PRODUCT ML

Case Study

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Idea

Machine Learning to shape Product Experience.

After deciding to stop the current product and pivot to something new. I led several brainstorm meetings with the team, to come up with all kind of ideas for products, then we divided within the team the ideas that survived the cuts, to do market research and a PR sheet promoting the product. Once there were 3 viable ideas left, the founders took a weekend to discuss the path of the company.

Market Placement

Machine Learning as an easy to use platform.

In our research we found out that AI and Machine Learning companies mostly fall into two categories, as a service where the internal team has very little control or as an engine, where the control is absolute but it requires advanced ML knowledge. Having found out that the Product Management community was very keen in ML but lacked the knowledge to be able to use it, we found a problem that might needed a solution.

Product Focus

Machine learning as a platform to change Game Difficulty optimized for retention.

We believed that this could be applied to any product, but we needed to select a market to start. We placed every different ML application for a product we could remember in a spreadsheet. For every instance we needed to state costumer, user, application.

Market Research

For ML to be accurate enough it needs enough data, only games with more 500K monthly users mattered, also the core experience of the game need it to be variable. Research indicated 30% of the market checked the first point, to proof the second point we deconstructed the top 50 grossing games and indicated which experience flow we would change, which levers to control and if it is variable enough for ML to be more effective than a list of rules.

User Stories

To find who would use our product, we created a list of user stories, describing the user, how they would use our product, in which moment in the lifecycle of a product and what was the goal. There were plenty of moments that the PM and the Game Designer could use our product, adding that to the previous research, it was clear that enabling those 2 users could be right direction to take.

Personas

By doing online research and writing everything we remembered about them, we had worked with this personas before, we were able to quickly create two very detailed personas plus the several moments where they would use our product and why.

User Interviews

I'm a big fan of user interviews and surveys, it brings very good indications to what is working or not. I've organized a few unscripted interviews and created a list of topics that needed answering, but the idea was to go with the flow, talk about the product to get reactions and feedback, let the user talk and focus where they wanted, but drive the conversation to complete the personas and the use cases. We found new use cases by understanding better the day-to-day life of our users.

Product Flow v1

The idea behind a product flow is to abstract from the visual and worry with just the content and structure, I use a mindmap organized from the left to the right and ordered top down in terms of importance. I start by placing the content the user needs to complete the task, from the first page and continue each flow creating all the subsequent pages.
At some point I had to stop because there were too many engineering and product unknowns, so I've decided to start visual exploration asap.

UX + Rest of the team meeting

Before visual exploration could start, I scheduled a meeting to educate the rest of team (eng) on the users and present the incomplete flow. It is a good way to track down dead ends and impossible or wrong things, also useful to get fresh ideas and have a better understanding on how the engine really works or is being designed. It was a very useful meeting, which solved plenty of engineer design problems they were having.

Wireframes v1

I believe that the wireframes should worry with font sizes and spacing along with functionality. First I design the main pages by the order defined by flow, I try to be adaptable and cut things that seem unnecessary.

Since we need to optimize for speed, the best solution was to create mid-weight wireframes, it takes a bit longer on the wireframing stage, but produces high quality screens of the product for promotion, without needing to add an extra layer of ui on top of it.

Invision Prototype

To quickly test the app, I created a prototype that would go through a specific flow to showcase the product in invision app. Then present it to the team to get feedback.

User Interviews 2 and General Feedback

We talked to users and many people related to the casual game industry. I've tracked down a few ux problems and components that I wasn't happy with. But more important, by the overall reaction I figured out that we weren't talking to the right user, we were focusing on the wrong things. By designing the installation process, configuration of the model and training, we weren't giving the control the PM or the Game Designer desired, sure this steps are needed but the whole app was focusing on that, instead of showing the results, the impact and variability of the ML models.

MVP Definition

Translate ML talk to PM talk.

Everything is more clear, I schedule a product meeting, where I share my findings and intuitions. For the MVP we need to focus on what are the more important features to showcase and how. We decide to build a demo of the product, as if the users were getting access to a demo account to see what the product does. We focus mostly on the features of control and visualization, we assume that the installation and training is made by the Product ML team.

MVP Product Flow and Wireframes

Working closely with the PM, I redesign the product flow and the wireframes/ui.

Feature Storyboard

As we feel more confident that we are on the right track, I proceed to the next stage of design.

Since the main pages are designed, I go through every feature flow to design all the steps/screens and user feedback related to the feature. Then I create a new prototype representing just that flow and present it to the team again, always iterating and improving.

Engineer Support and CSS Styling

Export assets, review, compromise, facilitate, the goal was to get something out, working with limited functionalities and fake data the fastest we could. I worked closely with the engineer to accelerate the process by taking decisions on when to simplify and when to invest more time. I'm also doing the styling of several components.

Next Steps

Test, test and test!

Flappy Bird
GAME

PRODUCT ML

HEALTH | DESIGN | MODELS | POLICIES | ROLLOUT

NEW MODEL | DOWNLOAD REPORT

Model Retention

Performance of the models retention

DOWNLOAD

All Users | All Time

RETENTION RATE

100% 80% 60% 40% 20% 0%

0 15 30 45 60 75 90

DAYS SINCE INSTALL

Control/Baseline

NEXT DAY RETENTION

Retention_nextday_1

7TH DAY RETENTION

Retention_7thday_2

Retention_7thday_3

30TH DAY RETENTION

Retention_30thday_4

Model Monetization

Impact of the model on monetization (In App Purchases only)

DOWNLOAD

All Users | All Time

ARPDAU

100% 80% 60% 40% 20% 0%

0 15 30 45 60 75 90

DAYS SINCE INSTALL

Control/Baseline

NEXT DAY RETENTION

Retention_nextday_1

7TH DAY RETENTION

Retention_7thday_2

Retention_7thday_3

30TH DAY RETENTION

Retention_30thday_4

Flappy Bird
GAME

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NEW MODEL | DOWNLOAD REPORT

Game Setu
Setup the SDK to m

EDIT

WIN OUTCOME TYPE

Avg Score
Return the number of milestones for the game

Levers
Configurable param

NEW LEVER

Pick the Levers

All				NEW COLUMN
Type 1	250	250	250	250
Type 2	250	250	250	250
Type 3	250	250	250	250

ADD | CANCEL

Flappy Bird
GAME

PRODUCT ML

HEALTH | DESIGN | MODELS | POLICIES | ROLLOUT

NEW MODEL | DOWNLOAD REPORT

Game Setup
Setup the SDK to match the game type, value returned and test config

SAVE

WIN OUTCOME TYPE

- Win Ratio — Return the difficulty of the game between 0 and 1
- Avg Score — Return the score for the game
- Time — Return the time in seconds for the game

PLAYER PROGRESSION

- Multi Levels
- Single Level

SAVE | CANCEL

Test Levers
Set an outcome value to always be returned by the SDK, for experimentation purpose

TURN ON TESTING

Set Outcome Value

Levers
Configurable parameters that can change the difficulty of the level and the experienced win rate.

NEW LEVER

gap_height — *Range of Numbers*

Gap Height
MIN VALUE 104 | MAX VALUE 265 | DEFAULT VALUE 170

pipe_distance — *Range of Number*

Pipe Distance
MIN VALUE 280 | MAX VALUE 425 | DEFAULT VALUE 390

cam_speed — *Increase Number*

Camera Speed
Curve : In Cubic | START RATE 3

ADD LEVER

Flappy Bird
GAME

PRODUCT ML

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NEW MODEL | DOWNLOAD REPORT

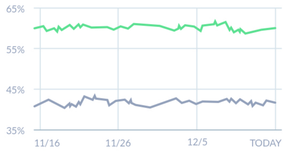
Active Models
Compare how the model preforms against the baseline

NEW MODEL

Control/Baseline

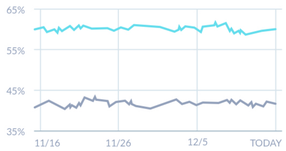
NEXT DAY RETENTION +14%

Retention_nextday_1



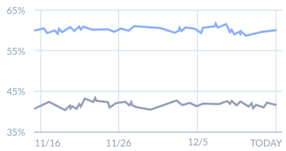
7TH DAY RETENTION +8%

Retention_7thday_2



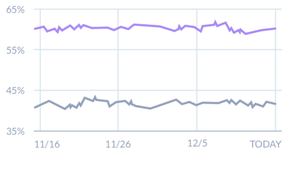
7TH DAY RETENTION +12%

Retention_7thday_3



30TH DAY RETENTION +6%

Retention_30thday_4



NEW MODEL

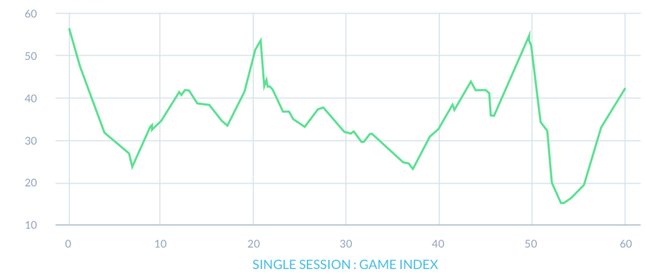
KPI : Next Day Retention
Compare models between the same KPI

DOWNLOAD

AVG SCORE | USER SKILL | KPI

Single Session | *60 Games Played*

AVG SCORE



MODELS

Control/Baseline

Retention_nextday_1

UPLIFT +14%

KPI : 7th Day Retention
Compare how the model preforms against the baseline

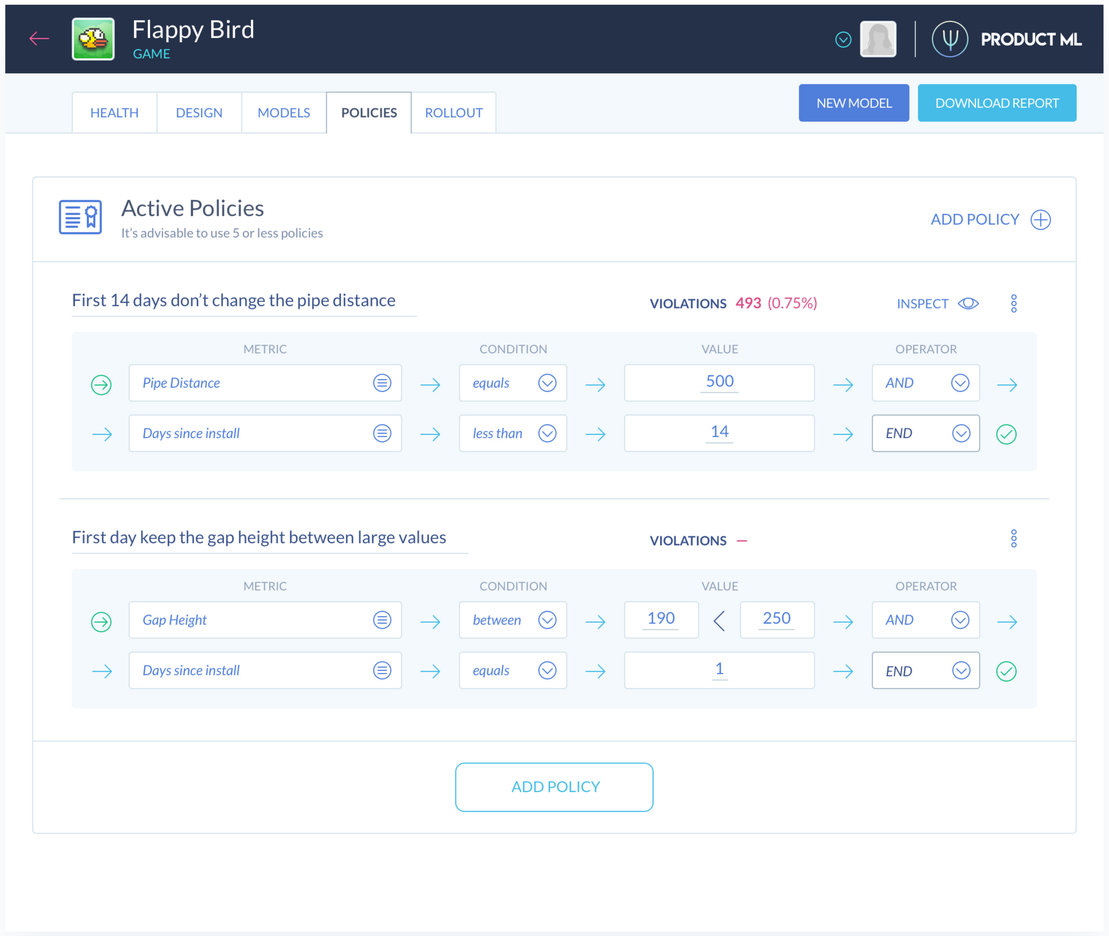
DOWNLOAD

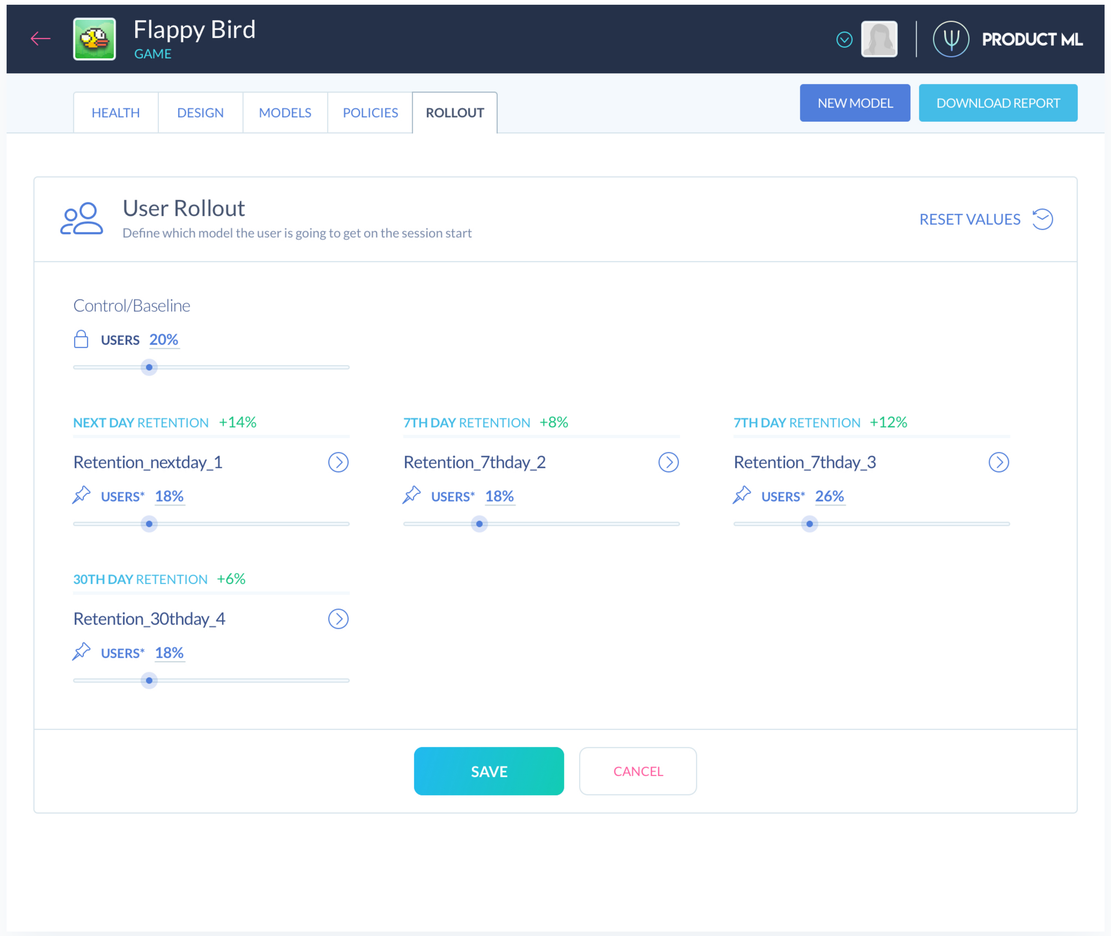
AVG SCORE | USER SKILL | KPI

Single Session | *60 Games Played*

AVG OUTCOME

MODELS


Flappy Bird
GAME
PRODUCT ML
HEALTH
DESIGN
MODELS
POLICIES
ROLLOUT
NEW MODEL
DOWNLOAD REPORT
Active Policies
It's advisable to use 5 or less policies
ADD POLICY
First 14 days don't change the pipe distance
VIOLATIONS 493 (0.75%)
INSPECT
METRIC
CONDITION
VALUE
OPERATOR
Pipe Distance
equals
500
AND
Days since install
less than
14
END
First day keep the gap height between large values
VIOLATIONS –
METRIC
CONDITION
VALUE
OPERATOR
Gap Height
between
190
250
AND
Days since install
equals
1
END
ADD POLICY


Flappy Bird
GAME
PRODUCT ML
HEALTH
DESIGN
MODELS
POLICIES
ROLLOUT
NEW MODEL
DOWNLOAD REPORT
User Rollout
Define which model the user is going to get on the session start
RESET VALUES
Control/Baseline
USERS 20%
NEXT DAY RETENTION +14%
Retention_nextday_1
USERS* 18%
7TH DAY RETENTION +8%
Retention_7thday_2
USERS* 18%
7TH DAY RETENTION +12%
Retention_7thday_3
USERS* 26%
30TH DAY RETENTION +6%
Retention_30thday_4
USERS* 18%
SAVE
CANCEL