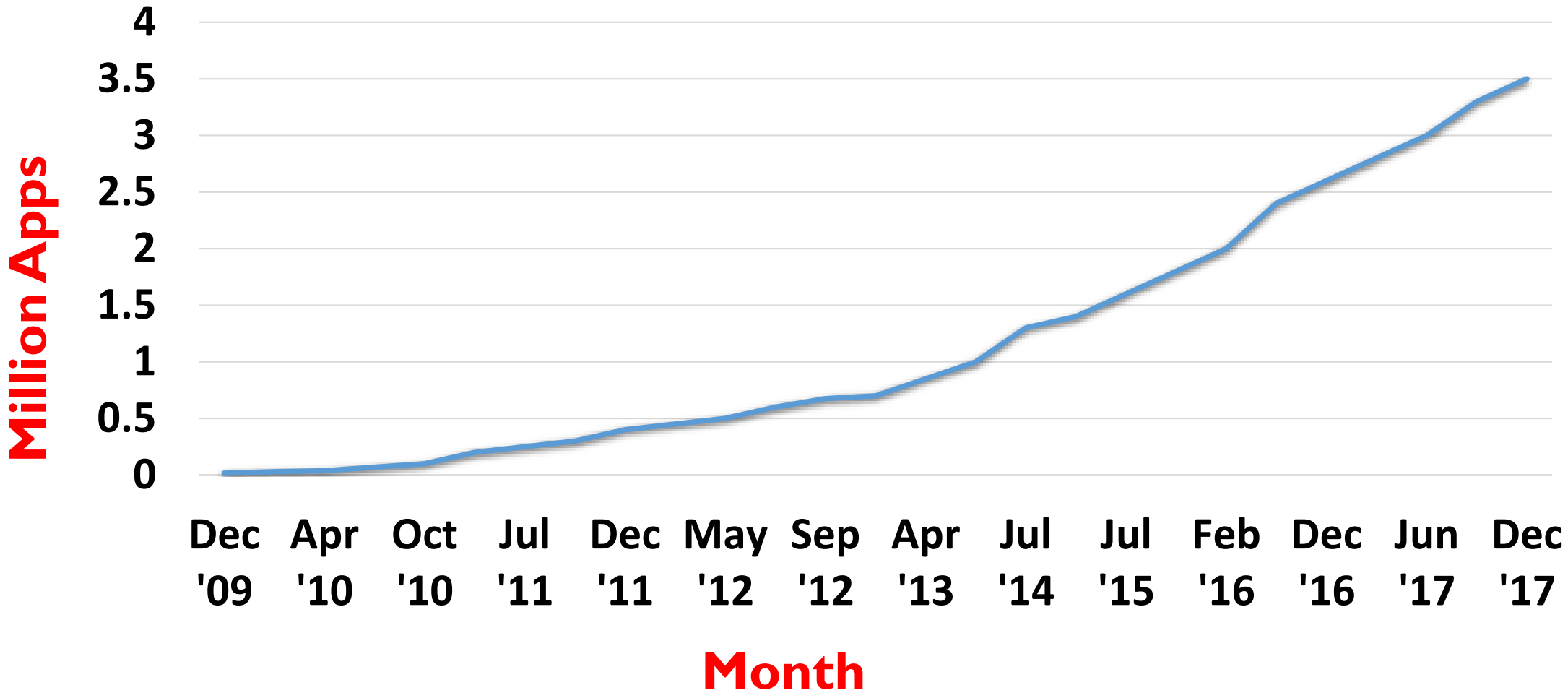
A study of the relation of mobile device attributes with the user-perceived quality of Android apps

Ehsan Noei, Mark D. Syer, Ying Zou, Ahmed E. Hassan, and Iman Keivanloo

Different mobile devices are available in the market.

The number of mobile apps continues to rise.



Stupid App!

Users rely on star-ratings when choosing a new app.

RQ1) Do devices have a relationship with the user-perceived quality of Android apps?

RQ2) Which device attributes share the most significant relationships with the user-perceived quality?

RQ3) Do device attributes have a stronger relationship with the user-perceived quality than app attributes?

Data Collection

Google Play Store

Google Play Store

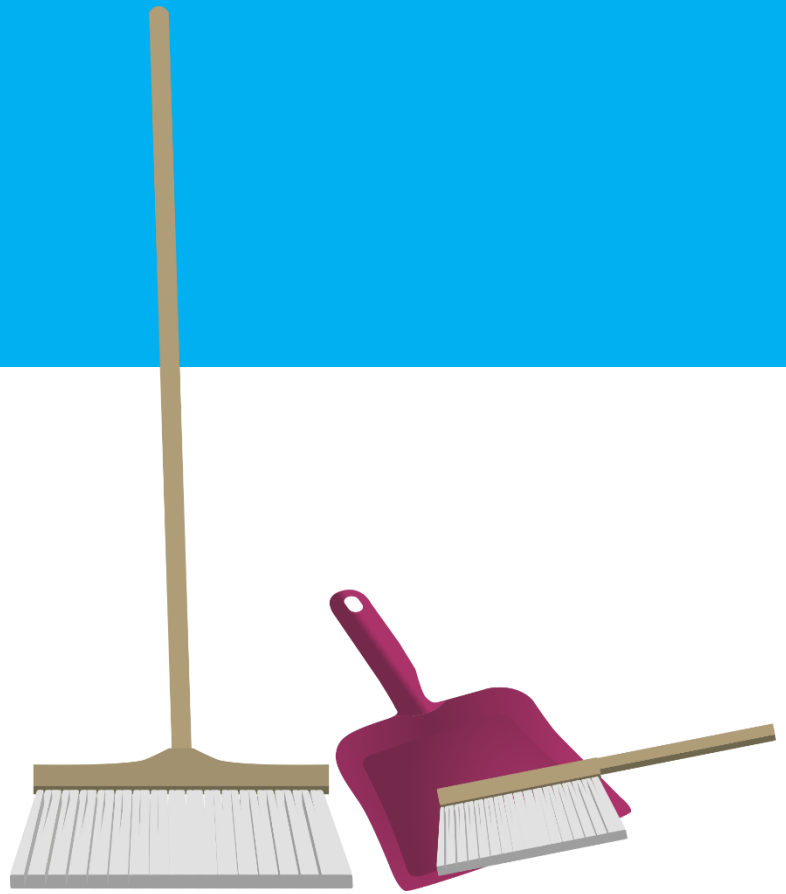
User-reviews

APK Files

Google Play Store

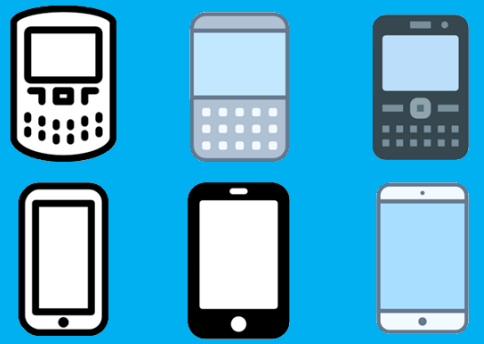
User-reviews

APK Files

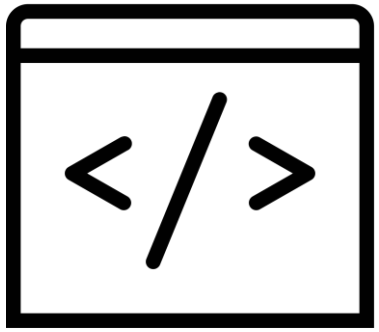


Google Play Store

150,373
star-ratings



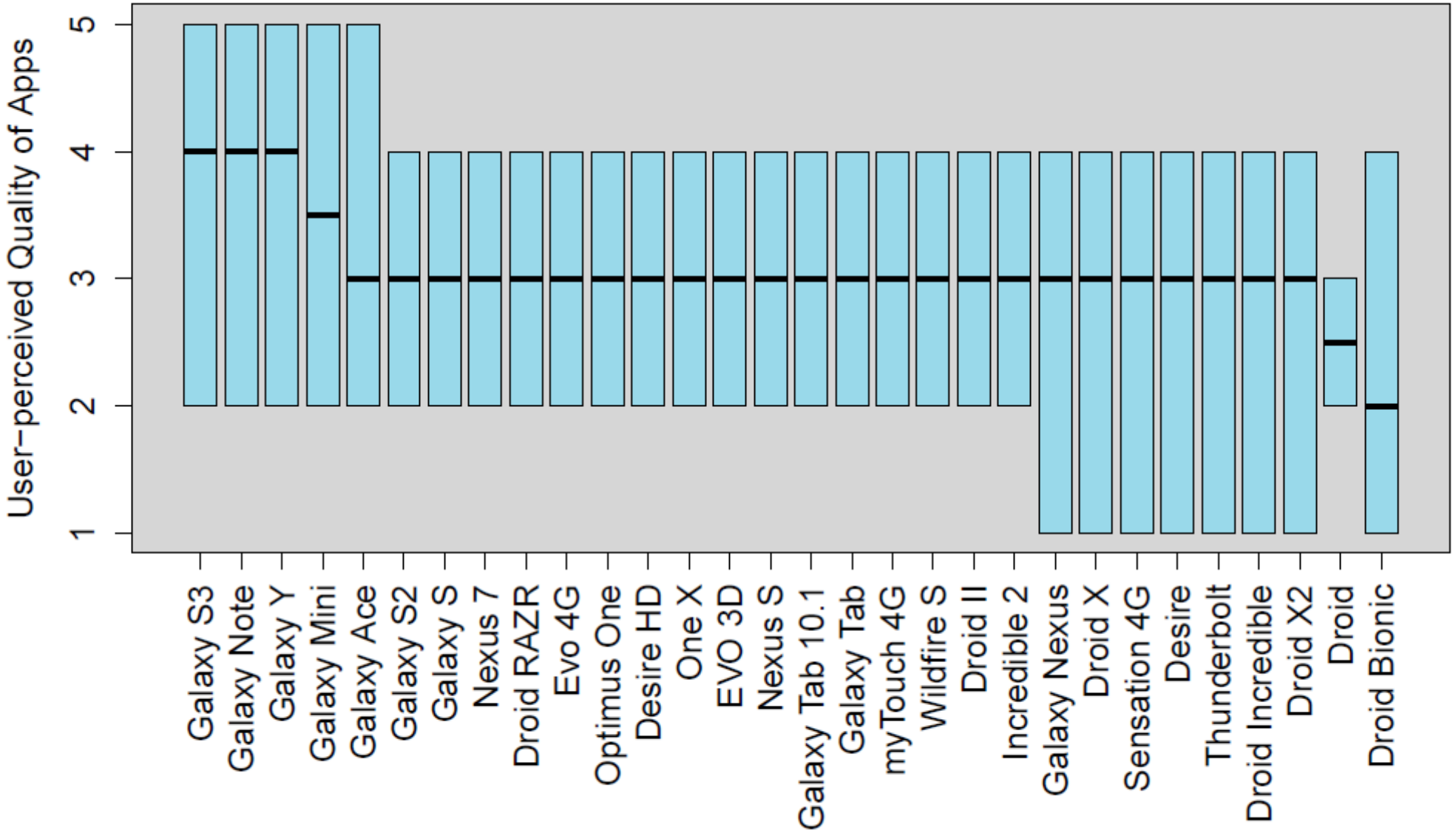
30 mobile devices



Bytecode of 280 Apps

RQ1) Do devices have a relationship with the user-perceived quality of Android apps?

The user-perceived quality of apps varies across devices.



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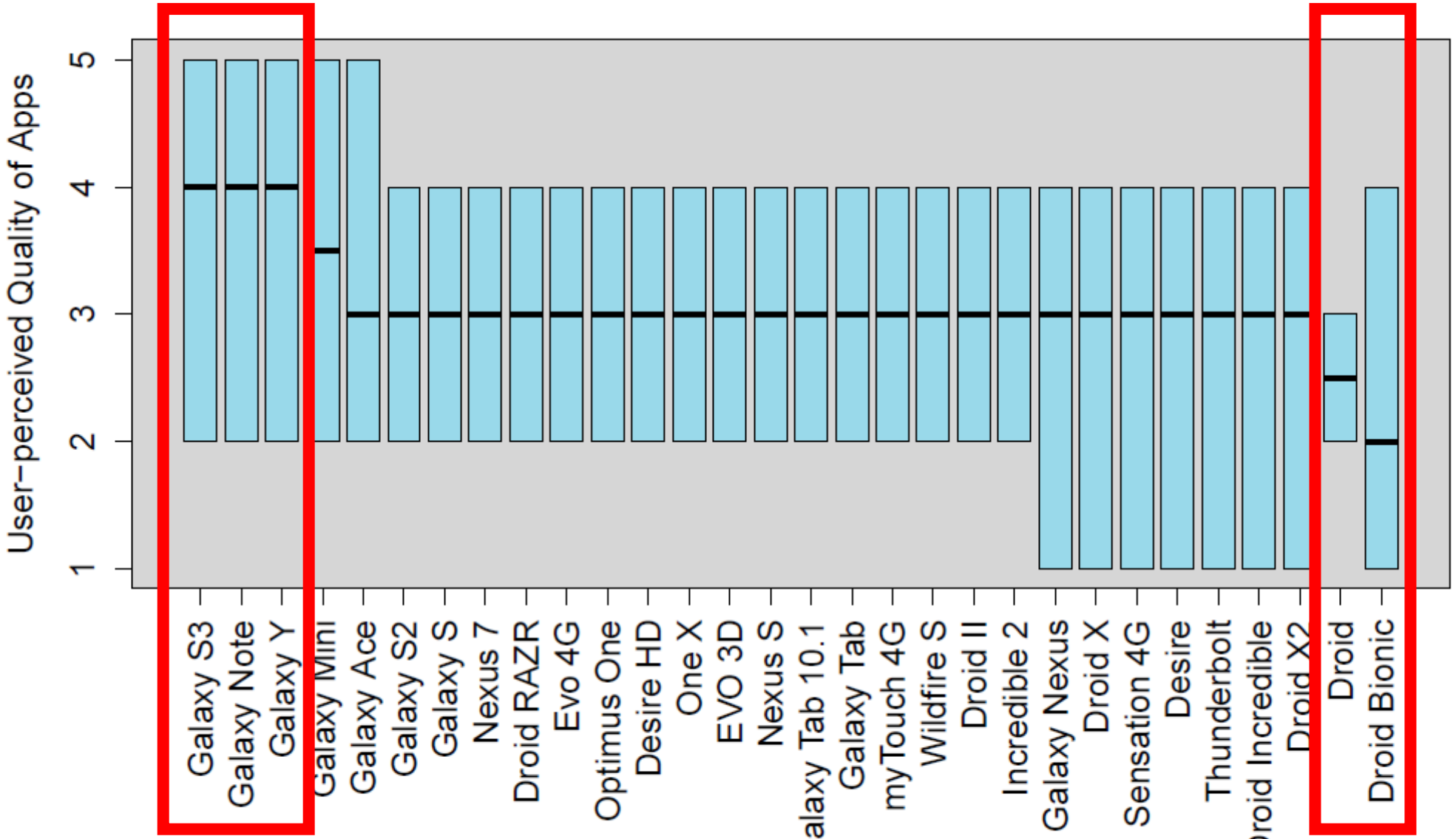

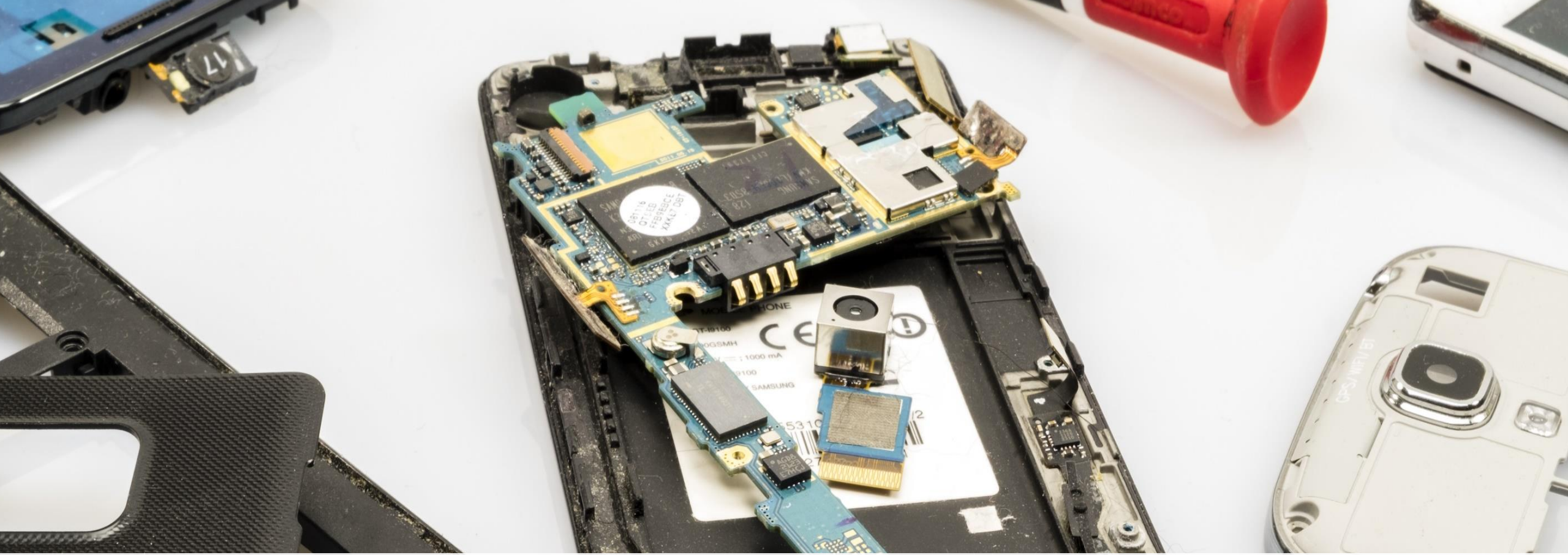

RQ2) Which device attributes share the most significant relationships with the user-perceived quality?

Mixed effects model

Dependent variable	Star-ratings
Independent variables	Device attributes
Mixed effect variables	App and device

Device Attributes

Display Size

Resolution

OS Version

CPU

GPU

Internal RAM

Internal ROM

Camera

Talk Time

etc.

Mixed effects model

Dependent variable	Star-ratings
Independent variables	Device attributes
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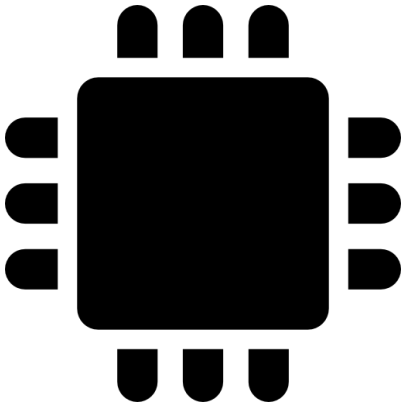
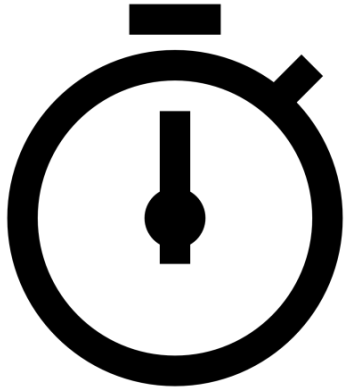
OS Version

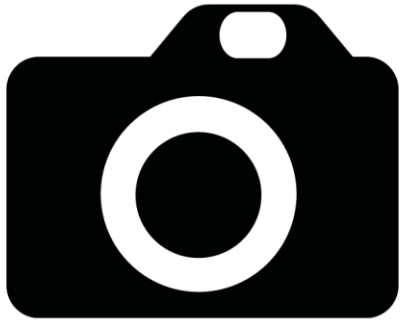
Display Resolution



CPU



Standby Time



Camera

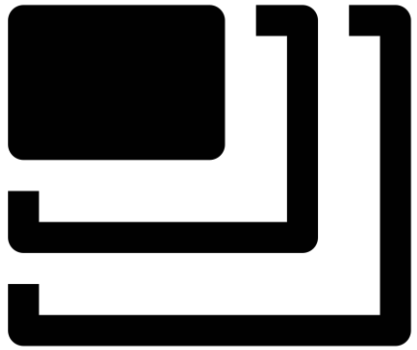
GPU

Battery

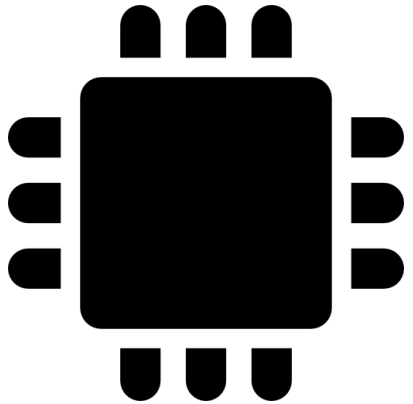
Device Size

Device attributes share a significant relationship with the user-perceived quality.

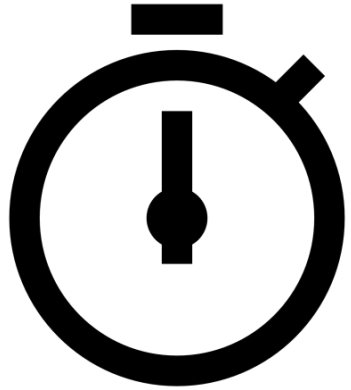
OS Version



Display Resolution



CPU

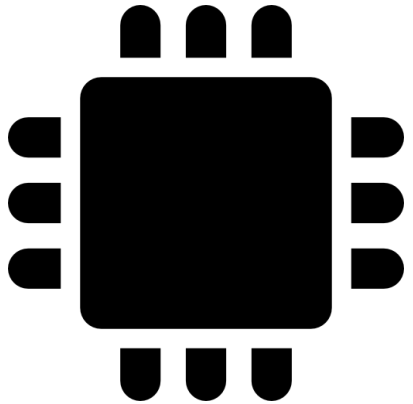


Standby Time

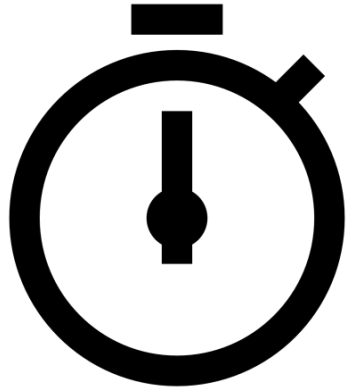
Having a better characteristic of an attribute does not necessarily share a positive relationship with the user-perceived quality of apps.

OS Version ↘

Display Resolution ↘



CPU ↗



Standby Time ↗

RQ3) Do device attributes have a stronger relationship with the user-perceived quality than app attributes?

Mixed effects model

Dependent variable	Star-ratings
Independent variables	Device attributes + App attributes
Mixed effect variables	App and device

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Device Attributes

Display Size

Resolution

OS Version

CPU

GPU

Internal RAM

Internal ROM

Camera

Talk Time

etc.

App Attributes

LOC

#Methods

WMC

Installation Package Size

UI Depth

#UI Nodes

#Inputs

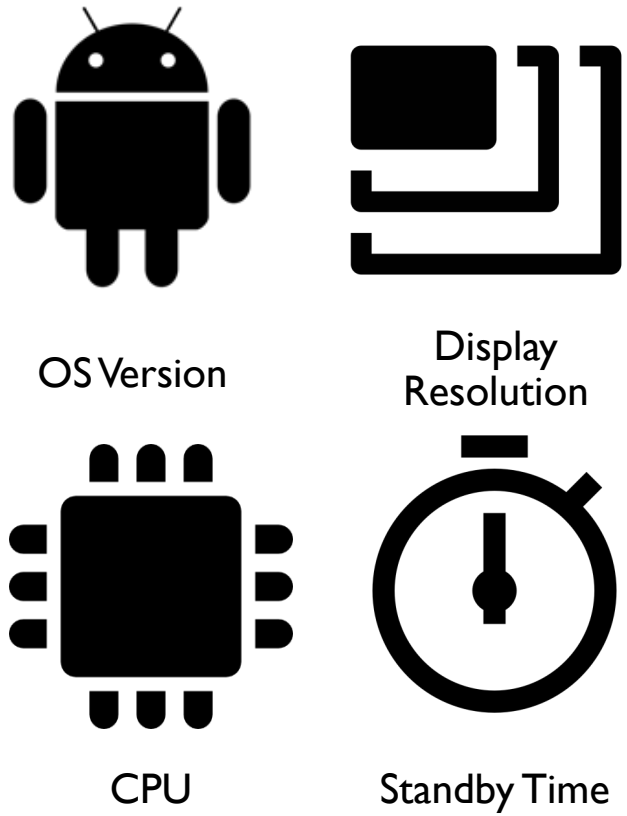
#Outputs

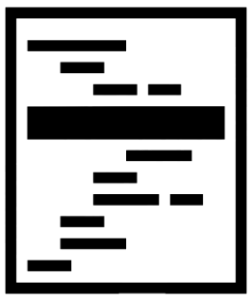
#Activities

etc.

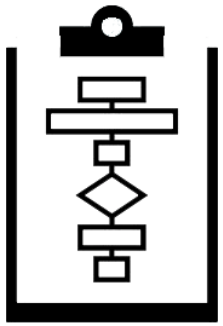
Mixed effects model

Dependent variable	Star-ratings
Independent variables	Device attributes + App attributes
Mixed effect variables	App and device

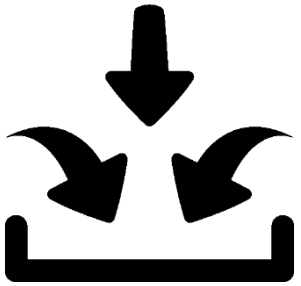

OS Version
Display Resolution
CPU
Standby Time



LOC

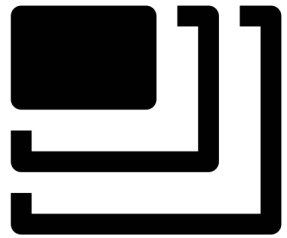


WMC

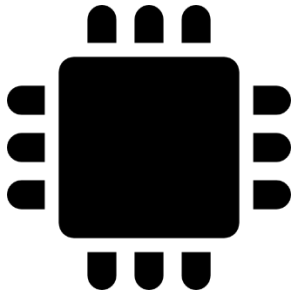


#Inputs

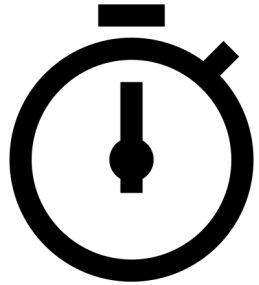
OS Version



Display Resolution

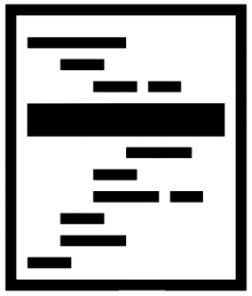


CPU

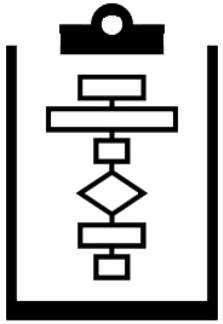


Standby Time

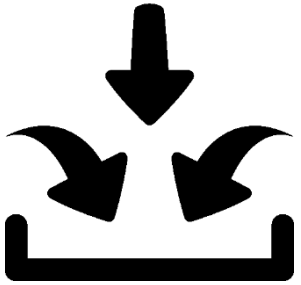
Both the app and the device attributes have significant relationships with the user-perceived quality.



LOC

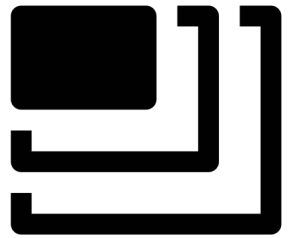


WMC

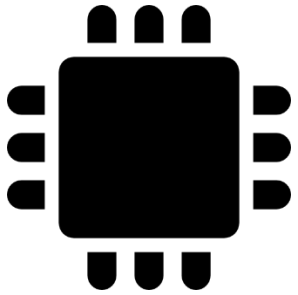


#Inputs

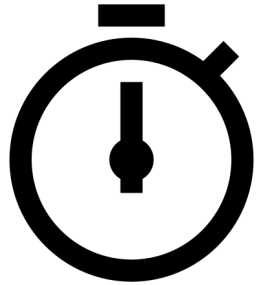
OS Version



Display Resolution



CPU

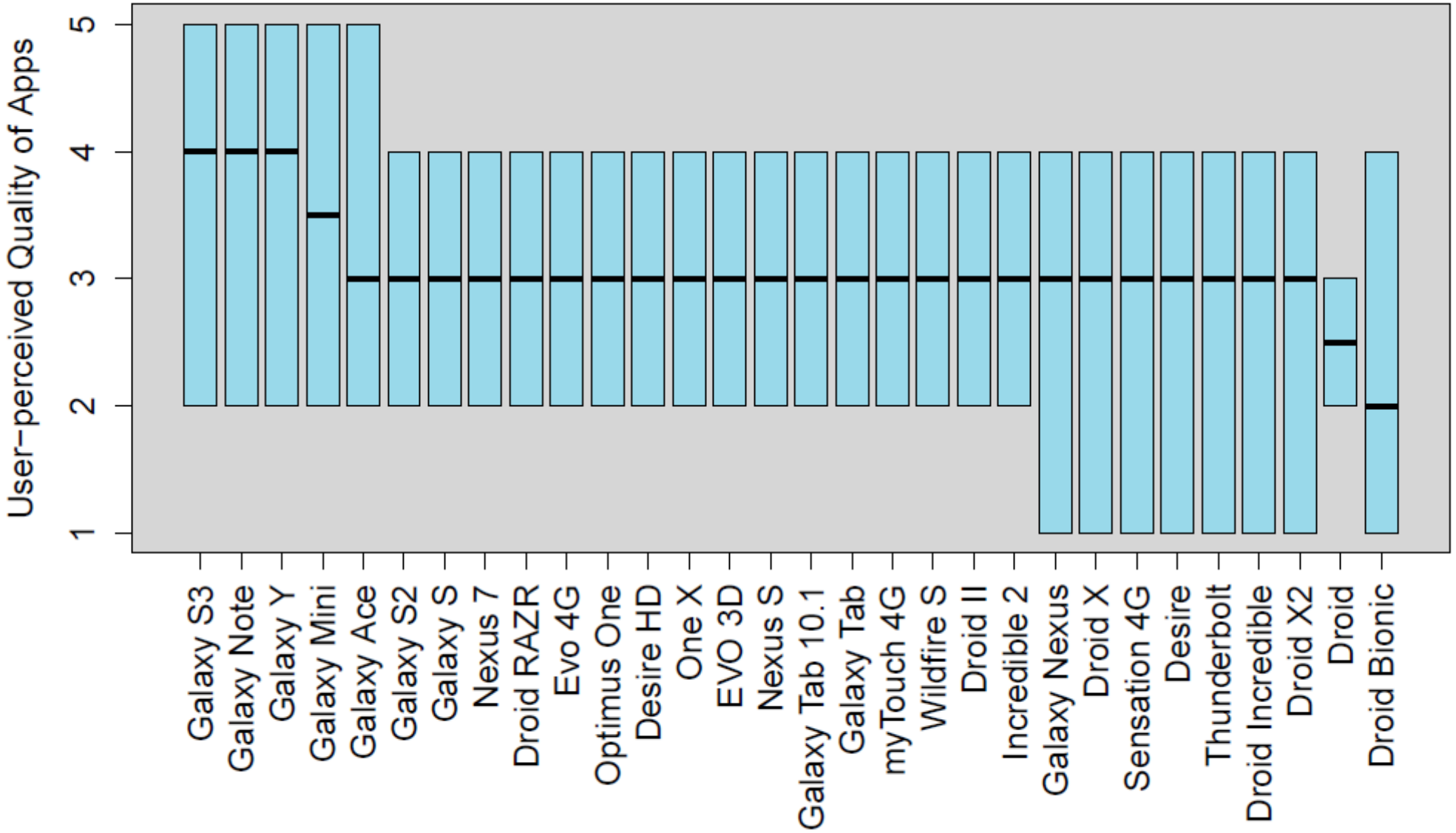


Standby Time

Some device attributes have stronger relationships with the user-perceived quality than some app attributes.

Attribute		Effect
LOC	***	↘
WMC	***	↘
#Inputs	*	↗
APK Size		↗
OS Version	***	↘
Resolution	**	↘
CPU	*	↗
Standby Time	*	↗
Photo Size (MP)	+	↘
Internal ROM	+	↘

The user-perceived quality of apps varies across devices.



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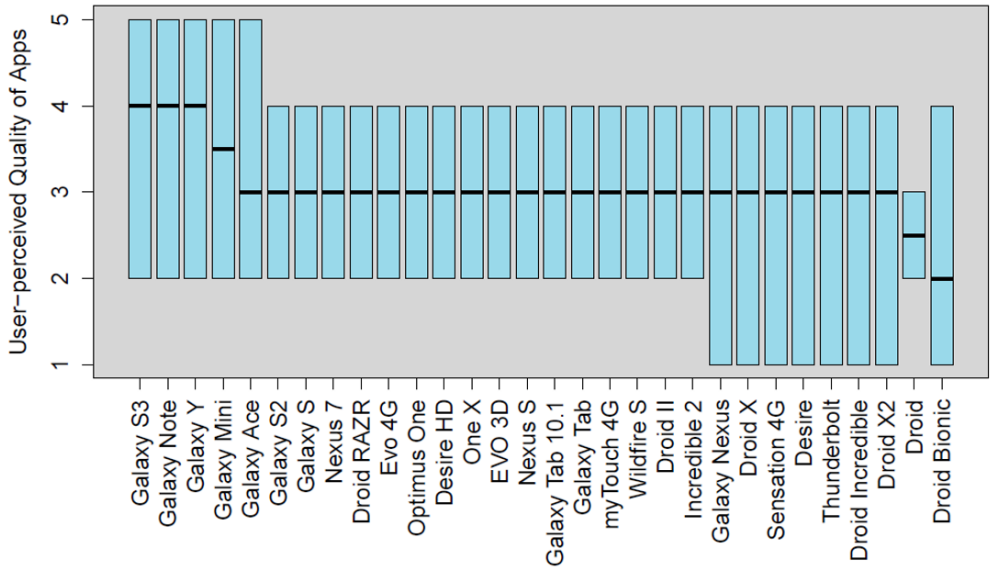

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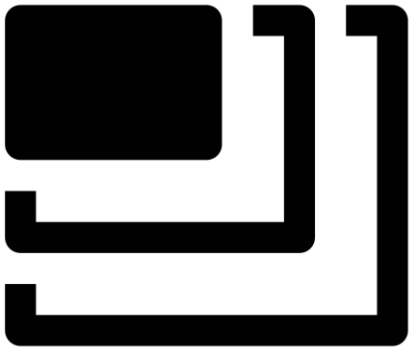
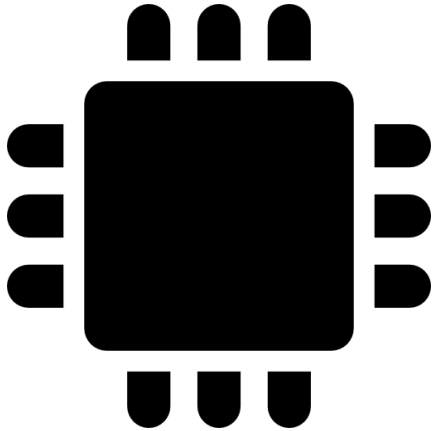
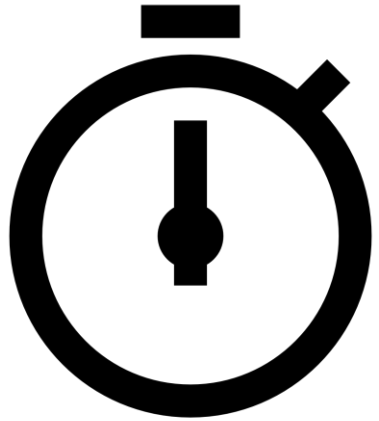
OS Version ↘



Display Resolution ↘



CPU ↗



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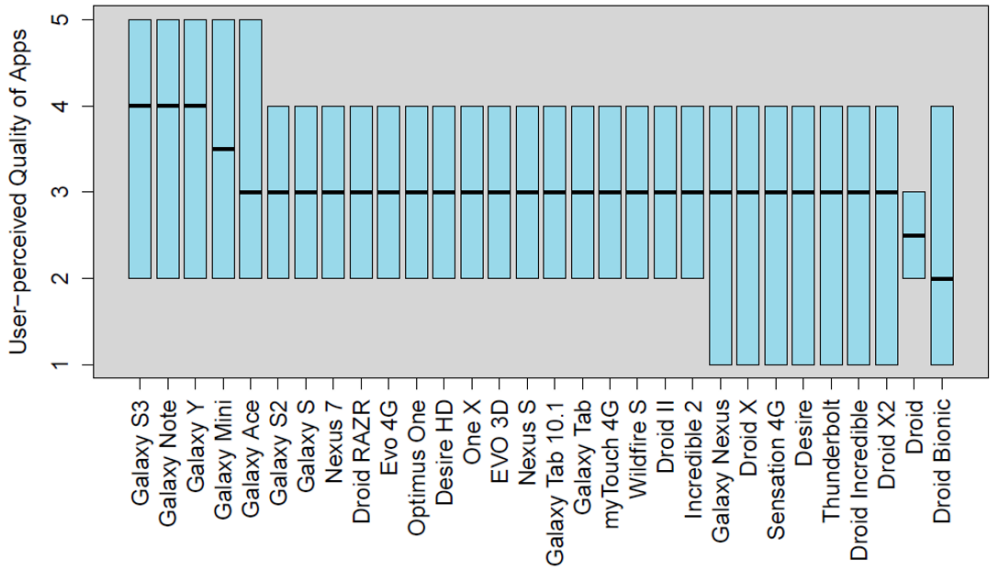

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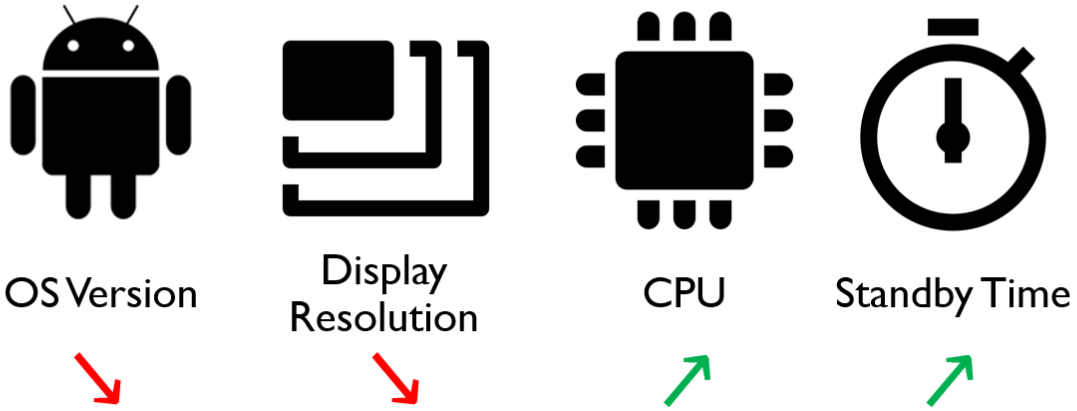

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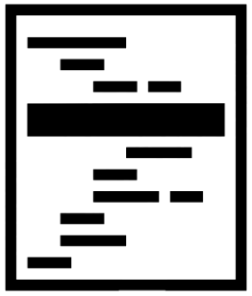
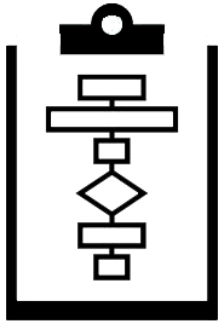
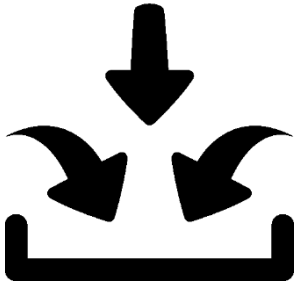


LOC

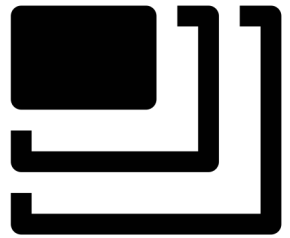


WMC

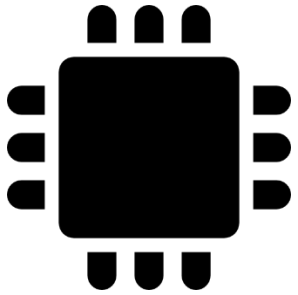


#Inputs

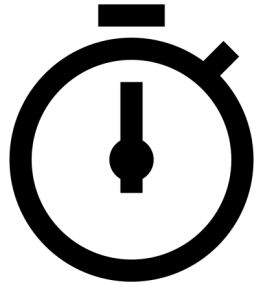
OS Version



Display Resolution



CPU



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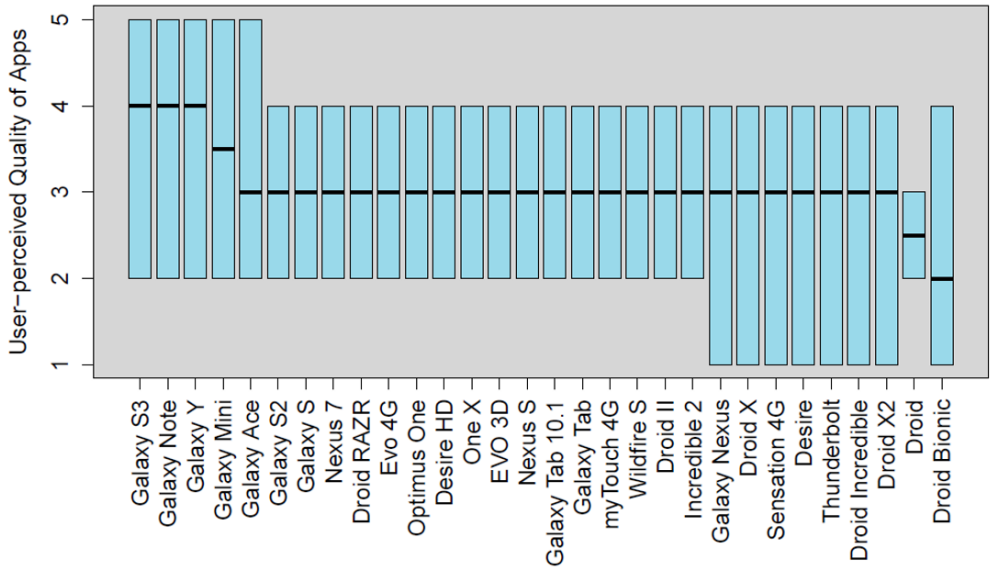

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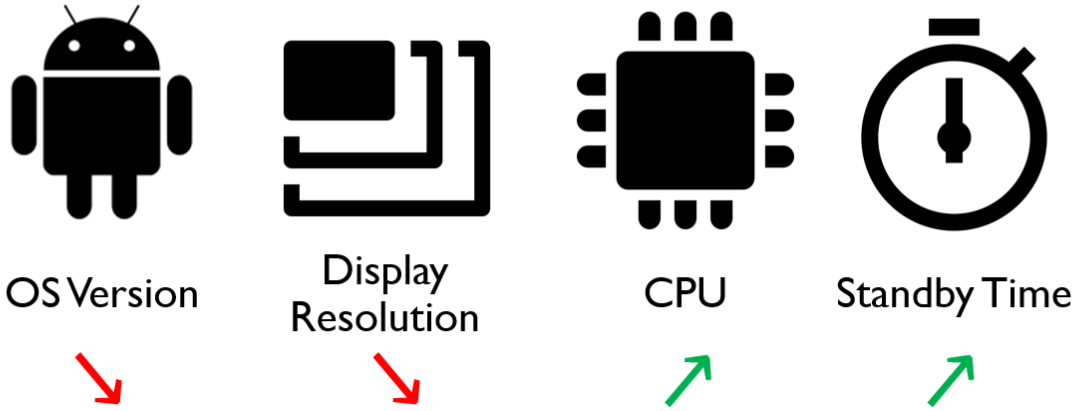

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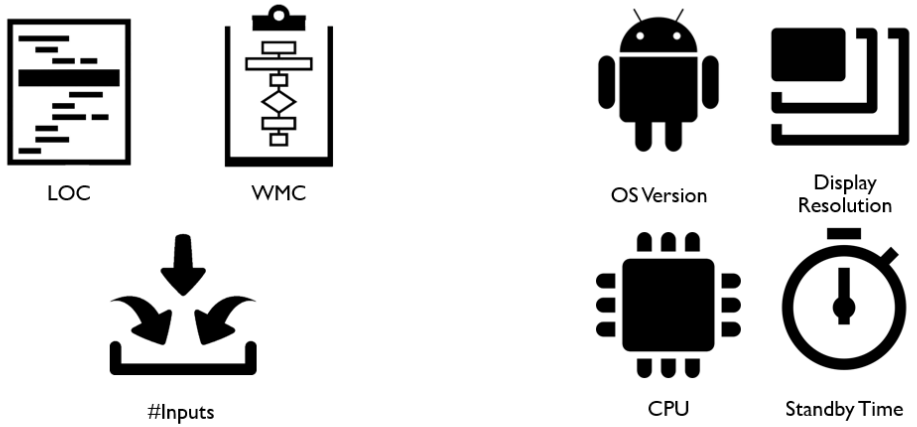

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WMC	***	↘
#Inputs	*	↗
APK Size		↗
OS Version	***	↘
Resolution	**	↘
CPU	*	↗
Standby Time	*	↗
Photo Size (MP)	+	↘
Internal ROM	+	↘

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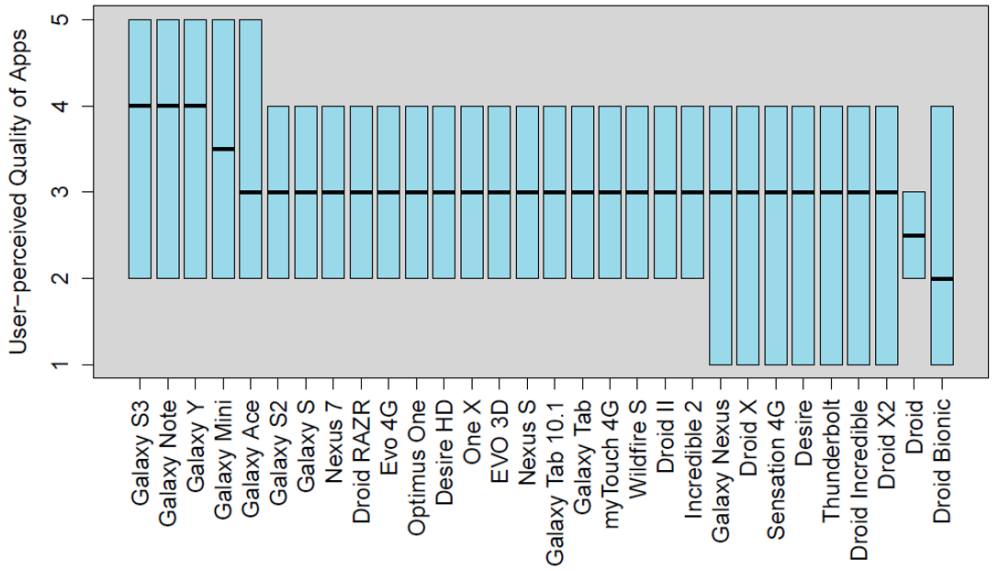

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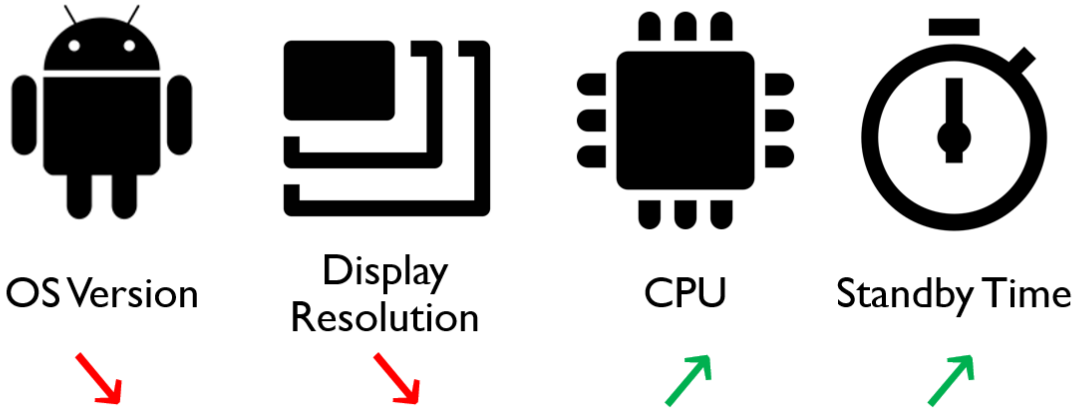

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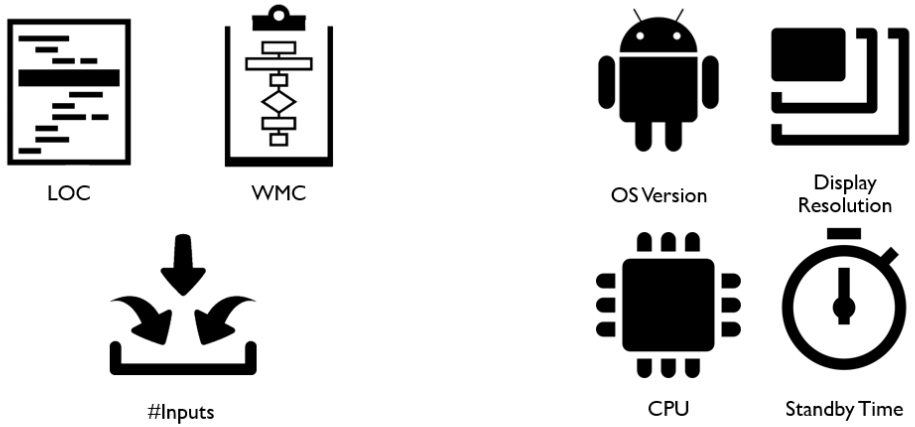

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CPU	*	↗
Standby Time	*	↗
Photo Size (MP)	+	↘
Internal ROM	+	↘