

# ***Çok Yakın Geleceğe Göz Atmak***

Burcak Soydan,  
BT Altyapı ve Dışkaynak Hizmetleri, Ülke Müdürü  
IBM Türk

*Some companies survive longer than others*



**IBM is operating since 1911  
in Turkey since 1938**

# IBM's secret for survival is to move out of its comfort zone



1911

IBM founded



1945

First corporate pure  
research lab



1948

SSEC:  
the first computer



1957

FORTRAN:  
The leading computing  
language



1961

IBM's legendary  
typing machines



1969

First man on the moon  
with the help of IBM



1970

Relational Database,  
the root of databases



1981

IBM PC:  
Computer became part of  
daily live



1990

Moving Atoms:  
The beginning of  
nanotechnology



1997

IBM Business  
Consulting



2011

Watson:  
A new era of computing



2014

Applying Watson's  
Advanced Analytics to  
Genomic Treatment  
Options for Brain Cancer  
Patients

# We transformed our Research Division for the new era

***1/3 of IBM Research's spending***  
is now focused on data, analytics and cognitive computing

***\$6 B investment*** each year on IBM Research

***22 consecutive years*** of patent leadership,  
with 7.534 patents only in 2014

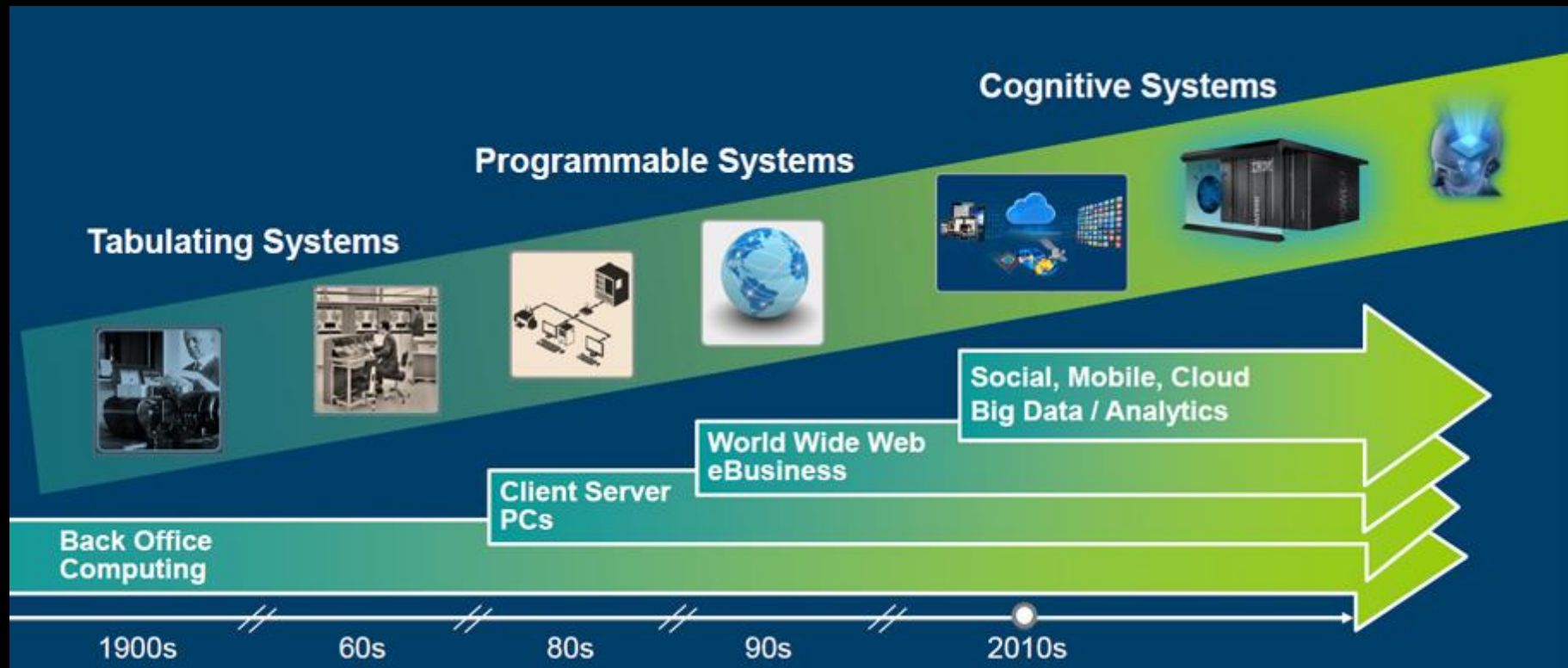
***13 Global R&D Labs***

***5 Nobel Prizes***



IBM  
Research

# We are leading to *a new era of computing*





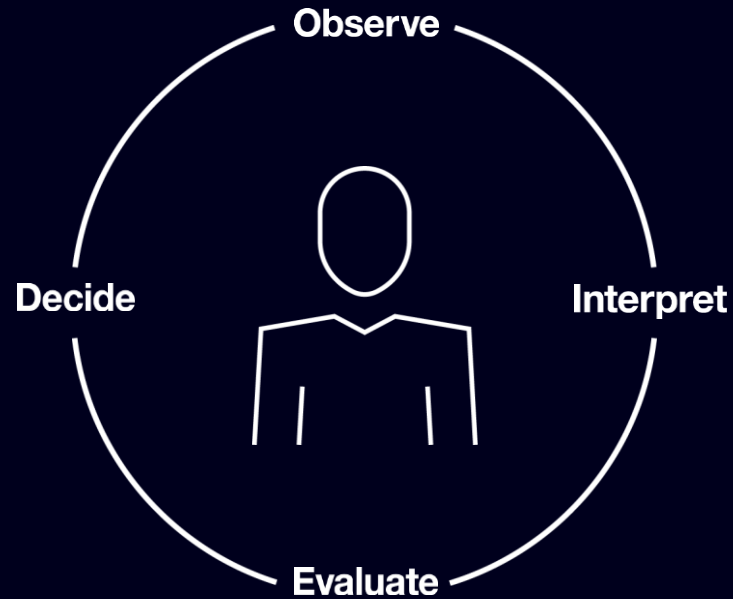
# Cognitive Systems in Hollywood



# Watson in Jeopardy!

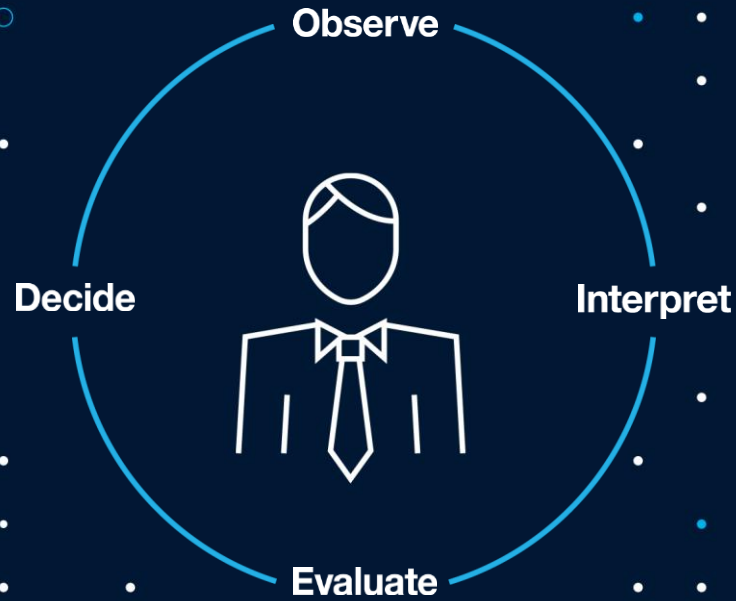


This is how cognition works.





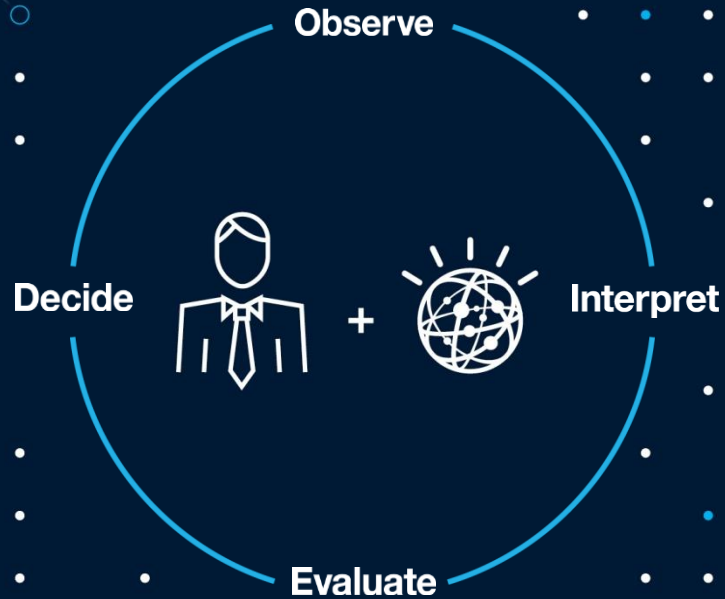
# The making of an expert.





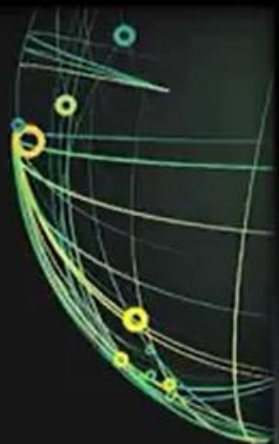
But even experts face challenges  
in our current environment.

# Watson scales expertise to expand what's possible.



A dark blue-tinted background featuring a medical office setting. In the top left, a portion of a laptop keyboard is visible. In the top right, a stethoscope is draped over a surface. In the bottom left, a clipboard with a pen is positioned over a document titled "MEDICAL CENTER". In the center, a document is partially visible with the text "Patient In". At the bottom center, there is a glowing blue molecular or network structure icon.

Watson is creating a new partnership  
between people and computers  
that **enhances, scales** and **accelerates**  
human expertise.



**Putting IBM Watson  
to Work in Healthcare:**

*IBM Watson Oncology Treatment Advisor*

IBM WATSON

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Memorial Sloan-Kettering  
Cancer Center





**Lin J. Yamato**

**Gender:** Female

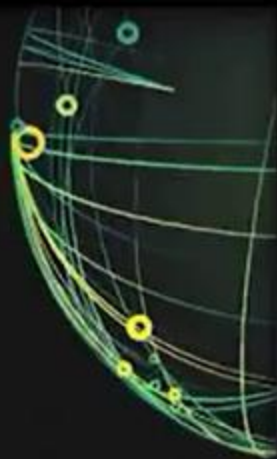
**DOB:** January 15, 1975 (37)

**Place of Birth:** Osaka, Japan

**Current Condition**

**DX:** Lung Adenocarcinoma

**Smoking History:** Never smoker





**Preparation for Doctor's  
First Consultation with Patient**

IBM WATSON



Memorial Sloan-Kettering  
Cancer Center



## Patient EMR

**Patient Details** MRN: 040103110830840 Name: Lin J. Yamato Age: 37

Home | Vaccinations | Conditions | Allergies | Medications | Labs | Test Results | Immunizations | **Imaging** | Procedures | Documents | Clinical Summary

### Imaging Report

From date:  To date:   
 Last:  Units:

Show Show all  
Send to EHR Reset

#### Imaging

##### Sort By:

- Modality
- Ordered by
- Date

Expand all Collapse all

MRI

CT (3)

CT Chest (2)

02/07/2012:  
Joanne Cameron / Chest

CT Abdomen (1)

08/12/2009:  
Joanne Cameron / Abdomen

#### Report

##### Chest CT Report

**Referring Physician**  
Dr. Joanne Cameron

**Source**  
N/A

**Referral Date**  
01/05/2012

**Electronically Signed**  
Dr. Joanne Cameron

HIDE IMAGE



#### Imaging Details

**Ordered by**  
Dr. Joanne Cameron

**Indication**  
Abnormal chest x-ray

**Status**  
Signed

Ask Watson

EMR Patient EMR



Watson is evaluating patient info against Watson Knowledge base...  
3,469 Textbooks

IBM WATSON

## Case Information

The IBM Watson case information does not obviate the need to review the EMR record in detail.



## PATIENT

**Lin J. Yamate**

Patient ID: 00-0000

Provider ID: 00-0000-0

## DEMOGRAPHICS

Gender: Female

DOB: Jan 15, 1975 (37)

Place of Birth: Osaka, Japan

## CURRENT CONDITION

DX: Lung Adenocarcinoma

Smoking History: Never smoker

## Diagnosis

Adenocarcinoma of lung origin

Adenocarcinoma of lung origin

## Location

3.1 cm lesion in the right upper lobe of the lung

1.7 cm lesion in the right adrenal gland

## Stage

IV Adenocarcinoma

## Key Points

2/16/12 - Pathology report from GT biopsy of right adrenal gland: Metastatic adenocarcinoma, morphologically consistent with specimen 312-647

2/07/12 - CT chest/abdomen/pelvis with contrast: 1.7 cm lesion right adrenal gland suspicious for a metastatic deposit

2/06/12 - CT chest without contrast: 3.1 cm lesion right upper lobe of lung suspicious for neoplasm



Case Information

Test Options

Treatment Options



IBM WATSON



## Case Information

The IBM Watson case information does not obviate the need to review the EMR record in detail



**WATSON**  
**Lin J. Yamato**  
Patient ID: 000-0000  
Provider ID: 00-0000-0

**DEMOGRAPHICS**  
Gender: Female  
DOB: Jan 15, 1978 (37)  
Place of Birth: Osaka, Japan

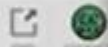
**CURRENT CONDITION**  
DX: Lung Adenocarcinoma  
Smoking History: Never smoker

## Key Points

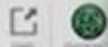
**2/16/12** - Pathology report from CT biopsy of right adrenal gland: Metastatic adenocarcinoma; morphologically consistent with specimen 312-847



**2/07/12** - CT chest/abdomen/pelvis with contrast: 1.7 cm lesion right adrenal gland suspicious for a metastatic deposit



**2/06/12** - CT chest without contrast: 3.1 cm lesion right upper lobe of lung suspicious for neoplasm



**2/03/12** - PCP visit note: dry cough - labored breathing



## Information Needed

Has the patient experienced any hemoptysis?



Does the patient have normal hearing?



Case Information

Test Options

Treatment Options



IBM WATSON

## Test Options to Consider

7

**WATSON:**

Test options are identified based on information available.

[Request Pre-Auth](#)

## Type of Disease Evaluation

 Molecular pathology panel

## Extent of Disease Evaluation

 MRI of the brain

## Pre-treatment Assessment

 Baseline EKG Hepatitis B test Pregnancy test

## Test Options to Consider

7



## WATSON

Test options based on info available.

Request Presc...

## Molecular pathology panel

## Supporting Evidence

Due to frequent presence of driver mutations in patients with lung cancers, it is recommended that all patients are tested for EGFR, KRAS, ALK mutations.

## References

NCCN Guidelines<sup>®</sup> Version 3.2014 NCCN-13  
EGFR mutation testing (category 1)



view



hide

Memorial Sloan-Kettering Cancer Center Best Practices  
Test for EGFR in patients w/ NSCLC



view



hide

El Angeli et al. Analysis of EGFR gene in Adenocarcinoma and Squamous Cell Carcinoma of Lung: Implications for Therapy and Prognosis. *Journal of Clinical Oncology* 2011; May 20; 29(19): 2666-70



view



hide

Case Information

Test Options

Treatment Options



IBM WATSON

## Test Options to Consider

## WATSON

Test options based on info available.

Request Pres

## Molecular Reference

## Supporting

Due to frequent lung cancers for EGFR, KR

**Purpose:** EGFR mutations underlie the sensitivity of lung cancers to erlotinib and gefitinib and can occur in any patient with this illness. Here we examine the frequency of EGFR mutations in smokers and men.

**Results:** We tested 2,142 lung adenocarcinoma specimens for the presence of EGFR exon 19 deletions and L858R. EGFR mutations were found in 15% of tumors from former smokers (181 of 1,218; 95% CI, 13% to 17%), 6% from current smokers (20 of 344; 95% CI, 4% to 9%), and 52% from never smokers (302 of 580; 95% CI, 48% to 56%;  $P < .001$  for ever v never smokers). EGFR mutations in former or current smokers represented 40% of all those detected (201 of 503; 95% CI, 36% to 44%). EGFR mutations were found in 19% (157 of 827; 95% CI, 16% to 22%) of tumors from men and 26% (346 of 1,315; 95% CI, 24% to 29%) of tumors from women ( $P < .001$ ). EGFR mutations in men represented 31% (157 of 503; 95% CI, 27% to 35%) of all those detected.

**Conclusion:** A large number of EGFR mutations are found in adenocarcinoma tumor specimens from men and people who smoked cigarettes. **Only women who were never smokers were tested. 37% of all EGFR mutations would be missed. Testing for EGFR mutations should be considered for all patients with adenocarcinoma of the lung at diagnosis, regardless of clinical characteristics.** This strategy can extend the use of EGFR tyrosine kinase inhibitors to the greatest number of individuals with the potential for substantial benefit.

## Treatment Options to Consider

Current Treatments

Clinical Trials

**WATSON:**

Insufficient information is available to provide treatment options with high confidence. See the Test Options tab for additional tests that would provide the needed information.

Clinical trials are an equivalent option to the top ranked treatment plan shown and should always be considered.

Request Pre-auth

Treatment Plan

Confidence

Patient Preferences Match

**Treatment plan 1**

Systemic Chemo: Coplatin, Paclitaxel, Docetaxel

32%



TBD

match with patient preferences



Match

**Treatment plan 2**

Systemic Chemo: Carboplatin, Paclitaxel, Docetaxel

30%



TBD

match with patient preferences



Match

**Treatment plan 3**

Systemic Chemo: Cisplatin

28%



TBD

match with patient preferences



Match



Match

Radiation and Surgery are unlikely to be appropriate.

Case Information

Test Options

Treatment Options

IBM WATSON



Patient Details MRN: 040103110830840 Name: Lin J. Yamato Age: 37

SUMMARY | ENCOUNTERS | CONDITIONS | ALLERGIES | MEDICATIONS | LABS | TESTS/RESULTS | IMAGING | PROCEDURES | DOCUMENTS | CLINICAL HISTORY

## Imaging Report

From date: [ ] To date: [ ] Show Show all  
Last: [ ] Unit: [ ] Send to EHR Reset

## Imaging

## Sort By:

- Modality
- Ordered by
- Date

Expand all

Collapse all

CT (3)

MRI (1)

MRI Brain (1)

03/01/2012  
Dr. Mark Kris, MSKCC  
/ Brain

## Report

## Brain MRI Report

## Referring Physician

Dr. Mark Kris, MSKCC

## Source

N/A

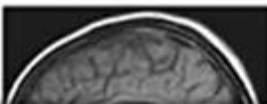
## Referral Date

01/05/2012

## Electronically Signed

Dr. Mark Kris, MSKCC

## HIDE IMAGE



## Imaging Details

## Ordered by

Dr. Mark Kris, MSKCC

## Indication

Rule out brain metastasis

## Status

Signed

## Case Information

The IBM Watson case information does not obviate the need to review the EMR record in detail



## PATIENT

**Lin J. Yamato**

Patient ID: 000-0000

Provider ID: 00-0000-0

## DEMOGRAPHICS

Gender: Female

DOB: Jan 15, 1975 (37)

Place of Birth: Osaka, Japan

## CURRENT CONDITION

DX: Lung Adenocarcinoma

Smoking History: Never smoker

## Diagnosis

Adenocarcinoma of lung origin

Adenocarcinoma of lung origin

## Location

3.1 cm lesion in the right upper lobe of the lung

1.7 cm lesion in the right adrenal gland

## Stage

T2N0M1

Key Points <sup>2</sup> Updates

03/06/12 - Molecular pathology shows EGFR exon 20 insertion



03/01/12 - Brain MRI is negative for metastases



2/16/12 - Pathology report from GT biopsy of right adrenal gland: Metastatic adenocarcinoma; morphologically consistent with specimen 312-647



## Treatment Options to Consider

Current Treatments

Clinical Trials

**WATSON:**

Treatment options are listed based on the information available.

Clinical trials are an equivalent option to the top ranked treatment plan shown and should always be considered.

[Request Pre-Auth](#)

Treatment Plan

Confidence

Patient Preferences Match

**Treatment plan 1**Systemic Chemor: Cisplatin,  
Pemetrexed, Bevacizumab

95%



Acceptable

match with patient  
preferences**Treatment plan 2**Systemic Chemor: Carboplatin,  
Paclitaxel, Bevacizumab

45%



Unacceptable

match with patient  
preferences**Treatment plan 3**

Systemic Chemor: Eribulin

8%



Preferred

match with patient  
preferences

Radiation and Surgery are unlikely to be appropriate.



Case Information

Test Options

Treatment Options



IBM WATSON

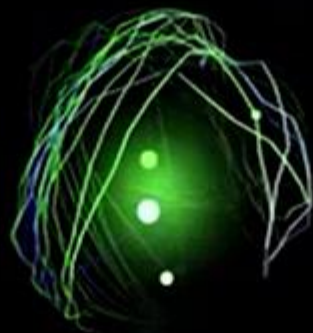
Patient EMR

Treatment Options to Consider

Ask Watson

Current Treatments

Clinical Trials



Watson is listening...



FINISHED SPEAKING



CANCEL

Case Information

Test Options

Treatment Options



IBM WATSON

## Treatment Options to Consider

1



Current Treatments

Clinical Trials

**WATSON:**

Treatment options are listed based on the information available.

Clinical trials are an equivalent option to the top ranked treatment plan shown and should always be considered.

[Request Pre-Auth](#)

Treatment Plan

Confidence

Patient Preferences Match

## Treatment plan 1

Systemic Chemotherapy, Capecitabine, Paclitaxel

90%



Acceptable

match with patient preferences



## Treatment plan 2

Systemic Chemotherapy, Carboplatin, Paclitaxel

25%



Acceptable

match with patient preferences



## Treatment plan 3

Systemic Chemotherapy, Carboplatin, Paclitaxel

25%



Unacceptable

match with patient preferences



## Treatment plan 4

Systemic Chemotherapy, Eribulin

8%

Preferred

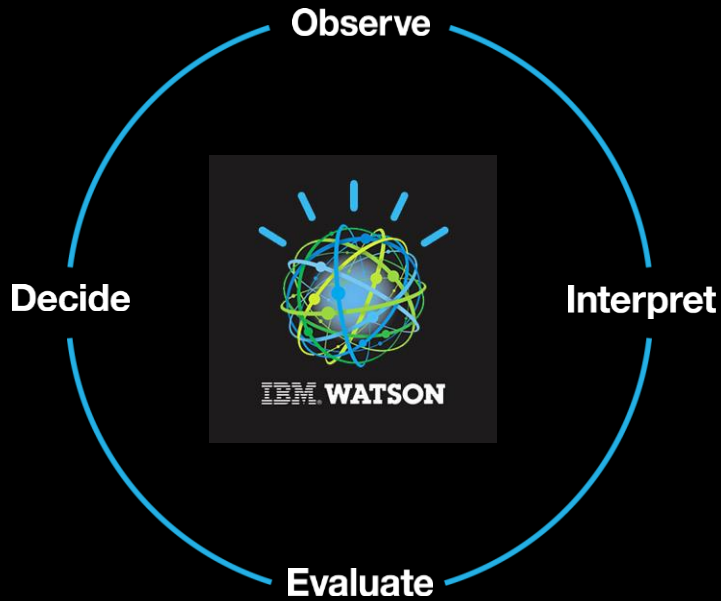
match with patient preferences

[Case Information](#)[Test Options](#)[Treatment Options](#)

IBM WATSON



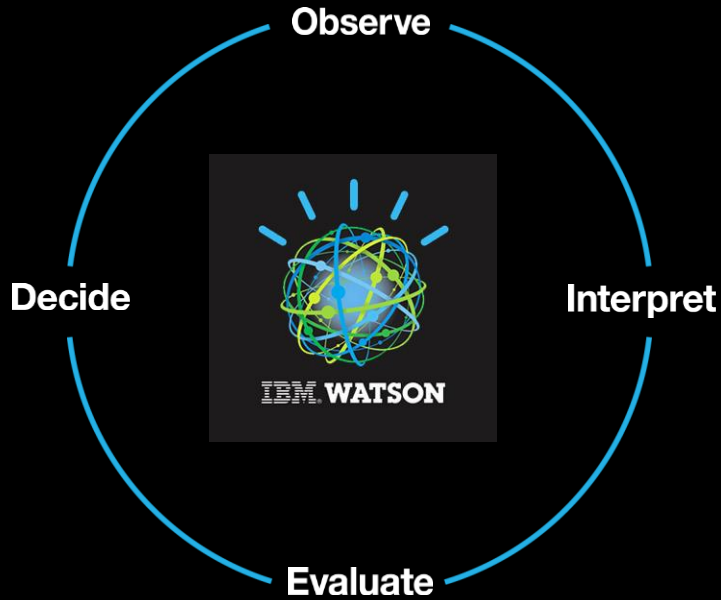
# **Cognitive Computing** is transforming our industries



## **Watson transforming Life Science Industry:**

With Watson, 7 cancer targets found in a few weeks.  
Before Watson, the norm is 1 per year.

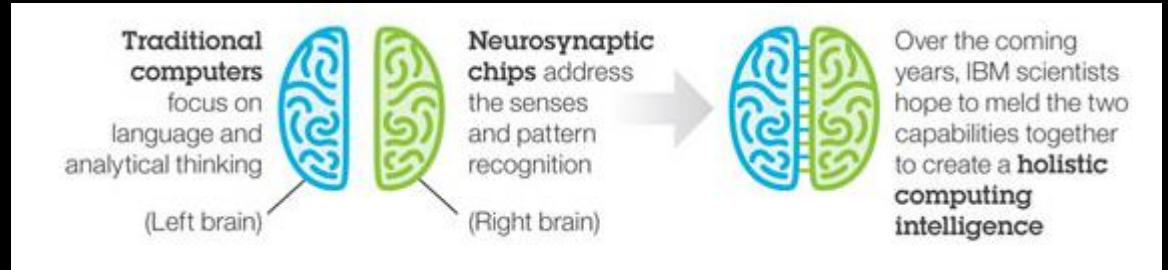
and soon more aspects of *our lives will be transformed*



This section shows four industry icons, each consisting of a white line-art icon of a professional followed by a plus sign and a globe icon, representing the integration of AI into these sectors:

- Call Centers**: Icon of a person in a suit.
- Retail**: Icon of a chef.
- Energy & Oil**: Icon of a person in a uniform.
- Banking**: Icon of a person in a uniform with a cap.
- Cooking**: Icon of a person in a uniform.
- Education**: Icon of a person in a uniform.
- Security**: Icon of a person in a uniform.

# TrueNorth – First Brain-inspired Neurosynaptic Chip



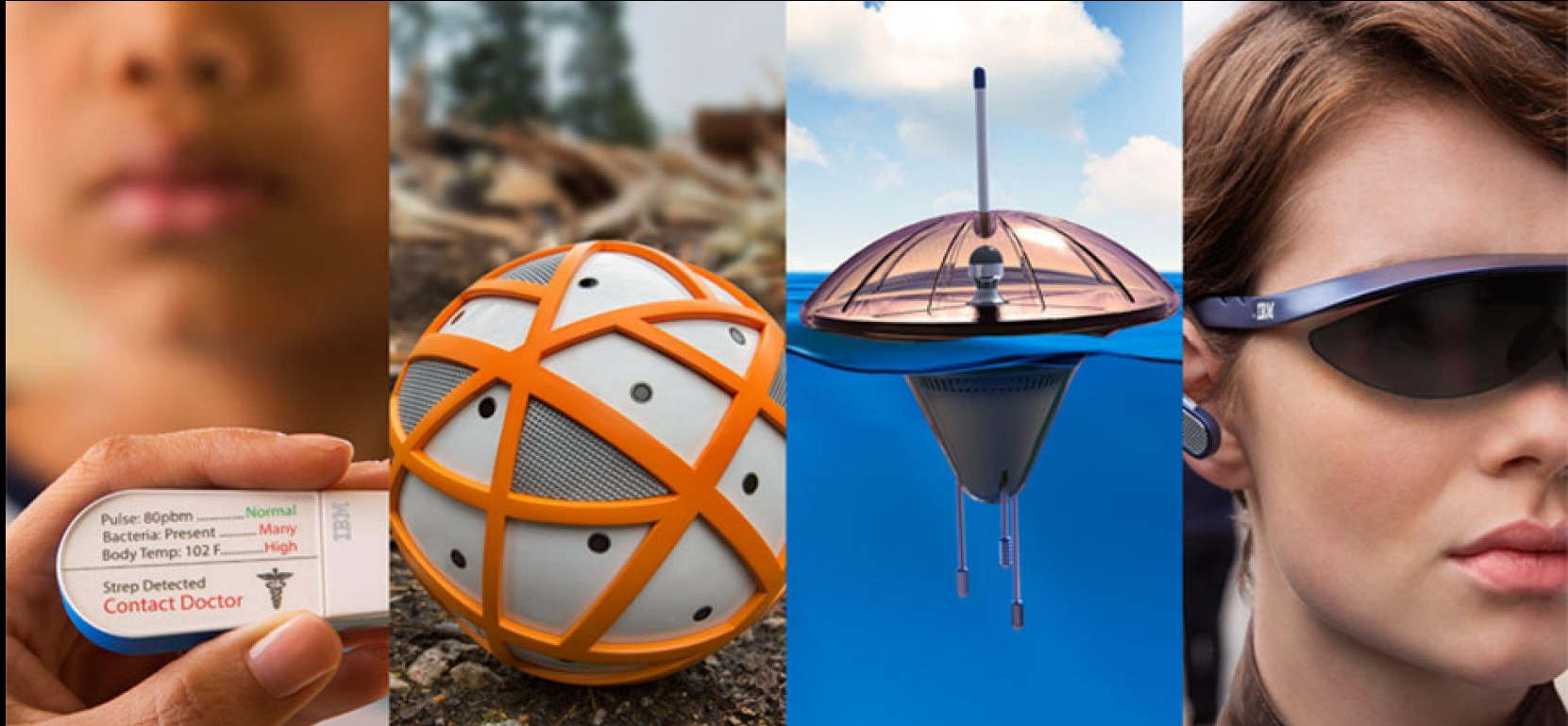
## Unprecedented scale

This second generation chip is the culmination of almost a decade of research and development, and is a huge leap forward from the initial single-core hardware prototype developed in 2011.



1/10th of a Watt powers the neurosynaptic chip's 256 million synapses  
...with the goal to simulate 1 trillion synapses using only 4kW of energy

# Pilot applications of TrueNorth chip - sample



# We are collaborating with our strategic partners



As a country, as companies and as individuals  
*we need to move to digital era to compete in this world*

	2014	2023
<i>Turkey Economic Size</i>	<i>18th Largest</i>	<i>Among Top 10</i>
<i>GDP</i>	<i>810 B USD</i>	<i>2 TRL USD</i>
<i>Annual Exports</i>	<i>160 B USD</i>	<i>500 B USD</i>
<i>IT Spending</i>	<i>1% GDP</i>	<i>3% GDP</i>

*We spend %80  
on Infrastructure!*

What will we make of *this moment*?