

Using Telemetry Data to Provide Feedback to Game Developers

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What is Telemetry?

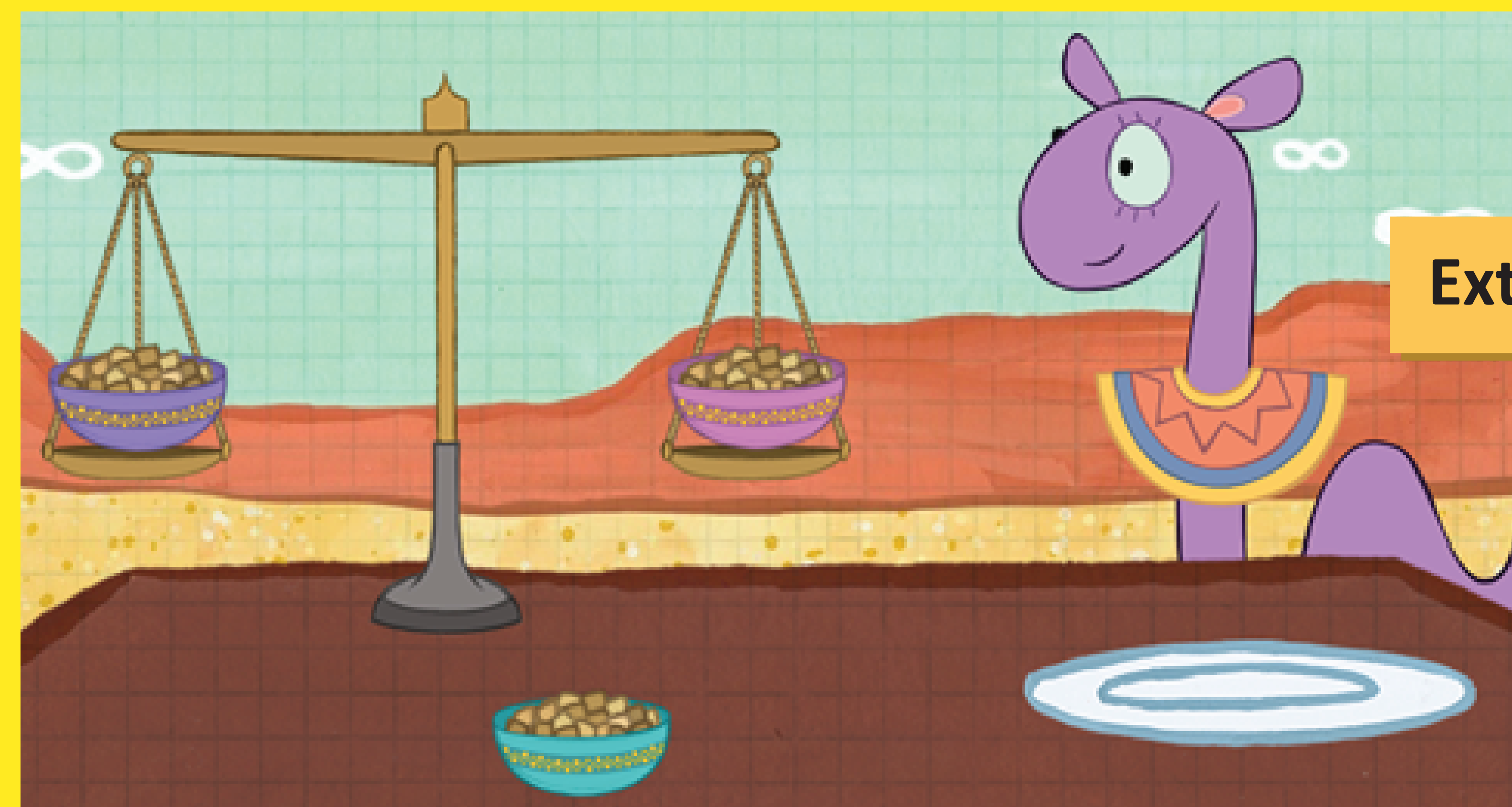
Systematic specification, capture, and logging of events that occur in a game (i.e., player-initiated or game-initiated events) and game states to a permanent external store using a predefined record format.

“Atomic” Events

The lowest level of user-interaction with the product. This usually translates to individual touches or mouse clicks. Also necessary is the context for the click. Every change to the game state also needs an event. The state of a game often changes over time, even without user action.

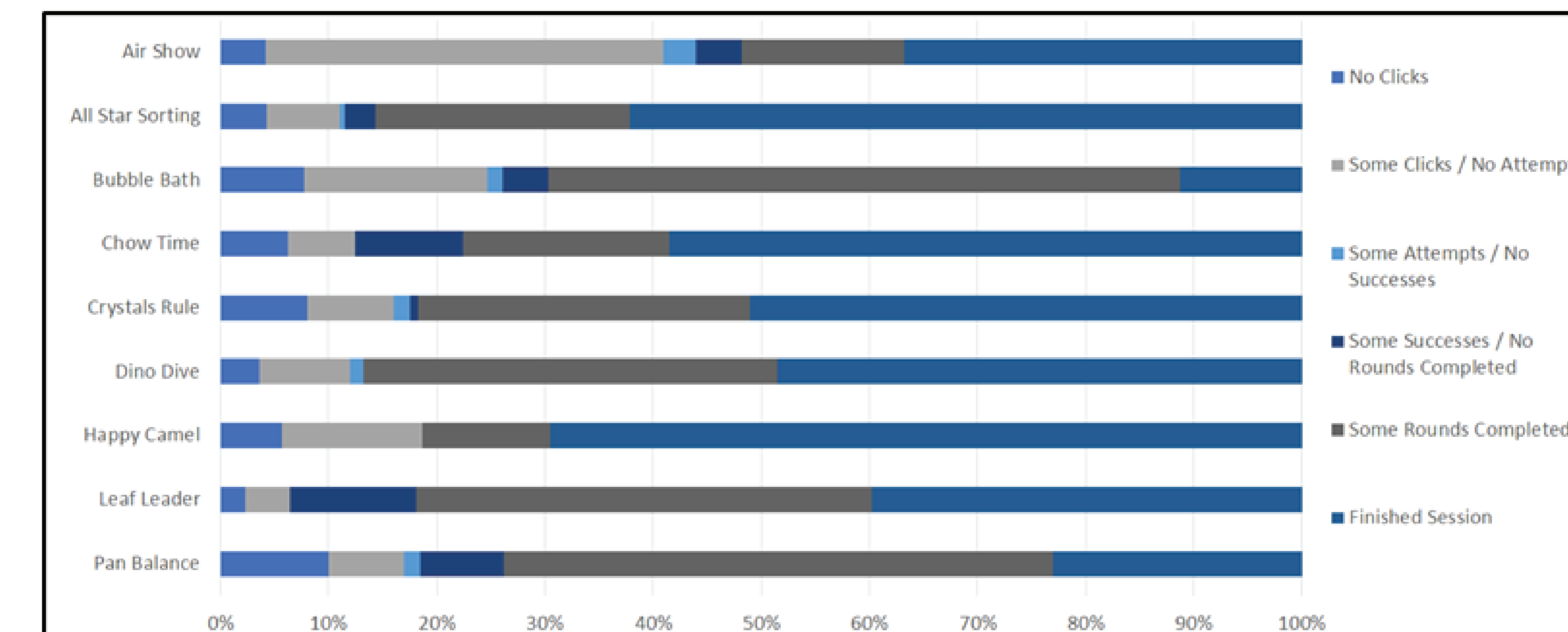
Why Use Telemetry?

When working with games that exist “live” or outside of a research setting, making changes to the code of a game can be costly or impractical. Therefore, rather than including your model or scoring method in the game code, log the model inputs and the model can be adjusted freely elsewhere. And why stop at inputs for the model you have now? We recommend logging every conceivably useful event so that your new insights are not hampered by a lack of data.



Game images are from the PBS KIDS Measure Up! app.

Extract events



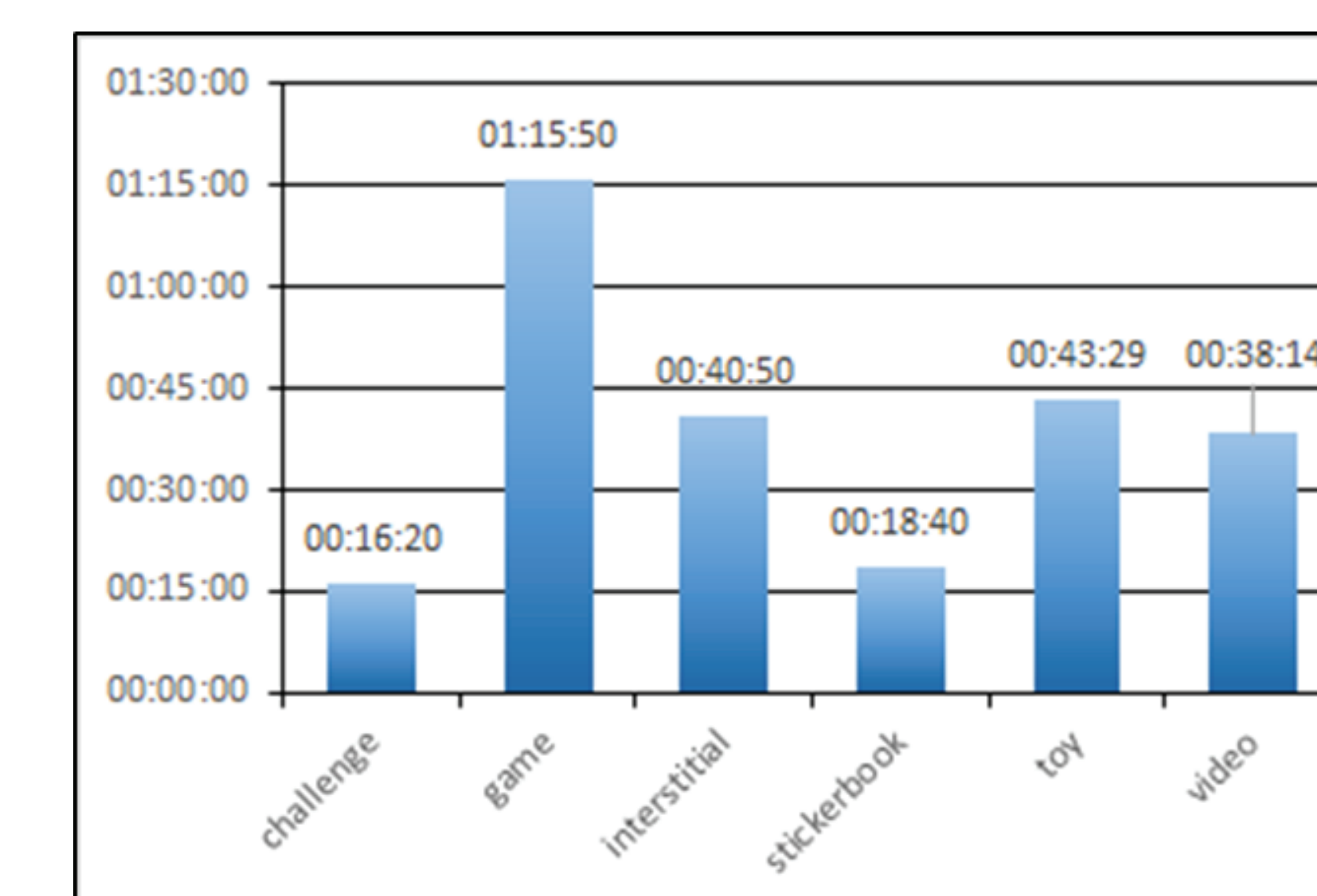
Off-clicks: when players click on non-interactive elements in the game.

- Are there non-interactive elements that are distracting children?
- Could children be misinterpreting the instructions of the game?

Feedback:

- The check button in the Pan Balance is very small on the iPad and many clicks occur around it.
- Mushroom Sorter only allows the first the mushrooms to be interacted with. The other mushrooms remain a distracting element for the rest of the challenge.

LOG SYSTEM	
CHANNELS	
happy-camel	
	<ul style="list-style-type: none"> • 4020: Select Answer • 2030: End Round • 3021: Start CorrectFeedback • 3121: End CorrectFeedback • 2020: Start Round • 3010: Start Instruction • 4080: Dwell Time • 4030: Start Drag • 3110: End Instruction • 4070: Off Click • 4030: Start Drag • 3010: Start Instruction • 4030: Start Drag • 4040: • 3110: End Instruction • 3010: Start Instruction • 3110: End Instruction • 4070: Off Click • 4070: Off Click • 2030: End Round



Telemetry: How to get it

We worked closely with the producers and the designers during development to specify exactly what events in the game should be logged. Event logging is then added to the game’s code.

Telemetry: How it works

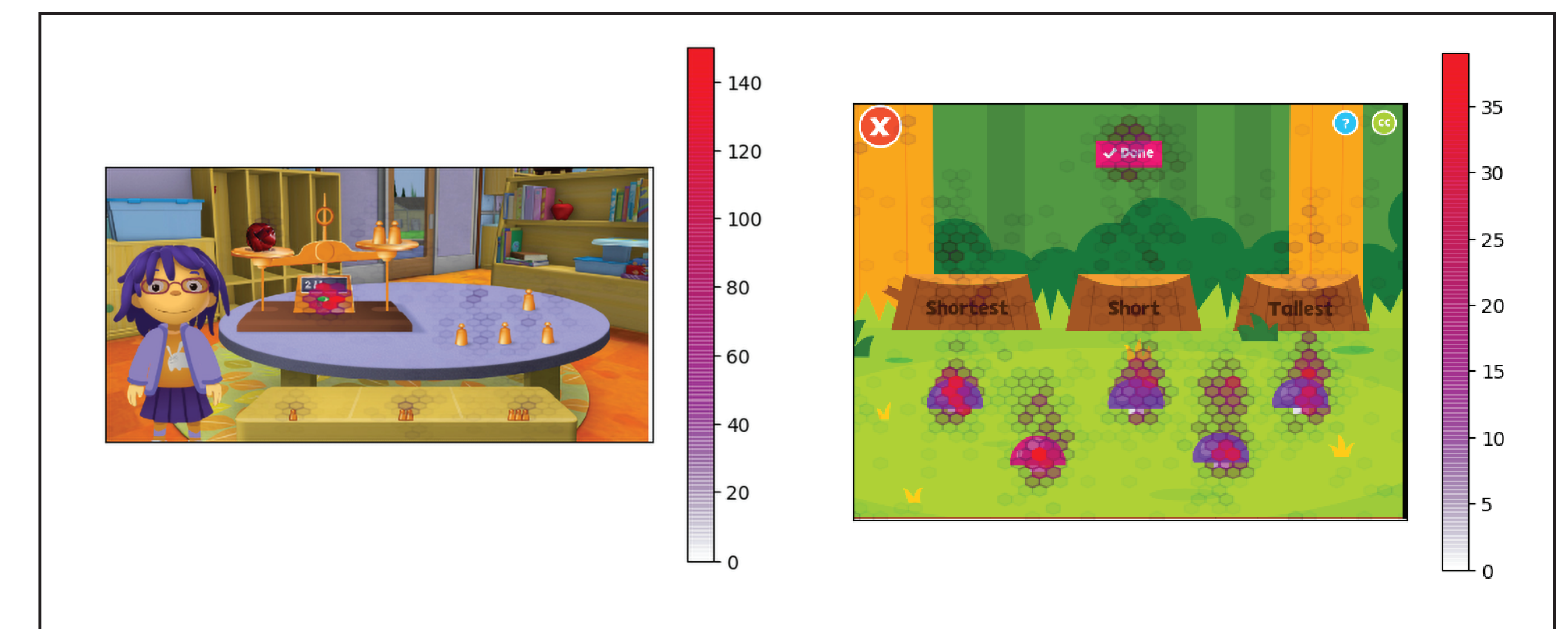
Each game implementing the Learning Analytics Platform generates events from player and game actions. Events are collected and stored on PBS KIDS’ servers. Samples can be pulled from storage later.

Bounce Rate: rate at which players leave games or activities without finishing them. Provides more precise information than market research.

- Which activities keep children’s attention?
- Do children make attempts at the activity before quitting?
- Are children successful at the activity before quitting or do they quit before any success?

Feedback:

- Games that are engaging: Happy Camel most often played to completion
- Games that are not as engaging: Bubble Bath least often played to completion. Air Show only played to completion 37% of the time, and 41% of sessions were quit without any attempt.



Time Spent: average time spent per user in each activity type.

- What activities are most engaging?
- How are children choosing to spending their time?

Feedback:

- Games were the most engaging activity by far.
- Children spent a surprisingly large amount of time in considering there are only 7 toys (as compared to 11 games).