

“Should I throw away my old iPad?” An evaluation of the barriers to device longevity

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Abstract. Device obsolescence contributes to the rising levels of annual e-waste. The research presented in this short workshop position paper summarises the findings of two studies conducted in 2021 and 2022 that highlighted the difficulties faced by consumers in directly downloading and installing applications on a device classified as ‘vintage’ and, subsequently, as ‘obsolete’. The results of both studies demonstrated that few applications could be downloaded directly on the legacy device but, with the help of a non-legacy device’s purchase history, a substantially larger number of applications could be downloaded and furthermore functioned. The results of the studies raise the question of whether devices classified as vintage or obsolete could have longer lifespans as functional and useful devices and whether support could avoid their unnecessary disposal as e-waste.

Keywords: Device Reuse, Software Reuse, E-waste, Digital Sustainability, Application installation

1 Introduction

Apple classify devices that are no longer being manufactured as either “vintage” or “obsolete, dependent on how long ago the device was supported (1,2). Apple defines products as ‘vintage’ when “Apple stopped distributing them for sale more than 5 and less than 7 years ago” and defines them as ‘obsolete’ when “Apple stopped distributing them for sale more than 7 years ago” [2]. These classifications are significant as it transitions devices from a fully compatible state to a patchy unclear state whereby applications are no longer supported. This presents consumers with few options to further use their device. The choice in most cases is either to discard the device, further contributing to e-waste or leave it dormant without use. (6,7) In this paper, comparisons are made between two separate studies conducted when an Apple device was “vintage” and then “obsolete” to evaluate a) the decrease in device usefulness and b) to attempt to benchmark the quantification of device usefulness by analysing application compatibility (3,4).

2 Method

For both studies, an Apple iPad Mini 1st Gen (2012) running iOS 9.3.5 was used. This device is significant due to it being the last 32-bit product Apple manufactured (8). It

was also uniquely placed between two device states (vintage then obsolete) therefore observations could be made to analyse the usefulness in this transitional state. The top 10 free applications across 23 popular categories were selected for both studies and attempts were made to download them directly onto the device. If the application failed to download directly, then the use of a modern device with pre-existing purchase history (Apple SE), was used. This is because there are barriers in place to directly downloading applications on older Apple devices because of compatibility issues, therefore a modern device is needed. Applications were then checked for whether they could be installed, opened, and finally functioned. Table 1 provides a summary of the device materials used in the studies.

Table 1: Materials Summary for the Study Devices: Direct Download (DD) and Download via Another Device (DvAD)

Device	Classification Study Sept 2021	Classification Sequel Study May 2022
STUDY DD device: Apple iPad Mini tablet, 16GB (Wi-Fi), 1GHz dual core ARM Cortex-A9. Released: 2 Nov 2012. Discontinued: 19 Jun 2015. Last OS update 25 Aug 2016: iOS 9.3.5	Vintage	Obsolete
OTHER DvAD device: Apple iPhone SE. 16GB Released: 31 March 2016. Discontinued 21 March 2017 Last OS update 13 Dec 2022: iOS 15.7.2	Current	Current

3 Analysis & Discussion

As shown in Table 2, there was a slight overall decrease in application functionality from the first study to the second study (61.3% vs 57%). However, the main discussion point taken from the research is the quantification of obsolescence. Currently, there is no way of measuring how obsolete or useful a legacy Apple device is without a tedious workaround of using a modern device. Furthermore, the methods used aren't user friendly with no official guidance from Apple on how to further enable the longevity of these devices (5).

Table 2: App Functionality for Directly and Indirectly Downloadable Apps in the Original and Sequel Studies

App Category	Apps DD (Sep 2021)	Apps DD (May 2022)	Change	Apps DvAD (Sep 2021)	Apps DvAD (May 2022)	Change
Books	4	0	-4	4	5	1
Business	1	0	-1	7	7	0
Education	3	1	-2	6	6	0
Entertainment	3	0	-3	5	6	1
Finance	1	1	0	6	6	0
Food & Drink	0	1	1	5	5	0
Games	1	4	3	1	3	2
Health & Fitness	0	1	1	6	6	0
Lifestyle	1	1	0	6	6	0
Magazine & Newspapers	5	0	-5	5	6	1
Medical	3	2	-1	3	4	1
Music	0	0	0	9	9	0
Navigation	1	2	1	5	5	0
News	0	1	1	8	8	0
Photo & Video	0	0	0	8	8	0
Productivity	0	0	0	10	9	-1
Reference	1	0	-1	7	7	0
Shopping	0	3	3	7	6	-1
Social Networking	2	1	-1	6	6	0
Sports	0	0	0	6	6	0
Travel	0	1	1	7	6	-1
Utilities	2	1	-1	6	6	0
Weather	1	0	-1	7	7	0
TOTAL	29	20	-9	140	143	3

4 Conclusion

This research highlights the barriers in place to downloading and installing applications on vintage and obsolete Apple devices. It questions the notion of device obsolescence by highlighting that legacy devices still have use, albeit more limited than modern devices. Understandably, legacy devices are susceptible to security issues over time with continued usage, but this decision should lie with the consumer. It is recommended that

future research pursues this quantification of device usefulness to further evaluate the longevity of devices to prevent future devices needlessly becoming e-waste sooner than needed.

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