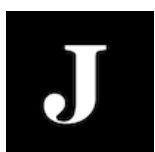# Audi MIB2+
User Testing

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October 2017

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1 Overview

When the development of MIB2+ gets to the end, it is a good time to review the current system. By doing the user testing, the Audi HMI designers can have a better understanding on what problems the system has now and what improvements the system can be done in the future.

2 Goals

1. Define MIB2+ main problems
2. Generate an overview for MIB2+ each function
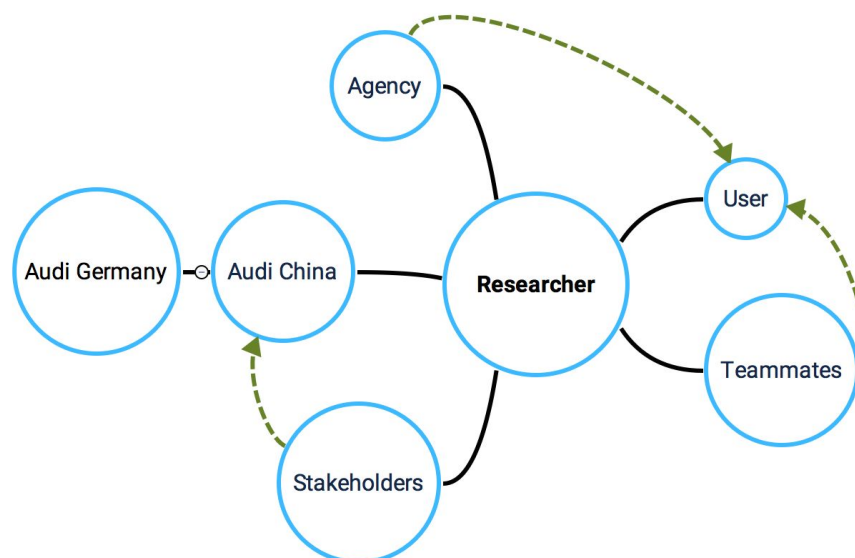3. Summarize design concepts for in-vehicle infotainment system

3 Durations

6 weeks.

4 Participants number

10 people.
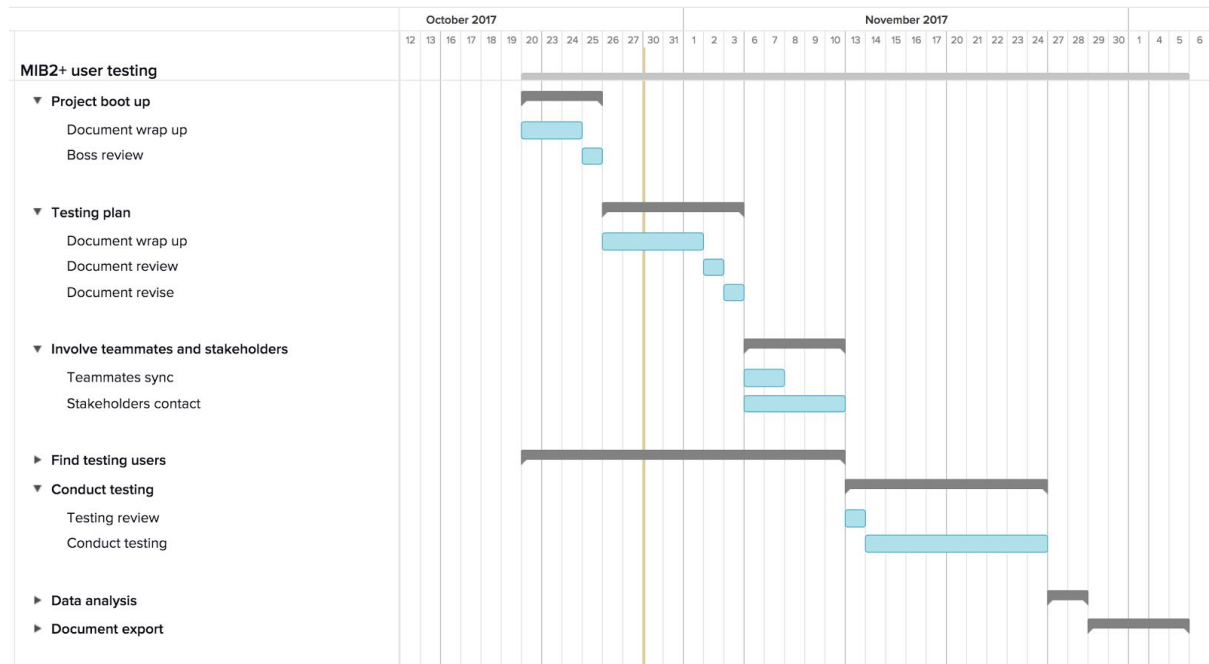
5 People relationships

Key Points:
1. Chinese customer's ideas
2. Function owner's ideas

3. Agency's cost fee
4. Manager's ideas
5. Stakeholder(VW)'s ideas

6 Gantt chart

Key Points:
1. Testing location confirmation
2. Testing people schedule confirmation
3. Testing car booking
4. Testing document editing
5. Testing process recording
6. Testing report writing

7 Milestones

7.1 Project Boot Up - 10.25

Apply money from manager for this project. Confirm the agency which helps us to find 10 users. Consider potential risks for postponing the project.

7.2 Testing Plan - 11.3

When and where users will meet interviewers. Prepare the testing document. Involve teammates and managers to improve the document.

7.3 Find Testing People - 11.10

Finalize interviewing time and people. Think of back-up plan in case exceptional things happen.

7.4 Conduct Testing - 11.23

Conduct testing and collect all data that we need for later analysis. Prepare car and camera.

7.5 Document Export - 11.30

Analyze user feedback and export analysis document to achieve project goal.

8 Testing guideline excerpts

Section I: Warm up / Pre-interview (20min) 前期访问（20分钟）

0. Introduction of the interviewer / the institute: 访问员自我介绍

INT Please provides the following information:

My name is …and I work for Audi China…… We are conducting this usability study 自我介绍姓名，此次研究目的

I am looking forward to talking to you about a very interesting topic in the next two hours. The focus of this study lies on the evaluation of future in-car system, and it will help us to improve them in the future.接下来两个小时会和您讨论一个有趣的话题:我们会来评价一下现有车内的功能，以帮助我们未来的开发。

0.1 Description of the process: 描述流程

INT Please provides the following information:

The interview will consist of three parts: 访问分为三部分:

Part 1 includes the introduction and contains preparatory questions (20 min) 第一部分：简介和一些初步询问的问题（20分钟）

Part 2 we will sit in test car and have you experience the different in-car system (60 min) 第二部分：在测试车内完成指定的测试项目（60分钟）

Part 3 you will do a test drive on the specified route and perform some further tasks, our interviewer will guide you the direction of diving. (30 min) 第三部分：在指定的线路上驾驶，同时完成一些测试项目；我们的访问员会指引您驾驶的路径。

Part 4 will include your final evaluations and some other topics (15 min) 第四部分：事后评估和一些其它相关话题（10分钟）

The Interview will be audio- and video-recorded for analysis purposes only. The legal obligations regarding data protection and anonymity wHI be ensured.告知录音录像，隐私保护相关内容。

Please tell us everything that comes to mind during the interview. Think out loud, there is no "right" and "wrong" answer Your feedback will help us to improve future cars.在整个访问过程中大声说出自己当时的想法，没有对错之分，您的想法会帮助我们改造我们的产品，请畅所欲言。

0.2 Demographics / Vehicle Statistics

Person related data 个人相关数据

a) Age 年龄_____岁

b) Gender 性别

1☐	Male 男
2☐	Female 女

c) Marriage status: Are you married? 您的婚姻状况是?

1☐	Married 已婚
2☐	Single 单身

d) Kids in household: How many kids (below 18 years) currently live in your household?

1☐	No kids 无小孩	
2☐	1 kid: _____	Age
3☐	2 kids: _____	Age
4☐	3 kids: _____	Age

---

e) Years of driving 驾龄: _____ 年

f) Profession 职业：_____

0.3 Vehicle usage 车辆使用

Average driving time every day _____ .平均一天您驾驶时间

1☐	<30 minutes
2☐	30-60 minutes
3☐	60-90 minutes
4☐	90-120 minutes
5☐	>2 hours

Section II: Static user experience evaluation - Intuitive impression and operation静态评估-直观感受和操作

| ACT -> Please take the respondent to the Audi vehcle. 带被访者区车辆（静态测试） |

| ACT -> Please check the folloing: 检查： |
| 1. Make sure all the systems are reset. 确保系统已重置。 |
| 2. Make sure the display is main menu. 确保在主菜单。 |
| 3. Make sure the smartphone is turned on and with power source. 确保手机开机并充电 |
| 4. Make sure the video recording system is power on and working properly. 确保视频录像设备已打开并正常工作。 |

| ACT -> Please enter the car: 入车： |
| 4. Power on the car 打开点火开关 |
| 5. Interviewer sits in the passenger seat 访问员坐在副驾驶座位 |
| 6. Remind respondent not to operate anything in the car untial interviewer told. 告知受访者先不奥操作社内的任何设备，直到访问员要求开始操作。 |
| 7. Please adjust the seat to your most comfortable position, just like what you did in your own car.现在请您调节座椅，按照您平时开车时最喜欢的姿势来调节。 |

| Please provide this information: 请向被访问者说明： |
| • Now we would like to test some of the functions of the in-car system. I will ask you to perform individual tasks in a sequence.现在我们想要测试，下系统的一些功能。我会要求您按照顺序完成一些单项任务。 |
| • As mentioned earlier, there is no right or wrong when you perform these tasks. We are not testing your skills; only the vehicle's operating system is being tested here. 正如之前提到的那样，在您进行操作的时候不存在正确或者错误的操作，我们并没有在测试您的技巧，这里仅仅是在测试车辆的操作系统。 |
| • Very important: When you execute these tasks, please think out loud and express everything that comes to mind, whether it is negative or positive.非常重要的一点是，在您 进行这些任务的时候，请说出所有您脑海中思考的内容，无论是正面的还是负面的。 |

4

1 AC

1.1 U1.1: Turn on AC / Adjust temp. 打开空调 / 设定温度

"Please activate the air conditioning and adjust the temperature to a certain degree of your choice." "请打开空调，并调到您选择的温度。"

1.1.1 Observations 观察

Complete 完成情况	□ Instant Success 一次成功 □ Success 成功 □ Failed 失败
Attemps 尝试 路径 (3 max)	
Observation 访问员观察 评分	Rating 访问员评级：
	1□ No problems 没问题
	2□ Irritation 有点犹豫
	3□ Minor errors 小错误
	4□ Massive errors 大错误
	5□ Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：

1□	System 系统_____
2□	Human c 操作者_____
3□	No differentiation possible 无法区分

1.1.2 How would you rate your satisification of the functions tested? 您会如何评价对此项设置的满意度?

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意
□	□	□	□	□

1.1.3 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您师傅遇到困难或者不方便的地方？请说出遇到的障碍和困难，或者改进的意见。

| |

1.2 U1.2: Set to inner cycle / adjust wind direction 设置内循环 / 风向调节

"Now please use the Air inner cycle. Afterwards adjust the wind flow to the foot area." "现在请使用空气内循环。之后调节至脚部出风。"

1.2.1 Observations 观察

Complete 完成情况	□ Instant Success 一次成功 □ Success 成功 □ Failed 失败

5

| Attemps 尝试
路径 (3 max) |
温度调节 温度调节 | | | | |

Observation 访问员观察 评分	Rating 访问员评级：
	1☐ No problems 没问题
	2☐ Irritation 有点犹豫
	3☐ Minor errors 小错误
	4☐ Massive errors 大错误
	5☐ Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：
	1☐ System 系统_____
	2☐ Human c 操作者_____
	3☐ No differentiation possible 无法区分

1.2.2 How would you rate your satisification of the functions tested? 您会如何评价对空调设置的满意度?

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意

1.2.3 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您师傅遇到困难或者不方便的地方？请说出遇到的障碍和困难，或者改进的意见。

☐	☐	☐	☐	☐

1.3 U1.3: Check the AQI / Close AC / 查看空气质量指数 / 关闭空调

"Now please check the AQI and then close AC" "现在请尝试查阅空气质量指数，之后关闭空调。"

1.3.1 Observations 观察

Complete 完成情况	☐ Instant Success 一次成功 ☐ Success 成功 ☐ Failed 失败
Attemps 尝试 路径 (3 max)	 AQI 温度调节
Observation 访问员观察	Rating 访问员评级：

6

评分	1☐ No problems 没问题
	2☐ Irritation 有点犹豫
	3☐ Minor errors 小错误
	4☐ Massive errors 大错误
	5☐ Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：
	1☐ System 系统_____
	2☐ Human c 操作者_____
	3☐ No differentiation possible 无法区分

1.3.2 How would you rate your satisification of the functions tested? 您会如何评价对此项设置的满意度?

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意
☐	☐	☐	☐	☐

1.3.3 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您师傅遇到困难或者不方便的地方？请说出遇到的障碍和困难，或者改进的意见。

7

2 Multi-steering wheel 多功能方向盘

2.1 Q2.1: Now let us focus on the streering wheel; please try to describe to me the function of each button according to your understanding. 现在我们讨论一下方向盘，请根据您的理解描述每一个按键的功能。

Item	Understand correctly? (Y/N) 是否理解？	If not correct, record the respondents' understanding, and then explain the right function description. 如理解错误，记录被访者的理解，并解释正确功能。
1		仪表盘，切换选项
2		仪表盘视图显示切换
B		返回，上一级菜单
4		调出选项菜单
5		旋转/选择功能，按压确认
6		电话功能，通话,结束通话，通话列表

7		语音对话 SDS
8		调节音，按下 MMI 静音
9		上一个/下一个曲 H
10 (* 自定		方向盘加热 *自定义键
11		重复上一次导航播报（确认）

2.2 Q2.2: Most used buttons/features 最常用的三个键/功能

1. _____
2. _____
3. _____

2.3 Q2.3: Which feature do you need to put on the steering wheel but currently is not available? 你最想放在方向盘上的操作/功能，而目前上面没有提供的是？

_____

2.4 U2.4 Please set the "*" key with function daylight nightlight map. 请尝试通过方向盘或者MMI设置方向盘上的自定义按键*键的功能为日间地图夜间地图切换。

2.4.1 Observations 观察

Complete 完成情况	□ Instant Success 一次成功 □ 2nd time success 成功 □ 3rd time success 成功 □ Failed 失败
Attemps 尝试 路径 (3 max)	1）长按*键选择 2）车辆 --> settings&service -> steering wheel buttons

Observation 访问员观察 评分	Rating 访问员评级：
	1□ No problems 没问题
	2□ Irritation 有点犹豫
	3□ Minor errors 小错误
	4□ Massive errors 大错误
	5□ Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：
	1□ System 系统_____
	2□ Human c 操作者_____
	3□ No differentiation possible 无法区分

2.4.2 How would you rate your satisification of the functions tested? 您会如何评价对空调设置的满意度？

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意
□	□	□	□	□

2.4.3 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您师傅遇到困难或者不方便的地方？请说出遇到的障碍和困难，或者改进的意见。

2.5 U2.5 Please activate the map in kombi and zoom in and our on the map. 请在虚拟座舱屏幕（液晶仪表盘）上打开地图界面，然后将地图放大或者缩小。

2.5.1 你是否有虚拟驾驶舱？

a. 有
b. 没有

2.5.2 Observations 观察

Complete 完成情况	□ Instant Success 一次成功 □ 2nd time success 成功 □ 3rd time success 成功 □ Failed 失败
Attemps 尝试 路径 (3 max)	
Observation 访问员观察 评分	Rating 访问员评级：
	1□ No problems 没问题
	2□ Irritation 有点犹豫
	3□ Minor errors 小错误
	4□ Massive errors 大错误
	5□ Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：
	1□ System 系统_____
	2□ Human c 操作者_____
	3□ No differentiation possible 无法区分

2.5.3 How would you rate your satisification of the functions tested? 您会如何评价对空调设置的满意度？

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意

☐	☐	☐	☐	☐

2.5.4 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您师傅遇到困难或者不方便的地方？请说出遇到的障碍和困难，或者改进的意见。

Section III: Dynamic test 动态测试

10.2 Haptic feedback 触控反馈

Now please open a music while driving(haptic feedback is off). 请在行驶中播放一首歌曲(关闭触控反馈)。

10.2.1 Observations 观察

Complete 完成情况	☐ Instant Success 一 次成功 ☐ 2nd time success 成功 ☐ 3rd time success 成功 ☐ Failed 失败	
Attemps 尝试 路径 (3 max)	???	
Observation 访问员观察 评分	Rating 访问员评级：	
	1☐	No problems 没问题
	2☐	Irritation 有点犹豫
	3☐	Minor errors 小错误
	4☐	Massive errors 大错误
	5☐	Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：	
	1☐	System 系统_____
	2☐	Human 操作者_____
	3☐	No differentiation possible 无法区分

10.2.2 How would you rate your satisification of the functions tested? 您会如何评价对此项设置的满意度？

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意

☐	☐	☐	☐	☐

10.2.3 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您是否遇到困难或者不方便的地方？请说出遇到的障碍和困难，或者改进的意见。

10.3 Haptic feedback 触控反馈

Now please open a music while driving(haptic feedback is on). 请在行驶中播放一首歌曲(开启触控反馈)。

10.3.1 Observations 观察

Complete 完成情况	☐ Instant Success 一 次成功 ☐ 2nd time success 成功 ☐ 3rd time success 成功 ☐ Failed 失败	
Attemps 尝试 路径 (3 max)	???	
Observation 访问员观察 评分	Rating 访问员评级：	
	1☐	No problems 没问题
	2☐	Irritation 有点犹豫
	3☐	Minor errors 小错误
	4☐	Massive errors 大错误
	5☐	Help from RA 需要访问员帮助
	Problems can be tracked back to (MA)...问题的原因是（可多选）：	
	1☐	System 系统_____
	2☐	Human 操作者_____
	3☐	No differentiation possible 无法区分

10.3.2 How would you rate your satisification of the functions tested? 您会如何评价对此项设置的满意度?

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意
☐	☐	☐	☐	☐

10.3.3 Did you experience any difficulties? Please name obstacles and difficulties. What exactly needs to be improved? 您是否遇到困难或者不方便的地方? 请说出遇到的障碍和困难, 或者改进的意见。

Is haptic feedback helpful for you to opereate touch screen? 触控反馈在驾驶时对你操作屏幕有没有帮助。
J.   Yes. 有
K.   No. 没有
L.   I don't. 不知道

10.4 Locking mode 加锁模式

Now please read news and then start the car. 请先阅读新闻然后驾驶。

10.4.1 Observations 观察

Complete 完成情况	☐ Instant Success 一次成功 ☐ 2nd time success 成功 ☐ 3rd time success 成功 ☐ Failed 失败
Attemps 尝试 路径 (3 max)	???

Observation 访问员观察 评分	Rating 访问员评级:
	1☐ No problems 没问题
	2☐ Irritation 有点犹豫
	3☐ Minor errors 小错误
	4☐ Massive errors 大错误
	5☐ Help from RA 需要访问员帮助

Problems can be tracked back to (MA)...问题的原因是(可多选):

1☐	System 系统_____
2☐	Human 操作者_____
3☐	No differentiation possible 无法区分

10.4.2 How would you rate your satisification of the functions tested? 您会如何评价对此项设置的满意度?

-2 Not satisfied at all 一点也不满意	-1 不太满意	0 中立	1 比较满意	2 Very satisfied 非常满意
☐	☐	☐	☐	☐

10.4.3 How do you feel about the locking of Keyboard, video, long text while you are driving? 您对驾驶时对键盘, 视频和长文字加锁是什么看法?

Section IV Sum-up / Post-interveiw (20min)
总结 (20 分钟)

> INT Please provide the following information: 提供以下信息
> So now we are finished with doing the tasks. I would like to talk about your recent impression• 现 在我们已经完成了所有任务。讨论一下您的感受和印象。

1.Among all the features and functions we tested today, could you list the top 3 that you are most impressed? 在我们今天测试了这么多系统和功能之后, 请您列举 3 个让您印象最深的。为什么是这三项?

1.

2.

3.

2.What do you really like about the system tested today, and do you dislike? What are the main pros and cons? Are there any important features, functionalities or controls which you perceive as not workable/functional?在今天测试的系统中, 您喜欢哪些方面, 不喜欢哪些方面? 有哪些优点和缺点? 有没有哪些重要的功能/特性的操作或控制按键您觉得是特别不好用的?

[INT] Important question! Please probe

3.Now please list the functions that you consider will be most helpful in your daily driving (5 most). 现在请您列举出您认为对您平时开车最具有帮助的功能和系统 (最多 5 项) 为什么您会选择这 5 项

1.

2.

3.

4.

5.

4.What else fucntions do you need particularly? 除此之外还有什么功能是您特别想要的?

5.If you could access explainations and recommendations of car features (e.g. how to use ACC, what services does Audi connect have, how can I change the ambient light color) via voice command, and even tutorial videos could be shown in the MMI screen. How useful do you think such a function would be? 在我们今天的测试中有些功能用起来会有点复杂, 如果可以通过语音指令, 来教你如何使用这些功能, 比如使用 ACC 的步骤, 调节氛围灯的步骤, 甚至这些教学步骤会显示在中控屏幕上, 帮你一步一步完成, 这对您来说有帮助吗? 需要吗?
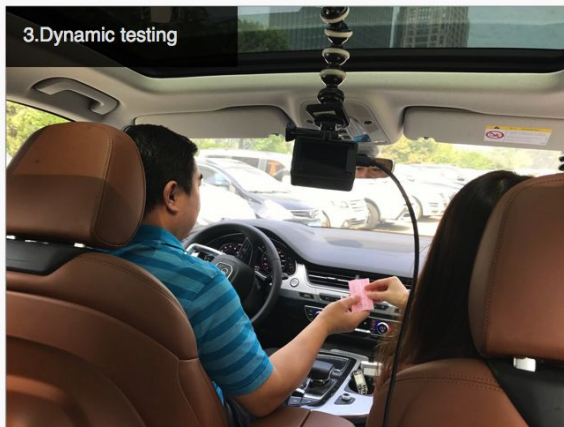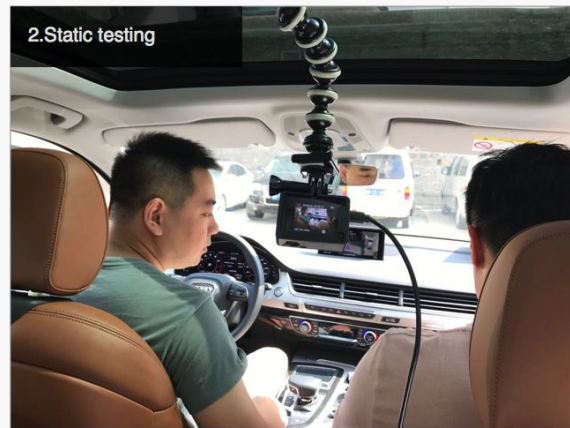
6. Which kind of customization service/feature do you want to have in your Infotainment system? 在车载系统中，你希望哪些功能和服务是可以定制化的？

7.SUS questionnaire 可用性测试量表

Questions 题目		Strongly Disagree 非常不同意	Disagree 不同意	Neatural 一般	Agree 同意	Strongly Agree 非常同意
1	I think that I would like to use this product frequently. 我愿意经常使用该产品	1	2	3	4	5
2	I found the product unnecessarily complex. 我认为该产品没必要这么复杂	1	2	3	4	5
3	I thought the product was easy to use. 我认为该产品很容易使用	1	2	3	4	5
4	I think that I would need the support of a technical person to to be able to use this product. 我认为需要有经验的人帮助我才能使用该产品	1	2	3	4	5
5	I found the various functions in the product were well integrated. 我发现该产品的多个功能结合的很好	1	2	3	4	5
6	I thought there was too much inconsistency in this product. 我发现该产品有太多不一致	1	2	3	4	5
7	I imagine that most people would learn to use this product very quickly. 我觉得大多数人可以很快的学会使用该产品	1	2	3	4	5
8	I found the product very awkward to use. 我觉得该产品使用起来很麻烦	1	2	3	4	5
9	I felt very confident using the product. 在使用该产品时，我感觉很自信	1	2	3	4	5
10	I needed to learn a lot of things before I could get going with this product. 为了用该产品我需要学习很多东西	1	2	3	4	5

9 Test recording

1. Pre-testing interview
2. Static testing
3. Dynamic testing
4. Post-testing interview
5. Group research

10 Data analysis

TBD.

Key Points:

1. Project introduction and key findings
2. Awareness and impact on purchase journey
3. Evaluation on existing services
4. Preliminary perception on future services
5. Payment attitude
6. Attitude on data usage

11 Document export

TBD. Document format see following example.

User Research Report for NDF and Free-search Functions on MIB2+

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Participants: Wentao Li, Yishi Yang, Shanshan Li, Qin Li, Liang Bai

CONCLUSION

After carefully conducting the user research for the NDF and free-search functions on MMI2+, most users only use free-search. From the usability aspect, the author hold the opinion that, for the purpose of designing for the next generation HMI navigation system, **it is better to remove NDF**.

ARGUMENTS

- It takes less time for users to finish search tasks by using free-search than by using NDF[1].
- Users' search performance has smaller variance for free-search than NDF[2].
- Few users actively choose to search destination by using NDF.
- Users has accustomed to free-search mental model and is unfamiliar with NDF search logic and NDF interface.
- Audi's NDF currently has a low performance with many user experience problems.

RESEARCH PROCESS

1.BACKGROUND

Since the rapid development of IVI, the navigation system has improved a lot as well. To compete with the mobile navigation user experience, IVI updated its original search method form NDF to free-search, the one-click search method. Moreover, to keep former user's behaviors consistent, IVI saves the NDF entry. However, currently we want to do research to figure out do IVI still needs to keep the NDF entry for Asia market.

2.GOALS

Does NDF still need to be kept for MIB3 and future IVI?

3.RESEARCH QUESTIONS

- How do people use search function in car?
- What do users like about each method (NDF and free-search)?
- What are improvements users want for each method (NDF and free-search)?

4.METHODOLOGY[3]

1. Separate users into 2 groups: A and B. Each group does the following two tasks (TaskA and TaskB) in the same way except the TaskA's order is opposite.
2. Warm up session: ask several general questions to make users ease and build rapport with them. For example, how do users use navigation normally? Also, remember to ask users to play the IVI for a while and tell them that our purpose is only for testing the IVI, not their behaviors?

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[1] 56:19, details see Appendix A

[2] 19.33:5.62, details see Appendix A

[3] Flowchart see Appendix B

3. TaskA: randomly collect 3 destinations[4]. Ask them to search each address by using NDF and then by using free search (See Figure 1).
4. TaskB: ask users to freely choose one method (See Figure 2), NDF or free search, to visit 3 destinations[5].
5. Take notes when notice useful information. Answer users' questions if they ask when getting confused. Record task-finishing-time for TaskA.
6. Ask users to fill a questionnaire[6] (See Figure 3**)** to collect qualitative information.
7. Analyze TaskA's task-finishing-time to collect quantitative information (See Figure 4).
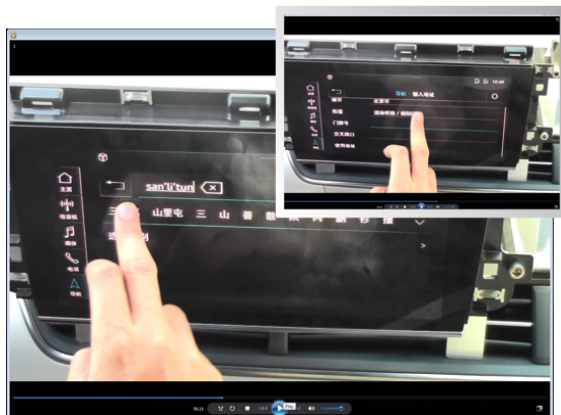8. Review the recording video[7] to collect useful information for improvements on IVI navigation.
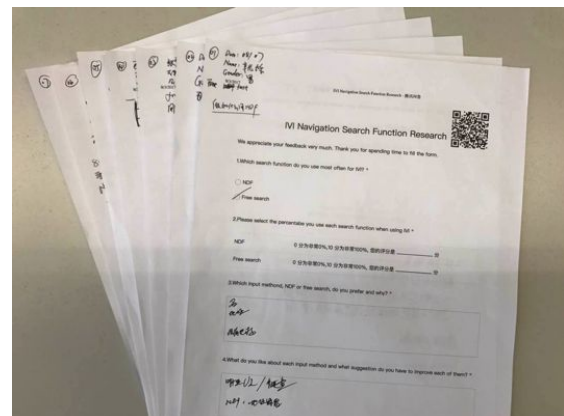

Figure 2.TaskB

Figure 3.Questionnaire

Figure 1.TaskA

Figure 4.Finishing time

5.SUBJECTS

7 people. 4 men and 3 women.
These are the primary characteristics of the study's participants:

- Audi employees
- Don't know much about MMI
- Aged between 20s-30s

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[4] See Appendix C
[5] See Appendix C
[6] See Appendix D
[7] See Appendix E

6.TESTING ENVIRONMENT
- Audi Q7
- Audi MIB2+
- Online free-search
- Onboard NDF

7.SCHEDULE
- Recruiting: August 4
- Rehearsal methodology: August 4
- Study day: August 7
- Results delivery: August 8

8.SCRIPTS
- Find the subjects
- Know where is the car
- Recording camera works
- Online free-search works
- Users allow to select keyboard mode
- Print questionnaire out
- Chat with users first
- Keep the testing condition comfortable (sun, temperature, rain)

9.SYNTHESIZE
- Calculate the mean and variable for the task-finishing-time of TaskA.
- Algorithm for mean: after removing the smallest and biggest numbers, $M = SUM / n$
- Algorithm for variable: $D(X) = SUM(X_n - M)^2 / n$

10.ADMISSION
- Limited number of subjects
- Testing device is only MIB2+
- Testing tasks could be more various

REFERENCE

[1] Julia DeBlasio Olsheski, Bruce N. Walker. IVAT (In-Vehicle Assistive Technology): Multimodal Design Issues for TBI Drivers. Sonification Lab, Georgia Institute of Technology. 2001.
[2] James Chudley.Effectively Planning UX Design Projects. 2017. https://www.ceros.com/blog/effectively-planning-ux-design-projects/

Appendix A - Task Finishing Time Analysis

NUMBER	NDF			MEAN	FREE SEARCH			MEAN
01	80	35	89	68	30	34	23	29
02	195	30	43	89	20	16	10	15
03	50	35	48	44	15	16	21	17
04	40	50	40	43	20	21	15	19
05	55	24	74	51	5	20	23	16
06	30	34	29	31	10	15	16	14
07	56	43	88	62	18	33	24	25
08								
09								
10								
			OVERAL MEAN	56			OVERAL MEAN	19
			VARIABLE	19.33			VARIABLE	5.62

Appendix B - Methodology Flowchart
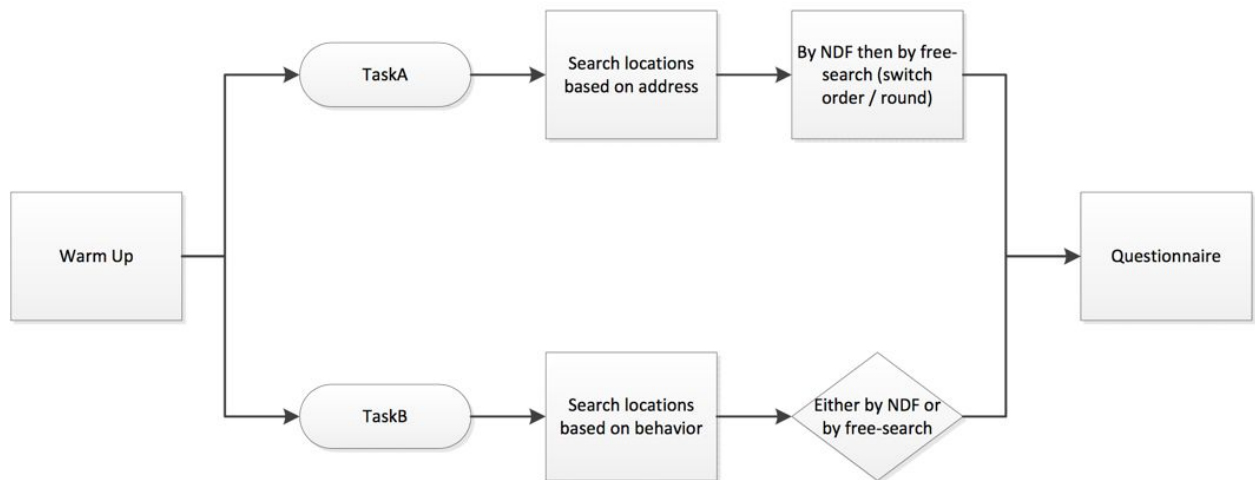
Appendix C - TaskA and TaskB Destination List

TaskA Destination	奥迪中国：北京市朝阳区酒仙桥路4号	三里屯优衣库：北京市朝阳区三里屯路19号	天津大学：天津市南开区卫津路92号
TaskB Destination	Home	Beijing University	IKEA

Appendix D - Questionnaire

IVI Navigation Search Function Research

We appreciate your feedback very much. Thank you for spending time to fill the form.

1.Which search function do you use most often for IVI? *

◯ NDF

◯ Free search

2.Please select the percentabe you use each search function when using IVI *

NDF	0 分为非常0%,10 分为非常100%, 您的评分是 ＿＿＿＿＿＿ 分
Free search	0 分为非常0%,10 分为非常100%, 您的评分是 ＿＿＿＿＿＿ 分

3.Which input methond, NDF or free search, do you prefer and why? *

4.What do you like about each input method and what suggestion do you have to improve each of them? *

5.Do you have any ideas for the research? We appreciate your feedback to improve our next time reserach. *

Appendix E

Please contact the author for research video files by email: tianchan.qiang@audi.com.cn