D1 Research
2022 New HMI Discovery

Da Vinci 2022

Overview of Research for Driver's Needs

The documents reveal a comprehensive understanding of the needs of drivers, particularly those using electric vehicles (EVs) in a ride-hailing context. The core needs can be categorized into three primary areas: safe driving, efficient operations, and convenience in daily activities. Key insights from the documents highlight the importance of addressing EV range anxiety, which is a significant concern for driver.

Core EV Ride Hailing Driver Needs

Safe Driving:

- Driver Monitoring: Systems to monitor driver behavior and ensure compliance with safety regulations.
- Real-time Alerts: Alerts for high-risk areas, potential violations, and other safety-related notifications.
- Emergency Features: One-click emergency services, such as alarm systems and quick access to emergency contacts.

Efficient Operations:

- Order Management: Efficient tools for receiving and managing ride requests, reducing downtime, and maximizing earnings.
- Navigation: Reliable and real-time navigation aids to avoid traffic and reach destinations efficiently.
- Communication: Integrated communication tools for seamless interaction with passengers and dispatch.

Daily Convenience:

- Comfort Features: Amenities like comfortable seating, climate control, and infotainment systems to enhance the driver's daily experience.
- Ease of Access: Simplified interfaces and controls for easy access to essential functions.

产品定位
Product Positioning

What: D1 IOV (Internet of Vehicles) is an interconnected system linking people, vehicles, and environments within the D1 context.

Which: The D1 IOV will be divided into four interfaces: cloud, mobile, vehicle, and fleet operation terminals, with a core focus on the vehicle and operation terminals.

Who: The core service of D1 IOV is aimed at drivers and operation terminals, indirectly serving the Didi platform.

When: D1 IOV will launch with a series of D1 products from 2020 to 2025 and will be operational throughout the D1 product lifecycle (2020-2030).

Where: D1 IOV operations will primarily be concentrated in first and second-tier cities in China.

How: The D1 IOV vehicle terminal will adopt a pre-installation method, the mobile terminal will be available for drivers to download, and the operation terminal will be licensed to car operators in the form of desktop software.

What
D1车联网是连接D1场景下人、车、环境的互联网。

Which
D1车联网将分云端、手机端，车机端和车队运营端四个端口，核心为车机端与运营端

Who
D1车联网核心服务于司机与运营端，并间接服务于滴滴平台

When
D1车联网将于2020–2025年随一系列D1产品上市，并在D1全生命周期运营（2020–2030）

Where
D1车联网将随一系列D1产品运营，运营地点主要集中在中国的1–2线城市

How
D1车联网车机端采用前装方式，手机端开放给司机下载，运营端将以桌面软件形式授权给汽车运营商

Core Needs of Drivers: Efficiency and Dignity

Dignity

Complaint Responsibility: Mechanisms for complaint resolution and accountability.

Order Recording: Audio and video recording during order fulfillment.

Operational Vehicle Terminal:

- Pre-order Verification: Identity verification before accepting orders.
- Quick Order Acceptance: Fast acceptance of pre-booked orders.
- Driver Terminal Version: Specific version of the vehicle terminal for drivers.
- Driver-Passenger Communication: Communication via phone or instant messaging (IM).
- Bluetooth/VoIP/I-CALL: Support for various communication methods.
- Violation Alerts: High-frequency violation alerts and reminders for high-ticketing areas.

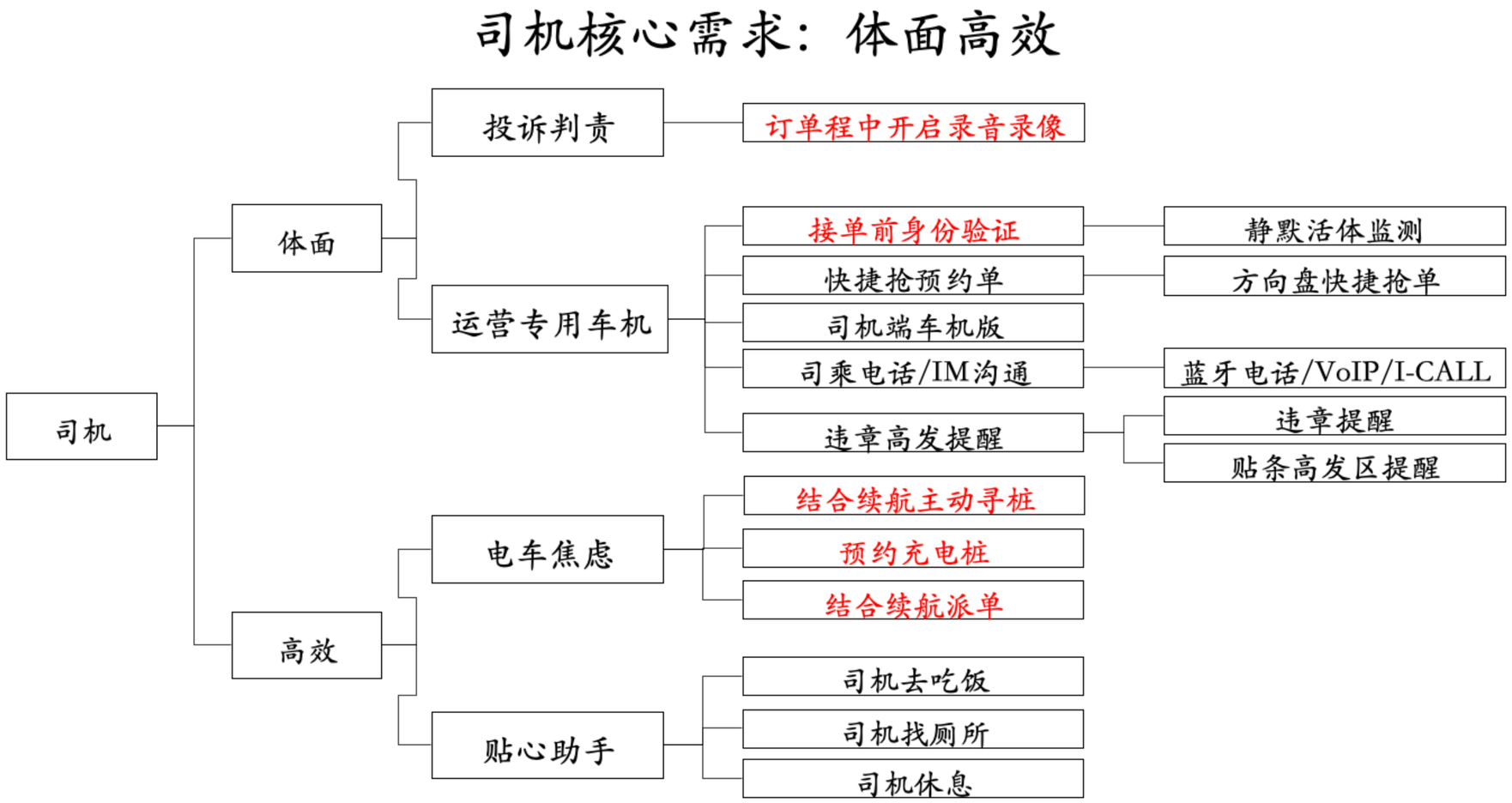
Efficiency

EV Range Anxiety:

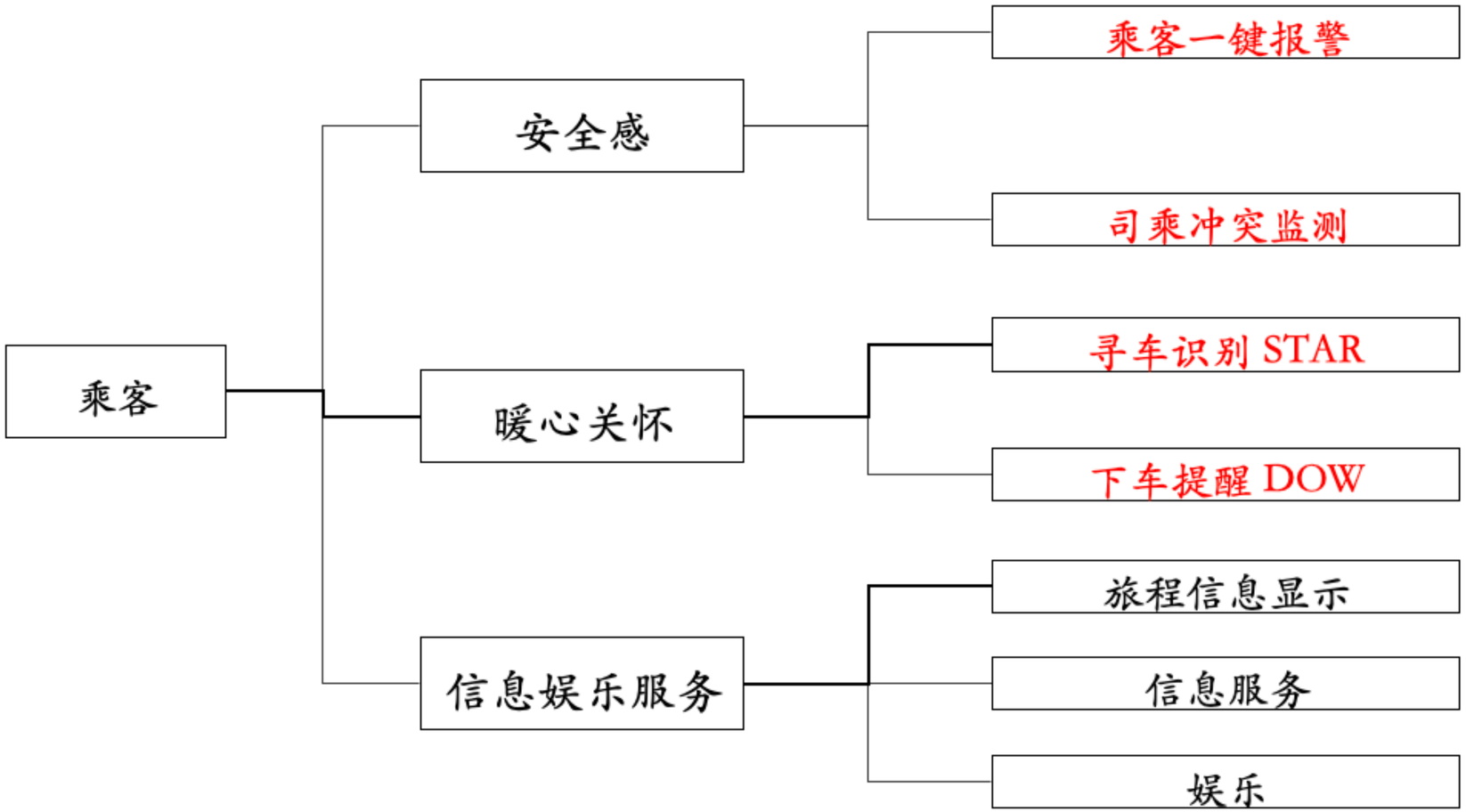
- Proactive Charging: Integration with navigation to find charging stations.
- Scheduled Charging: Options to book charging stations in advance.
- Order Matching with Range: Dispatching orders based on the vehicle's remaining range.

Supportive Assistant:

- Meal Breaks: Assistance in finding meal options.
- Restroom Breaks: Help in locating restrooms.
- Rest Breaks: Guidance for finding suitable rest areas.



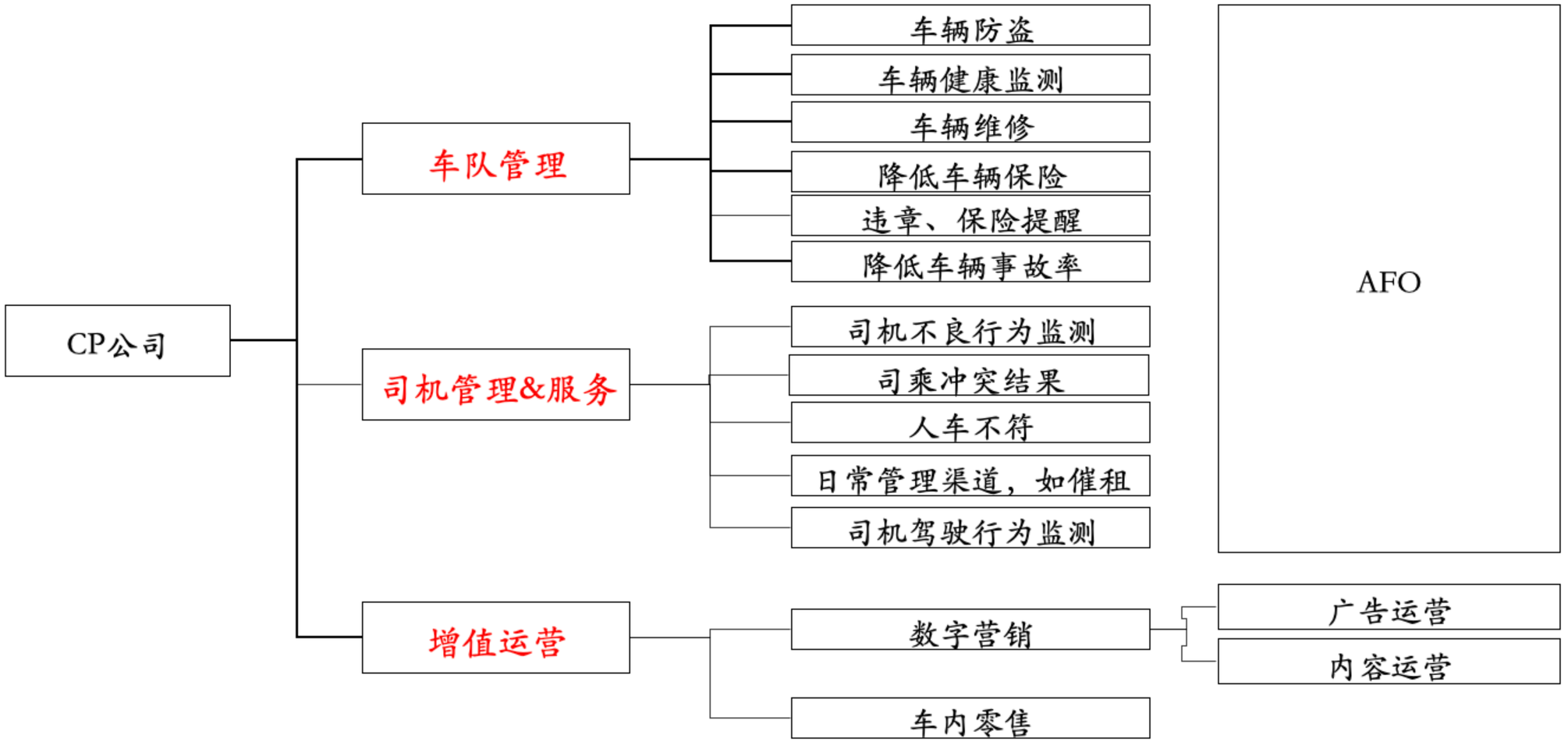
乘客核心需求：体验提升



Passenger Core Needs:

1. **Safety**:
   - One-click emergency alert system.
   - Monitoring of driver-passenger conflicts.
2. **Warmth and Care**:
   - Easy car identification with STAR.
   - Reminder system (DOW) to avoid leaving personal items behind.
3. **Information and Entertainment Services**:
   - Display of journey information.
   - Access to information services.
   - Entertainment options within the vehicle.

CP核心需求：运营管理



Core Needs for Operational Management:

1. **Fleet Management**:
   - Vehicle theft prevention.
   - Vehicle health monitoring.
   - Vehicle maintenance.
   - Reducing vehicle insurance costs.
   - Violation and insurance reminders.
   - Lowering vehicle accident rates.
2. **Driver Management and Services**:
   - Monitoring driver misconduct.
   - Resolving driver-passenger conflicts.
   - Ensuring driver compliance with regulations.
   - Daily management tasks such as rent collection.
   - Monitoring driving behavior.
3. **Value-Added Operations**:
   - Digital marketing.
   - In-car retail.
   - Advertising operations.
   - Content operations.

关键发现1：司机的用车环境非常恶劣，对改善职业病、超时长工作等问题有强烈需求

如何看待疲劳驾驶的问题

司机

“一天跑十五六个小时，腰椎、颈椎、前列腺全部有问题。”

“冬天续航不够，不舍得开空调，脚上经常生冻疮。”

“身体就是本钱啊，愿意为改善健康多花钱。”

One of the key finding of driver needs is the poor working conditions of drivers, who face severe health issues and fatigue due to long working hours, often exceeding 10 to 16 hours a day. Common health problems include back, neck, and leg pain, as well as issues related to poor posture and inadequate climate control in vehicles. The environment inside the car can also be uncomfortable for passengers. It is emphasized that the design of D1 vehicles should not only focus on passenger comfort but also address drivers' working conditions and health to ensure their well-being and satisfaction.

Fact

1. **疲劳：**全职司机普遍工作**超过10小时**，个别司机达到**16小时以上**，经常出现危险的**疲劳驾驶**问题。
2. **健康：**司机普遍有**腰椎、颈椎、前列腺（久坐）、胃病（饮食不规律）**等问题，还有个别司机有**冬天生冻疮（续航太少不舍得开暖风）、夏天生痱子（座椅没有通风）**等问题。
3. **环境：**部分司机在车内过夜造成**车内异味**，给乘客很差的体验。

Point

➢ **D1定制车不应该仅仅是“design for passengers”，而应该致力于解决司机的工作环境、体质健康等问题，让司机感受到滴滴的关怀。**

关键发现2：司机最希望解决续航、充电等基础功能问题

Drivers primarily want solutions for range anxiety and charging issues. They face significant challenges with long queues at charging stations, poor charging performance in winter, and slow charging in summer. Over 90% of drivers are dissatisfied with the current range, desiring a realistic range of at least 350 km. They expect charging to be completed within 40 minutes to an hour, including waiting times. Additionally, drivers associate higher rental or purchase costs of EVs with better range and charging efficiency. To enhance competitiveness, achieving a 350 km range and fast charging capabilities (30 minutes from 20% to 80%) is crucial.

充电主要的问题是充电排队、冬天充不进电、夏天充电慢问题

司机

“如果不是因为牌照，我不会租电动车的，续航又焦虑，充电又麻烦。”

“一天充两次也可以，反正中间要休息。”

“续航长一点，每天能多跑一点流水，就愿意多付一点租金。”

Fact

1. **续航：**90%以上司机对于**续航不满意，**期待实际续航达到**350km（预计约等于NEDC综合工况400km），**期待**一天一或两充**。
2. **充电：一天两充**是普遍现象并且普遍可以接受，每次充电**总体耗时1小时以内（实际充电时长40分钟以内）**可以接受，**充电排队**以及**夏天充电慢、冬天充不进电**等问题抱怨多。
3. **其他：**司机认为品牌同档次情况下，**电动车租金/售价与续航里程相关性最大**。

Point

➢ **对司机来说，在车辆售价/租金有竞争力的情况下，做到实际续航350km，快充30分钟从20%充到80%，会成为产品核心竞争力。“不冗余”是获得性价比竞争力的策略。**

关键发现3：乘客对车辆满意度明显比司机高，但期待创新

Passengers are generally more satisfied with the vehicles compared to drivers, but they still have expectations for innovation. Passengers are primarily concerned with cleanliness and the absence of odors. They also value safety, comfort, and spaciousness, and are willing to pay more for these features. Additionally, passengers expect specialized ride-hailing services to offer a unique experience that distinguishes them from regular rides. This highlights the need for innovative design improvements that enhance the user experience without significantly increasing costs.

乘客是基本满足的；对安全性、仪式感有期待

乘客

“只要干净整洁，没有味道，其他没什么问题。”

“既然是定制车，肯定要有点什么不一样的吧。”

“我愿意为安全、舒适、大空间多付钱，其他锦上添花的东西不会多付钱。”

Fact

1. 除了**异味，整洁度**等少数痛点外，大多数乘客认为现在的车“没什么问题”。
2. 对于**司乘安全、腿部/头部空间、乘坐舒适度**有一定升级需求，又觉得可以满足需求的滴滴**专车太贵**。
3. 期待“滴滴专属网约车”通过创新，带来不一样的体验（**关键词：安全感、舒适感、仪式感**）。

Point

➢ **对乘客来说，需要创新型设计来升级现有的用户体验，同时又不增加使用成本。**

关键发现4：外观应表达滴滴品牌形象

Both drivers and passengers believe that the exterior appearance of the vehicle should reflect the Didi brand image. Drivers want the vehicle to look professional and easily identifiable as a Didi car, while passengers expect a customized look that differentiates it from standard vehicles. The appearance of the car is no longer seen as a personal statement of social status or taste but as an expression of the Didi brand. This insight suggests that the vehicle's exterior should be designed to communicate the brand effectively, enhancing its visibility and reputation.

司机

“要有滴滴的形象，显得正规”

“不介意别人一眼看出来我是开滴滴的”

乘客

“体现着滴滴的品牌形象”

“既然是定制车，应该看上去不一样”

Fact

1. **外观风格：**对于滴滴定制车的整体风格，**司机与乘客普遍认为应该更加“突破传统”，“看上去不一样”，“符号化”。**
2. **品牌形象：**司机与乘客不再将网约车的外观看做自身社会地位或品味的表达（当他们购买或使用私家车时是这样的），**而看做是滴滴品牌形象的表达**

Point

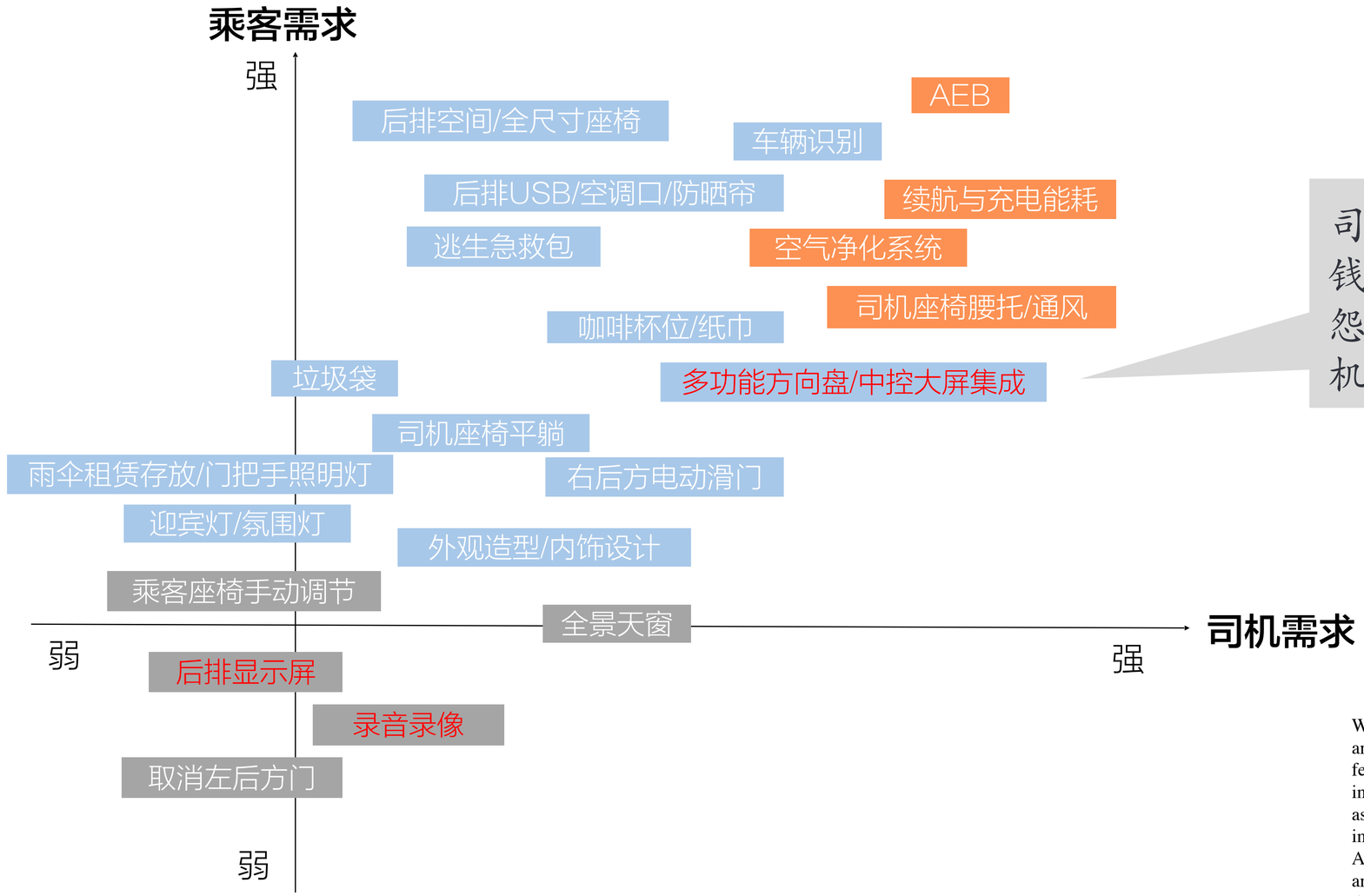
➢ **车辆外观不再是用户对自身社会地位或品味的表达，而被认为是滴滴品牌形象的表达。**

司机非常喜欢 愿意增加成本

司/乘都喜欢 但不愿增加成本

司/乘都不喜欢的设计

红色字体：车联网相关



司机不愿意多花钱，但没有会抱怨（57%的司机）

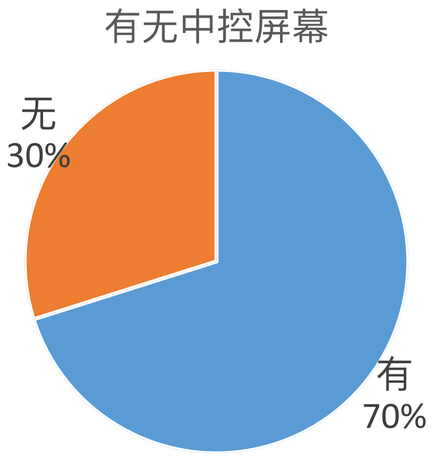
备注：基于司机和乘客的建议同等重要的原则，有些卡片司机有问，但是乘客没有问，按照司机得分=乘客得分的方法统计，反之亦然

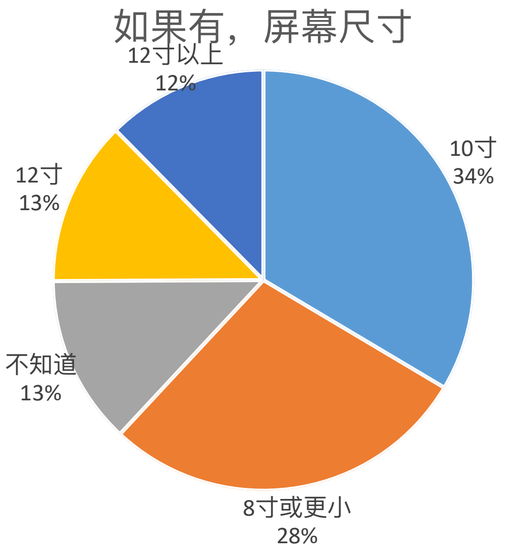
We discovered that drivers highly appreciate features they perceive as beneficial and are willing to pay extra for them. However, both drivers and passengers prefer features that do not significantly increase costs. Essential features appreciated by both include USB ports in the rear seats, full-sized rear seats, and emergency kits. Key aspects such as AEB (Automatic Emergency Braking), traffic sign recognition, and integrated charging solutions for EVs are crucial for enhancing safety and efficiency. Additionally, comfort features like air purification systems and seat lumbar support are highly valued. It's notable that while drivers are hesitant to spend excessively, they do not strongly object to necessary expenses, with 57% accepting minor additional costs. Balancing these preferences is essential to meet both driver and passenger needs effectively.

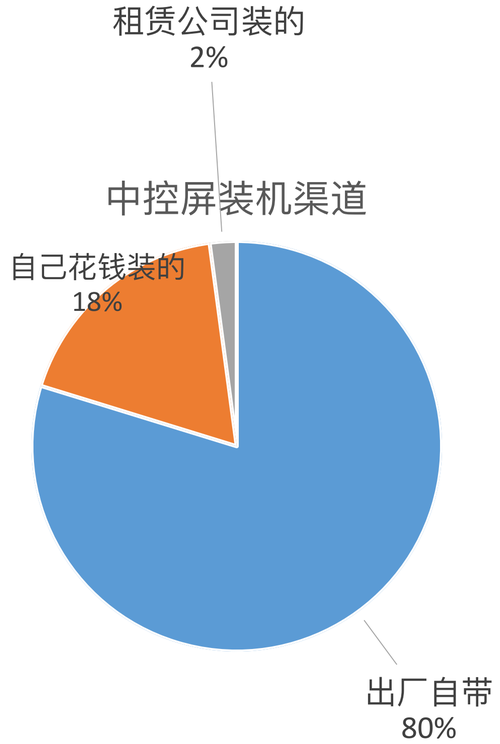
车载大屏配置率

- 70%的快车都有车载大屏幕
- 59%的屏幕尺寸大于等于10寸屏幕
- 80%的中控屏幕均为前装出厂自带，18%的司机为自己付费安装，租赁公司付费安装为2%

70% of ride-hailing vehicles are equipped with a central control screen. Among these, 59% have screens larger than 10 inches. Most central control screens (80%) come pre-installed from the factory, while 18% of drivers pay for the installation themselves, and only 2% are installed by the rental companies. This data highlights the widespread adoption of large screens in vehicles, with a significant preference for larger displays to enhance the user experience and operational efficiency.



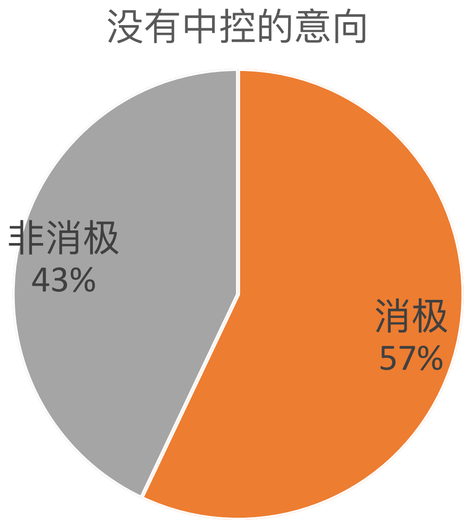


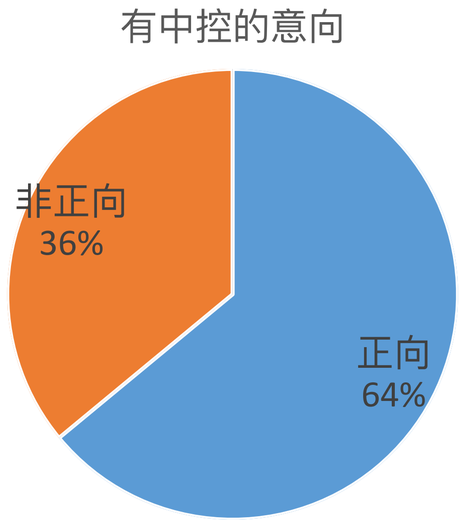


车载大屏司机意愿

- 没有中控屏幕时，57%的司机会抱怨
- 有中控屏幕时，64%的司机会表示愉悦

Drivers' attitudes towards central control screens significantly impact their satisfaction. Without a central control screen, 57% of drivers express dissatisfaction. Conversely, when a central control screen is present, 64% of drivers report being pleased. This highlights the importance of central control screens in enhancing driver satisfaction and underscores the need for their inclusion in vehicle designs to improve the overall driving experience.

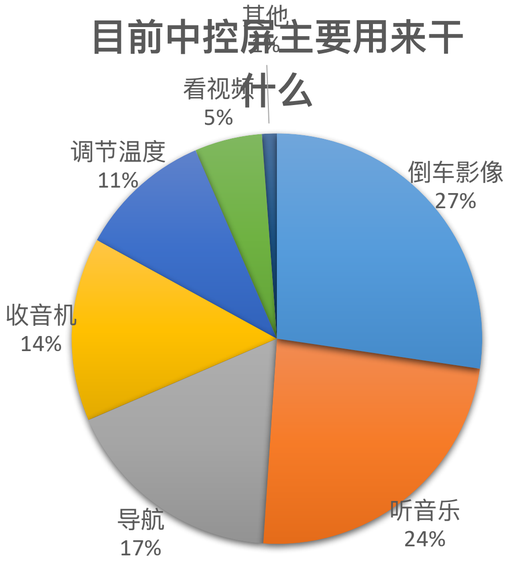


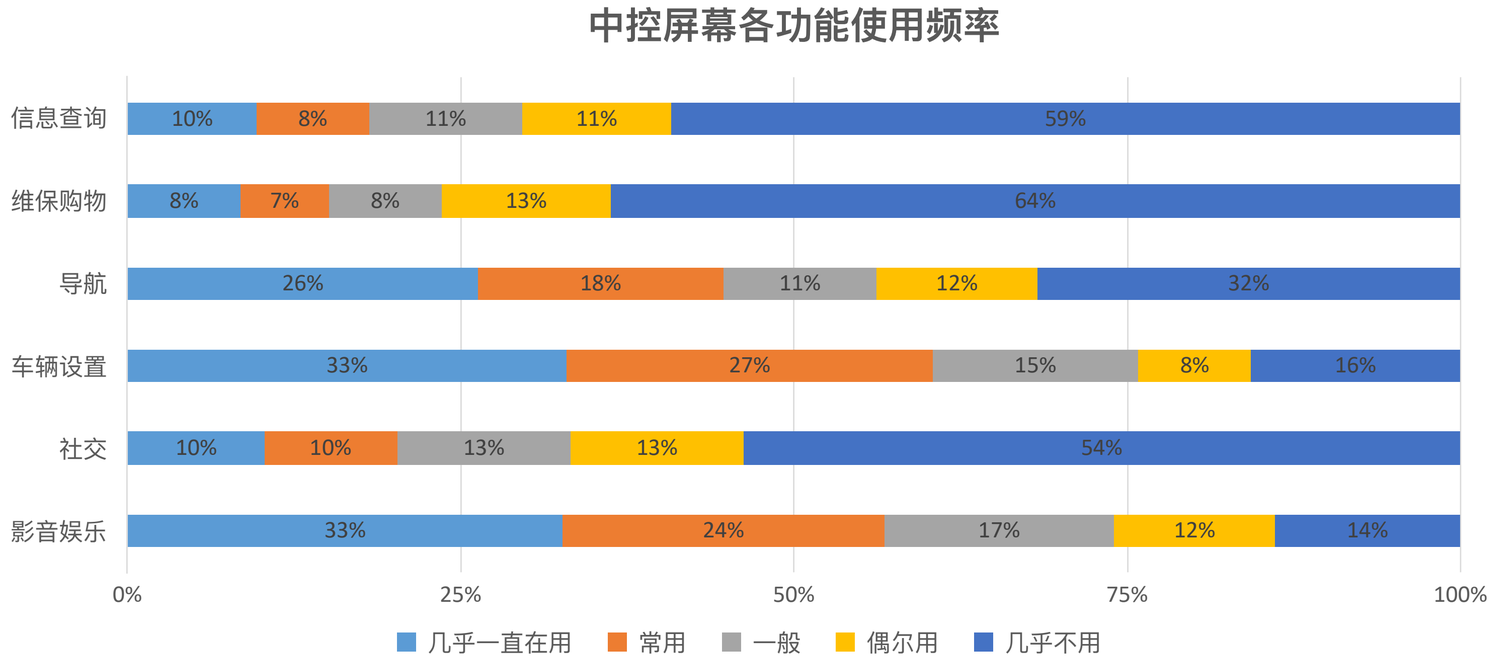


中控大屏作用

The most frequently used functions on the central control screen are the rearview camera (27%), listening to music (24%), navigation (17%), radio (14%), and adjusting temperature (11%). The central screen is also used for checking information, maintenance shopping, and social interactions. Drivers primarily rely on the central screen for practical and essential functions, which enhance their driving experience and operational efficiency. This insight highlights the importance of integrating these high-frequency functions into the central control screen to meet drivers' needs effectively.

- 目前中控大屏使用频次最高的是功能依次是：倒车影像、听音乐、导航、收音机

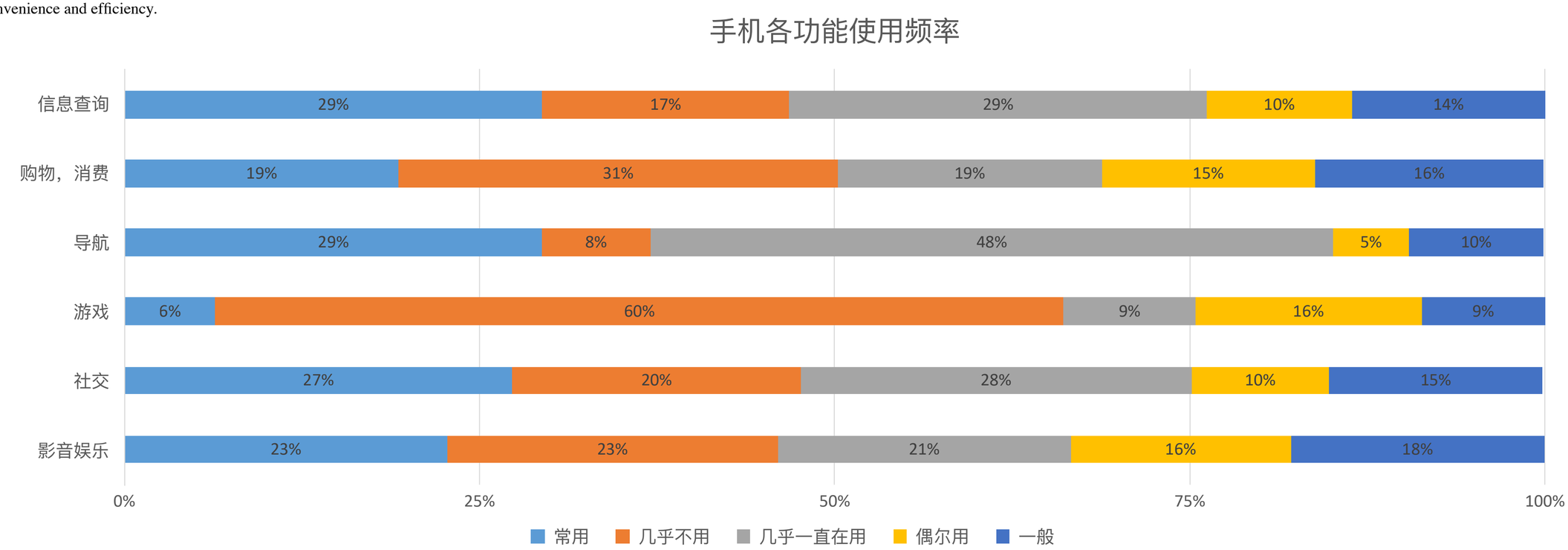




司机用手机做什么

We found that drivers use their mobile phones primarily for navigation, information queries, entertainment, and social networking. The frequency of these activities varies, with navigation (29%), information queries (29%), and social networking (27%) being the most commonly used functions. Entertainment, including audio and video, is also popular (23%). Conversely, gaming and online shopping are used less frequently. This insight underscores the importance of integrating these high-frequency functions into the vehicle's interface to enhance driver convenience and efficiency.

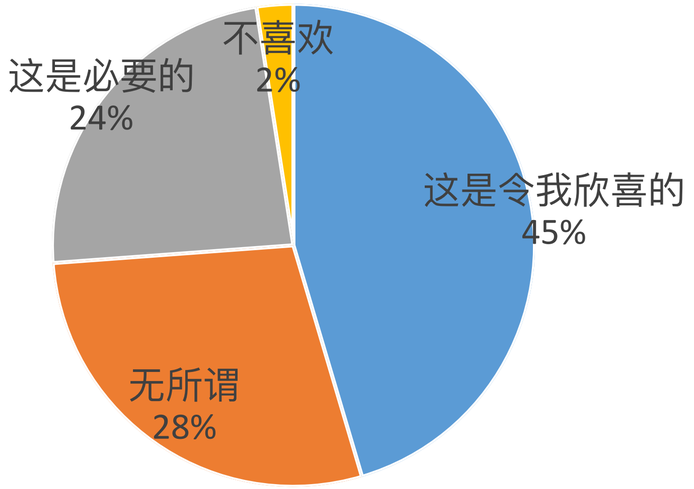
- 目前手机中较多使用的功能为：导航、信息查询、影音娱乐、社交
- 游戏比例较低

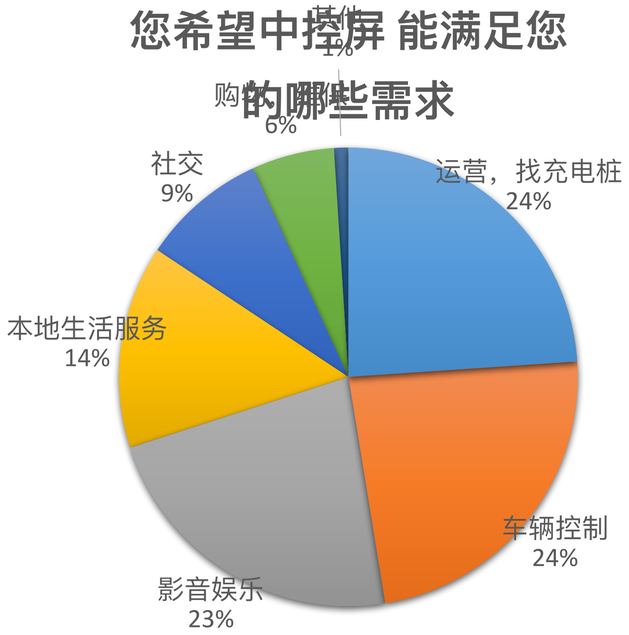


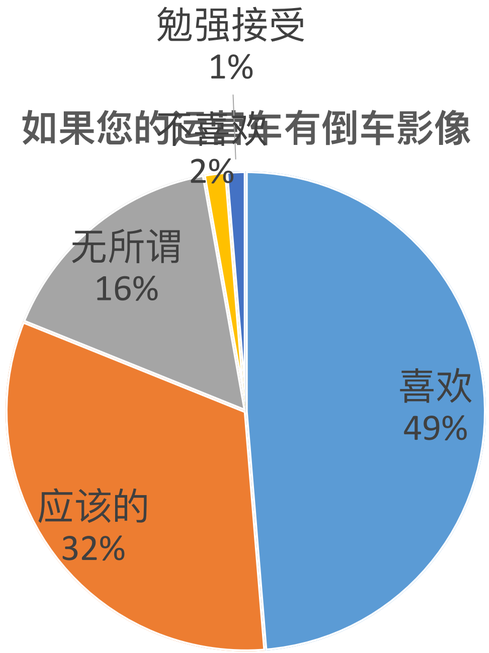
司机期望功能

Drivers highly desire integration of operational and charging functions within the central control screen. High-priority features include vehicle control, entertainment, local services, and social networking. Regarding the central control screen's ability to accept orders, 69% of users expressed satisfaction. Additionally, 81% of drivers favor the inclusion of a rearview camera. The preferred functions on the central control screen, based on user feedback, are operational management and finding charging stations (24%), vehicle control (24%), and entertainment (23%), with lower priorities given to local services (14%) and social networking (9%). This indicates a strong preference for functionalities that enhance efficiency and convenience in daily operations.

- 司机最期望中控屏幕内集成运营和找电桩功能
- 其余优先级较高的是：车辆控制、影音娱乐、本地服务、社交
- 对于中控屏幕能接单有69%用户表示满意
- 81%的司机表示欢迎倒车影像







用户需求

Users demanding

Drivers need:

Safety and compliance.

Convenient order handling and daily operations.

They want systems that consider vehicle range when dispatching orders.

Surveillance inside the vehicle to provide evidence in case of passenger disputes.

Integration of ride-hailing apps directly into the car's display for ease of use.

Assistance in finding charging stations, restrooms, and convenient dining options.

运营商

1. 高效管理司机；
2. 高效管理车辆。

- “我们特别希望有一个司机的信用体系，可以看到司机开车习惯是否良好，是否按时交租金，是否经常违章等。”
- “车是我们的重要财产，我们希望保证它是安全的、健康的，最好能系统性管理事故与维修、保养、保险、车辆状态监控与诊断等。”
- “现在基本在用微信和QQ管理司机，确实需要一个更高效的实时沟通和通知/任务分发系统。”

司机

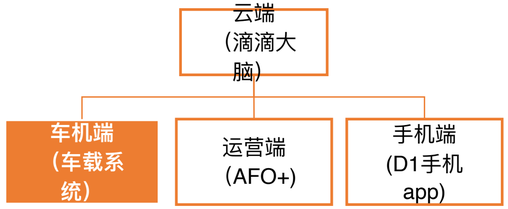
1. 安全合规；
2. 使接单及日常更便捷。

- “系统能知道我的续航，不要派给我超过续航的订单就好了。”
- “车内如果有监控，乘客无端投诉就能有客观判责的依据了。”
- “滴滴app能直接放在车机大屏上，接单肯定会更方便，不用再放一个手机支架了。”
- “如果车能帮我主动找充电桩，甚至是洗手间、方便停车的饭馆就太棒了。”

乘客

1. 车内安全监控+一键报警；
2. 暖心提醒+后排信息。

- “如果车里有摄像头全程监控和一键报警，会对坏人有震慑作用，我会更有安全感。”
- “如果车能够提醒我别忘东西，比如手机、包、雨伞等，就好了。”
- “夜晚或雨天有时候很难看到车牌号，希望能更容易找到车。”
- “有时候带小孩打车，希望后排有个屏幕放放动画什么的，他就会很开心。”

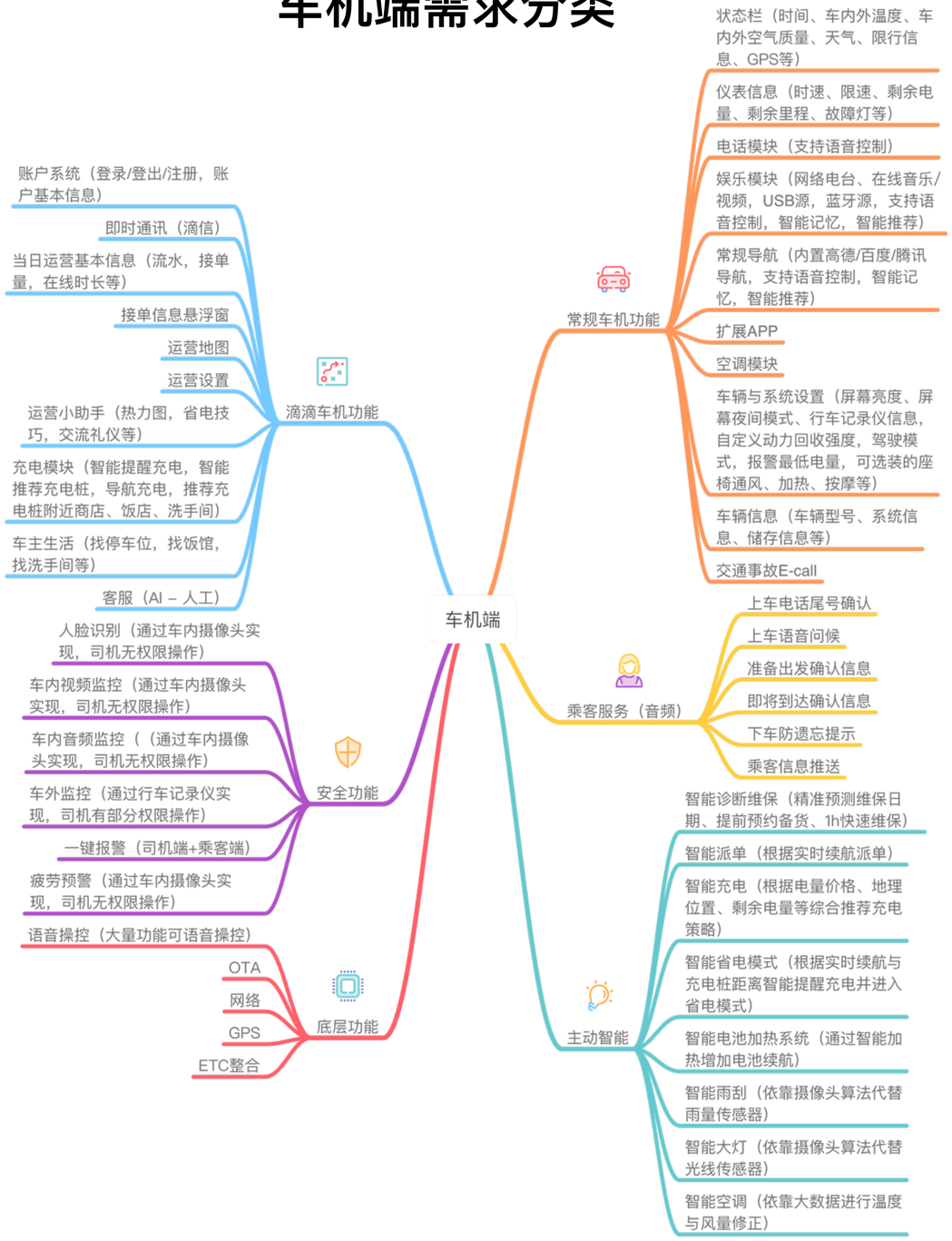


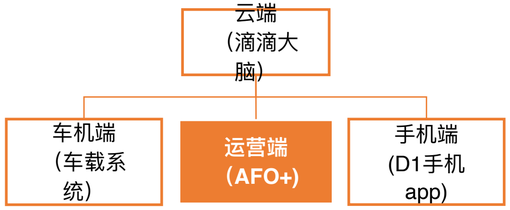
车机端产品模块

1. 账户系统模块
2. 车辆基本状态
3. 空调模块
4. 娱乐模块（电台、音乐、视频）
5. 导航模块
6. 电话模块
7. 车辆信息与设置
8. E-call（软硬件）
9. 运营信息
10. 接单悬浮窗
11. 运营地图
12. 运营设置
13. 充电
14. 司机即时通讯（滴信）
15. 客服
16. 车内视频监控（软硬件）
17. 车内音频监控（软硬件）
18. 一键报警
19. 行车记录仪
20. 扩展APP/内容平台
21. 运营小助手
22. 车主生活
23. 智能诊断维保
24. 智能派单
25. 智能充电
26. 智能省电
27. 智能电池加热
28. 智能雨刮、大灯、空调控制

高优先级　中优先级　低优先级

车机端需求分类



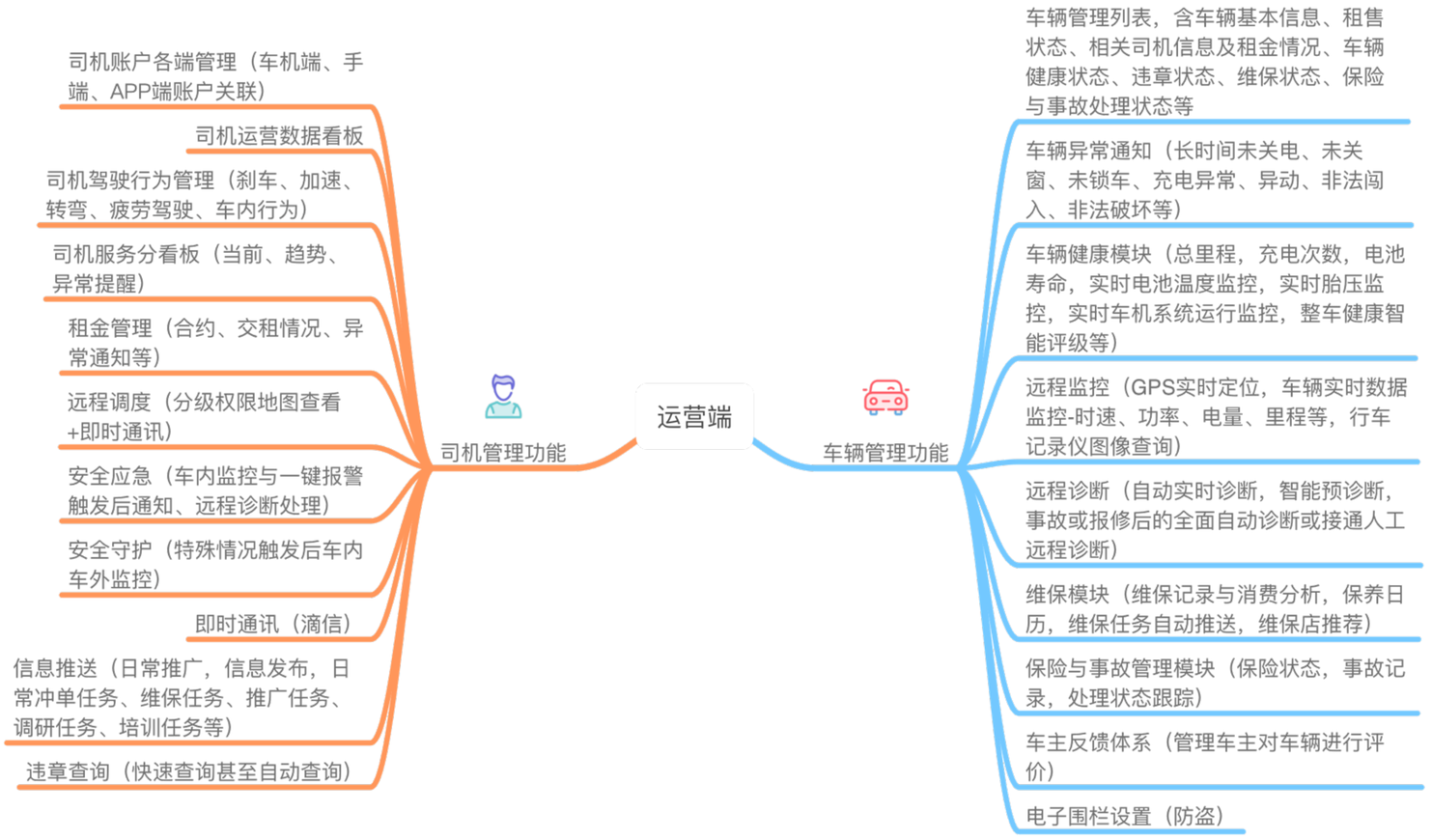


运营端产品模块

1. 车辆管理列表
2. 车辆健康模块
3. 远程监控与控制模块
4. 维保管理模块
5. 车辆异常通知系统
6. 远程自动诊断
7. 保险与事故管理模块
8. 车辆评价模块
9. 自动违章查询系统
10. 地图看板
11. 电子围栏
12. 司机管理列表（账户关联）
13. 司机运营数据看板
14. 司机租金管理模块
15. 安全应急模块
16. 安全守护模块
17. 司机信用评级系统
18. 司机驾驶行为分析
19. 司机即时通讯（滴信）
20. 司机信息推送模块

高优先级 中优先级 低优先级

运营端需求分类

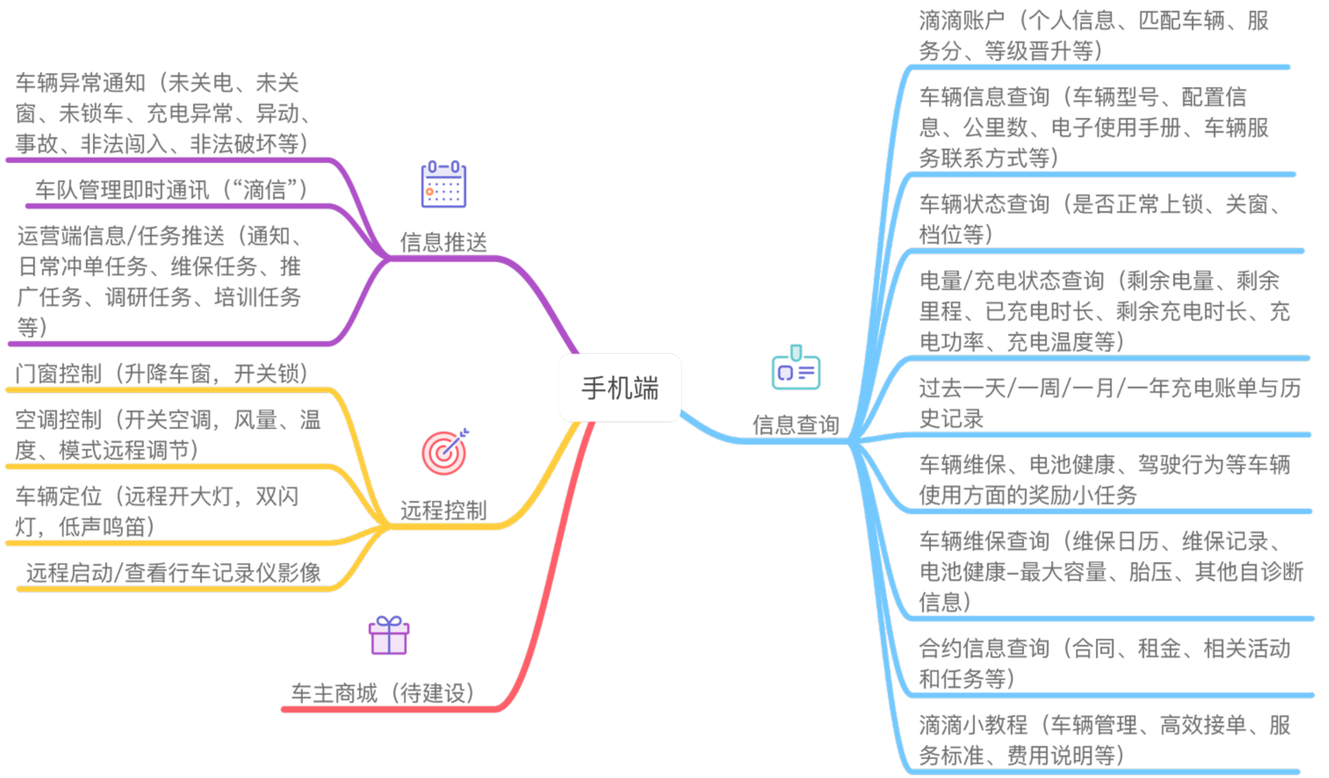


手机端产品模块

1. 账户系统（账户关联）
2. 车辆状态（充电、门锁等）
3. 车辆健康/维保信息查询
4. 车辆基本信息
5. 租赁合约信息查询
6. 车辆异常通知
7. 车辆定位（寻车）
8. 远程控制（车窗、门锁）
9. 远程控制（空调）
10. 行车记录仪控制
11. 司机即时通讯（滴信）
12. 车队活动推送
13. 车辆小教程
14. 司机良好行为奖励机制
15. 车主商城

高优先级 中优先级 低优先级

手机端需求分类



2、网约车全场景 智能化拆解 路径概览

司机 乘客

	上车前	解锁车辆	开门上车	开机登录	登录后出车前	出车/行驶	听单接单	接驾	到达上车点/识别
痛点	• 担心车内过冷/过热 • 车况/电量等情况未知	• 忘记车停放位置 • 忘带钥匙无法解锁	• 司机开门上车落座 • 闷了一晚上，车上有味儿	• 车机反应慢/卡顿 • 登录繁琐成功率低	• 出车规划迷茫 • 连接蓝牙不便	• 剐蹭/追尾/碰撞等 • 疲劳驾驶，容易犯困 • 长期驾驶，腰酸背痛	• 长时空驶，接不到单 • 视线离路，不便利	• 视线离路，不安全 • 担心车内气味环境差 • 外面太冷/热	• 定位不准 • 无法识别接驾车辆
预期	• APP查询/远控功能 • 续航/电量/天气/温度 • 记忆习惯/推荐引导	• APP寻车定位 • APP解锁车辆	• 座椅智能记忆调节 • 司机智能迎宾仪式 • 大屏智能换气	• 人脸自动登录 • 大屏开机流畅	• 查看热力图 • 路线规划推荐 • 自动连接蓝牙	• 行车安全提醒 • 疲劳智能缓解 • 语音控制车辆	• 查看热力图 • 一键接单 • 查看流水	• 电话联系乘客 • 智能通风换气 • 乘客APP控制	• 定位准确 • 醒目的接驾提示

司机独驾

非接单时

司乘共驾

订单循环

	END	收车	晚上充电	故障异常	午休/停车等单休息	中午充电/午餐	到达目的地/下车	送驾	乘客上车
痛点		• 下车忘记锁车窗	• 充电离家太远	• 不知道车辆是否异常	• 车内休息不舒适 • 不接单时打发时间	• 充电处吃饭不便	• 下车碰撞剐蹭 • 未复位影响下一乘客	• 被导航播报声音打扰 • 对空气/温度不满意 • 车内音乐不喜欢	• 乘客上车不便 • 不知道从哪儿上车 • 腿部空间局促不舒适
预期		• 自动检测车况 • 智能提醒/执行	• 顺路单 • 结合电量派单	• 故障及时提醒 • 故障排查建议	• 基础娱乐体验 • 小憩模式体验	• 充电桩推荐 • 周边服务推荐	• 下车安全提醒 • 音乐/空调/座椅 • 智能复位	• 勿扰模式/声音分区 • 乘客听歌体验 • 乘客APP智能控制	• 乘客智能迎宾仪式 • 推荐落座位置 • 自动调节座椅空间

DA VINCI

3、司乘核心价值创造 所围绕的体验方向

司机价值

P0	P0	P0	P1	P1	P2
舒适性	接单效率	安全性	科技智能	便利性	非接单可消遣
- 乘坐舒适	- 接单体验好	- 行车安全	- HMI	- 操作便利	- 本地音频
- 温度舒适	- 缓解里程焦虑	- 驾驶行为安全	- 车机流畅	- 查看信息便利	- 在线音频
- 气味舒适		- 车内冲突	- AI智能	- 连接便利	
- 声音舒适		- 车辆安全	- 智能场景交互	- 导航便利	
- 亮度舒适		- 信息安全		- 充电便利	
- 休息舒适					

乘客价值

P0	P1	P1	P1
舒适性	娱乐性	可控性	安全性
- 换气舒适性	- 乘客播歌	- 乘客控车便利性	- 安全带未系提醒
- 乘坐舒适性	- 声音分区		- 车内安全播报
	- C位音效		

4、Alita智能座舱全功能 分层策略

- Must：基于座舱必备能力、成本目标管控、平台运营需求、定制车属性及行业基本水平等多维度明确Alita座舱基础能力搭建方向
- Nice to have：针对桔子司机or对公司机非接单场景，围绕车内消遣娱乐、智能场景交互及私人用车场景打造用车体验升级
- Wow：结合运营场景下乘客智能化乘车体验，匹配整车产品定义方向的同时，打造座舱内功能核心亮点

5、围绕整体目标，Alita智能座舱主打的核心产品亮点