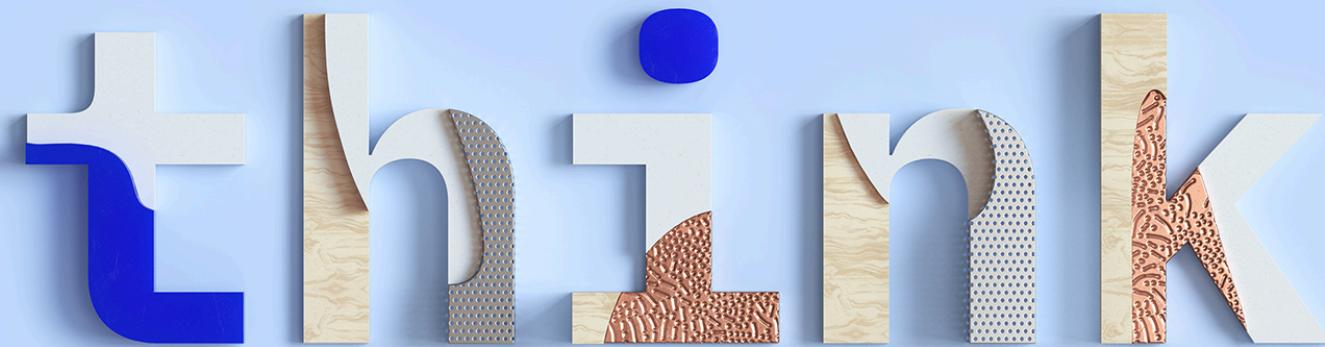


# The Voice of Art with IBM Watson: Technical Details and Challenges

**think 2018**

—  
Fabricio Barth

Tech Lead, Watson and Cloud Platform Expert and Delivery Services





Tarsila do Amaral. São Paulo, 1924



Almeida Júnior. Saudade, 1899



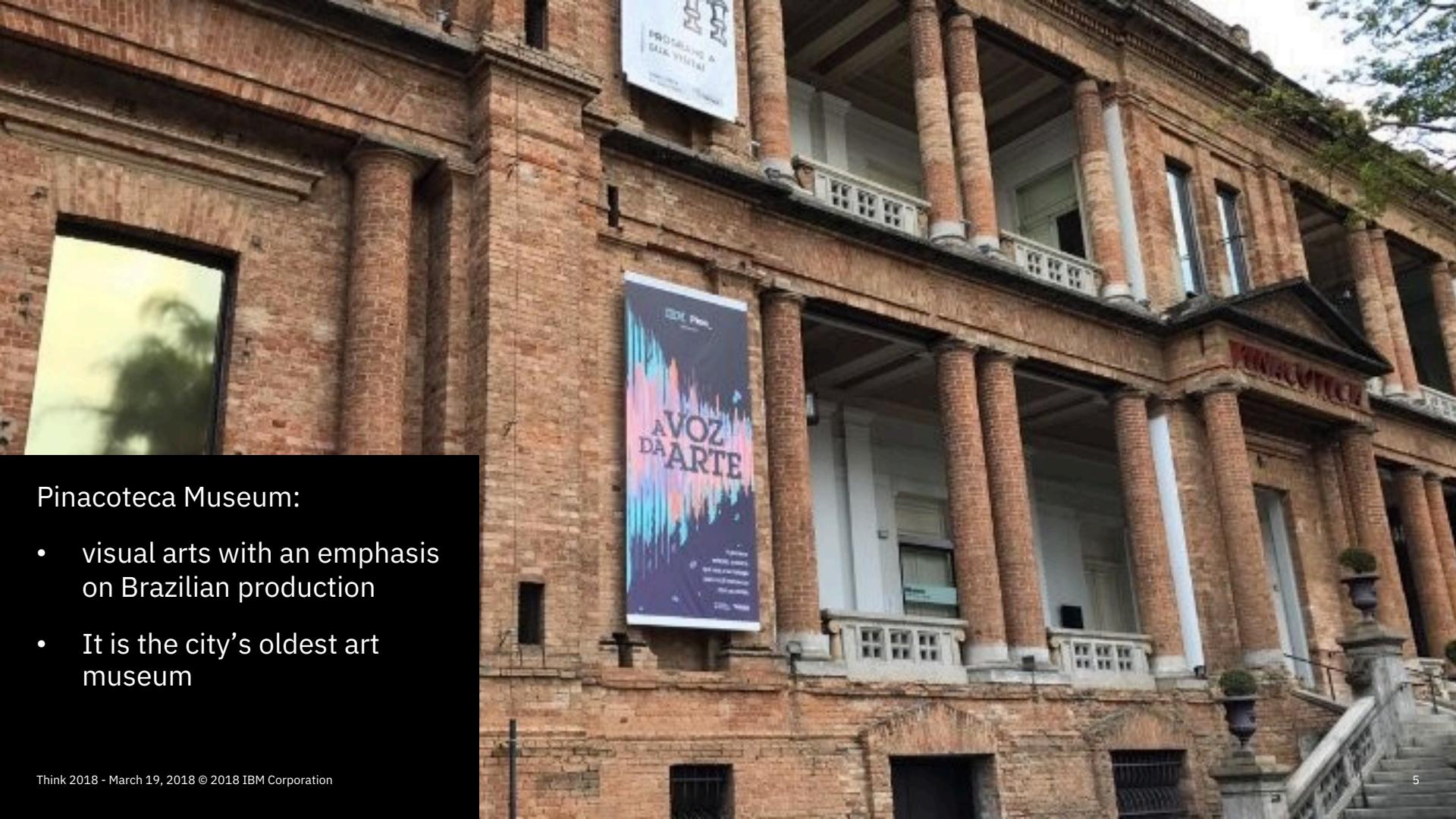
Antônio Parreiras. Ventania, 1888



THE VOICE OF ART |

WITH  
**WATSON**

IBM

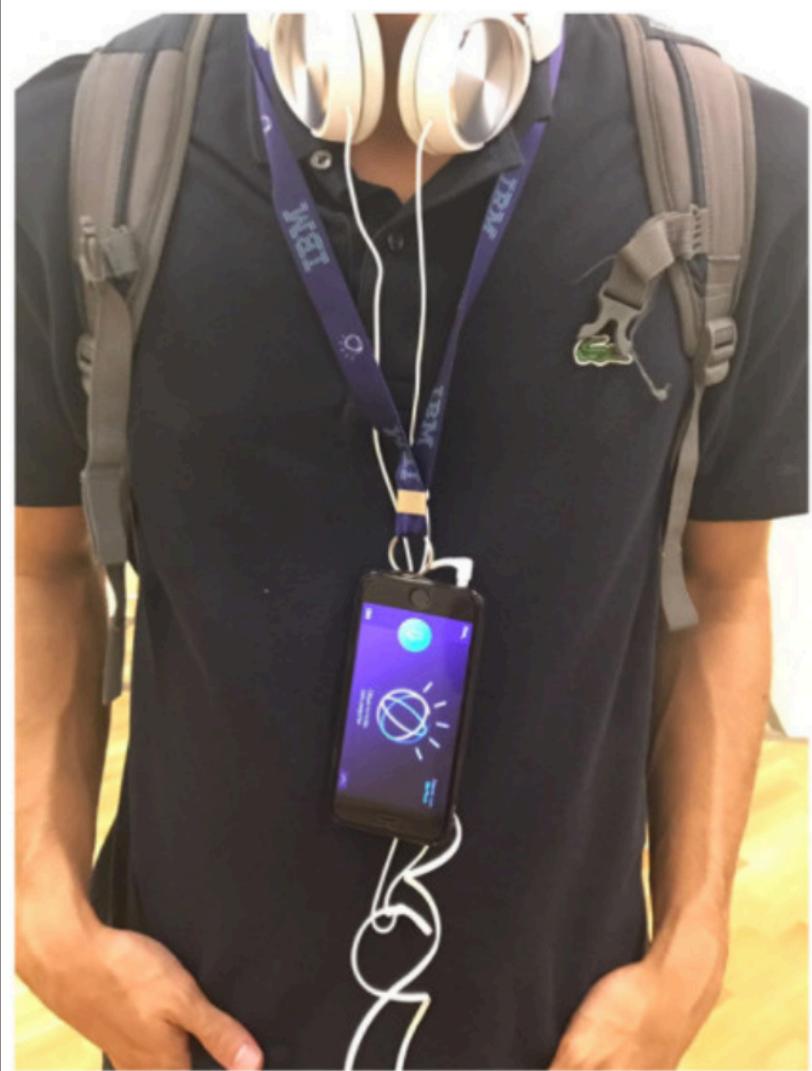


## Pinacoteca Museum:

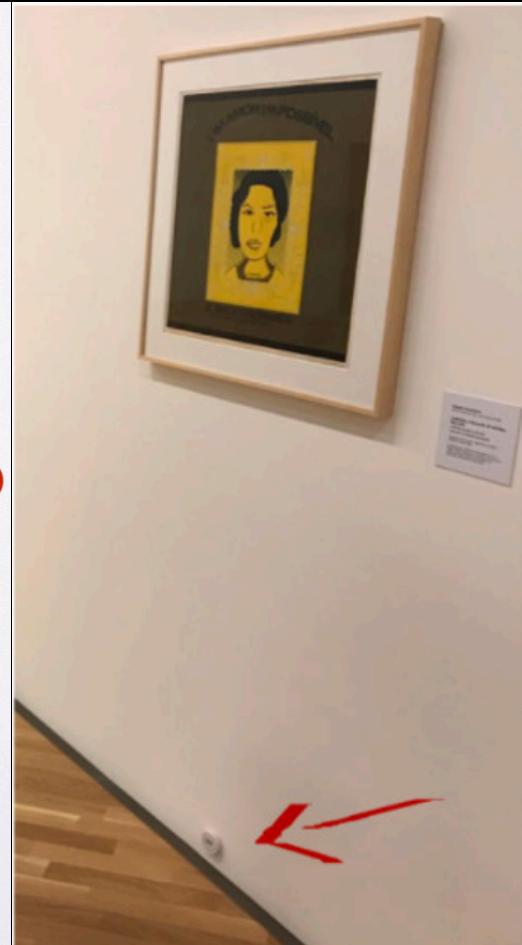
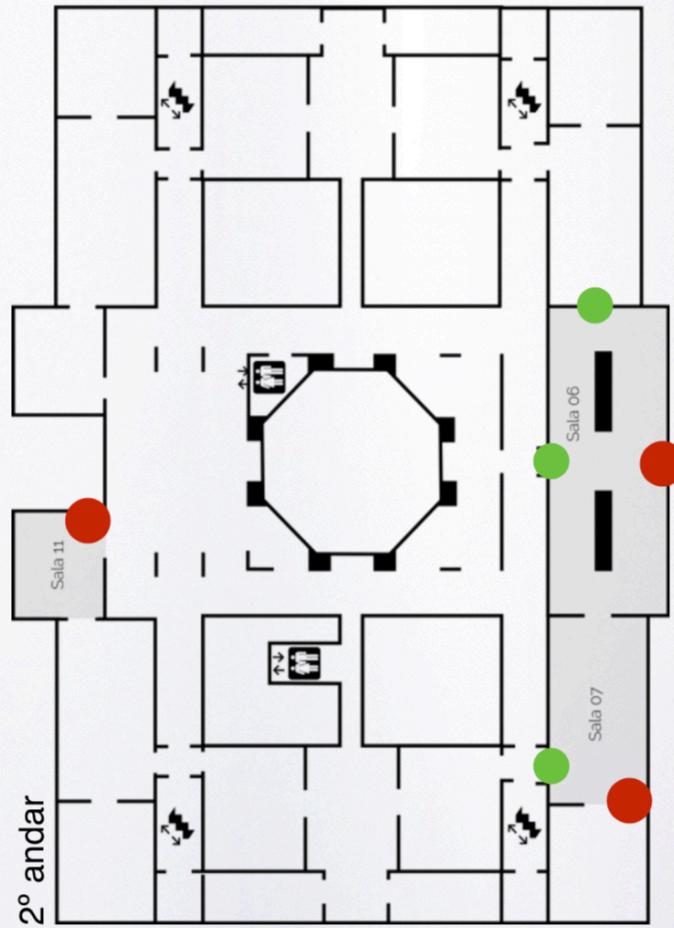
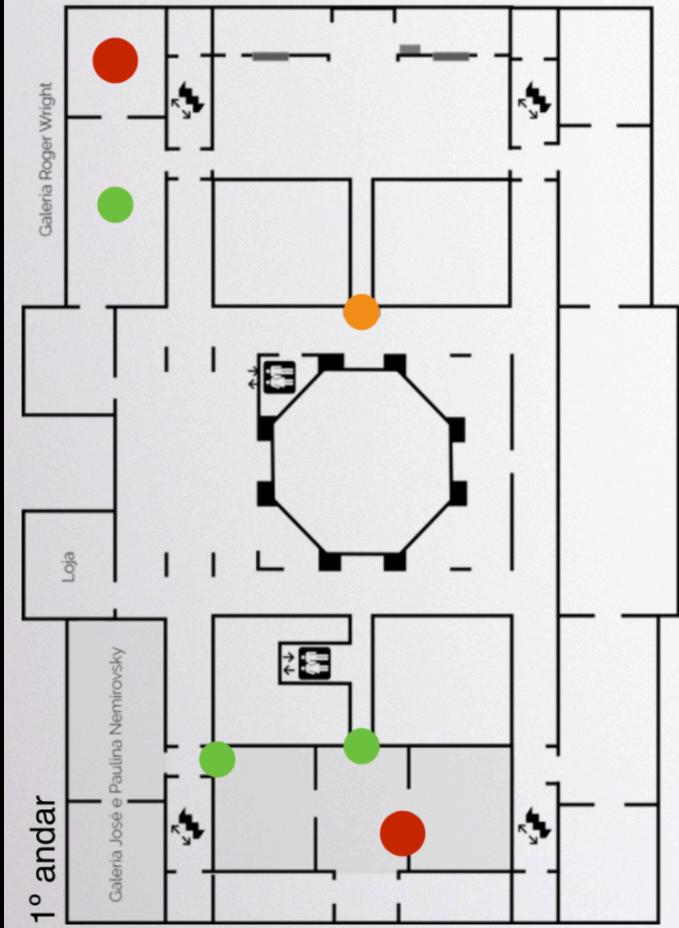
- visual arts with an emphasis on Brazilian production
- It is the city's oldest art museum

# Visitor's Experience

- All visitors receive an equipment with cellphone and headset.
- This equipment **guides** visitors through the museum, and allow visitors to **talk** with pieces of art.



# Beacons: location and artwork





# User Interface

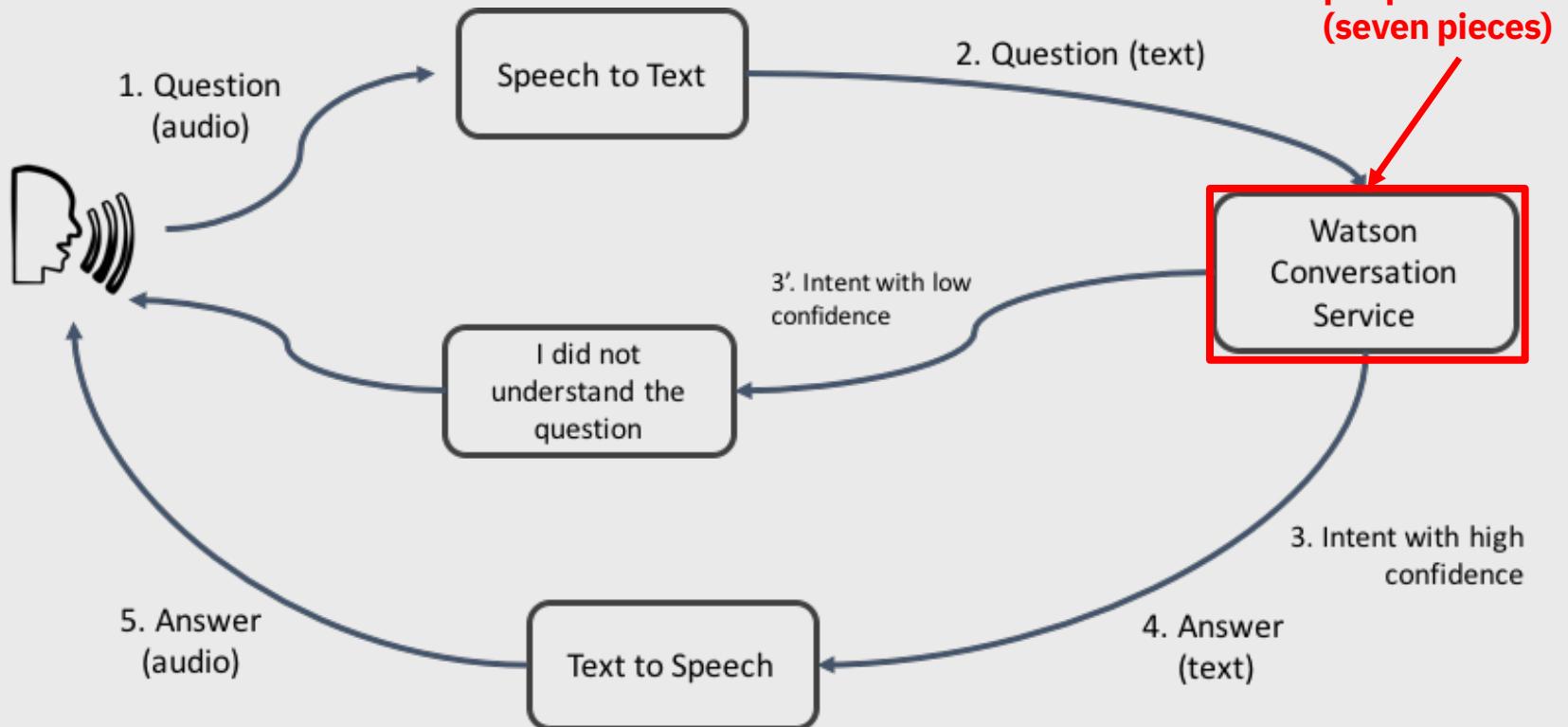


The visitor asks a question about the piece of art, the system identifies what the intent behind that question is and provides an answer



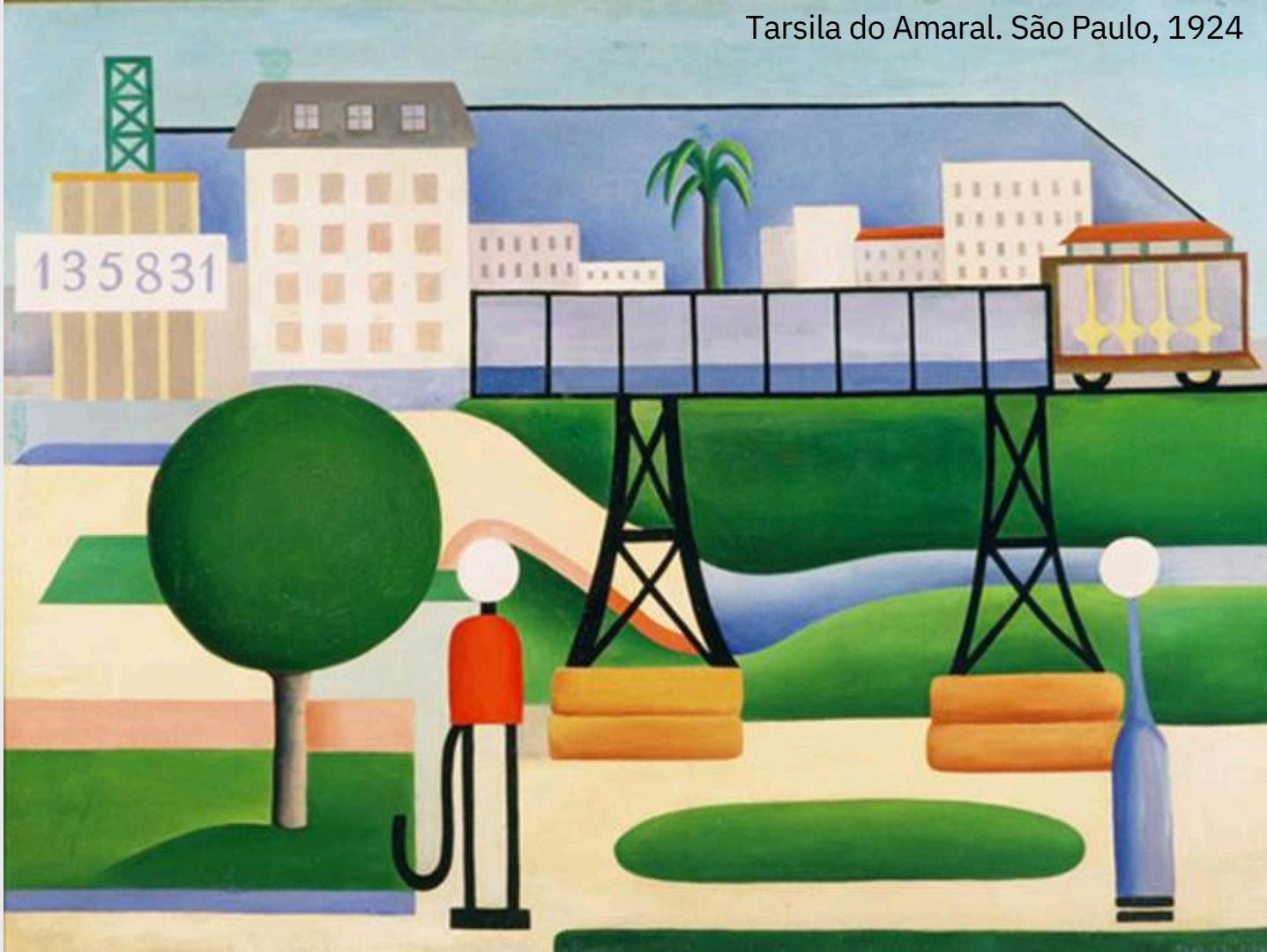
How does this interaction happen?

# Voice and Recognition



The big **challenge**  
is how to  
implement a  
system that can  
understand every  
question about  
some works of art  
and provide the  
best answer to  
most questions.

Tarsila do Amaral. São Paulo, 1924



# Training

1

**End Users** ask questions  
using the question  
collector tool



**Watson  
Conversation  
Service**



## Olá!

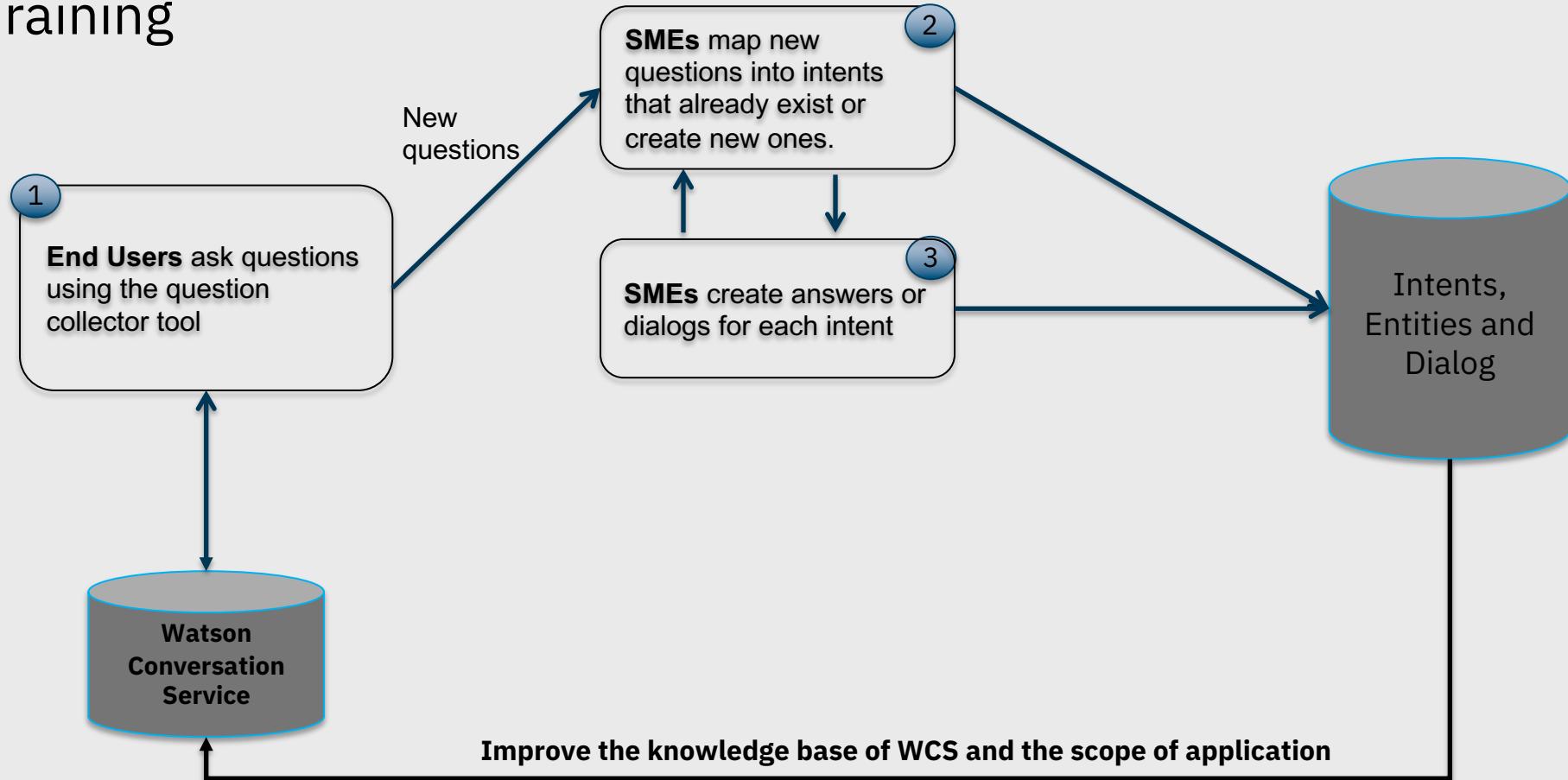
A seguir, você poderá nos ajudar a entender quais tipos de perguntas e curiosidades as pessoas gostariam de saber sobre 9 grandes obras de arte brasileiras.

[CLIQUE AQUI PARA COMEÇAR!](#)

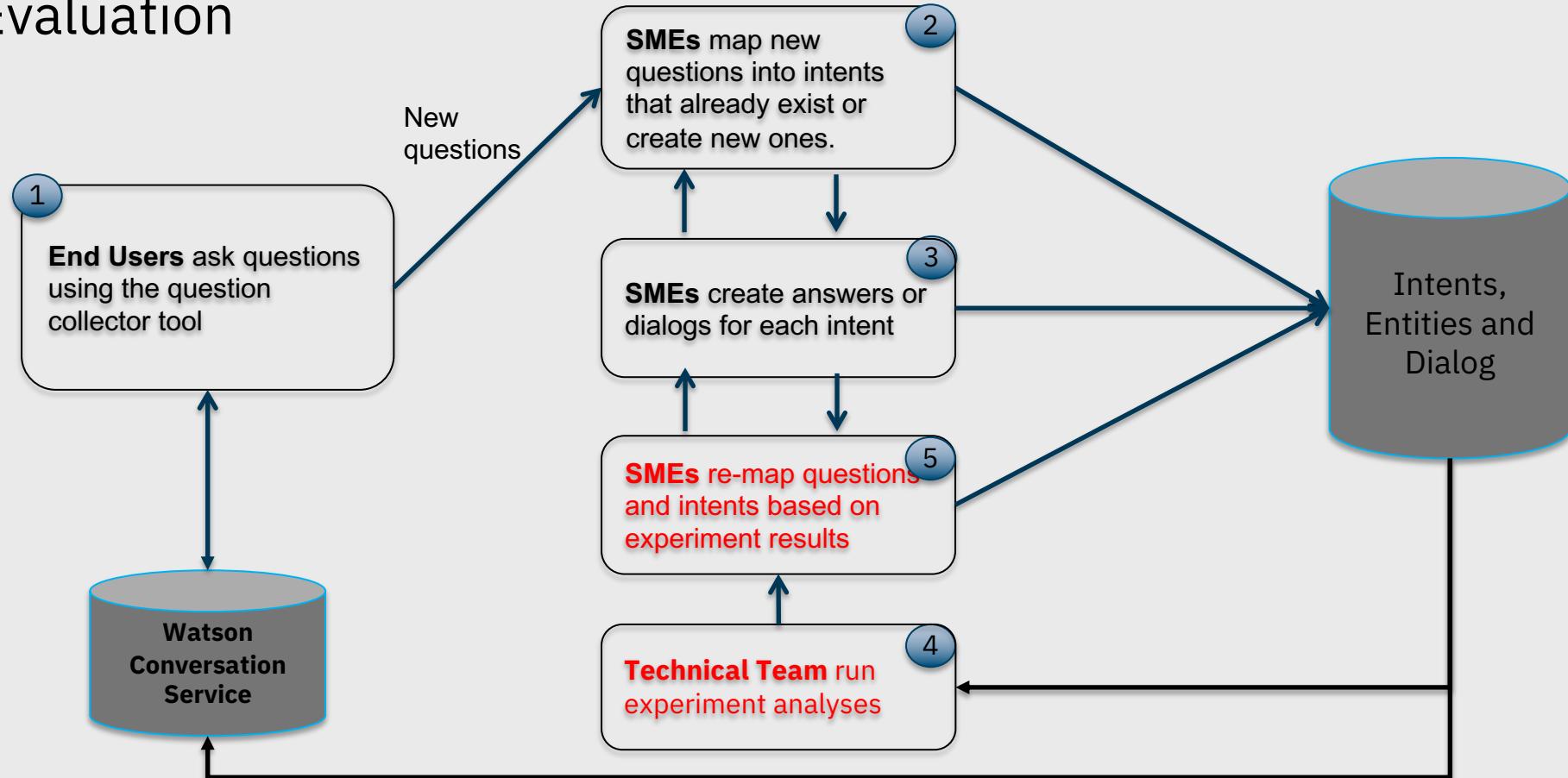
Hi!

In this site, you will help us understand the questions people might have and how curious they are about these 9 wonderful Brazilian pieces of art.

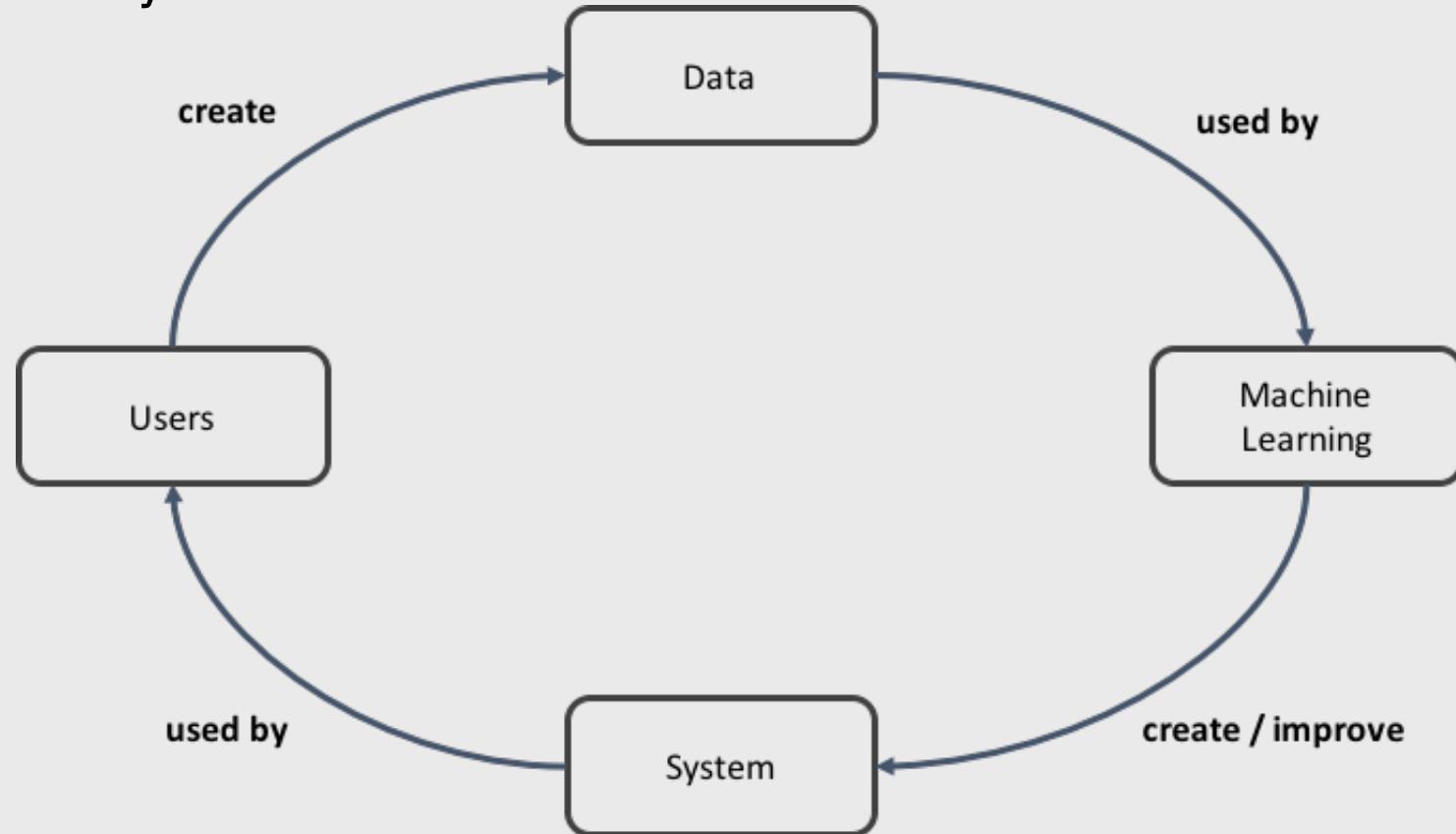
# Training



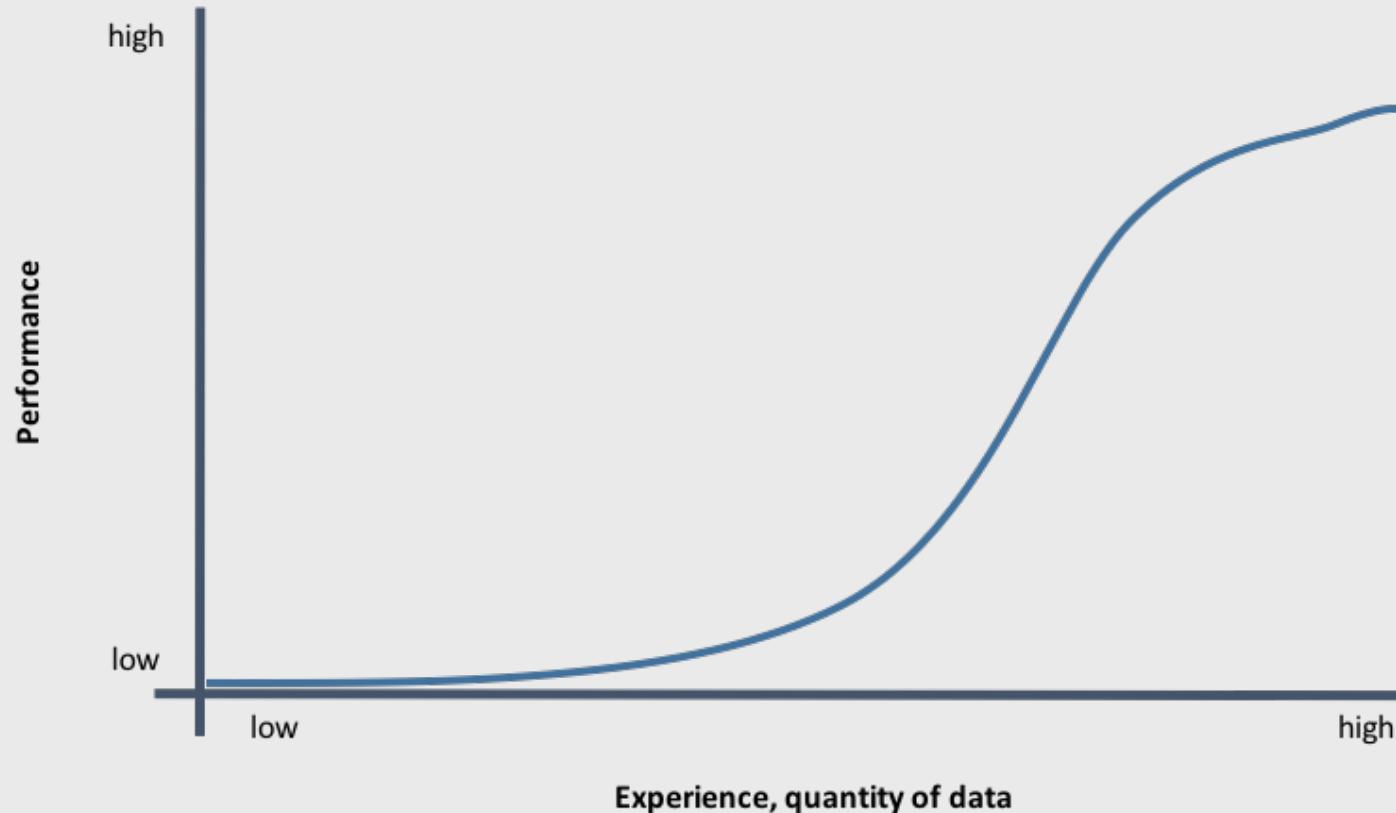
# Evaluation



# Virtuous Cycle of AI



# Virtuous Cycle



# Virtuous Cycle

Artwork: São Paulo

Date	Dataset size	Quantity of Classes	p@1
<b>11/09/16</b>	<b>330</b>	<b>17</b>	<b>0.80</b>
11/21/16	885	25	0.78
12/07/16	885	25	0.81
02/02/17	975	25	0.84
02/18/17	975	25	0.85
02/23/17	975	25	0.85
03/03/17	975	25	0.86
03/08/17	975	27	0.85
03/16/17	975	27	0.86
03/17/17	1170	37	0.79
03/24/17	1750	50	0.84
04/01/17	2090	51	0.79
04/18/17	3005	51	0.89
05/09/17	4495	51	0.91
05/31/17	4500	51	0.92
<b>08/18/17</b>	<b>4500</b>	<b>51</b>	<b>0.92</b>

Artwork: Mestiço

Date	Dataset size	Quantity of Classes	p@1
<b>11/09/16</b>	<b>375</b>	<b>7</b>	<b>0.61</b>
11/21/16	915	7	0.57
12/07/16	1115	21	0.63
02/02/17	1215	24	0.74
02/18/17	1390	33	0.72
02/23/17	1395	34	0.71
03/03/17	1455	38	0.76
03/08/17	1455	38	0.81
03/16/17	1530	46	0.75
03/17/17	1530	46	0.69
03/24/17	1840	48	0.75
04/01/17	1950	48	0.75
04/18/17	2625	49	0.82
05/09/17	3600	50	0.84
05/31/17	4245	50	0.88
<b>08/18/17</b>	<b>4245</b>	<b>50</b>	<b>0.88</b>

Artwork: Bananal

Date	Dataset size	Quantity of Classes	p@1
11/09/16	NA	NA	NA
11/21/16	NA	NA	NA
12/07/16	NA	NA	NA
<b>02/02/17</b>	<b>195</b>	<b>15</b>	<b>0.51</b>
02/18/17	340	25	0.65
02/23/17	340	25	0.52
03/03/17	340	25	0.60
03/08/17	340	25	0.47
03/16/17	340	25	0.51
03/17/17	340	25	0.46
03/24/17	815	39	0.71
04/01/17	1105	44	0.72
04/18/17	2750	46	0.85
05/09/17	3460	46	0.88
05/31/17	4535	64	0.89
<b>08/18/17</b>	<b>4540</b>	<b>64</b>	<b>0.87</b>

Artwork: Porco

Date	Dataset size	Quantity of Classes	p@1
<b>11/09/16</b>	<b>265</b>	<b>9</b>	<b>0.73</b>
11/21/16	730	14	0.80
12/07/16	730	14	0.75
02/02/17	740	15	0.76
02/18/17	875	29	0.83
02/23/17	875	29	0.80
03/03/17	925	32	0.76
03/08/17	925	32	0.83
03/16/17	925	32	0.74
03/17/17	1070	41	0.75
03/24/17	1450	45	0.83
04/01/17	1960	48	0.80
04/18/17	2795	49	0.87
05/09/17	5865	51	0.93
05/31/17	6870	52	0.94
<b>08/18/17</b>	<b>6880</b>	<b>52</b>	<b>0.94</b>

Artwork: Saudade

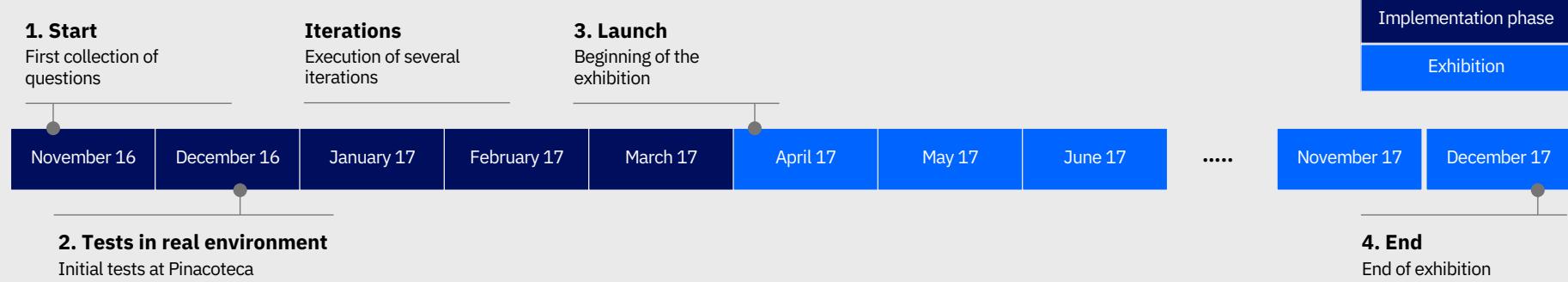
Date	Dataset size	Quantity of Classes	p@1
<b>11/09/16</b>	<b>525</b>	<b>22</b>	<b>0.68</b>
11/21/16	1195	25	0.83
12/07/16	1200	26	0.76
02/02/17	1340	27	0.81
02/18/17	1345	27	0.80
02/23/17	1450	33	0.82
03/03/17	1450	33	0.82
03/08/17	1450	33	0.81
03/16/17	1450	33	0.85
03/17/17	1450	33	0.85
03/24/17	1860	50	0.80
04/01/17	1950	50	0.83
04/18/17	2540	50	0.87
05/09/17	4020	50	0.90
05/31/17	4020	50	0.89
<b>08/18/17</b>	<b>4270</b>	<b>50</b>	<b>0.90</b>

Artwork: Lindonéia

Date	Dataset size	Quantity of Classes	p@1
11/09/16	NA	NA	NA
11/21/16	NA	NA	NA
12/07/16	NA	NA	NA
<b>02/02/17</b>	<b>140</b>	<b>10</b>	<b>0.71</b>
02/18/17	220	18	0.57
02/23/17	230	18	0.59
03/03/17	230	18	0.70
03/08/17	230	18	0.63
03/16/17	230	18	0.70
03/17/17	230	18	0.65
03/24/17	745	34	0.74
04/01/17	880	38	0.82
04/18/17	1135	38	0.79
05/09/17	3330	40	0.91
05/31/17	4145	40	0.93
<b>08/18/17</b>	<b>4145</b>	<b>40</b>	<b>0.94</b>

Improvement of accuracy and coverage during several iterations.

# Timeline and Results



## Results

- Earned media valued at US\$ 3.3 million;
- More than 60 PR stories, including a 4-minute segment on Brazil's leading soft news TV show;
- +6.4M views on YouTube and Facebook to date;
- 50% increase on the number of Pinacoteca's visitors in the first month;
- +26K people with direct contact with Watson to date

## Awards

- Bronze – Cannes Lions Mobile
- Bronze – Cannes Lions Cyber
- Silver – Cannes Lions Radio
- Grand Prix – Brazil
- Bronze – Innovative Use of Radio & Audio
- Graphite Pencil – Communication & Interaction



# Thank you

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