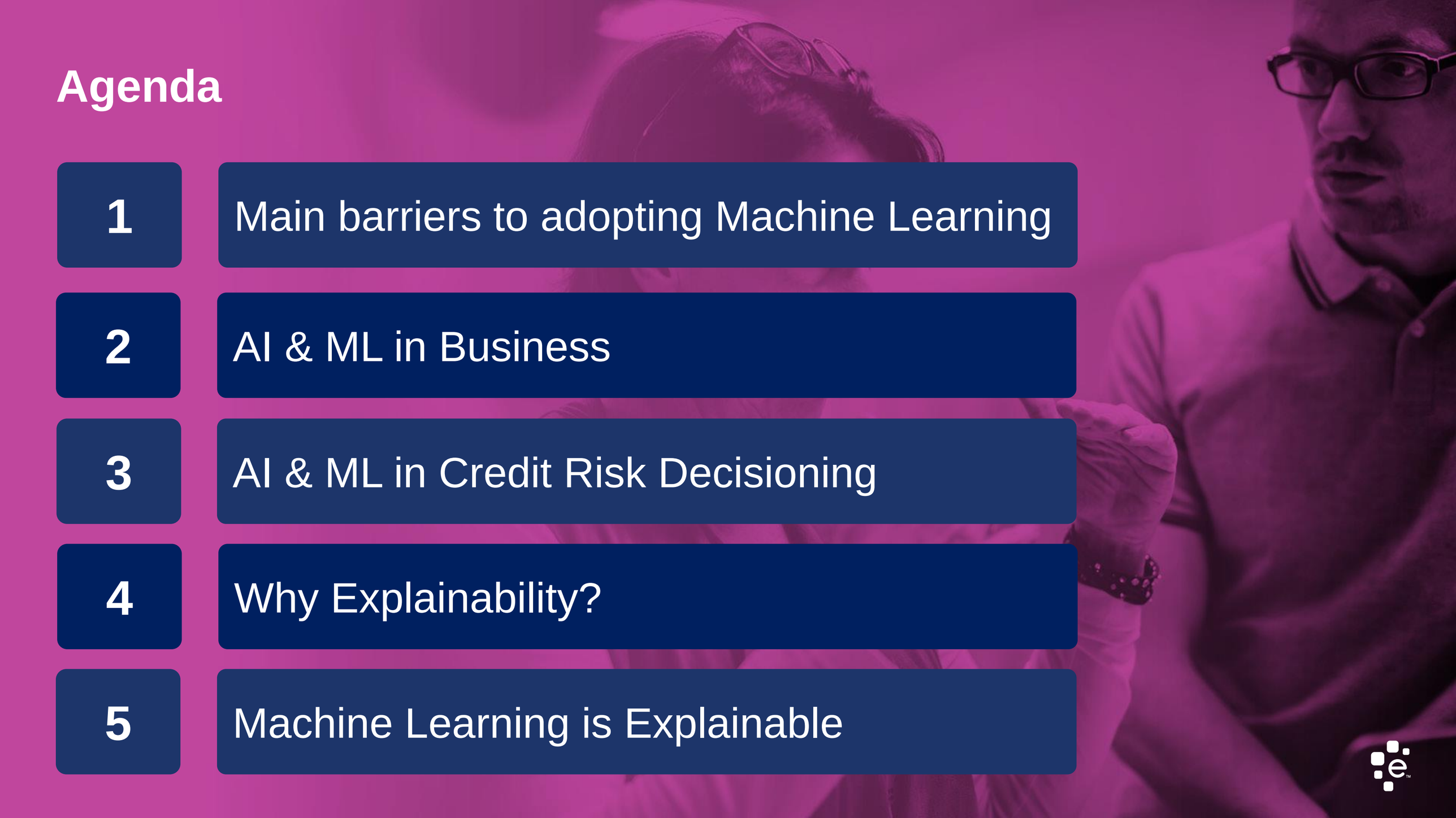
Machine Learning and Artificial Intelligence in credit risk decisioning

Real case studies and explainability

Leandro Guerra
Head of Data Science – Experian EMEA

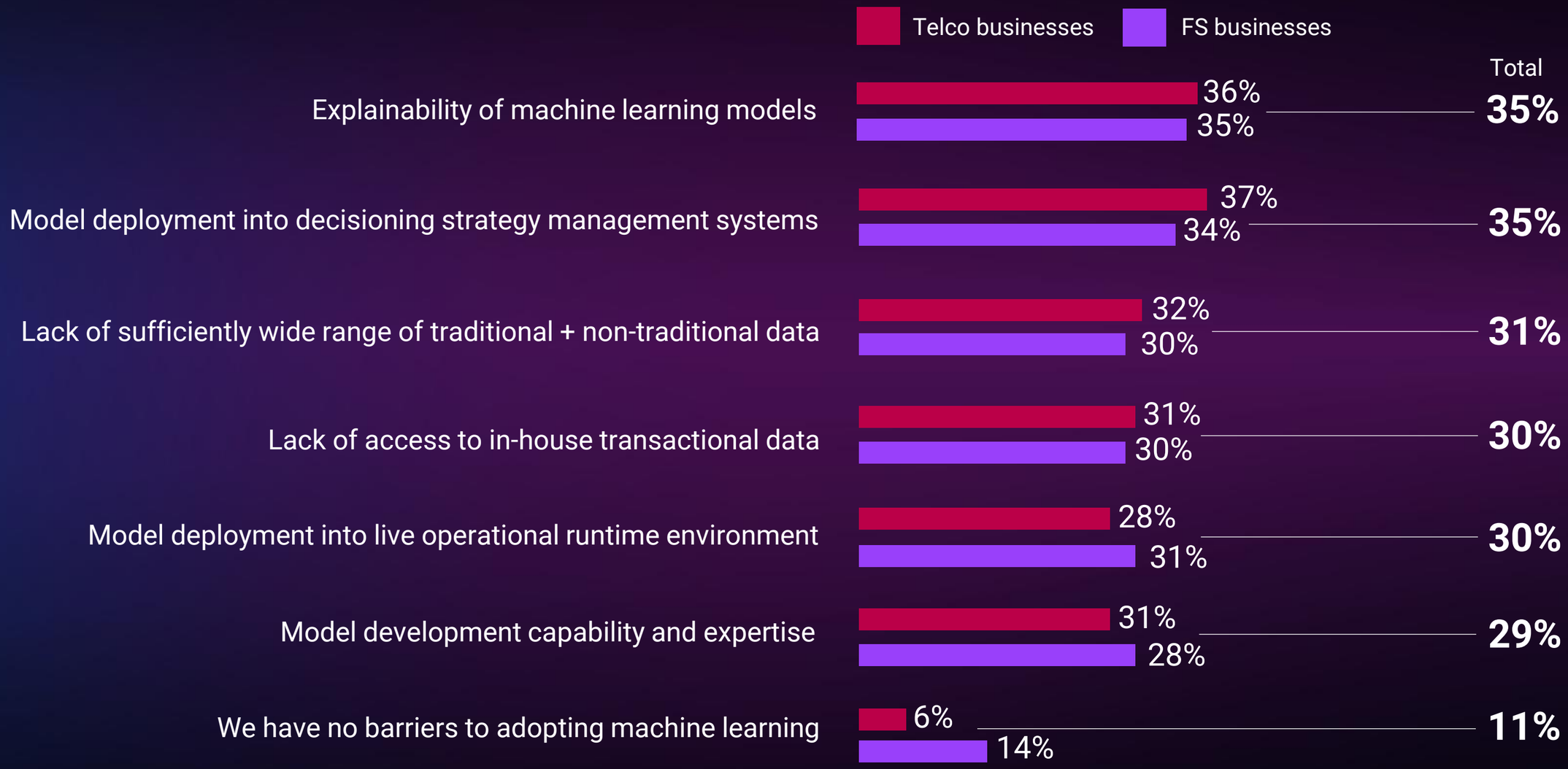
Agenda

1. Main barriers to adopting Machine Learning
2. AI & ML in Business
3. AI & ML in Credit Risk Decisioning
4. Why Explainability?
5. Machine Learning is Explainable



Deployment and explainability are the top barriers to machine learning adoption

Q: What are the main barriers to adopting Machine Learning in your organisation?



Base: 598 senior decision-makers in financial services and telecommunications firms globally.
Source: a commissioned study conducted by Forrester Consulting on behalf of Experian, August 2021.

AI & ML in Business: A Machine Learning Technique Is Not…

A Black Box

- Many lenders associate machine learning with techniques such as neural networks that are “black boxes” in the sense that it is very hard to explain their decisions.
- The AI/ML technique used by Experian is a variation of the well-known predictive modeling technique known as decision tree learning. Decision trees are explainable.
- Experian DataLabs has a patent pending on a technique to generate adverse action codes from ensemble models.

Hard to Manage

- Lenders may associate machine learning with *continuous or adaptive learning*, where the lender’s policy may automatically evolve based on experience with new applicants.
- Experian’s approach is to build a static model—analogous to a traditional credit scoring model but built with a newer technique.
- Model governance issues for model ensembles will be nearly the same as those involved in traditional credit scoring models (decision trees or segmented logistic regression models).

I - Performance improvement: increased efficiency and accuracy in comparison with traditional techniques

1

-80%

Data Preparation Time needed

(decrease from 2.5 weeks to 3 days)

2

+13%

Higher predictability in an acceptance model

(increase in Gini from 70.2% to 79.2%)

3

+15%

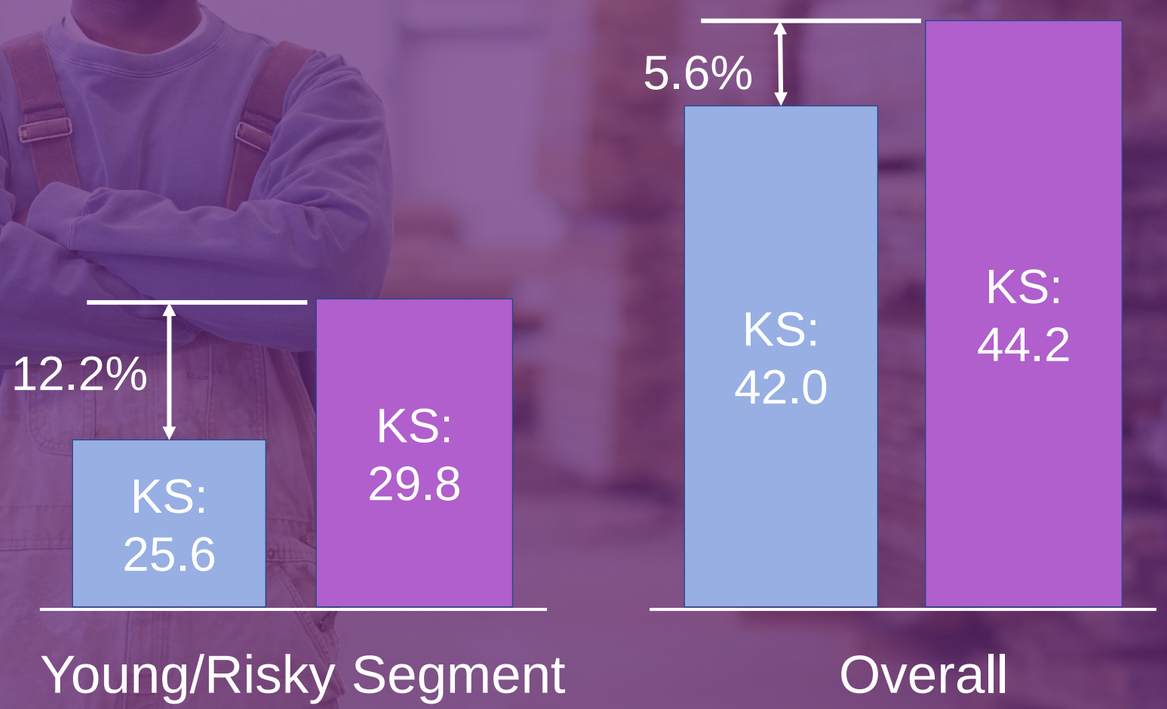
Higher predictability in a marketing model

(increase in Gini from 44.0% to 50.6%)

II - Machine Learning-based Credit Scoring

Improving over traditional logistic regression/scorecard-based approach

- Credit scoring has traditionally been scorecard-based or logistic-regression based
- ML solution can better ensure regulatory requirements (e.g. monotonic requirements)
- Demonstrated performance gains:
  - **12.2% more accurate scoring in young/risky segment segments contributing to financial inclusion**
  - **5.6% more accurate scoring in overall database**



Explainability

The output of a statistical model is explainable when its internal behaviour can be directly understood by humans (interpretability) or when explanations (justifications) can be provided for the main factors that led to its output.

Why Explainability?

To Justify

Why was this loan rejected?

To Control

Why was this loan accepted?

To Improve / Discover

How can these variables be adjusted to improve approvals or rejections?

Source: EBA Report on big data and advanced analytics, January 2020.

Take better risk decisions!

P(bad_customer) = ?

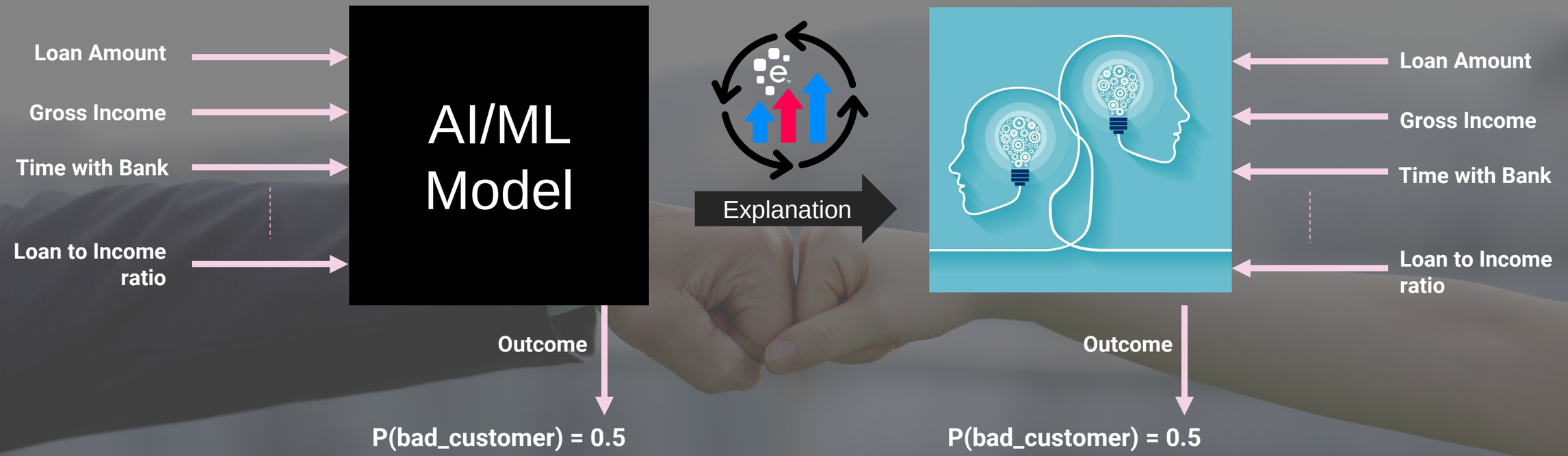
P(bad_customer) = 0.5

Amount_Due = +0.9
Age_40_50 = -0.2
DIR = -0.2

P(bad_customer) = 0.5

To Justify **To Control** **To Improve and Discover**

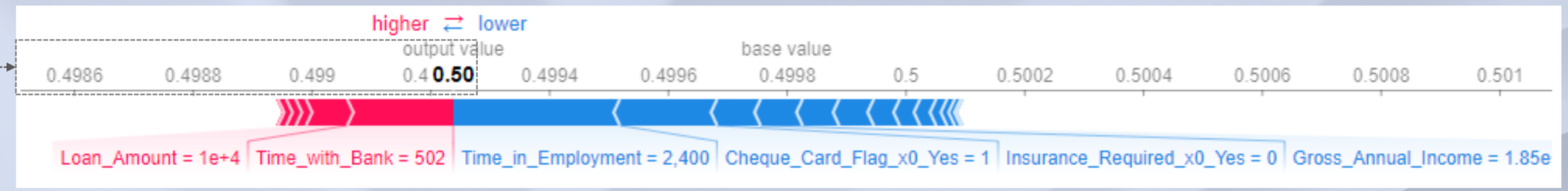
Explain your AI/ML model with Experian: Get to know you explainability report!



The Machine Learning Model is transparent and explainable!

Red attributes push the risk higher

Blue attributes push the risk lower



Exactly impact in the probability

Thank you!


Digital Distribution & Sales
Analysis
AR Consumption growth
Average user base
+89%
Social Networks growth in marketing