Epic Games, Inc., v. Apple Inc.

Expert Testimony of Professor Lorin Hitt

May 12, 2021
Professor Lorin Hitt

B.S. and M.S. in Electrical Engineering, Brown University

Ph.D. in Management, MIT Sloan School of Management

Zhang Jindong Professor of Operations, Information and Decisions, University of Pennsylvania, Wharton School

Research Focus:
Economics of information technology industry and related industries; emphasis on internet-based commerce
Data Used to Analyze Competitive Effects

App Store transaction data on all initial downloads and in-app purchases

Industry and third-party data on other transaction platforms

Monthly Epic data on Fortnite play time and spending for all accounts on all platforms
Output Growth

App Store game transactions: 1,200%
   App Store launch–FY2019

Developer revenue from App Store game transactions: 2,600%
   2010–2018

All U.S. consumer spending on digital game transactions: 448%
   2010–2018

All App Store transactions: 500%
   Launch of IAP–FY2019

Developer revenue from all App Store transactions: 3,700%
   Launch of IAP–FY2019

(Hitt Written Direct Testimony, Figure 55, ¶ 185; DX-4810 (summarizing DX-5338); DX-4811 (summarizing DX-5338); DX-4808; DX-4812 (summarizing DX-5338); DX-4813 (summarizing DX-5338))
App Store Game Transactions and Developer Revenue Growth

App Store Game Transactions

Transactions (in millions)

App Store Game Developer Revenue

Developer revenue (in millions)

1,200%

2,600%

Figure 43
App Store initial game downloads and in-app purchases (July 10, 2008–September 30, 2019)

Figure 44
Developer revenue from App Store initial game downloads and in-app purchases (July 10, 2008–September 30, 2019)
Developer revenue on the App Store grew $6 \times$ faster over the same period.

Figure 45
Amount spent by U.S. consumers on digital game transactions (2010–2018)
Figure 53 App Store initial downloads and in-app purchases (July 10, 2008–September 30, 2019)

Figure 54 Developer revenue from App Store initial downloads and in-app purchases (July 10, 2008–September 30, 2019)
App Store All App Transaction and Developer Revenue Growth

App Store All App Transactions

Transactions (in millions)

4Q 08 | 4Q 09 | 4Q 10 | 4Q 11 | 4Q 12

Figure 53
App Store initial downloads and in-app purchases (July 10, 2008–September 30, 2012)

App Store All App Developer Revenue

Developer revenue (in millions)

4Q 08 | 4Q 09 | 4Q 10 | 4Q 11 | 4Q 12

Figure 54
Developer revenue from App Store initial downloads and in-app purchases (July 10, 2008–September 30, 2012)
Price Analysis

- Apple’s commission rates
- Competitors’ commission rates
- Epic’s partners’ commission rates
- Apple’s effective commission rates
App Store Commission Rate Decreases

Original rate: 30%

New rate: 15%

Affected Developers:

• 2016: Developers offering subscriptions
• 2016: Developers in Video Partner Program
• 2021: Small Business Developers—earning < $1M/year on the App Store
Free App Store Transactions: Fiscal Year 2019

91%  76%  83%

Free to download games  Totally free games  Totally free apps
App Store Games by Monetization Type

- Free-to-download game app with in-app purchase
- Free-to-download game app without in-app purchase
- Paid-download game

Paid-download apps predominated

Majority is now free-to-download without in-app purchases

Figure 38
Percent of App Store game apps by monetization type
(July 10, 2008–September 30, 2019)

DX-4802 (summarizing DX-5338)
Average Apple Commission Rate on Game Downloads

Figure 39

Average commission rate for App Store initial game downloads (July 10, 2008–September 30, 2019)
Average commission and prices from App Store in-game purchases (July 1, 2009–September 30, 2019)
Figure 42
Average and median in-game purchase price for Epic apps through the App Store over time (December 21, 2010–September 30, 2019)
App Store Effective Commission Rate: 2019

- **Professor Hitt’s correct calculations**
  - All transactions: 4.7%
  - Game transactions: 8.1%

- **Dr. Evans’ incorrect calculation**
  - All transactions: 27.7%

**Ignores free transactions**

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Hitt Written Direct Testimony, ¶¶ 178–180; DX-5469 (summarizing DX-5338)
Measures of Quality Improvement of App Store Game Transactions

**Quantitative**
- Volume of game transactions
- Developers’ ability to generate revenue

**Qualitative**
- Expansion of available game types
- iOS ecosystem innovations
Consumers and Developers Have Choices for Game Transactions
Developers Have Choices for Game Transactions

- Potential customers
- Tools
- Services
- Technology
- Cost
Consumers Have Choices for Game Transactions

Developers

- Potential customers
- Tools
- Services
- Technology
- Cost

Game Transaction Platforms

- Nintendo eShop
- Google Play
- PlayStation Store
- STEAM
- Origin

Consumers

- Many platforms
- Multi-homing even for the same game
- Consumers switch
### Multi-Platform Fortnite User Accounts

<table>
<thead>
<tr>
<th>Platform</th>
<th>Total users (in millions)</th>
<th>Percent of users that are multi-platform users</th>
</tr>
</thead>
<tbody>
<tr>
<td>iOS</td>
<td>115</td>
<td>35.9%</td>
</tr>
<tr>
<td>PlayStation 4</td>
<td>104</td>
<td>32.1%</td>
</tr>
<tr>
<td>PC/Mac</td>
<td>90</td>
<td>42.4%</td>
</tr>
<tr>
<td>Xbox One</td>
<td>53</td>
<td>33.0%</td>
</tr>
<tr>
<td>Android</td>
<td>31</td>
<td>53.7%</td>
</tr>
<tr>
<td>Nintendo Switch</td>
<td>31</td>
<td>34.7%</td>
</tr>
<tr>
<td>Google</td>
<td>8</td>
<td>54.4%</td>
</tr>
</tbody>
</table>
Figure 15

Purchasing behavior of worldwide user accounts that access Fortnite through iOS (January 2020–July 2020)

- No purchase: 75.9%
- Only purchase on non-iOS: 15.8%
- Only purchase on iOS: 5.6%
- Purchase on iOS and non-iOS: 2.8%
### Hours Played and Revenue for iOS Fortnite User Accounts

<table>
<thead>
<tr>
<th>Platform</th>
<th>Hours (in millions)</th>
<th>Percent</th>
<th>Revenue (in millions)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>iOS</td>
<td>2,752</td>
<td>10.2%</td>
<td>$745</td>
<td>13.2%</td>
</tr>
<tr>
<td>Other platforms</td>
<td>24,219</td>
<td>89.8%</td>
<td>$4,890</td>
<td>86.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,971</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>$5,635</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

*Figure 14*

**Percent of worldwide time played and revenue by user accounts that accessed Fortnite through iOS (March 2018–July 2020)**
Empirical Analyses Showing Consumer Substitution

1. Analysis of switching after the Hotfix
2. Introduction of Nintendo Switch
3. Console and PC gaming companion app analysis
4. Spotify subscriptions
5. Netflix subscriptions
Switching After the Hotfix

- Expected iOS spending that moved to other platforms:
  - 22%–51% for all iOS users
  - 22%–38% for iOS-only users

81%–88% of Fortnite spending by iOS users was retained
Consumers Substitute Spending Away From App Store

Figure 18

Worldwide Fortnite iOS revenue from user accounts that accessed Fortnite on an iOS device in June 2018 (March 2018–March 2019)

Customers who used both iOS and Switch spent less on iOS relative to their spending before June 2018 compared to users who used iOS but not Switch.

Launch on Switch

July 2018
Fortnite Season 5 launches
Console and PC Gamers Substitute Spending Away From App Store

Figure 16
Comparison of growth rates in iOS game spending between 2017 and 2019

Did not download console or PC gaming app: 24%

Downloaded console or PC gaming app: 19%
## Portability of Top Apps in the App Store

<table>
<thead>
<tr>
<th>App Category</th>
<th>Offer single sign on</th>
<th>Offer full or partial portability</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Apps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 25 by revenue</td>
<td>96%</td>
<td>92%</td>
</tr>
<tr>
<td>Top 25 by downloads</td>
<td>80%</td>
<td>84%</td>
</tr>
<tr>
<td>Game Apps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 25 by revenue</td>
<td>92%</td>
<td>84%</td>
</tr>
<tr>
<td>Top 25 by downloads</td>
<td>32%</td>
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