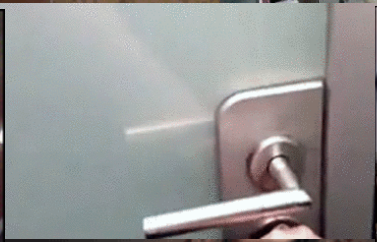
# Sustainable Innovation

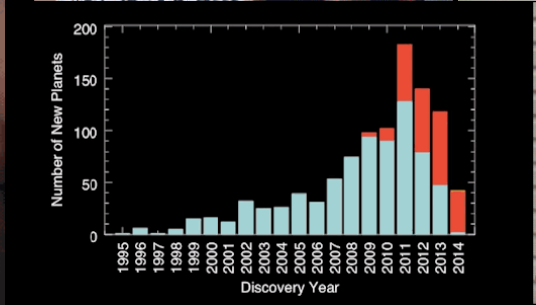
Kim Escherich | Executive Innovation Architect, IBM | @kescherich

# On the subject of [sustainble] innovation

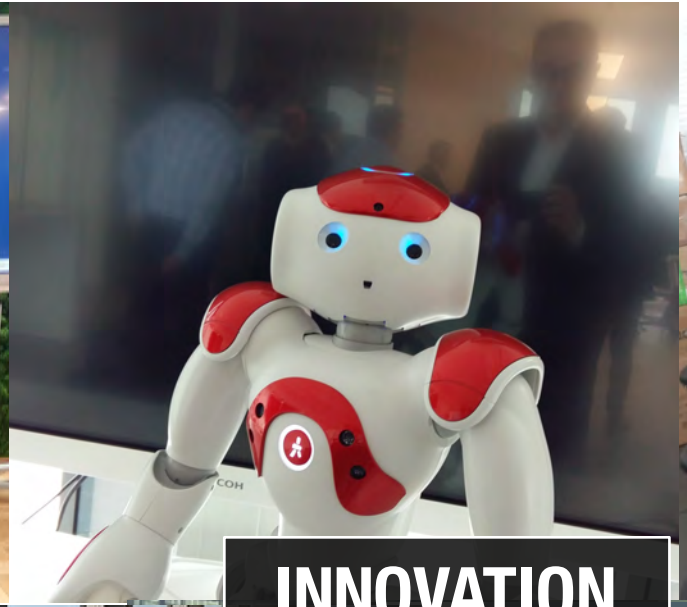
1. What we see
2. What we do
3. How we do it

Camera stabilizing tech used in spoon for Parkinson's



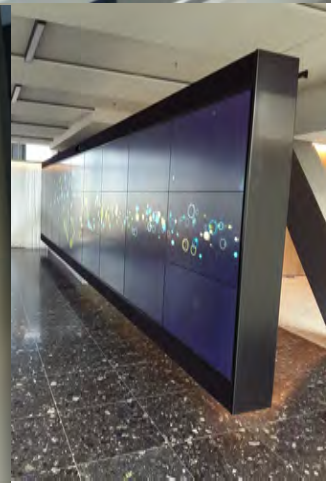


The Industry Lab
Mission, facilities, and offerings
Watson IoT



# INNOVATION

navimatix
navimatix



# LEADERSHIP FOCUS

ENGAGEMENT + ECOSYSTEM

# NEW WAYS OF WORKING

# Digital cognitive capabilities

**Watson's APIs are the cognitive building blocks that harness our data.**

- Message Resonance
- Concept Expansion
- Face Detection
- Natural Language Classifier
- Speech to Text
- Text to Speech
- Language Translation
- Language Detection
- Sentiment Analysis
- Dialog
- Retrieve and Rank
- Image Link Extraction
- Tradeoff Analytics
- Entity Extraction
- Tone Analyzer
- Personality Insights
- Taxonomy
- Author Extraction
- Concept Tagging
- Relationship Extraction
- Concept Insights
- Relationship Extraction
- Question & Answer
- Feed Detection
- Keyword Extraction
- Visual Recognition
- Image Tagging
- Text Extraction

US 20180000355A1

(19) **United States**

(12) **Patent Application Publication**
**DeBusschere et al.**

(10) **Pub. No.: US 2018/0000355 A1**

(43) **Pub. Date: Jan. 4, 2018**

(54) **ASSESSING CARDIOVASCULAR FUNCTION USING AN OPTICAL SENSOR**

(71) Applicant: **Google Inc.**, Mountain View, CA (US)

(72) Inventors: **Brian Derek DeBusschere**, Los Gatos, CA (US); **Jeffrey L. Rogers**, San Carlos, CA (US)

(73) Assignee: **Google Inc.**, Mountain View, CA (US)

(21) Appl. No.: **15/704,825**

(22) Filed: **Sep. 14, 2017**

**Related U.S. Application Data**

(62) Division of application No. 14/681,625, filed on Apr. 8, 2015.

**Publication Classification**

(51) **Int. Cl.**

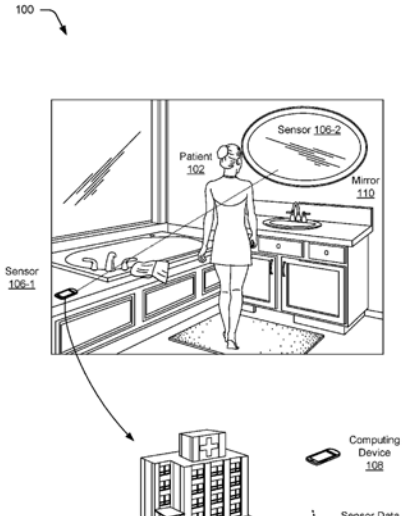
| | |
|---|---|
| ***A61B 5/0205*** | (2006.01) |
| ***A61B 5/021*** | (2006.01) |
| ***A61B 5/00*** | (2006.01) |
| ***A61B 5/024*** | (2006.01) |
| ***A61B 5/11*** | (2006.01) |
| ***A61B 5/103*** | (2006.01) |

(52) **U.S. Cl.**

CPC ..... ***A61B 5/0205*** (2013.01); ***A61B 5/1102*** (2013.01); ***A61B 5/1032*** (2013.01); ***A61B 5/0077*** (2013.01); ***A61B 5/02427*** (2013.01); ***A61B 5/021*** (2013.01); ***A61B 5/02433*** (2013.01)

(57) **ABSTRACT**

This document describes assessing cardiovascular function using an optical sensor, such as through sensing relevant hemodynamics understood by pulse transit times, blood pressures, pulse-wave velocities, and, in more breadth, ballistocardiograms and pressure-volume loops. The techniques disclosed in this document use various optical sensors to sense hemodynamics, such as skin color and skin and other organ displacement. These optical sensors require little if any risk to the patient and are simple and easy for the patient to use.



# What we do

Latest in Science

Most habitable planets may be completely covered in water

04.23.17

Nearby 'super-Earth' may be our best shot yet at finding alien life

04.19.17

Facebook details its plans for a brain-computer interface

04.19.17

Alphabet starts collecting health info to better predict disease

04.19.17

# IBM's Watson AI saved a woman from leukemia

It discovered a rare illness that doctors had missed.

Jon Fingas, @jonfingas
08.07.16 in Medicine

8
Comments

16883
Shares

Andrew Spear for The Washington Post via Getty Images

IBM's Watson has done everything from winning at *Jeopardy* to cooking exotic meals, but it appears to have accomplished its greatest feat yet: saving a life. University of Tokyo doctors report that the artificial intelligence diagnosed a 60-year-old woman's rare form of leukemia that had been incorrectly identified months earlier. The analytical machine took just 10 minutes to compare the patient's genetic changes with a database of 20 million cancer research papers, delivering an accurate diagnosis and leading to proper treatment that had proven elusive. Watson has also identified another rare form of leukemia in another patient, the university says.

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Moved to Denmark & Have UK Savings? Increase Savings Income by up to 45%

Expat Pension Solutions

Top 10 Coolest Gadgets Under $50 (2017 Edition)

Share The Buzz

Tiny Device Allows You To Track Anything (it's Genius!)

TrackR Bravo

Carlo Ratti Associati: Supermarket of the future
How to decide?
I contain residues from 38 pesticides and other chemicals. Buy me, please! Please?

# Watson Personality Insights

## Personality Portrait

24378 words analyzed: Very Strong Analysis

### Summary

You are a bit critical and excitable.

You are adventurous: you are eager to experience new things. You are authority-challenging: you prefer to challenge authority and traditional values to help bring about positive changes. And you are self-controlled: you have control over your desires, which are not particularly intense.

You are motivated to seek out experiences that provide a strong feeling of efficiency.

You are relatively unconcerned with both tradition and taking pleasure in life. You care more about making your own path than following what others have done. And you prefer activities with a purpose greater than just personal enjoyment.

How did we get this?

### You are likely to_____

- be sensitive to ownership cost when buying automobiles
- have experience playing music
- like historical movies

### You are unlikely to_____

- be influenced by social media during product purchases
- prefer style when buying clothes
- be influenced by brand name when making product purchases

*% = percentile

### Personality

Emotional range 88%

Openness 83%

Introversion/Extraversion 52%

Conscientiousness 49%

Agreeableness 1%

*% = percentile

### Consumer Needs

Practicality 61%

Curiosity 57%

Liberty 33%

Structure 31%

Love 24%

>>

*% = percentile

### Values

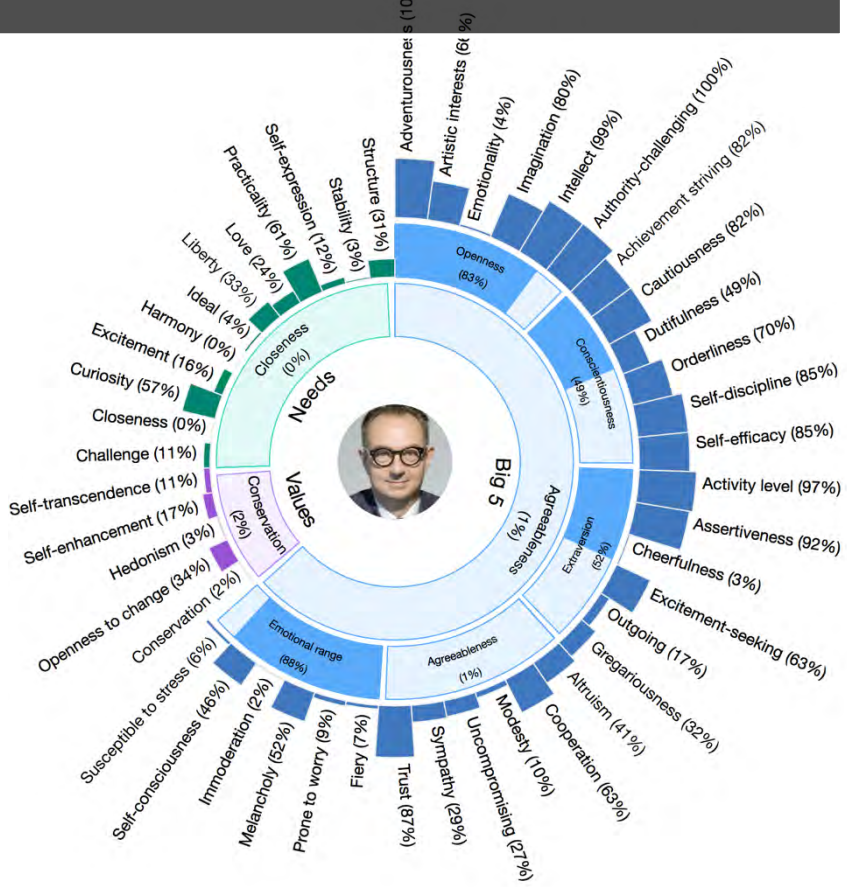
Stimulation 34%

Achievement 17%

Helping others 11%

Taking pleasure in life 3%

Tradition 2%



# WHERE TWINKIES® COME FROM

**My insight**

## MINE
- ENRICHMENT MINERALS
- PHOSPHATE ROCK
- TRONA
- LIMESTONE

MECHANICAL PROCESSING
CHEMICAL PROCESSING

- BAKING SODA
- BAKING POWDER
- ENRICHMENT MINERALS
- SODIUM ACID PYROPHOSPHATE
- MONOCALCIUM PHOSPHATE

## WELL
- OIL
- NATURAL GAS
- SALT (SALT WATER)

CHEMICAL PROCESSING

- DIESEL FUEL (ROAD AND RAIL TRANSPORT)
- NATURAL GAS
- VITAMINS
- FOLIC ACID
- BLEACH
- ARTIFICIAL FLAVORS
- SORBIC ACID
- SODIUM STEAROYL LACTYLATE
- SULFURIC ACID
- FD&C YELLOW No. 5, RED No. 40
- HEXANE

## FARM
- MILK
- EGGS
- WHEAT
- CORN
- SOYBEANS
- SUGARCANE
- SUGAR BEETS
- COTTON
- WOOD
- PALM KERNELS
- VANILLA
- BEEF
- PORK
- YEAST
- UNSPECIFIED PLANTS

MECHANICAL PROCESSING
CHEMICAL PROCESSING

- ENRICHED BLEACHED WHEAT FLOUR
- CORN FLOUR
- STARCH
- CELLULOSE GUM
- SOY LECITHIN
- SOY PROTEIN ISOLATE
- LIQUID OILS
- VEGETABLE SHORTENING (TRIGLYCERIDES)
- LARD
- TALLOW
- MONO AND DIGLYCERIDES (SOLID FATS)
- POLYSORBATE 60
- VANILLA
- WHEY
- CREAM
- SODIUM AND CALCIUM CAESINATE
- SUCROSE (CANE AND BEET SUGAR)
- DEXTROSE
- CRYSTALLINE FRUCTOSE
- HIGH FRUCTOSE CORN SYRUP
- VANILLIN (ARTIFICIAL FLAVOR)
- NATURAL FLAVORS (UNSPECIFIED)

MECHANICAL PROCESSING
CHEMICAL PROCESSING
THERMAL PROCESSING

ETTINGER, STEVE: *TWINKIE, DECONSTRUCTED.* HUDSON STREET PRESS: 2007.

# Watson Visual Recognition for Food

Largest known collection: > 1.5 million food images

| Food | Score |
|---|---|
| Strawberry dipped in chocolate | 1.00 |
| Fruit dipped in chocolate | 1.00 |
| Fruit dish | 1.00 |
| Sweet treat | 1.00 |
| Chocolate egg | .50 |
| Easter egg | .50 |
| Candy | .50 |
| Sweet | .50 |
| Delicacy | .50 |

# Big data = insight

Roasted Pork Sandwich Peak at 18.00

Recovery Drink is Strawberry Smoothie

ITEMS_Sum (Sum)

2.1K 2K 1.9K 1.8K 1.7K 1.6K 1.5K 1.4K 1.3K 1.2K 1.1K 1K 900 800 700 600 500 400 300 200 100 0

0 1 2 3 12 13 14 15 16 17 18 19 20 21 22 23

Hour

TEXT

- Butter Chicken
- Caffe
- Chocolate Brownie
- Chocolate Mousse
- Kanelsnurre
- Lemon Fromage
- Light Chocolate Brownie
- Oelands Wheet Roll
- Rasberry Cake
- Rubarb Trifil
- Salmon Sandwich
- Sandwich of Rosted Pork
- Spring Water
- Strawberry Smoothie
- The
- Tuborg Draft Beer
- Vegetarian Meal
- Yoghurt with Rubarb
- Cold Bowl
- Airdried Pork
- Boilt Egg
- Croissant
- Danbo Cheece
- Extra Butter
- Premium Cinnamon Roll
- Rasberry Jam
- Salmon
- Tebirkes

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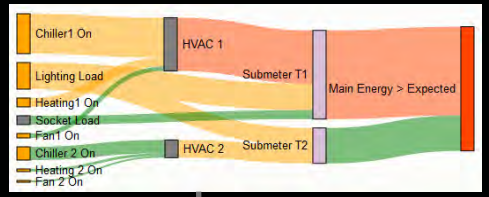
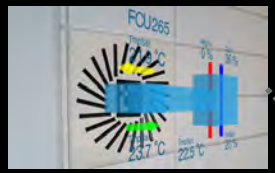
# A Cognitive Building




Proactively manages energy

Optimises service delivery

Makes occupants happy



Predicts when maintenance is needed

Know's your preferences and sentiment

Keeps you informed

Maintains a healthy environment

Helps you navigate & connect

Easy to talk to

# Accessing a vast amount of untapped data could have a great impact on our health - yet it exists outside medical systems.

**75%**
Social Context, Behaviors
Impact on population health status

**20%**
Medical Care

**5%**
Genetic

**1100 Terabytes**
Generated per lifetime

Consumer-contributed data from non-medical sources: wearables, social media activity, public records

**6 Terabytes**
EMR, EHR, claim systems

**0.4 Terabytes**
Genetic research, personalized medicine, clinical trials

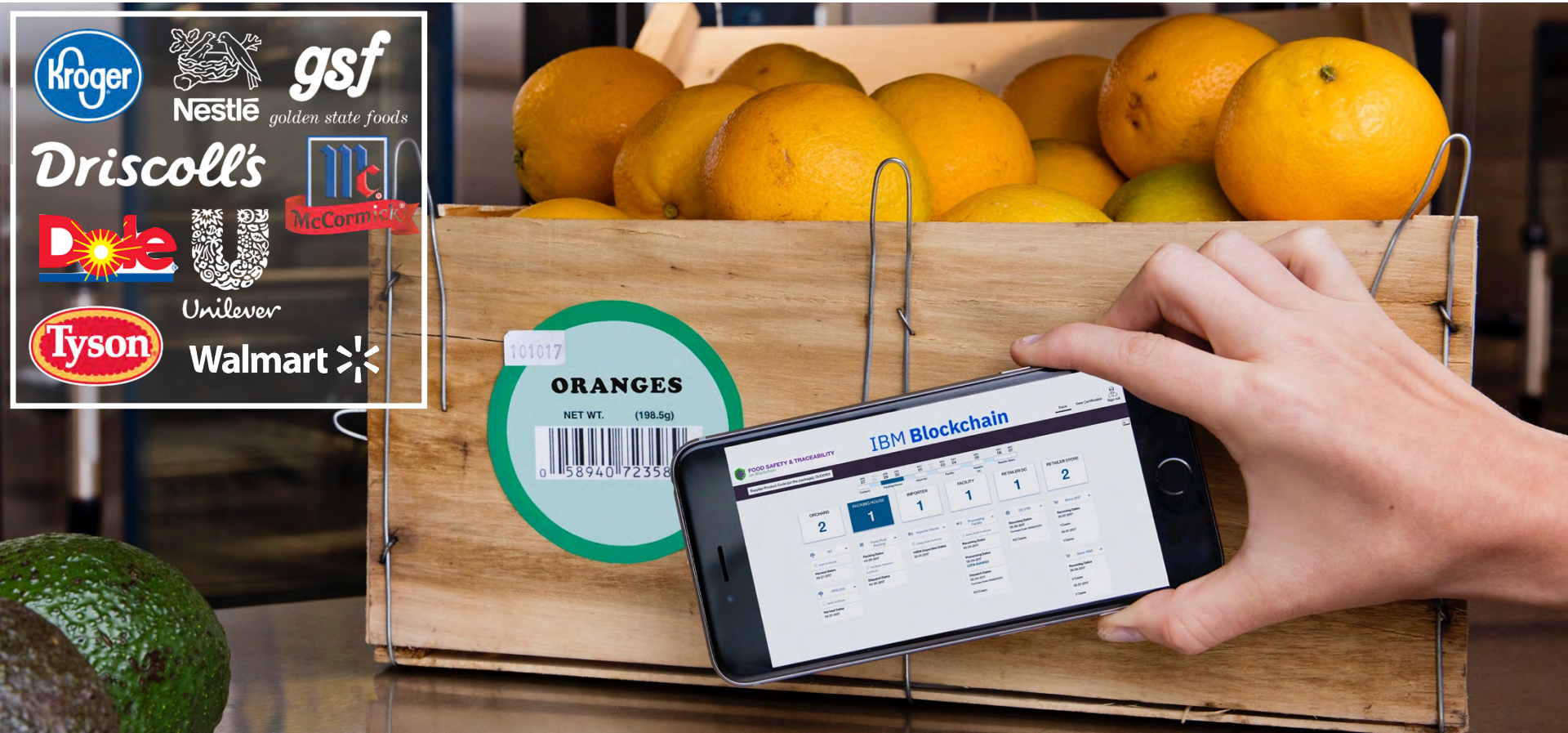
SOURCE: Barbara J. Sowada, *A Call to Be Whole: The Fundamentals of Health Care Reform*, July 30, 2003, Praeger.

UNDER ARMOUR

Medtronic

Medtronic build glucose monitoring devices with Watson that can predict hypoglycemia up to 3 hours in advance of onset.

# IBM Food Blockchain Consortium



# IBM Consortium for sequencing the supply chain

**1 in 6**
Americans each year suffer a food borne disease (CDC)

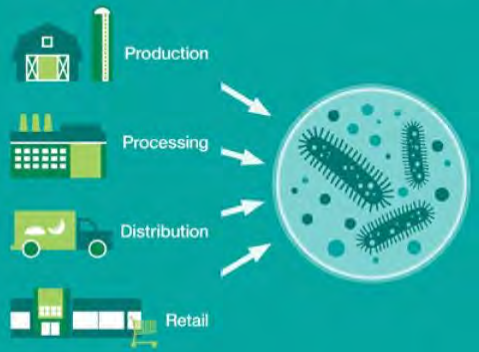
**2 Million**
Annual deaths in emerging areas due to food borne infections

**3,000**
Annual food borne disease deaths in U.S. (CDC)

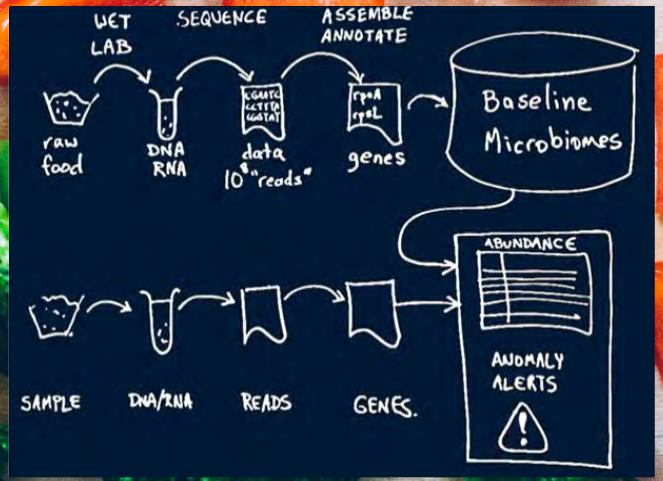
**$80 Billion**
Annual cost of losses and illness caused by food borne disease

Surveillance, risk assessment, and diagnosis of food borne pathogens across the food supply chain using a scientific approach

## Metagenomics for food safety




With **DNA and RNA sequencing**, we are able to profile communities of microorganisms—the **microbiomes**—in the supply chain anywhere along the **process from farm to table.**



LOOK FOR INGREDIENTS

CHOOSE A DISH

PICK A STYLE

START AGAIN

FAVORITES

BROCCOLI

Broccoli is an edible green plant in the cabbage family, whose large flowering head is used as a vegetable. The word broccoli comes from the Italian plural of broccolo, which means "the flowering top of a cabbage", and is the diminutive form of brocco, meaning "small nail" or "sprout". Broccoli is often boiled or steamed but may be eaten raw Broccoli is classified in

GINGER

Ginger or ginger root is the rhizome of the plant Zingiber officinale, consumed as a delicacy, medicine, or spice. It lends its name to its genus and family (Zingiberaceae). Other notable members of this plant family are turmeric, cardamom, and galangal. The distantly related dicots in the Asarum genus have the common name wild ginger because of their similar

GIN

Gin is a spirit which derives its predominant flavour from juniper berries (Juniperus communis). From its earliest origins in the Middle Ages, gin has evolved over the course of a millennium from a herbal medicine to an object of commerce in the spirits industry. Gin was developed on the basis of the older Jenever, and become widely popular in Great

RASPBERRY

The raspberry is the edible fruit of a multitude of plant species in the genus Rubus of the rose family, most of which are in the subgenus Idaeobatus; the name also applies to these plants themselves. Raspberries are perennial with woody stems.

BACK

SYNERGY

MORE

~~chocolate~~

## HERE ARE SOME IDEAS

### Broccoli Meat Salad

firm tofu, **gin,** coconut cream, **broccoli,** green bell pepper, zucchini, white radish, vegetable oil, **ginger, raspberry,** herbes de provence, ketchup, fish sauce, spinach, pea tendrils, lettuce

Based on: Summer Steak Salad With Ginger-Lime Dressing from Bon Appétit

MORE...

### Broccoli Linguine

**gin,** linguine, salmon, **broccoli,** olive oil, butter, **ginger,** thai chile, orange juice, **raspberry,** savory

**Dear AI, What to eat tonight?**
https://www.ibmchefwatson.com

How we do it

**Design is the intent behind an outcome.**

# Understand people's needs.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# Form intent.


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# Deliver outcomes at speed and scale.


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# Creative and collaborative problem-solving

## Using design artefacts

Stakeholder Map

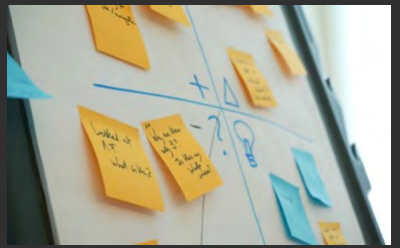
Empathy Map

Scenario Map

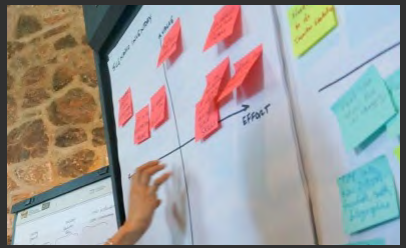
Story Map

Wireframe

Technical Prototype



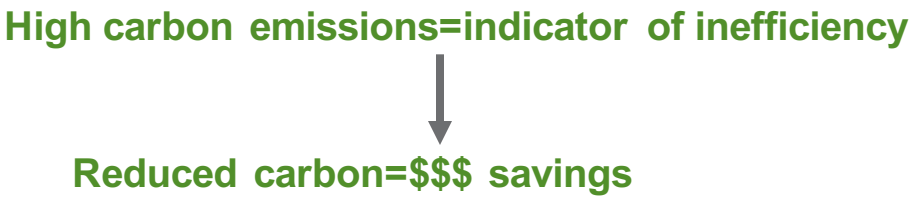
Feedback Grid



Prioritization Grid

# IBM's Point of View on sustainability

- Sustainability strategy is an integral component of business strategy and can act as a competitive differentiator.
- Assessing business processes through a sustainability lens can help identify significant opportunities. There is often a compelling business case to pursue sustainability initiatives based on economic considerations alone.
- The fact that sustainability initiatives produce reputational, environmental, and social benefits (e.g., talent attraction, enhanced reputation, etc) makes the case for investment even more compelling.



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