INTELLIGENZA ARTIFICIALE IN BANCA: CASE STUDY REPLY IN BANCA MEDIOLANUM

Milano, 21 Febbraio 2019

ROBOTICS FOR CUSTOMERS

FRAMEWORK ON DATA DRIVEN CUSTOMER ENGAGEMENT

Robotics for Customers framework

based on AI and Personalized Services

Recommendation Systems

Conversational Systems (chatbots)

A new approach to Customer Experience based on data (Data Driven, Machine Learning)

A new touchpoint for Customer Engagement thanks to Natural Language Understanding

A new way to get interaction across channels thanks to a specific Customer Journey design

CONVERSATIONAL SYSTEMS

CASE STUDY ENYA

- ✓ **Conversational Interface**
- ✓ **User Experience and frictionless interaction**
- ✓ **End-to-end meeting management**

- **Studied and developed jointly with Banca Mediolanum team, based on the Bank' needs**
- **ENYA is a digital assistant addressed at Private Bankers, conceived to help in their daily routines**
- **BEFORE THE MEETING, Enya will ask information about the Customer for chasing knowledge about his interests, attitudes, and propensity to buy**
- **AFTER THE MEETING, the Banker records the meeting minutes talking with ENYA. ENYA will recognize relevant opportunities straightforwardly: actions to do, next meetings to schedule, commercial leads, etc.**

RECOMMENDATION ENGINES

THE IDEA

The idea behind a Recommendation Engine is to associate each Customer with a list of products ordered with propensity scores calculated on the personal characteristics of the Customer

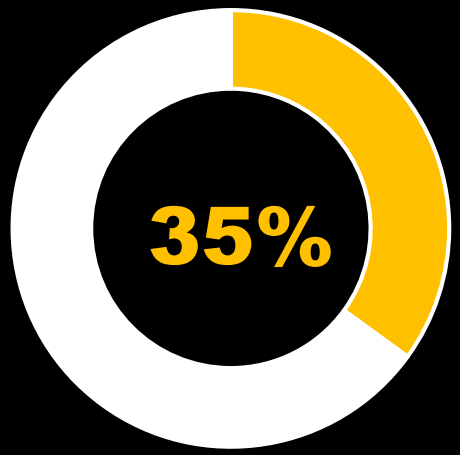
PRODUCTS → Recommendation Engine → RANKED LIST | SCORE

RANKED LIST	SCORE
Product a	0.89
Product b	0.78
Product c	0.56
Product d	0.48

Recommendation engines (or recommender systems) are digital services that seek to predict the “rating” or “preference” that a user would give to an item

RECOMMENDATION ENGINES

THE MARKET: AMAZON

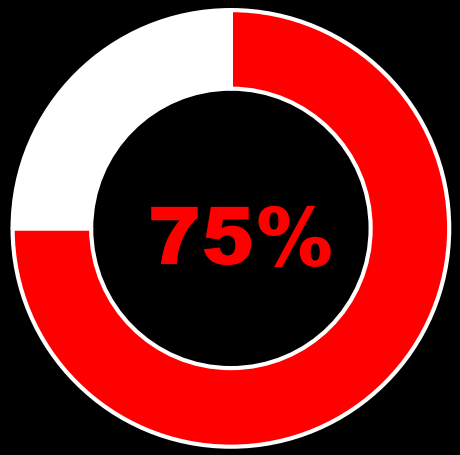


of Amazon.com product sales are generated by its recommendation engine

Source: VentureBeat.com

RECOMMENDATION ENGINES

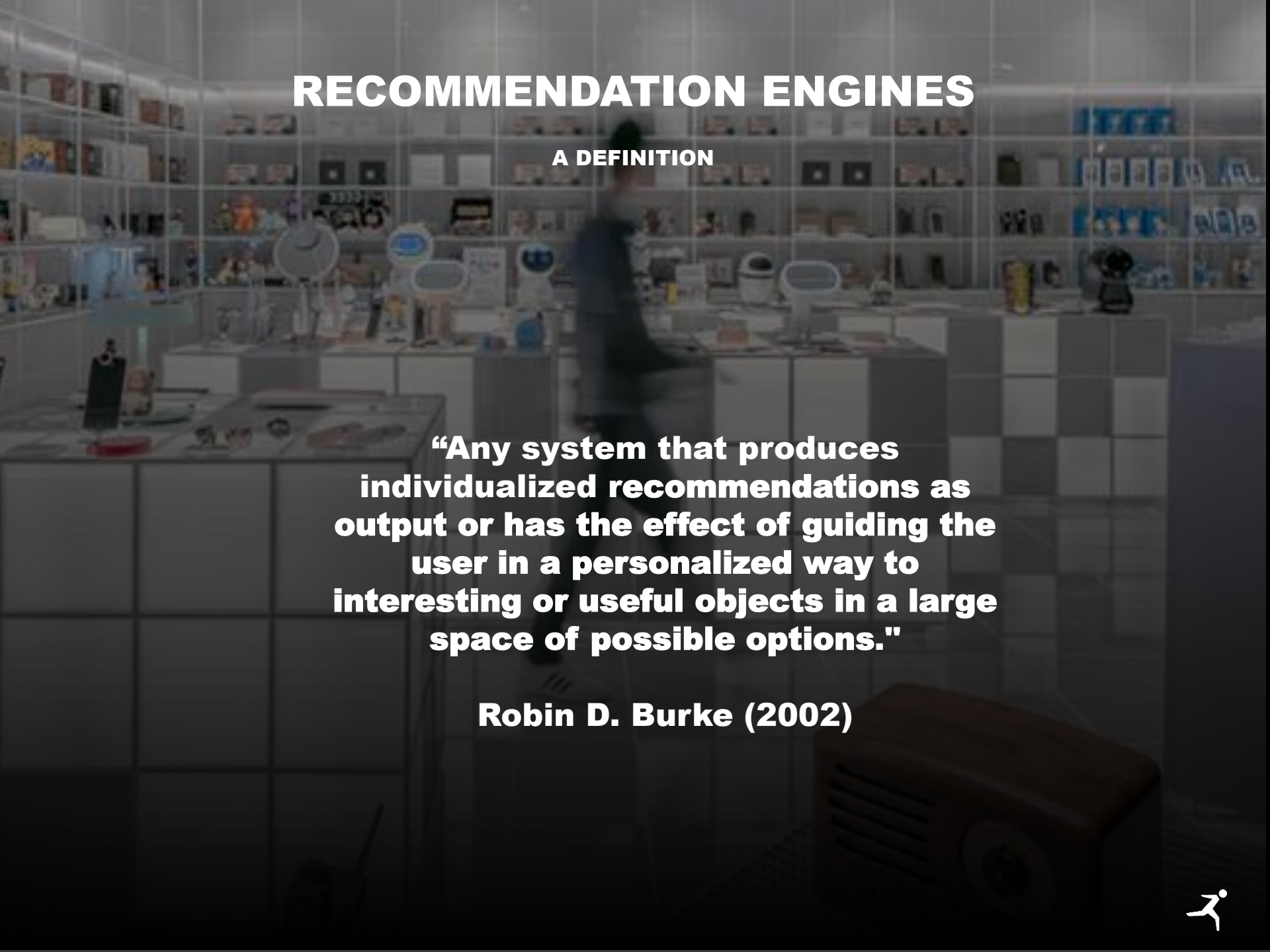
THE MARKET: NETFLIX



of the streaming video traffic Netflix generates is driven by personalized recommendations for TV series and movies

NETFLIX

Source: McKinsey, «How retailers can keep up with consumers»,



RECOMMENDATION ENGINES

A DEFINITION

“Any system that produces individualized recommendations as output or has the effect of guiding the user in a personalized way to interesting or useful objects in a large space of possible options."

Robin D. Burke (2002)

RECOMMENDATION ENGINES

AREAS OF USE

RECOMMENDATION SYSTEMS

Some example of applications...

E-STORE

Recommendations for new products, up-sell, cross-sell suggestions and product discovery

PRODUCT DISCOVERY

Matches varying individual customers taste with a huge inventory

SEARCH

Order of search results on the store can be varied for each customer to aid product discovery

BILLS AND MAILERS

Whitespace can be used for cross-sell and up-sell opportunities. Usage can be analyzed for recommending plans

EMAIL CAMPAIGNS

Effectively targeting abandoned shopping carts with personalized recommendation

LOYALTY PROGRAMS

Recommendations pertaining to specific program, suggestions for redemption and program upgrades

...

THE BANCA MEDIOLANUM CASE: DATA ANALYTICS LABORATORY AND RECOMMENDATION ENGINE

CONTEXT

- An AI laboratory initiative has been managed within the renewal of the Analytic CRM platform
- A major focus has been addressed at developing services for data driven personalization, to be seamlessly integrated within CRM and Marketing Automation facilities. Examples range from recommendation systems, to customer propensity scores and behavioral segmentation

APPROACH

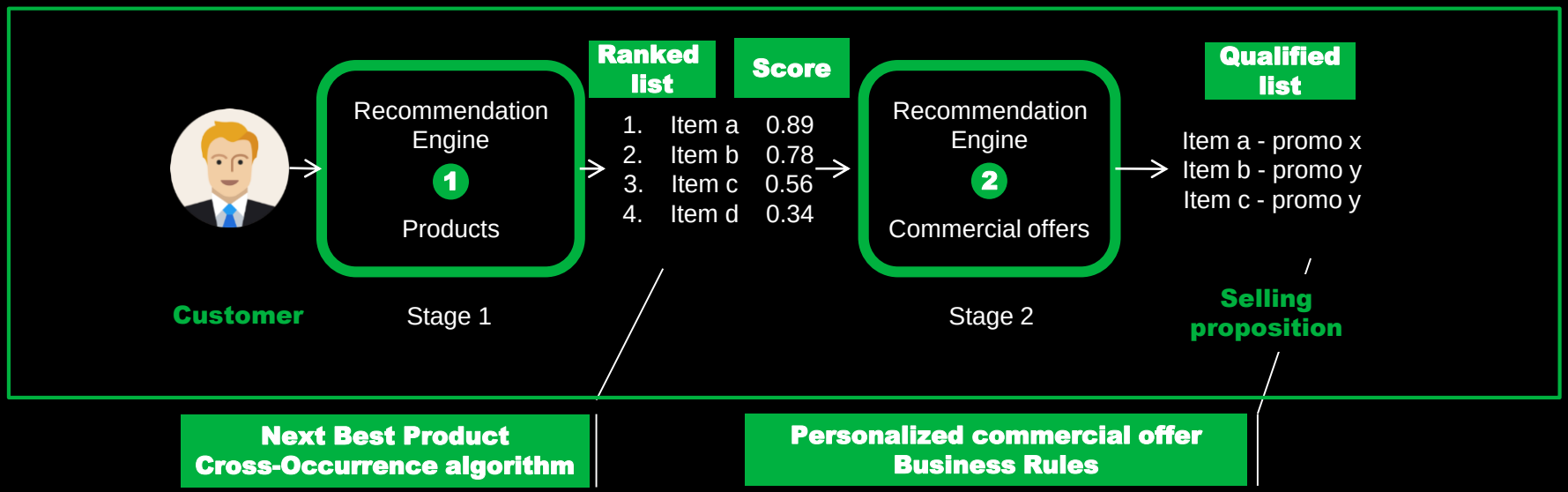
- The adoption of the Robotics for Customers Framework allowed to create a new analytic platform, based on advanced tools for analytics
- The initiative has introduced several analytic engines, developed using multiple machine learning techniques
- Besides, cross checking promoted an experimental testbed used for evaluating different models and for focusing on the most promising approaches currently fitting the business needs

90% of customers labelled with top level scores currently purchase a target product in the next 3 months

Success metrics of Campaign boosted with an order of magnitude
(i.e. Precision +170% Recall +900%)

THE BANK RECOMMENDATION ENGINE

The Recommendation Engine allows to associate to each Customer a ranked list of banking products based on a mix of behavioral, patrimonial and demographic attributes



The analytical engine is integrated in **automated marketing campaigns** in two processing stages:

1. **Association Customer – product**
2. **Association product – offer**

- **Stage 1**: a first engine associates **to each Customer a list of products** that have a high relevance for that Customer
- **Stage 2**: a second engine associates **to each product** in the previous listing **a commercial offer**

GDPR COMPLIANT!
No sensitive data used

USING RECOMMENDATION SYSTEMS

RECOMMENDATION ENGINE

API

MARKETING RESEARCH

- **Propensity to buy** processed on the whole Customer base
- Used to investigate the target for specific Marketing Campaigns (**target list**)

SALESFORCE

- **Operational CRM dashboard** used for a complete Customer centric view
- Exploitable as Business Intelligence tool to get **Customer insights**

DIGITAL TOUCHPOINTS

- **Selling propositions** can be delivered on direct channels (web / mobile / chatbot)
- Exploitable for **real time** and **one-to-one** campaigns

TARGET LIST

OPERATIONAL CRM DAHSBOARD

REAL TIME 1-TO-1 CUSTOMER EXPERIENCE

EXPERIMENTAL METHOD AND EFFECTIVENESS

1. **Extraction of about 160.000 Customers in Lombardy**
2. **Next-best-offer scores: for each Customer the best five items are selected**
3. **Customer's portfolio re-analyzed six months later**
4. **Application of Universal Recommender, based on Co-Occurrence Matrix**
5. **Redemptions evaluation (precision and recall)**

mediolanum BANCA

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Success metrics of Campaign boosted with an order of magnitude
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Precision: Num. of purchases among recommended items / num. of recommended items
Recall: Num. of purchases among recommended items / num. of purchases

METRICS EVALUATION

DATA SIMULATION ON BANCA MEDIOLANUM

		BENCHMARK RANDOM MODEL	SETTING 1	SETTING 2	SETTING 3	SETTING 4	SETTING 5	SETTING 6
TOP 1 Best 1 Score	PRECISION	1,03%	1,73%	2.7%	2.71%	2.71%	**2.76%**	2.73%
	RECALL	2.93%	19.81%	30.87%	30.93%	30.93%	**31.47%**	31.12%
TOP 5 Best 5 Scores	PRECISION	0.99%	2.19%	2.46%	2.43%	2.43%	**2.66%**	2.65%
	RECALL	13.83%	32.09%	36.09%	35.64%	35.66%	**39.05%**	38.91%

Settings 1-5 refers to different configurations of the UR Algorithm parameters, given the same training set and test set. The data simulation approach has been applied to determine the recommendation effectiveness

- **Considering the higher recommendation score (top 1), PRECISION = 2.76% (+167% wrt. the random benchmark) RECALL = 31.47% (+974% wrt. the random benchmark)**
- **Considering the top 5 scores, PRECISION = 2.66% (+168% wrt. the random benchmark)**
  RECALL = 39.05% (+182% wrt. the random benchmark)

CONCLUSIONS

In contrast to traditional approaches based on segmentation and profiling, which require a costly analytical study to assign each customer to a Personas cluster, in this case it is the data already available that drives the Collaborative Filtering and, therefore, the selection process of the best offer

The minimum dataset of primary events on which the Recommendation Engine is based can in fact be obtained from sales data, typically extractable from a common commercial data warehouse.

Two aspects worth noting are the ability to take data that is readily available and make it actionable , together with the ease of implementation of the process. The Banca Mediolanum pilot case was created in a totally unconnected manner with respect to the Bank's Business Intelligence infrastructure and was developed as a service-based solution on a cloud-based platform.

THANKS

WWW.REPLY.COM
WWW.BANCAMEDIOLANUM.IT