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A growing number of intelligent systems and technologies are being installed as standard in new vehicles today, with even more in development and set for installation in the near future. While the most commonly marketed innovations by OEMs stem from the vehicle's HMI and infotainment systems, this innovation extends to safety and security.

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Digital Key Guide

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The increased presence of software-based features and systems inside the vehicle has led to a rise in the number of experiences hosted on a smartphone. The most notable of these is the digital key, which sees the user's smartphone leveraged to unlock/lock and start the vehicle. Today, it is widely seen as a premium feature – with select luxury OEMs offering it as standard and mass market automakers providing it as an optional feature in premium packages or higher trim models.

In the future, however, digital key systems – especially those that utilize a smartphone – could become an increasingly common user experience. Likewise, as they become more accessible through native vehicle integrations, alongside new partnerships between OEMs and consumer electronics firms, digital keys could replace current passive smart key systems and potentially replace the key fob altogether.

Updated annually in .PPT and .XLS formats, the Digital Key Guide tracks the latest trends and offerings from OEMs across three major regions. Similarly tracked are the features and pricing models of each system as well as the technologies used to produce them. Through dedicated releases for the USA, Europe, and China, the report understands how the fitment and maturity of digital keys can vary around the world.

ANNUALLY

PUBLICATION FORMAT



PAGES

85+

Key questions answered

- > Which models offer Digital Keys and by what technologies?
- > What features and pricing models are being launched by OEMs?
- > What are the latest developments from the Digital Key ecosystem?
- > What are the main technologies being deployed to support Digital Key technologies?





PRODUCT PLANNERS





Q

IT



Do I have access?



View Excel Data Sheet Sample

Digital Key Guide

Track the latest digital key system trends and offerings from OEMs





>



Digital Key Guide

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Introduction

Introduction

Digital key systems are not just seen as an **attractive replacement for key fobs**, but also offer a method of sharing and revoking keys over the air. Since the **introduction of passive entry passive start (PEPS)** systems, customers have grown used to convenient ways to unlock and start the vehicle without having to operate the key fob. For the digital key systems to be seen as a long-term option, OEMs must develop systems that **offer more features**, **be as easy and as simple to use** as what they are replacing and **be secure**.

The **712-Digital Key Guide** details how this can happen, what technologies are currently being used and the **standard changes, best practice guidance and system developments** that will likely shape future system designs. Through these considerations, this report identifies the major drivers and barriers for the **FOUR key OEM motivations for digital key space**.



- How do the OEM-based digital key offerings fare against the aftermarket systems?
- What are the associated features/attributes of digital key technology being offered by OEM groups/brands?
- Where are OEMs positioned in terms of features(NFC/BLE/UWB) and security of the digital key feature?

Section	Content
Bird Eye View	An overview of the key findings from SBD's view of what's important on Digital Key, Consumer Experience landscape of mobility services today and positive security culture within OEMs, suppliers
Executive Summary	Digital key standards, technologies , the evolution of digital key, future predictions on what types of features may be available, the main challenges, and a snapshot of the current market landscape.
The Basics	Overview of the digital regulations, standards and the different technologies implemented by the OEMs
What's New?	Focusing on the new partnerships completed by the OEMs, the latest technology being used for developing Digital Keys and which OEMs have introduced or launched them.
Market Analysis	In-depth information on the trends and features of digital keys, offered by the OEMs.
Summary Tables	Summarizing the trends identified in the associated Excel spreadsheet database and a score is given to each system.
Ecosystem	Offering, acquisition and patent insights for key non-OEM stakeholders
Future Outlook	Four OEM personas are considered against drivers and barriers into the future to understand when Digital Key benefits will be truly realized
Next Steps	Can SBD help you with any unanswered questions?



We Listened and Invested In Our Report to Align to Your Goals

You Said...

"I sometimes struggle to relate conclusions from research reports to the Outcomes and KPIs that we are working towards..."

"I would like to see what has recently changed within a forecast or domain to help decide if any changes to strategy need to be made..."

"I want to know where we stand 'head-to-head' against the competition on major industry trends....."

"I can find it difficult to take actionable next steps on Guides without assessing the future direction of the industry..."

"It would be helpful to identify disruptive companies and startups to keep an eye for partnerships in the future..."

"I would like the topics to be more 'forward looking' to help with future planning and take advantage of enabling technologies."



Added a **Birds-Eye View** chapter with a high-level overview of all our Automotive app guide, Cyber Security, Connected Services, and Cockpit reports.

Enhanced **CROSS-REFERENCING** with considerations of our Cyber security principles and insights from our Connected Services Forecast.

Introduced a **FUTURE OUTLOOK** chapter with motivations such as operational efficiency, and its drivers and barriers.

More **DATA-DRIVEN ANALYSIS** through our Summary Table analysis, and Executive Summary.

Created a **DIGITAL KEY OEM RANKING** and an **ECOSYSTEM** chapter with offering, acquisition and patent insights for key non-OEM stakeholders.





1. Birds-Eye View

Macro level summary of insights and So-What analysis to customers.



2. Ranking & Ecosystems

Analysts view on OEM positioning within guides and rankings as part of generations of technology alongside Assessment of key partners, enablers.





Example slides from the report







Getting consumers to trust digital key



When the mega volume OEMs roll out digital key, consumers will start to get accustomed to using it.

Systems must be reliable to gain consumer trust.

Having a back-up system will greatly improve consumer confidence.



Opportunities



 $((\frown)$

In the long term, digital key could become the default key allowing OEMs to save costs on key fobs.

Best Practices



The CCC is playing a vital role in winning customers' trust by making systems a more reliable, compatible and consistent user experience. This know-how could also filter through to OEM proprietary systems.



iOS & Android Compatibility



Apple phones and Android phone are compatible with the digital key technology. In order to promote greater platform compatibility, industry alliances such as the Car Connectivity Consortium (CCC) are striving to create uniform standards for digital keys.

Compatibility between iOS and Android devices is anticipated to increase as standardization efforts advance and automakers prioritize wider reach.

- The digital automotive industry is dependent on iOS and • Android phones, which provide a multitude of applications that improve convenience and user experience.
- Convenience, security, and a peek into a future where our • cellphones serve as our primary vehicle key are all provided by digital key technology.

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BYD Introduces its New Smart Watch with Built-In Car Key Source: gizmochina









BMW digital key now compatible with Android devices, Source: BMW Group

Use cases:

- With the certain apps, vehicle owners can remotely check the • battery life, tire pressure, and fuel level of your vehicle.
- Customizable permissions let users do more than just unlock items; they can even start the engine.
- Create user profiles with specific access levels. •



What? are the challenges faced in digital key adoption

UWB technology is more precise in calculating the proximity of your smartphone's digital car key. Despite its security benefits, **not all cars that are compatible with digital car keys have implemented UWB technology**. Some car manufacturers like Tesla, Hyundai, and Lincoln use digital car keys that rely on Bluetooth Low Energy (BLE) or Near-Field Communication (NFC) systems. The problem is, it could be a while before most cars are compatible with UWB technology because **it is more expensive to install compared to BLE systems**. It goes without saying that cost is a major challenge, however, some of the main technical challenges that system developers should be asking about are summarized below.



APP AWAKE

Keeping the app awake so the digital key can be used without accessing the phone is a challenge and is out of the vehicle OEM's control.



REPLACING THE KEY FOB

In the long term, OEMs will be considering replacing the key fob. In the short term, there is an additional upfront cost in supplying vehicles with both systems.



Analysis



Vehicle access trends

OEMs tend to offer Approach and/or passive unlock are premium features. BLE+UWB offers the most secure method of PEPS and approach unlock, while BLE systems offer the same level of convenience but are generally less secure. Contactless (NFC) systems are generally very secure but less convenient because the user must handle their smartphone.



percentage of brands with these features, counting the most convenient feature (starting with approach unlock) for each brand.

Overview

Hyundai Motors Group has introduced Digital Key 2 touch convivence feature which has cross-platform facility for contactless sharing of digital key capabilities between smartphones. Kia has added the Digital Key 2 technology to the EV9, offering its users improved consumer convenience and in-car connection.

Note: Vehicle failure information is not available for all the OEMs

Start-ups



	User Experience Index		Index	Overview				
Strong	Poor	Average	Strong	 Among the start-up OEMs, Xpeng offers digital key systems across its model range and Lucid offer a more advanced UWB- powered system. 				
ecurity Ind Average				 Key Highlights All the start-up OEMs score poorly for security. However, this is partly due to the lack of information. These items will be 				
S Weak				 updated in the next revision of this report when more information is available. Lucid, Nio and X-Peng score highly in terms of UX and their respective security scores are expected to be above average when the information becomes available. Notably, the Lucid system features BLE+UWB and is compatible with both iOS and Android devices. 				

System	Original key needed for pairing	Off- boarding feature	Prevents locking key inside the cabin	Range control	Standards compliance	Passive unlock / start	Advanced features	Shared keys	Multiple key sharing channels	Phone battery low back up	Vehicle failure back up	IOP
	Х	Х	Х	\checkmark	Х	\checkmark	\checkmark	Х	Х	\checkmark	Х	Х
Phone Key	-	-	-	BLE+UWB	ТВС	Both	Both	ТВС	-	NFC phone / card	TBC	TBC
Xpeng	\checkmark	Х	Х	\checkmark	\checkmark	\checkmark	\checkmark	Х	Х	\checkmark	\checkmark	Х
Smartphon e Key	-	-	-	NFC	IIFAA	Passive Unlock	Both	TBC	App only	NFC phone / card	Mech Key	TBC
	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Xpeng	-	-	-	-	TBC	TBC	TBC	ТВС	TBC	TBC	TBC	TBC

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Do you have any questions?

If you have any questions or feedback about this research report or SBD Automotive's consulting services, you can email us at info@sbdautomotive.com or discuss with your local account manager below.



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