An Empirical Study of Trends of Virtual Reality Games and Their Complaints

Rain Epp
Dayi Lin
Cor-Paul Bezemer
The market for virtual reality (VR) games is growing rapidly.

- **2018**: $3.3B
- **2022**: $13.7B
- **14M users in 2018**
- **51M users in 2022**
VR games are different than non-VR games and may get different complaints
To examine trends among virtual reality games, we gathered game metadata from three sources:

1. **SteamDB**
   - Extract historical prices
   - Estimate release price

2. **Steam Store**
   - Extract game metadata
   - Filter by VR support, popularity

3. **Steam Community**
   - Extract news posts
   - Estimate number of game updates

Data from these sources are combined to create metadata of popular VR games.
We gathered user reviews for VR games and categorized the most frequently-occurring complaints.
We used automatic and manual analysis to categorize the negative reviews

Negative, English reviews

Use Twitter-LDA to group reviews into topics

... topic 0
... topic 1
... topic 2

Select top 10 topics

Classify topics into categories

Combine categories and re-classify

Classify topics into categories

Complaint categories
We categorized negative reviews into seven complaint categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Median Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacks Content</td>
<td>1</td>
</tr>
<tr>
<td>Game-specific</td>
<td>3</td>
</tr>
<tr>
<td>Community</td>
<td>4</td>
</tr>
<tr>
<td>Crashes</td>
<td>4</td>
</tr>
<tr>
<td>Nausea</td>
<td>5</td>
</tr>
<tr>
<td>Controls</td>
<td>6</td>
</tr>
<tr>
<td>Optimization</td>
<td>7</td>
</tr>
</tbody>
</table>
The quality of VR games is increasing, even as fewer are released each week
The quality of VR games is increasing, even as fewer are released each week

Median price of paid VR games released each month
The quality of VR games is increasing, even as fewer are released each week.

Fraction of categorized reviews with the category *lacks content*.
The quality of VR games is increasing, even as fewer are released each week.
Developers should be prepared to deliver cross-platform experiences

Fraction of games released each month supporting each type of VR headset
Developers should support multiple play areas

Fraction of games released each month supporting each type of play area
Complaints of cybersickness are rarer than we expected
Developers should focus on game quality rather than VR-specific aspects
VR games are different than non-VR games and may get different complaints

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Metadata of popular VR games

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Developers should focus on game quality rather than VR-specific aspects

Mitchell Epp • mdepp@ualberta.ca