RnD 42
KNOW THE QUESTION

Personalized Pricing

based on AI modeling of customer's behavior

Dmitry Volkov, Ph.D.
CEO of RnD-42 LLC

Toll roads, parking

Public transport

Car, Bike etc. sharing

Telecom

Much more…

WE PREDICT IN REAL-TIME PROBABILITY OF SERVICE USAGE FOR EACH CUSTOMER AND CALCULATE A DISCOUNT TO OFFER THE PRICE HE IS READY TO PAY NOW

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For any paid resource there are a lot of potential customers that do not use the resource because of price

For an idle resource (free parking place, toll road without traffic, etc.), almost any non-zero price becomes profit

Not to lose revenue from current users, the reduced price should be offered only to customers who do not intend using the resource by normal price

System requirements: anonymized orders' history for training ML models and a channel for personal offers delivery

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We analyze the behavior of each specific user of a paid resource using machine learning

We know how to accurately find those who do not use because of the high price

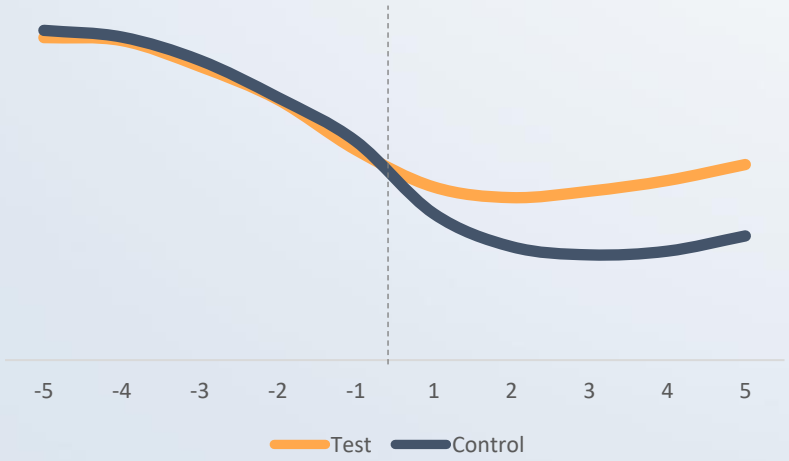
We utilize the idle resource by attracting those who really care about the high costs with the help of personal prices

We guarantee an increase in both resource loading and revenue due to the high accuracy of models trained on big data

We use our cloud service to demonstrate the effectiveness of the technology on real clients in the form of a quick POC pilot

Pilot projects at intracity toll road, Saint Petersburg

- Three A/B tests in 2019-2021
- 50 000 real customers
- Proven growth in both traffic and revenue



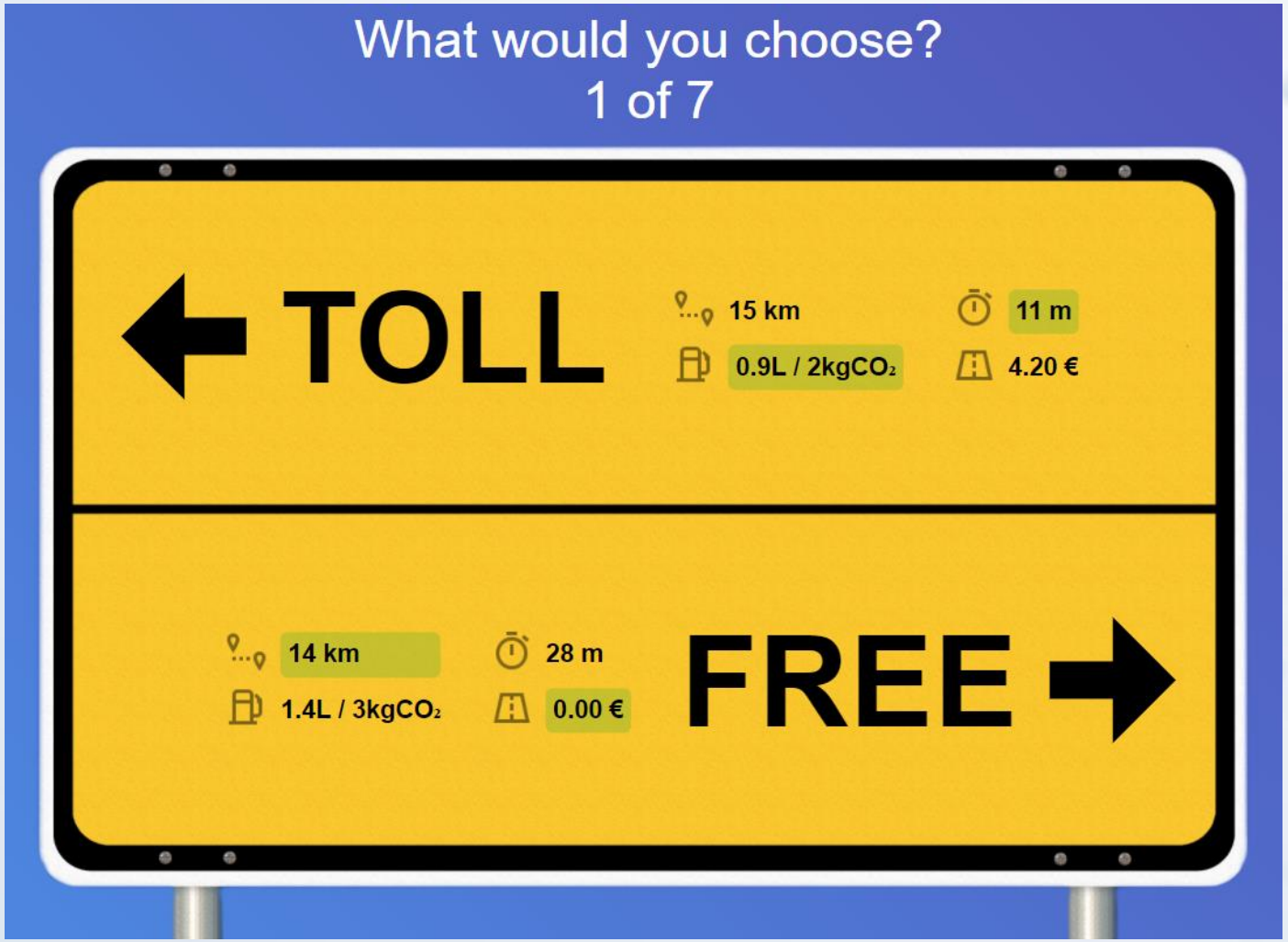
+ 4-6% traffic

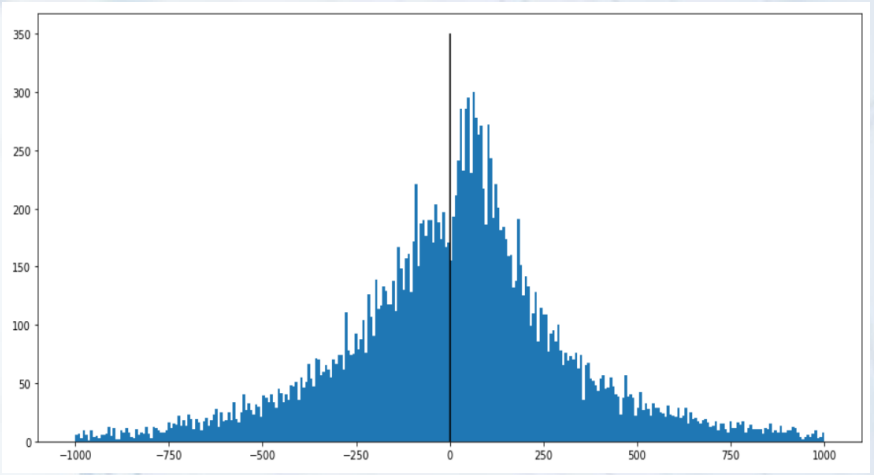
+ 2-4% revenue *

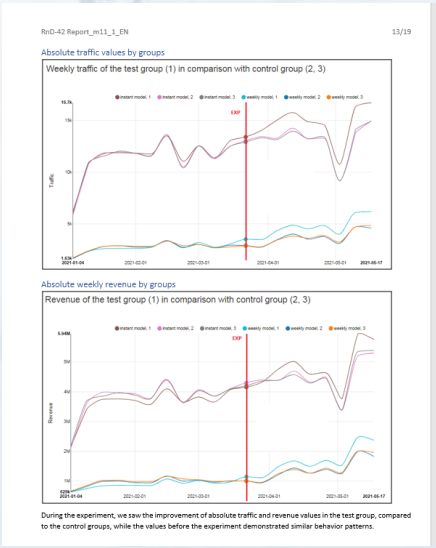
* according to A/B test results

http://rnd-42.com/whsd_exp_3

WE CONDUCT SEVERAL RESEARCHES AND TRY DIFFERENT MODELS DURING THE PILOT TO FIND THE BEST SOLUTION FOR EACH CONCRETE PROJECT



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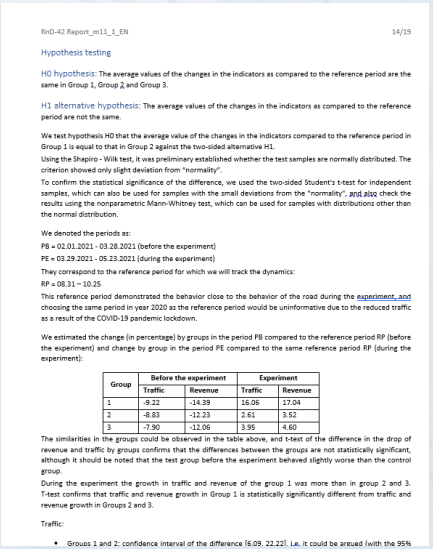
Absolute traffic values by groups

Weekly traffic of the test group (1) in comparison with control group (2, 3)

Absolute weekly revenue by groups

Revenue of the test group (1) in comparison with control group (2, 3)

During the experiment, we saw the improvement of absolute traffic and revenue values in the test group, compared to the control groups, while the values before the experiment demonstrated similar behavior patterns.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Hypothesis testing

H0 hypothesis: The average values of the changes in the indicators as compared to the reference period are the same in Group 1, Group 2 and Group 3.

H1 alternative hypothesis: The average values of the changes in the indicators as compared to the reference period are not the same.

We test hypothesis H0 that the average value of the changes in the indicators compared to the reference period in Group 1 is equal to that in Group 2 against the two-sided alternative H1.
Using the Shapiro - Wilk test, it was preliminary established whether the test samples are normally distributed. The criterion showed only slight deviation from "normality".
To confirm the statistical significance of the difference, we used the two-sided Student's t-test for independent samples, which can also be used for samples with the small deviations from the "normality", and also check the results using the nonparametric Mann-Whitney test, which can be used for samples with distributions other than the normal distribution.

We denoted the periods as:
PB = 02.01.2021 - 03.28.2021 (before the experiment)
PE = 03.29.2021 - 05.23.2021 (during the experiment)
They correspond to the reference period for which we will track the dynamics:
RP = 08.31 − 10.25
This reference period demonstrated the behavior close to the behavior of the road during the experiment, and choosing the same period in year 2020 as the reference period would be uninformative due to the reduced traffic as a result of the COVID-19 pandemic lockdown.

We estimated the change (in percentage) by groups in the period PB compared to the reference period RP (before the experiment) and change by group in the period PE compared to the same reference period RP (during the experiment):

Group	Before the experiment		Experiment	
	Traffic	Revenue	Traffic	Revenue
1	-9.22	-14.39	16.06	17.04
2	-8.83	-12.23	2.61	3.52
3	-7.90	-12.06	3.95	4.60

The similarities in the groups could be observed in the table above, and t-test of the difference in the drop of revenue and traffic by groups confirms that the differences between the groups are not statistically significant, although it should be noted that the test group before the experiment behaved slightly worse than the control group.
During the experiment the growth in traffic and revenue of the group 1 was more than in group 2 and 3. T-test confirms that traffic and revenue growth in Group 1 is statistically significantly different from traffic and revenue growth in Groups 2 and 3.

Traffic:

- Groups 1 and 2: confidence interval of the difference [6.09, 22.22], i.e. it could be argued (with the 95%

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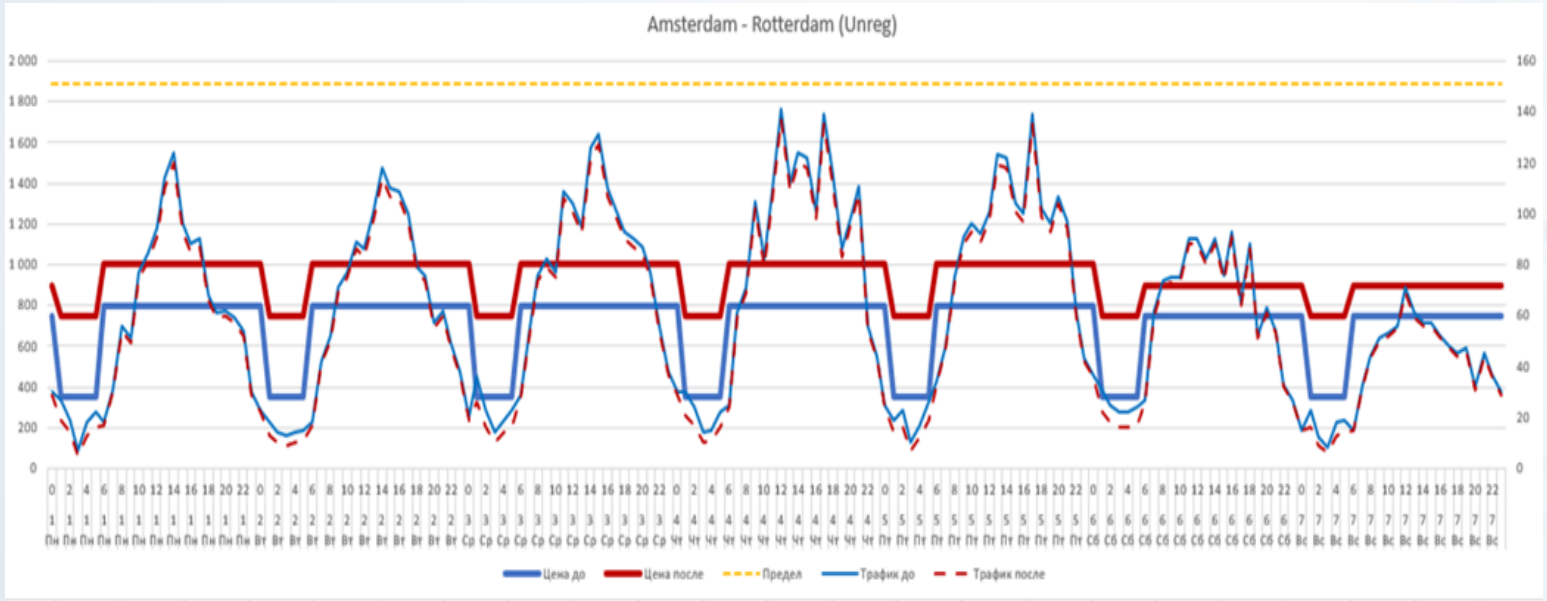
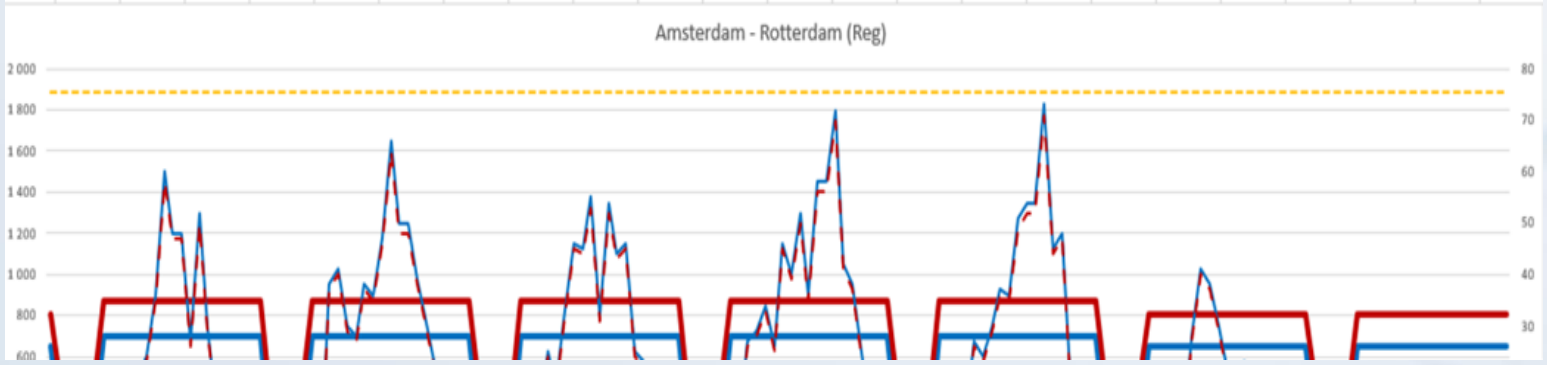
OFTEN, BEFORE PERSONALIZATION YOU NEED TO OPTIMAZE YOUR BASE PRICING
WE PROVIDE SPECIAL CLOUD SERVICE FOR PRICING OPTIMIZATION

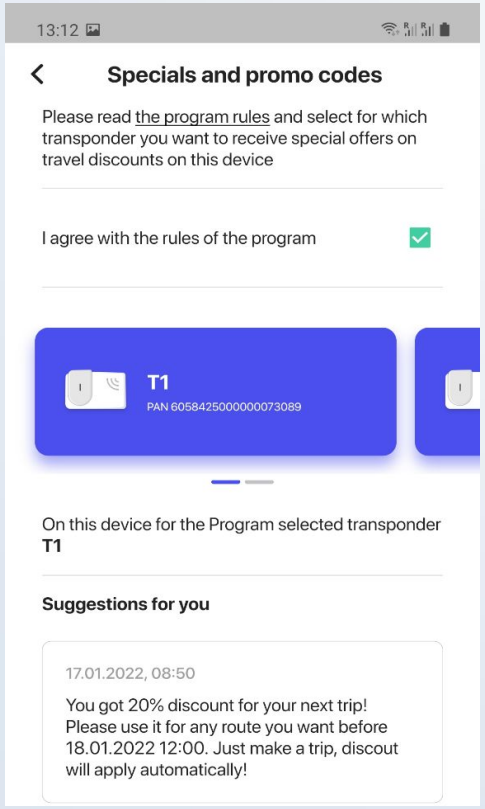


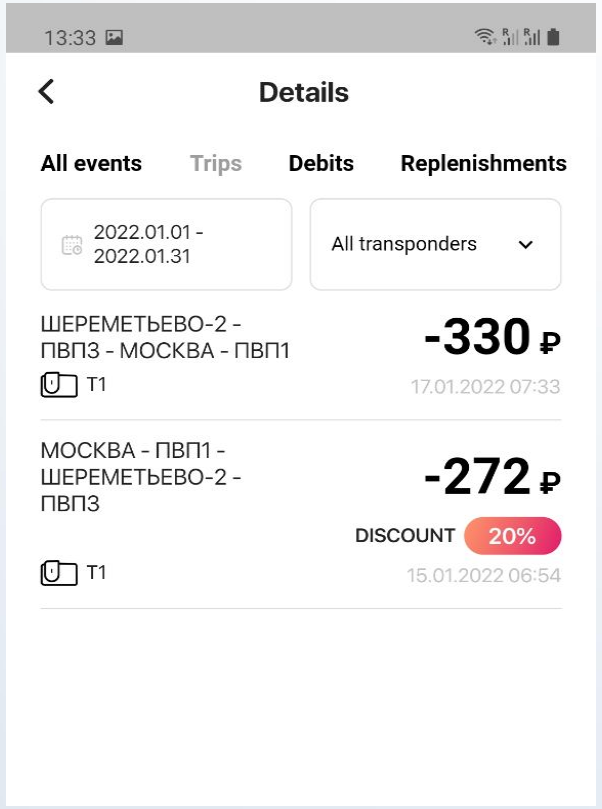


- Elasticity estimation, traffic structure forecast
- Multicriterial mathematical optimization
- Timetable and pricing recommendation

Smart Loyalty program for M11 Highway Moscow – Saint Petersburg

- Pricing Optimization
  Personalized Pricing
- Proven growth in both traffic and revenue





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RnD-42 LLC was founded in 2020, research company in the field of using artificial intelligence to predict user behavior and influence this behavior through personal pricing.
The team consists of smart city scientists, mathematicians, programmers and marketing specialists.

Dmitry Volkov, Ph.D., Founder & CEO

more than 25 years in software industry, co-owner and development director of Onyma® software brand (Billing, CRM, and BPM, 80+ clients around the world).
Architect of toll collection system used at most of the Russian highways (M3, M4, M11, WHSD).

Looking for clients and partners to conduct pilot projects with service providers around the world to prove the “win-win” concept and then implement personalized pricing based on our products.

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