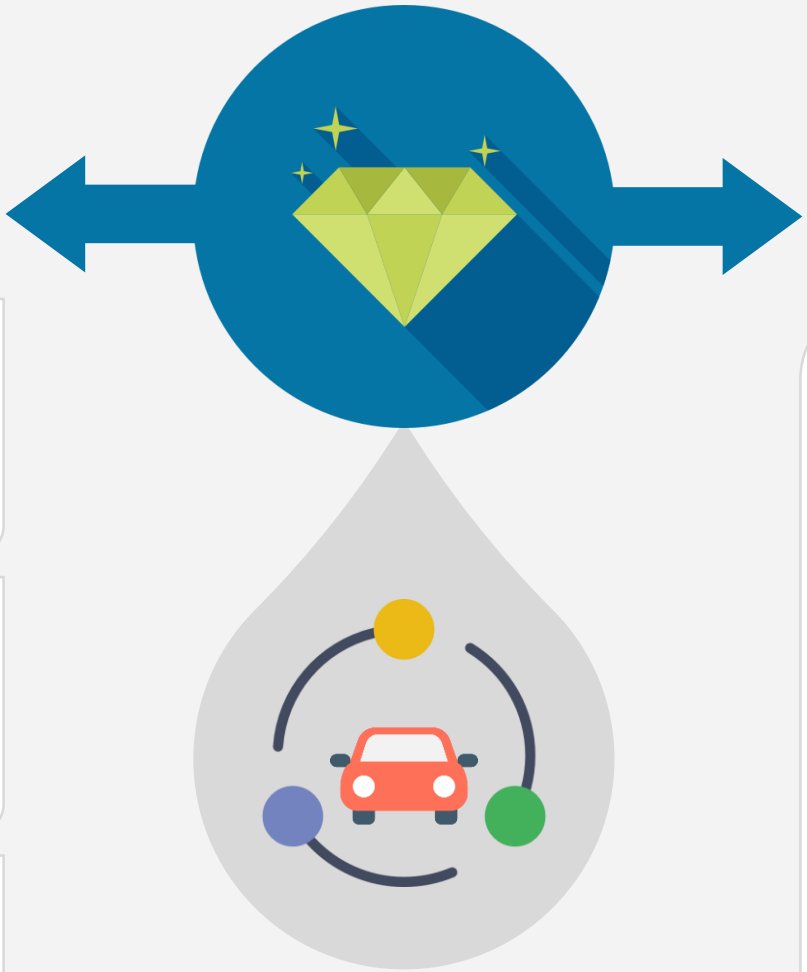
Variable Earning



Companies that have different car usage patterns

4 Suggestion

Strength of the Business Model



Benefit to KJ Rental

✓ Increase market share

✓ Reach more customers

✓ Earn regular incomes

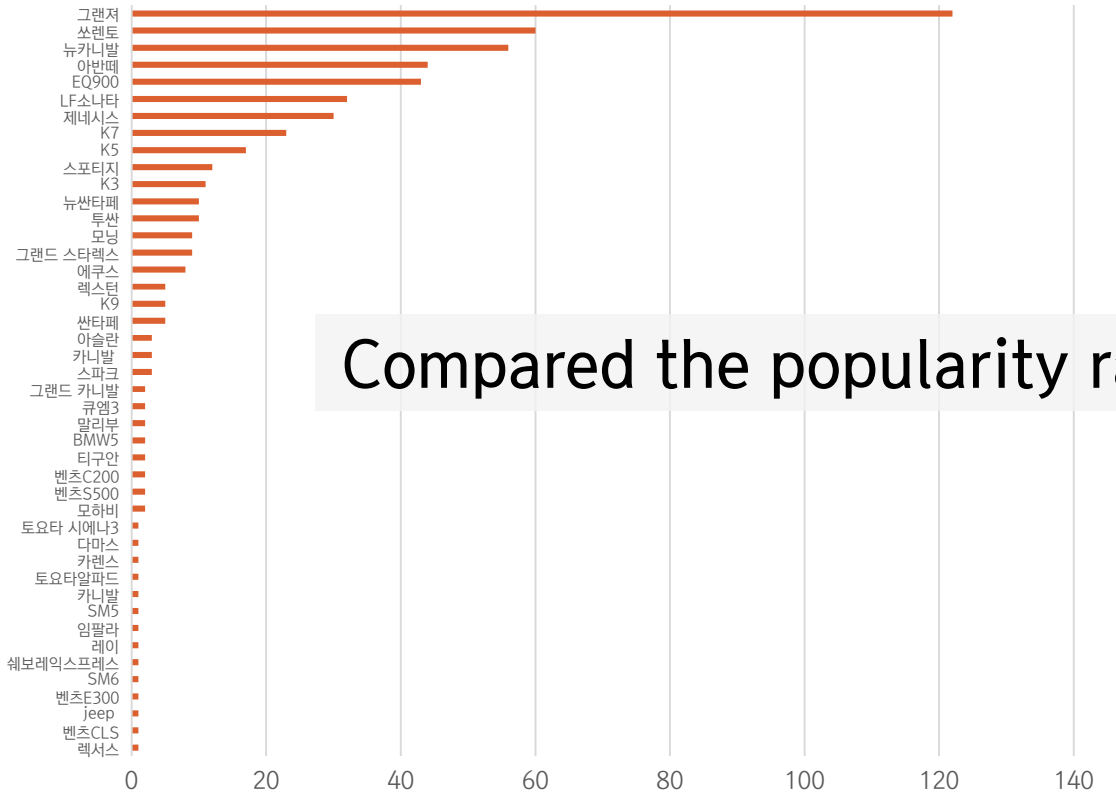
Benefit to Customers

✓ Save costs

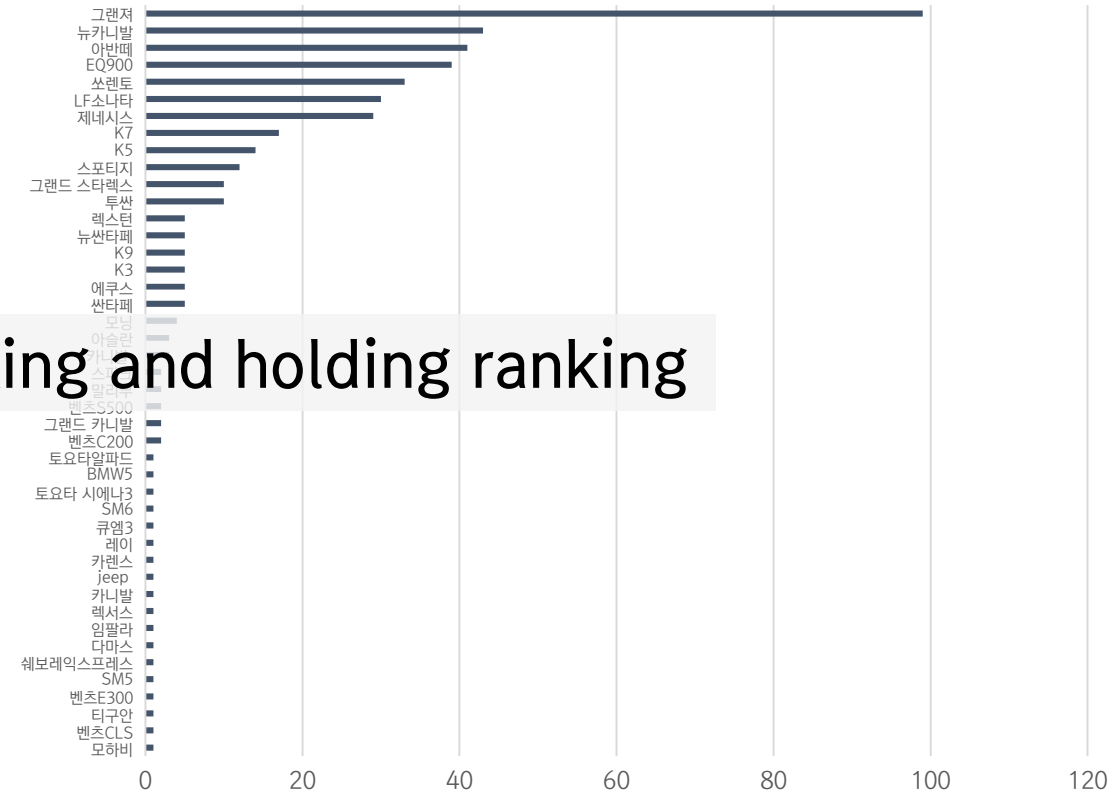
5 Data Modeling
Future Demand Prediction Model

Which Cars to Buy First?

보유차량 차종별 대여횟수



보유차종

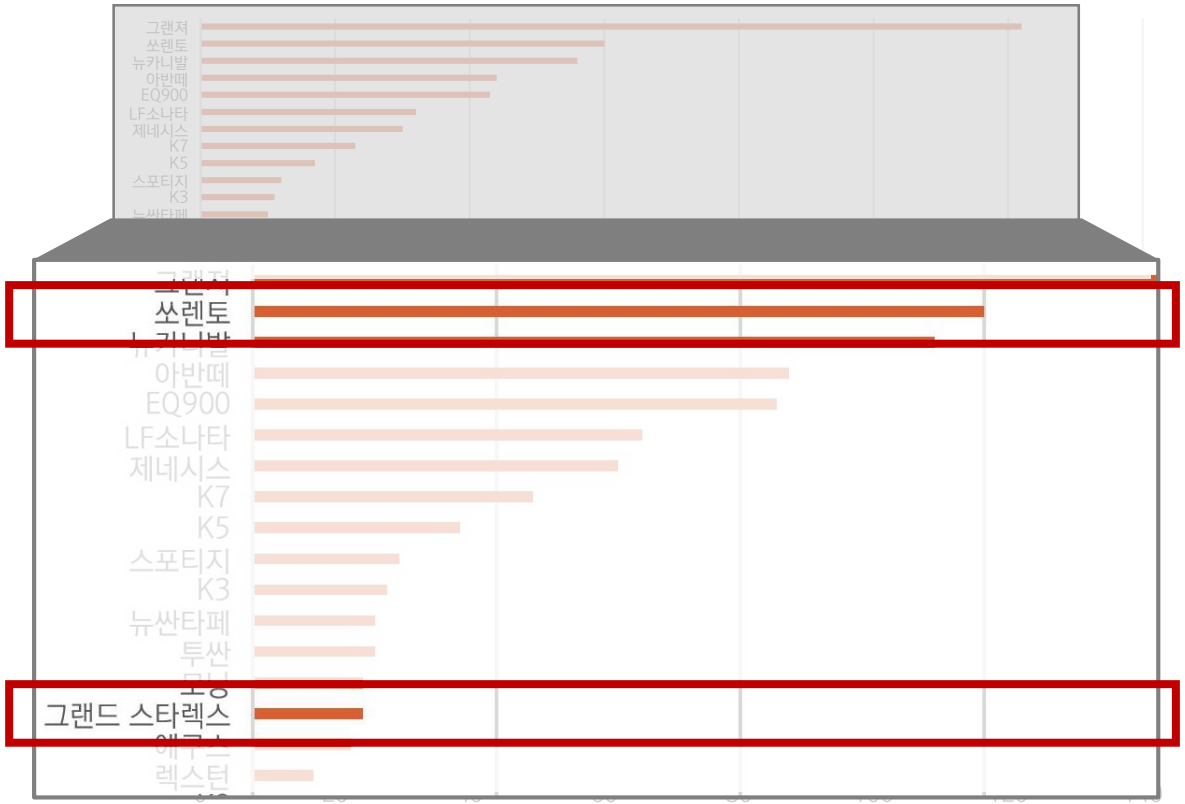


Compared the popularity ranking and holding ranking

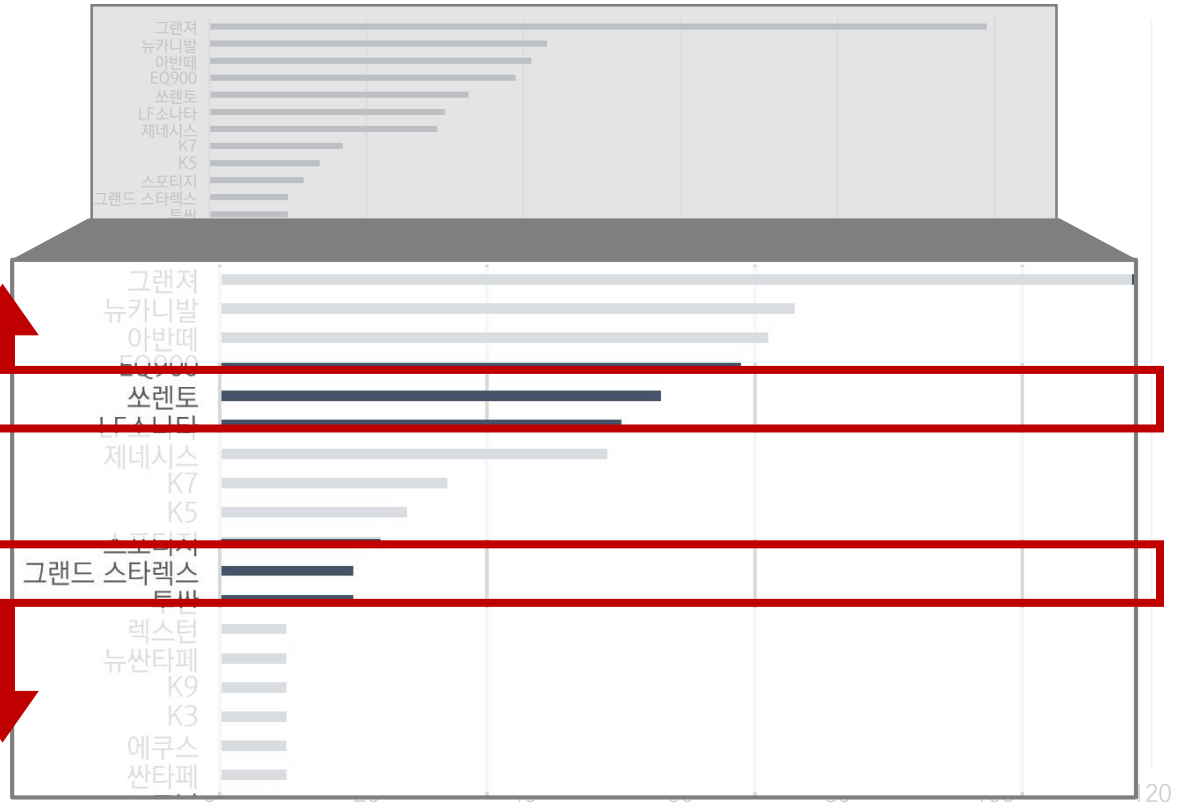
5 Data Modeling
Future Demand Prediction Model

Which Cars to Buy First?

보유차량 차종별 대여횟수



보유차종

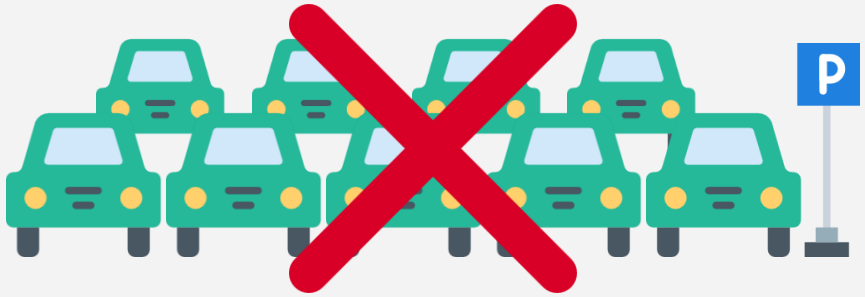


5 Data Modeling

Future Demand Prediction Model

Always able to book cars

Buying tons of cars?



Inefficient

5 Data Modeling

Future Demand Prediction Model

How?

Step 1
- Collecting the Data

Step2
- Clustering the Companies with Their Car Use Pattern

Step3
- Classification – Train the Model

Step4
- Input New Company and Get the Predicted Car Use Pattern

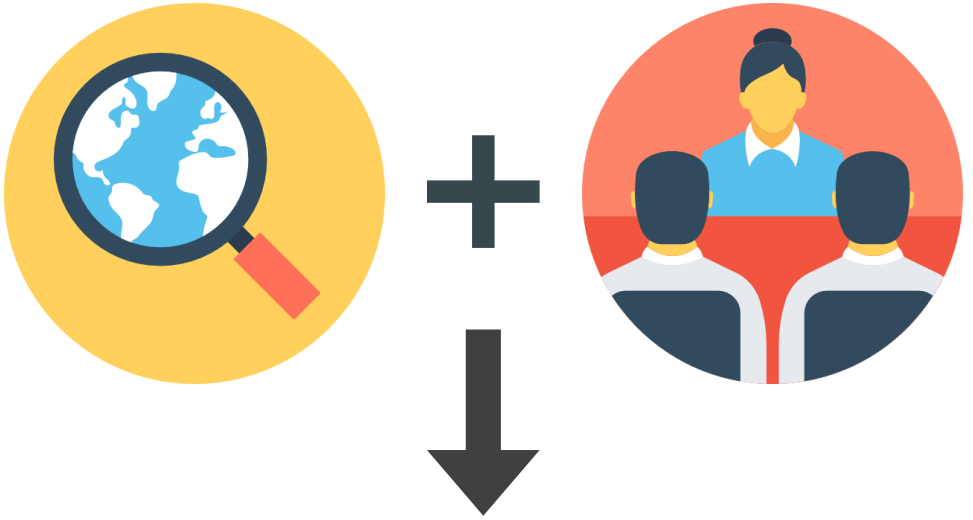
5 Data Modeling
Future Demand Prediction Model

Step1) Collecting the Data

Hard To Gather The Real Car Use Data

Small companies tend
not to datafy car usage

Datafication – Creating Sample Data



인테리어사업	서비스	인테리어	B2B	8	1	서울	영업
정수기 사업	서비스	정수기	B2B	11	1	서울	영업
커피머신사업	서비스	커피머신	B2B	12	1	서울	영업
인테리어사업	서비스	인테리어	B2C	9	1	서울	영업
정수기 사업	서비스	정수기	B2B	13	1	서울	영업
냉장고사업	서비스	패션유통	B2B	13	1	서울	영업
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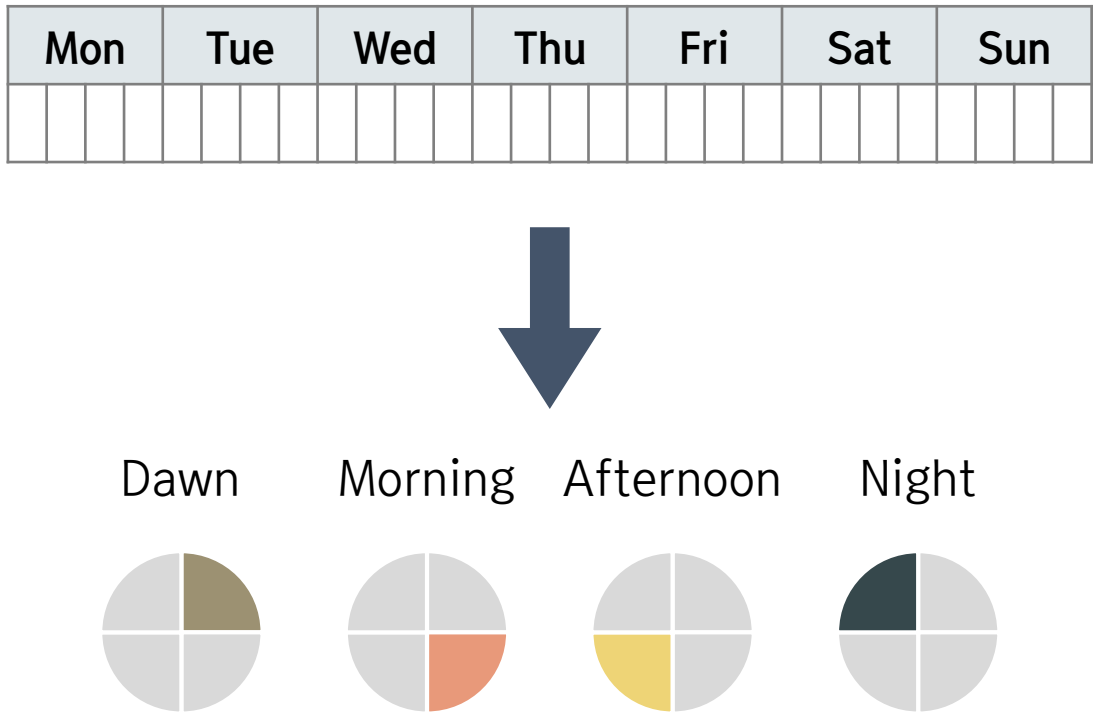
정수기 사업	서비스	정수기	B2B	14	1	서울	영업
정수기 사업	서비스	정수기	B2B	16	1	서울	영업

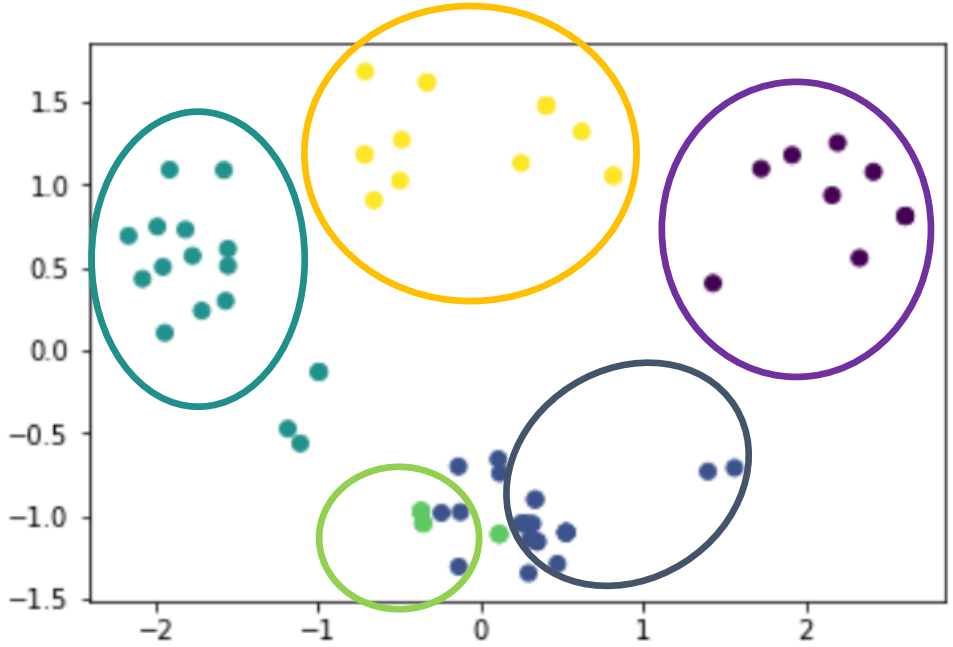
5 Data Modeling
Future Demand Prediction Model

Step2) Clustering

Car Usage Pattern



Clustering Result



5 Data Modeling
Future Demand Prediction Model

Step3) Classification – Train Model

Features of Companies

① The Customer(B2B, B2C)

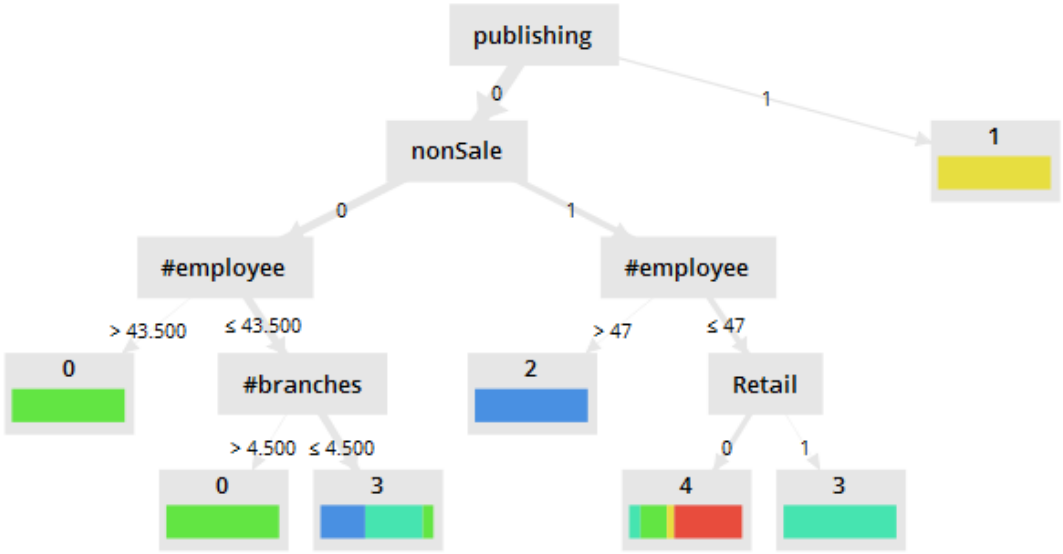
② The Kinds Of Business
(Service, Retail, Manufacturer, Livestock, Publishing)

③ The Goal Of Renting The Car
(Sales, Non-sales)

④ The Number Of Employees

⑤ The Number Of Branches

Classification Result



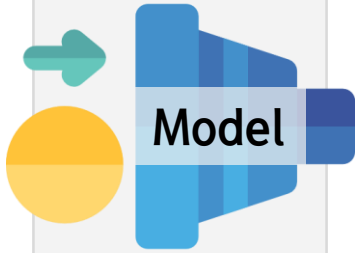
5 Data Modeling
Future Demand Prediction Model

Step4) Input New Company And Get The Predicted Car Use Pattern

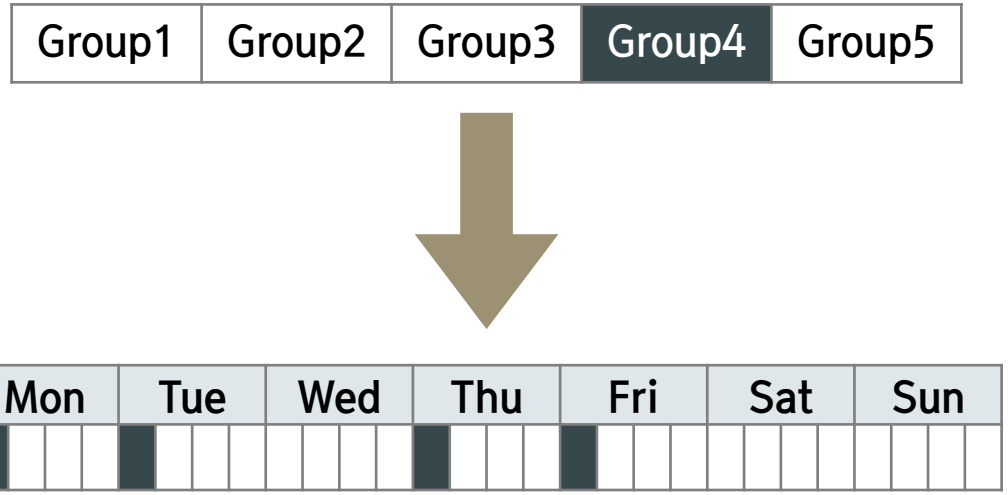
Input: Company A Data

① The Customer(B2B, B2C)
② The Kinds Of Business
(Service, Retail, Manufacturer, Livestock, Publishing)
③ The Goal Of Renting The Car
(Sales, Non-sales)
④ The Number Of Employees: 19
⑤ The Number Of Branches: 1

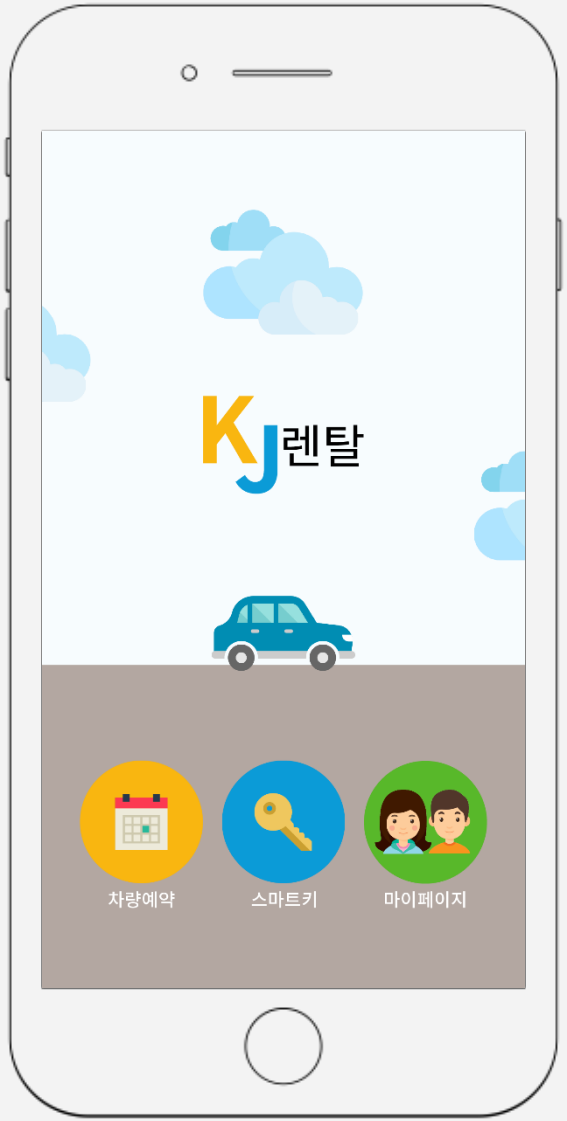
Accuracy: 0.733333333333
Precision: 0.664285714286
Recall: 0.666666666667
F1_score: 0.616883116883

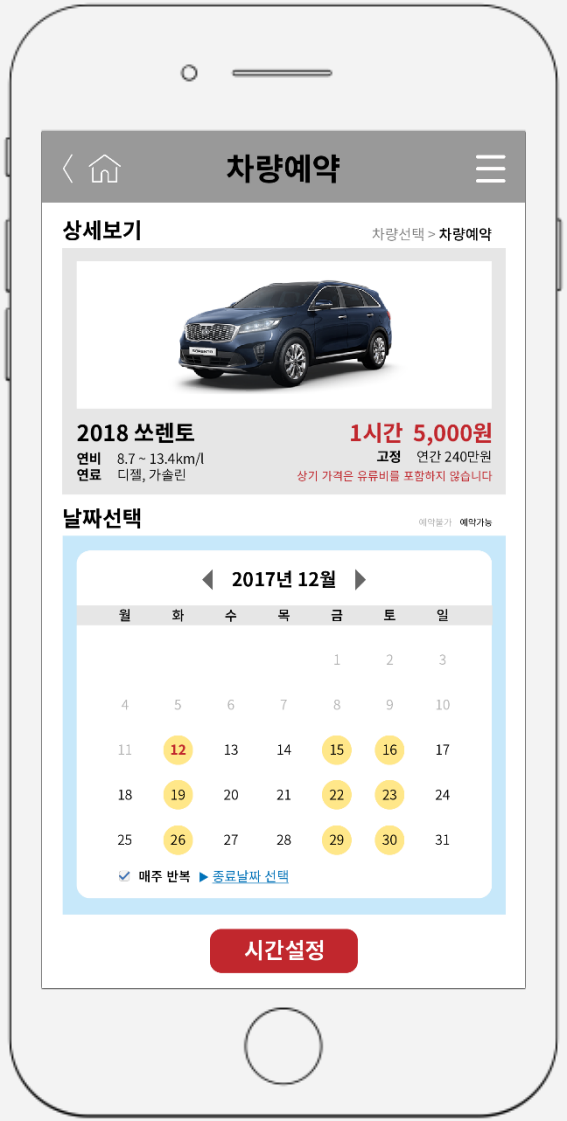


Return: Predicted Car Usage Pattern



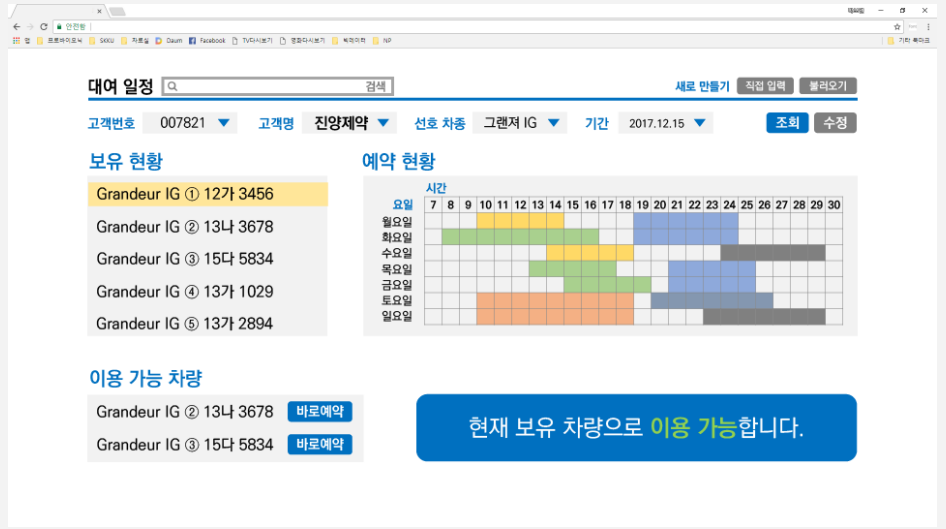
6 Prototypes
Smartphone Applications





6 Prototypes
Smartphone Applications

Real-Time
Data Transfer



안전함 |

앱 | 기타 북마크

회원 정보

검색

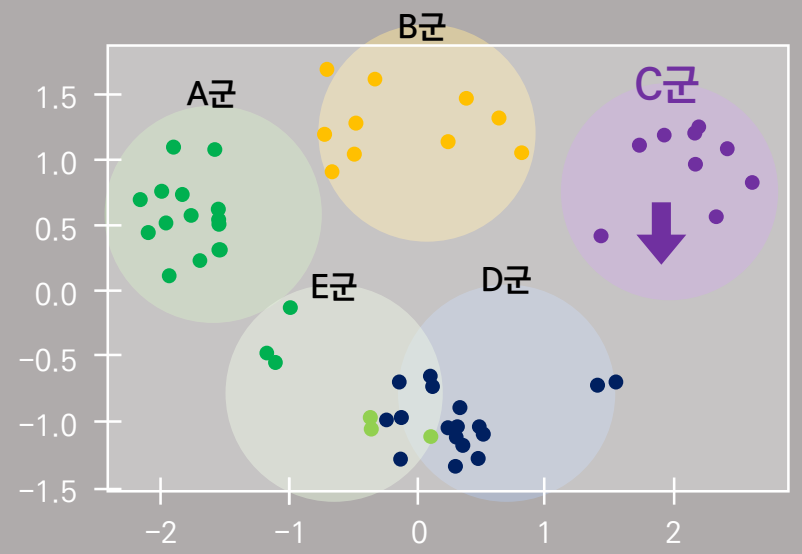
새로 만들기 | 직접 입력 | 불러오기

007821 진양제약

정보 업데이트 | 이용내역 조회

구분	B2B	사원 수	217	담당자	박보연
업종	제조업	지점 개수	3	연락처	02-123-4567
차량 용도	영업용	가입일	2017.12.10	소재	서울 강남구 신사동

분석



예상 사용 패턴 조회

C군 평균 사용 패턴

- ✓ 주요 사용 시간대: Time ② 13:00-19:00
- ✓ 선호 요일: 월, 화, 수, 목
- ✓ 사용 시간: 1회 4시간
- ✓ 선호 차종: 대형

안전함 |

앱 | 기타 북마크

대여 일정

검색

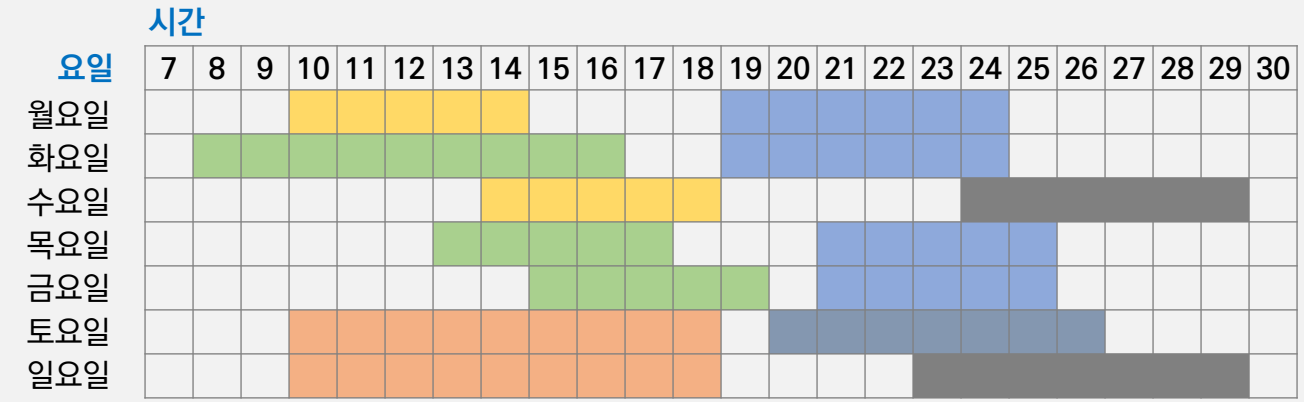
새로 만들기 | 직접 입력 | 불러오기

고객번호 007821 ▼ | 고객명 **진양제약** ▼ | 선호 차종 그랜져 IG ▼ | 기간 2017.12.15 ▼ | **조회** | 수정

보유 현황

- Grandeur IG ① 12가 3456
- Grandeur IG ② 13나 3678
- Grandeur IG ③ 15다 5834
- Grandeur IG ④ 13가 1029
- Grandeur IG ⑤ 13가 2894

예약 현황



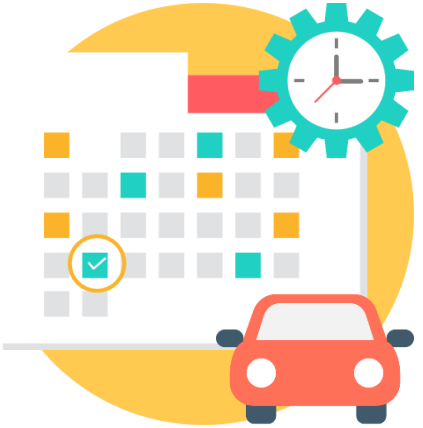
이용 가능 차량

Grandeur IG ② 13나 3678 **바로예약**

Grandeur IG ③ 15다 5834 **바로예약**

현재 보유 차량으로 이용 가능합니다.

7 Conclusion
Summary

Problem	Environment	Suggestion
		
Need to increase profit level	Mobility	Time-based sharing system

7 Conclusion
Wrap-up

Optimization

Predict the car use pattern of new company

On-Time Prediction

New Company

Optimized minimum number of cars

Please Ask
Any Questions

THANK YOU

SKKU Integration of Systems and Business Informatics
계지연 김가연 박보연 최용승 허주연

Appendix

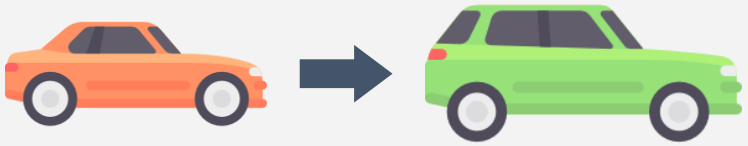
Business Model Explanation

Potential Risk

- ✓ Car Shortage
- ✓ Double Booking

➡ **Minimized via Prediction Model**

If Problem Occurs?



- ✓ Upgrade car model
- ✓ Issue ‘Apology Coupon’

Companies that have different car usage patterns