
Fostering Business Growth with AI AI for Happiness of People

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Changes We Face Now

| | 20 th Century | | 21 st Century |
|-------------|---|---|---|
| Demand | Basic infrastructure for life & society | ➔ | Diversified & changing needs |
| Supply | Mass production & mass marketing | ➔ | Customization for individual situations |
| Profit from | Standardized rule for repeated deployment | ➔ | Flexible learning & adaptation |
| Result | 1st productivity revolution Larger middle layer & environmental load | ➔ | 2nd productivity revolution Recovery of middle-layer & environment |

How We Face Changes & Diversity

From Standardize & Deploy to

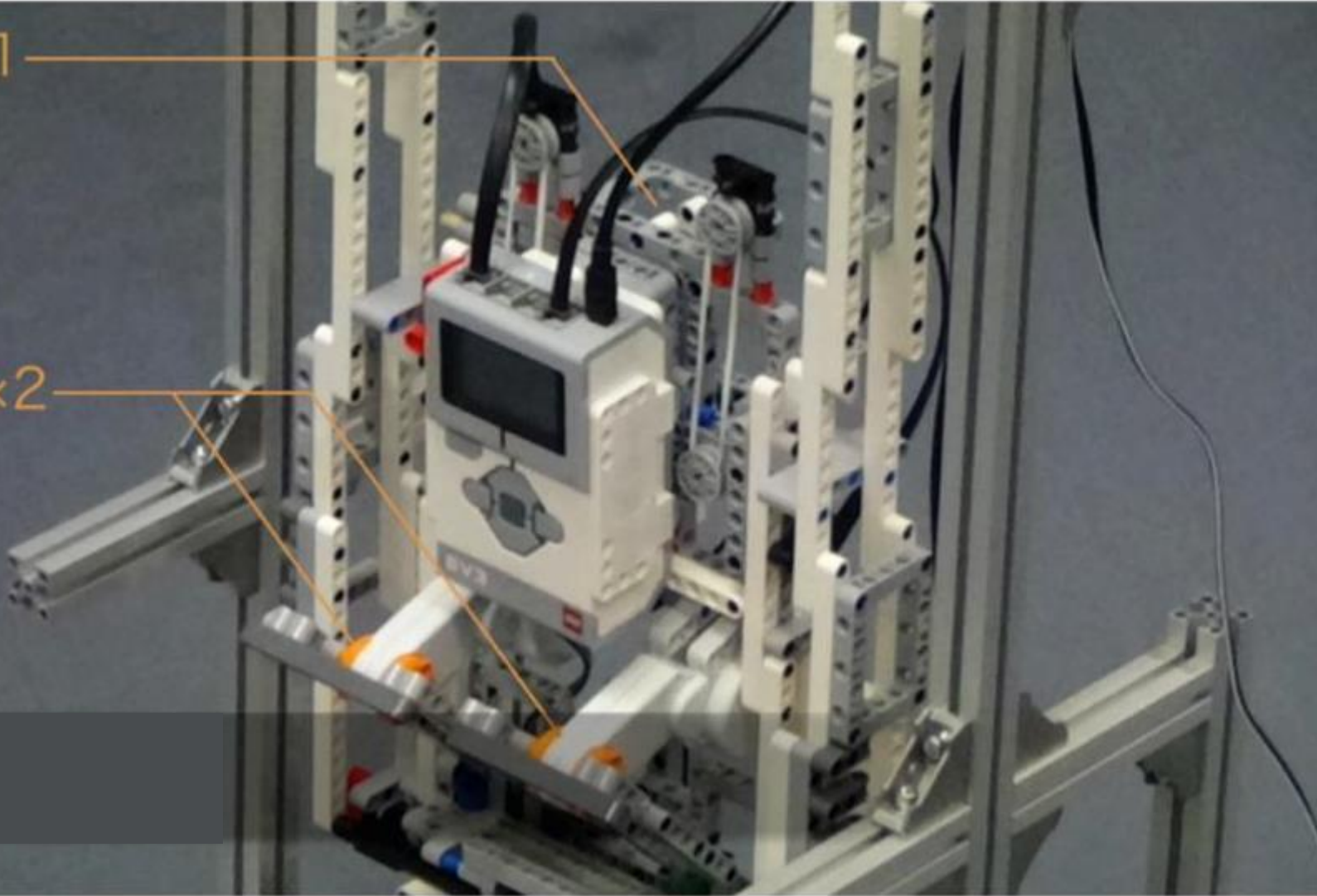
Experiment & Learn

AI as an Experiment Site

Demonstration

Gyrox 1

Motor x2



Warehouse



Checking & Packing

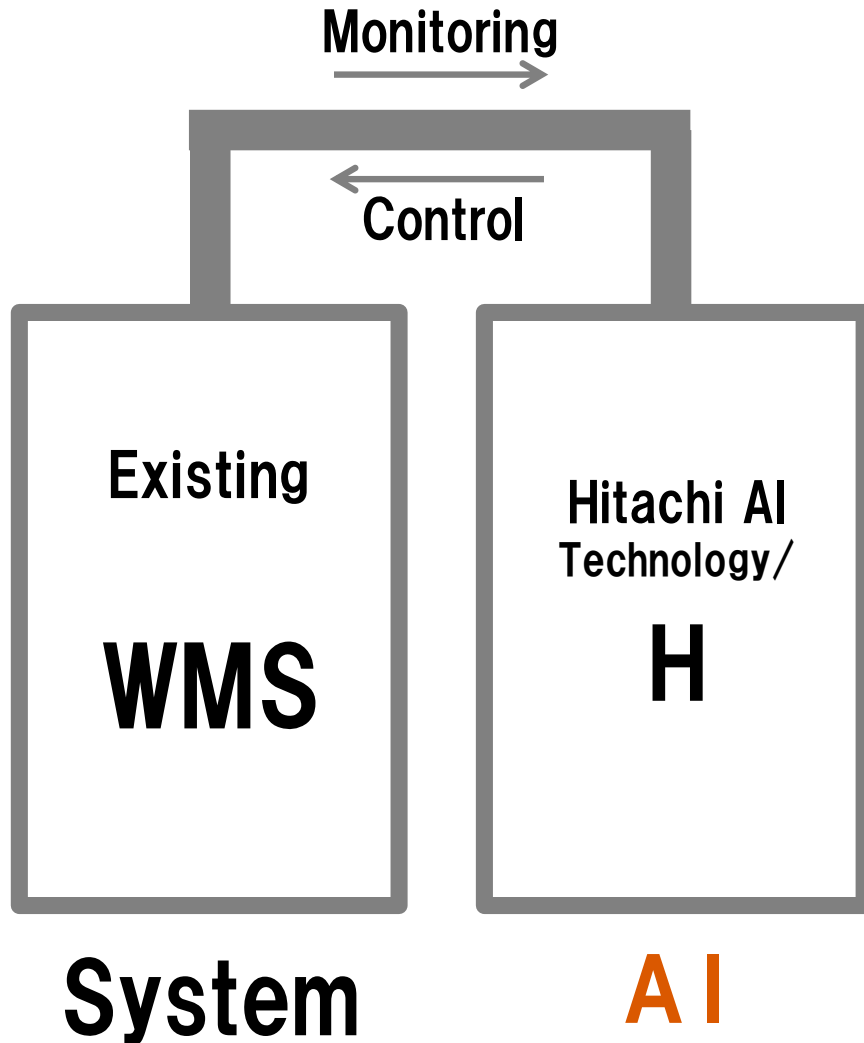


Picking



Outcome-Oriented Warehouse System

WMS = Warehouse Management System



Learns from data, adaptively grows, and provides the results

- ◆1 **Outcome** is defined as “total work time”
- ◆2 No inputs of **warehouse knowledge nor logic**
- ◆3 Added-on to **existing WMS system**

Outcome-Oriented Warehouse Management Working & Learning Daily Added on Existing WMS with **8% Productivity Enhancement**

Artificial Intelligence Helps **Workers**
Optimize Work Orders

8am



1am

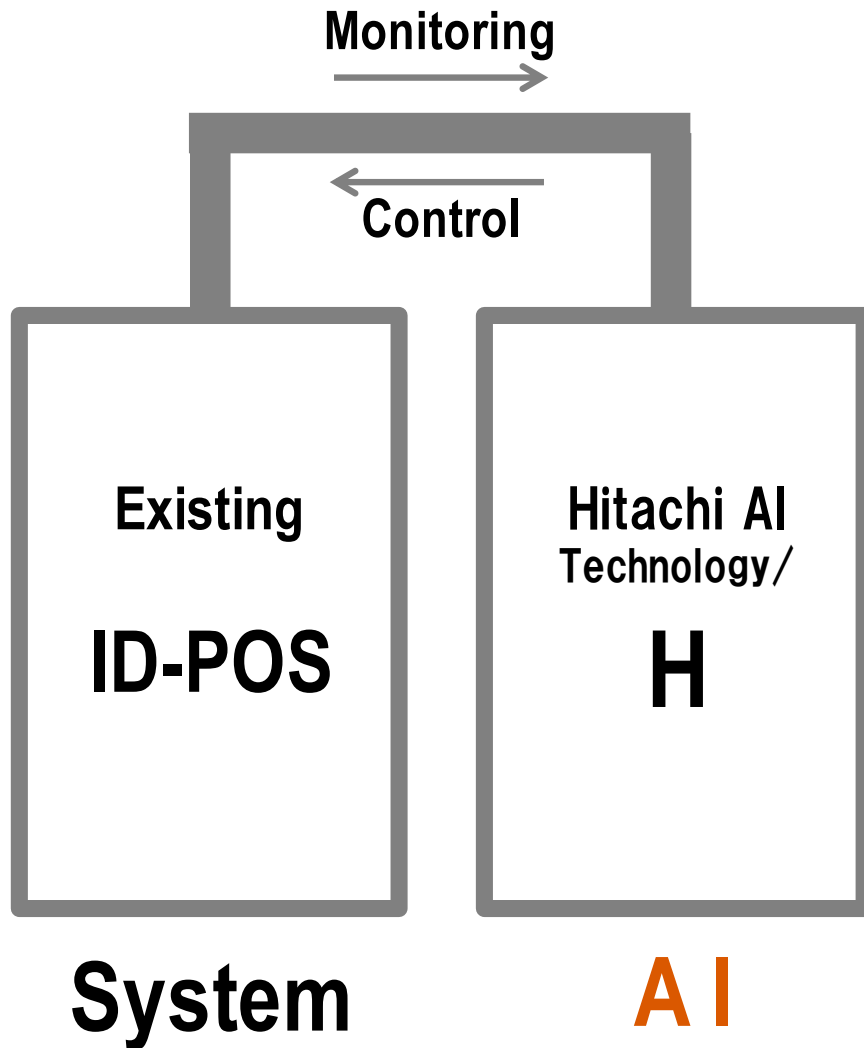
Workers Help **Artificial Intelligence** Input
a Variety of Data that Affect Outcome

Retail-store



Outcome-Oriented Store System

POS = Point of Sales



Learns from data, adaptively grows, and provides the results

- ◆ 1 Outcome is defined as “**sales per customer**”
- ◆ 2 No inputs of **store knowledge nor logic**
- ◆ 3 Added-on to **existing POS system**

Human vs. AI

Rule: Increase customer sales based on 10-day data

| | <u>Retail Specialists (2 persons)</u> | <u>Artificial Intelligence</u> |
|----------|--|---|
| Approach | Interviews with executive etc Use of domain knowledge | Data only No domain knowledge |
| Action | POP ads for focus items & item rearrangement | Employee presence at hot spot Identified |
| Result | No sales increase confirmed | Sales per customer was increased by 15% |

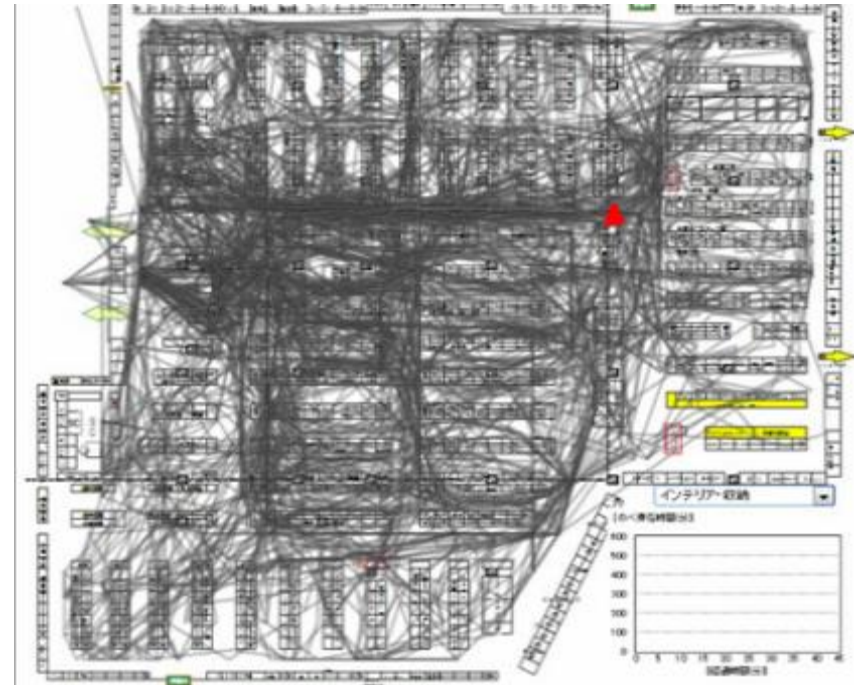
Computer with big data enhances business performance

Hot-Spot Employee Presence Enhanced Sales

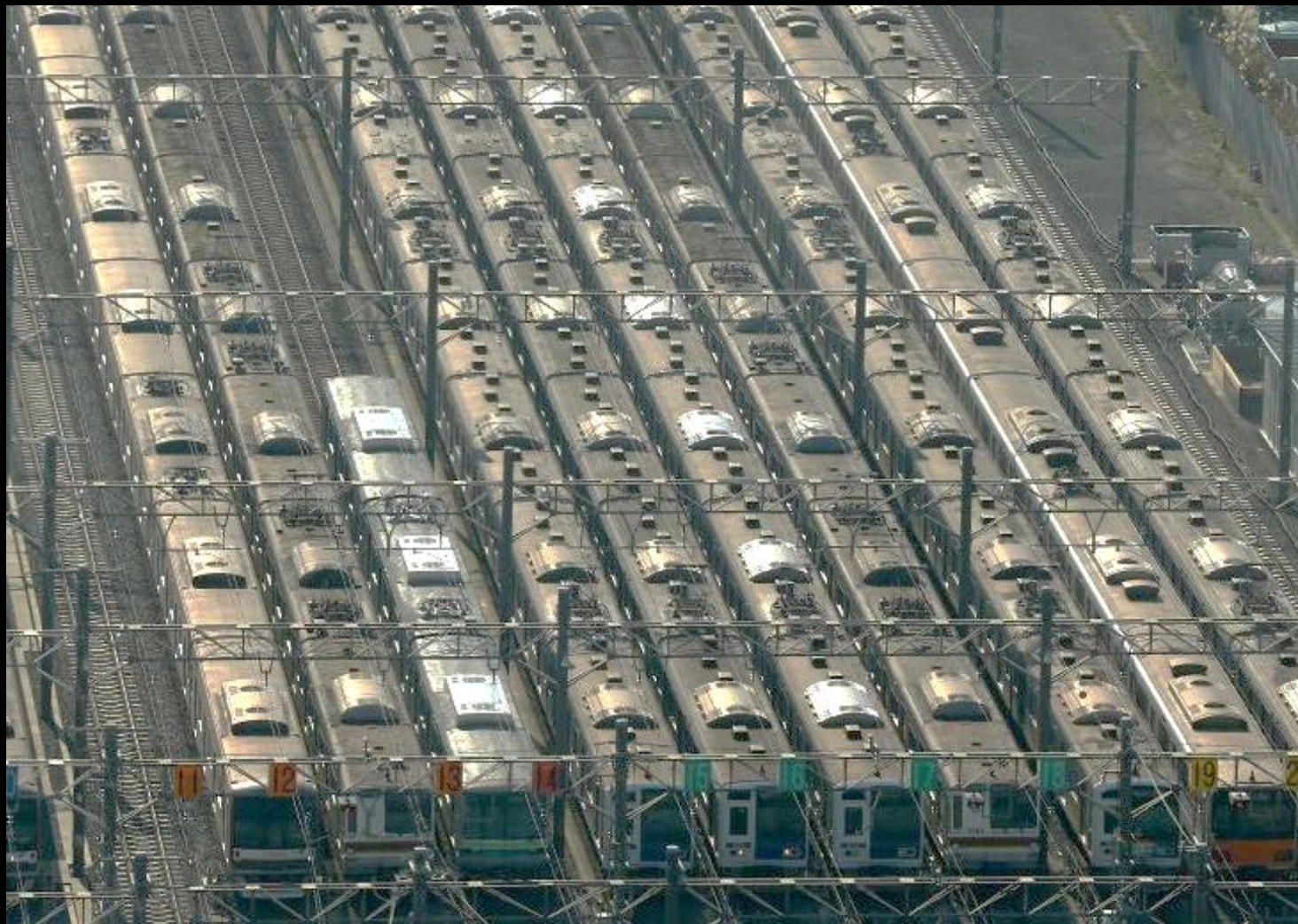
100%



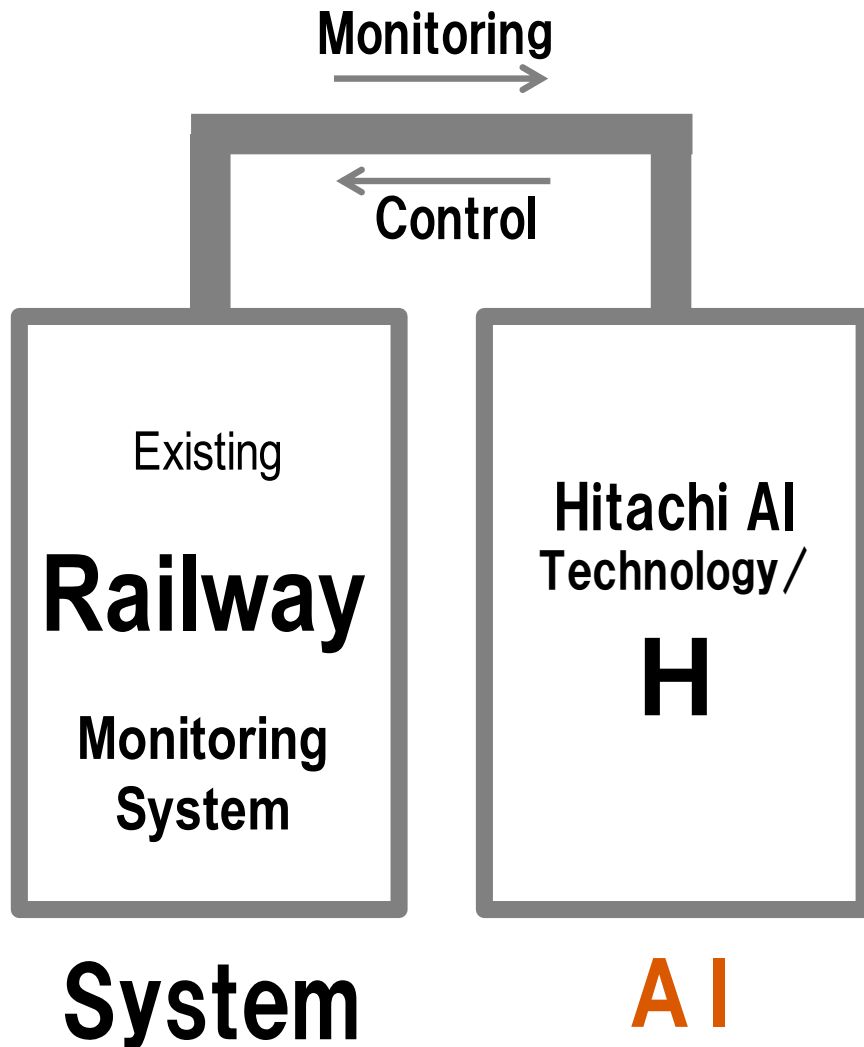
115%



Railway



Outcome-Oriented Railway

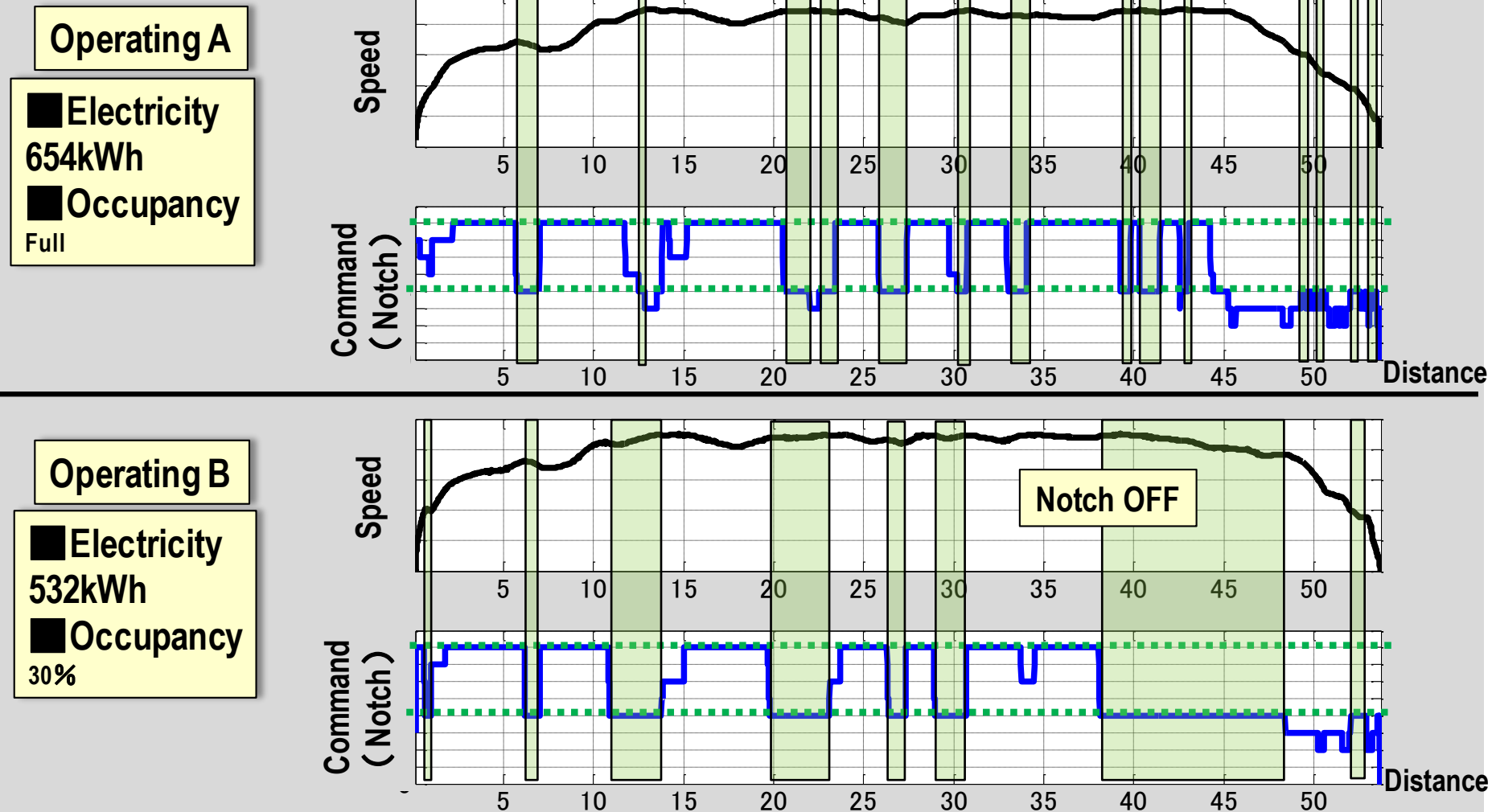


Learns from data, adaptively grows, and provides the results

- ◆1 **Outcome** is defined as “Reducing Electricity”
- ◆2 No inputs of **railway knowledge nor logic**
- ◆3 Added-on to **existing monitoring system**

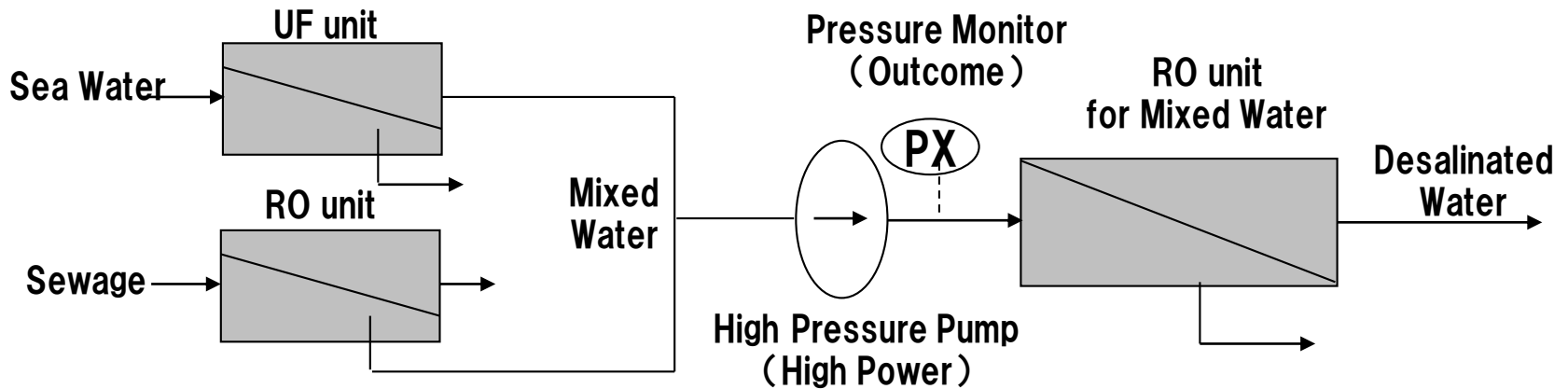
AI Discovers Low-Power Train Operation

Optimized Operation Enables 14% Power Saving (Annual Prospect)



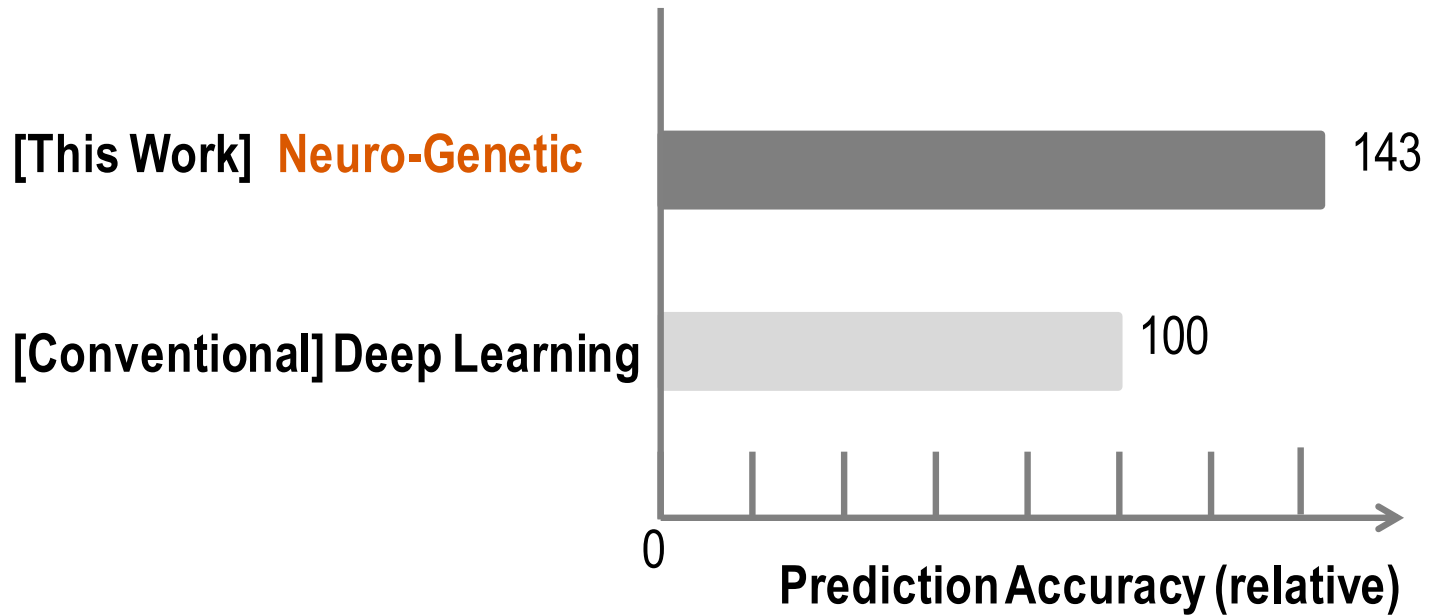
Water Plant: Electricity Saving

6% Saving in Electricity Cost

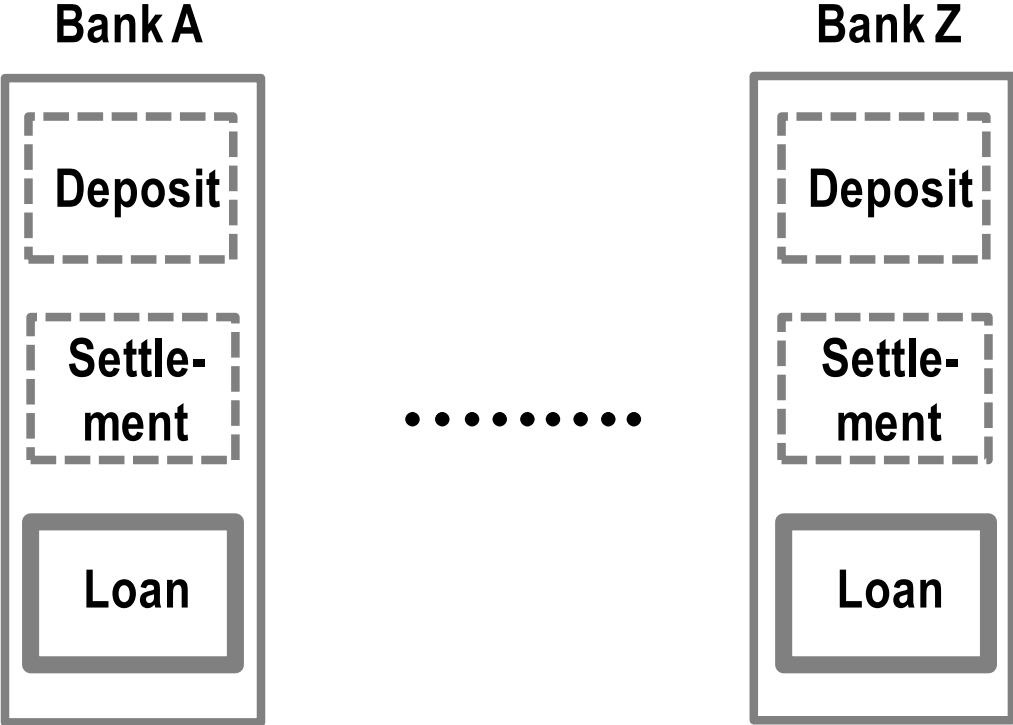


Water Desalination System (Remix Water)

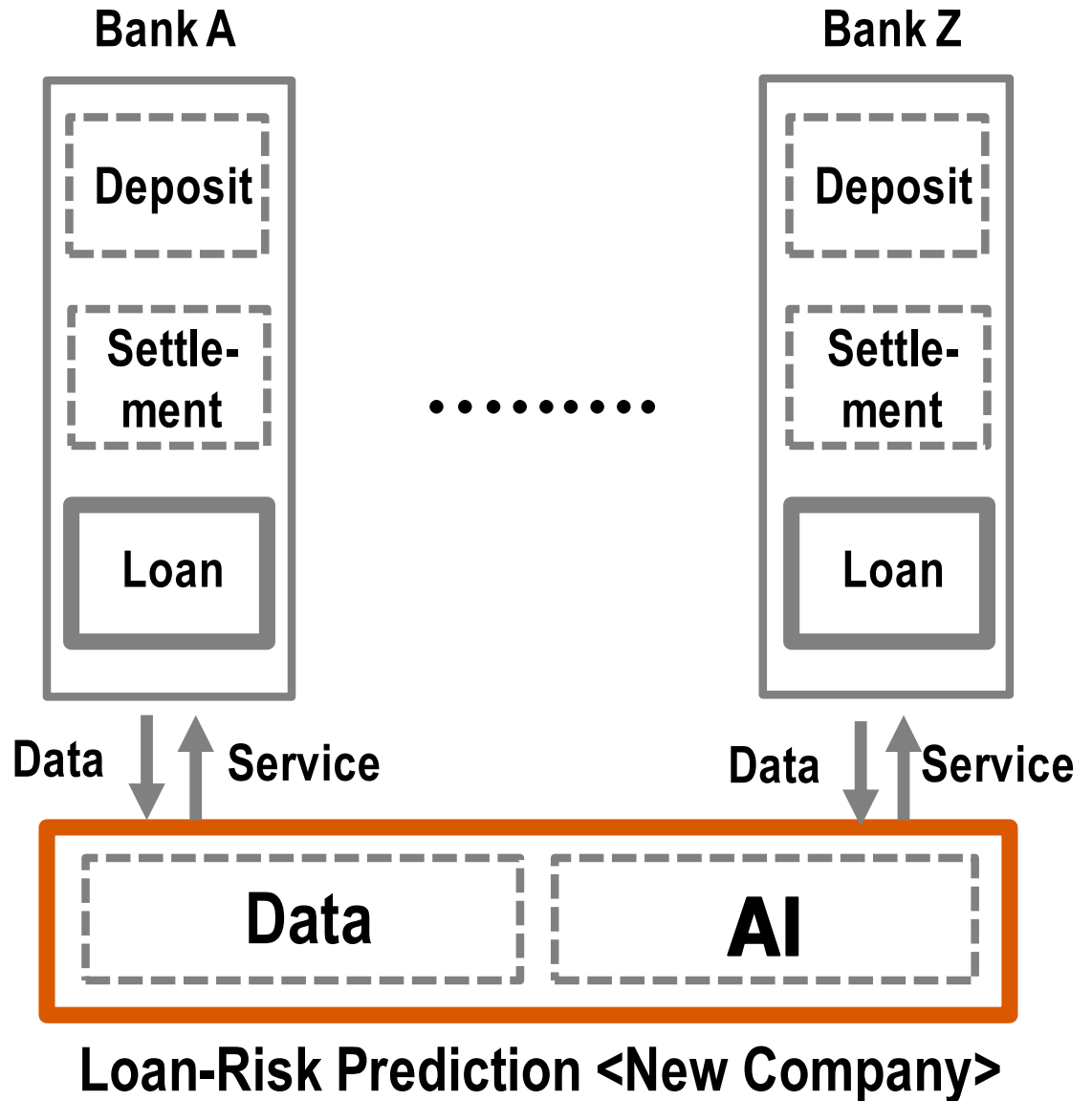
Housing-Loan Default Prediction



Conventional Banks

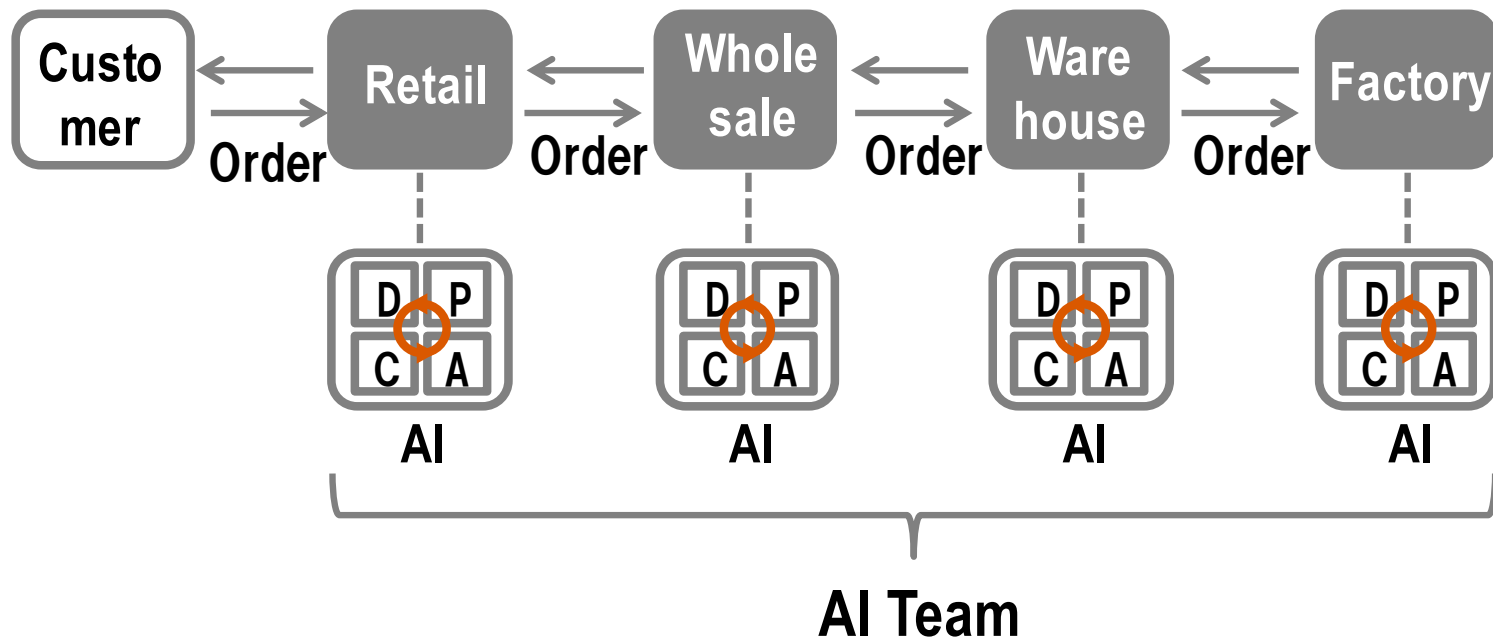


Renovation
Outcome-Oriented
Banking



Meeting Supply with Demand

Minimize Loss (Inventory & Stockout)



Supply Chain

Loss

(Cumulative in 35 weeks)

Humans 2028 \$

(After Practice)

AI 489 \$

Multi-Purpose AI

Hitachi AI Technology/H

14 Domains

60_{cases}

Does AI Replace Labor?

Upgrade the Concept of Rules

20th Century

21th Century

Supply Chain

- Chain Store
- Work Manual

Mobility

- Signal/Lane
- Speed Limit

Finance

- Check Guarantee
- Check Attributes (e.g. Single Mother)

Work

- Plan-Do-Check-Action
- Hierarchy

Conventional Rules

- Assumption-based
- Fixed to Changes
- Deviates from Purpose
- Complex Description

Outcome-Oriented Evolvable Rules

- Evidence-based
- Flexible to Changes
- Consistent to Purpose
- Simple Description

Artificial Intelligence

From Rule-Oriented

To Outcome-Oriented

Physical Motion

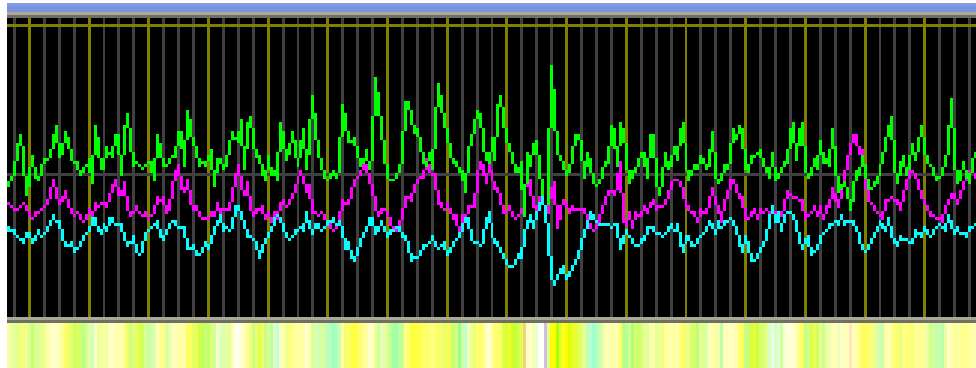


Wristband Sensor

Walk

2Hz

1S

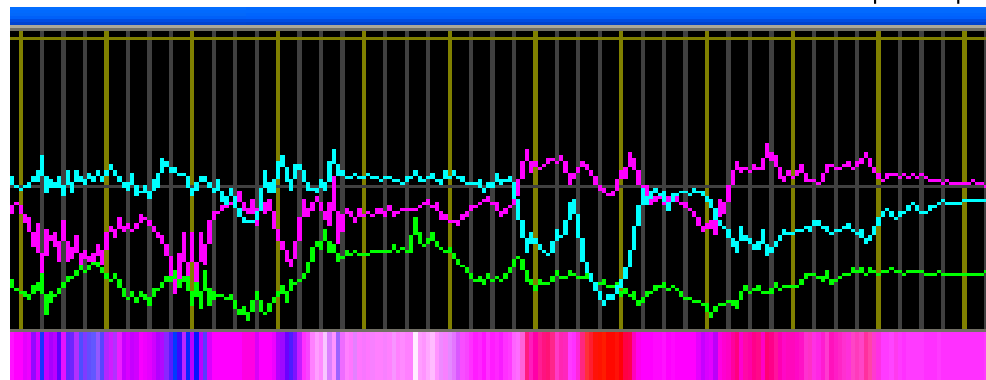


Badge Sensor

E-Mail

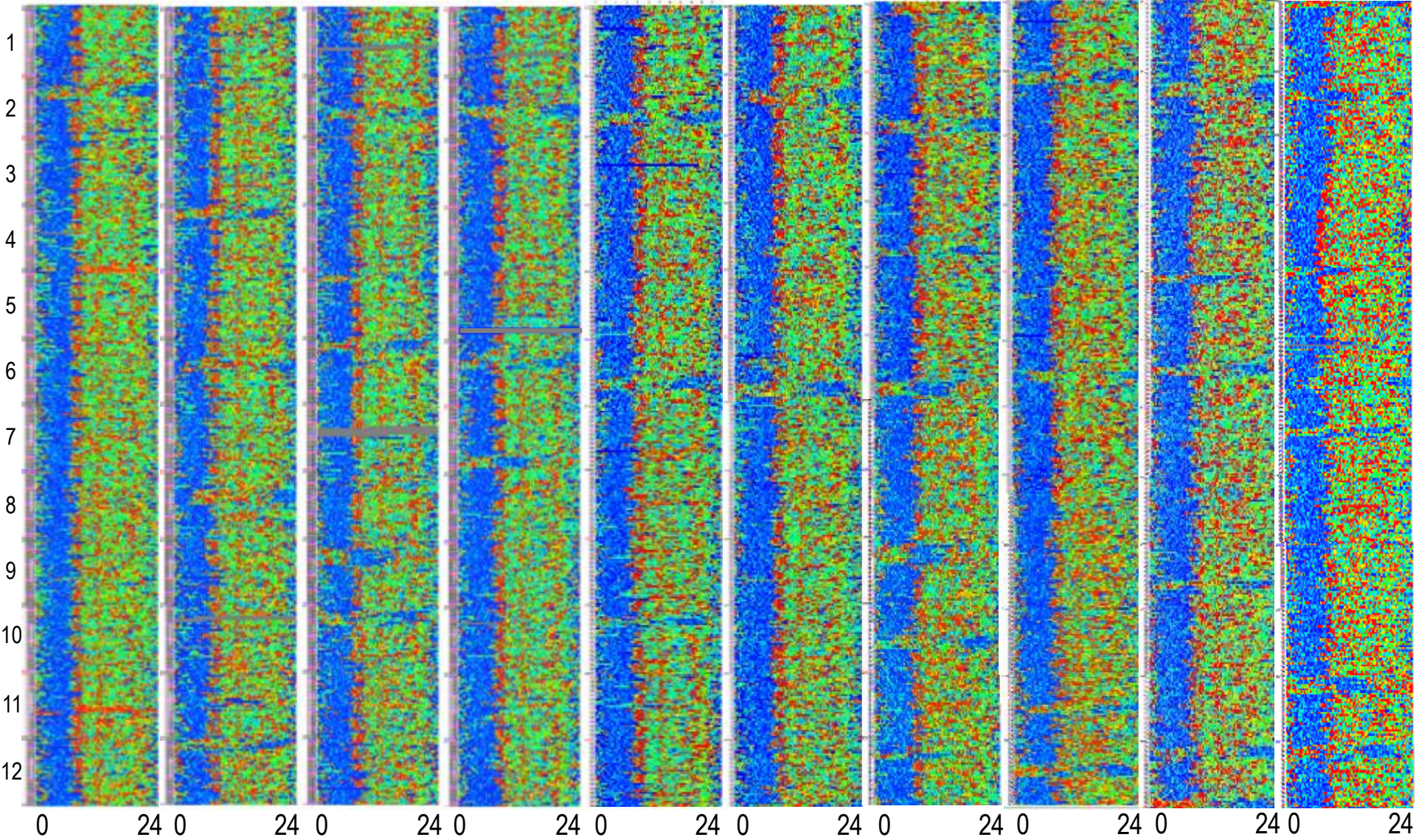
0.8Hz

1S



My Life has been Recorded for 12 Years every 50 ms

Y2009 Age 49 Y2010 Age 50 Y2011 Age 51 Y2012 Age 52 Y2013 Age 53 Y2014 Age 54 Y2015 Age 55 Y2016 Age 56 Y2017 Age 57 Y2018 Age 58



Time

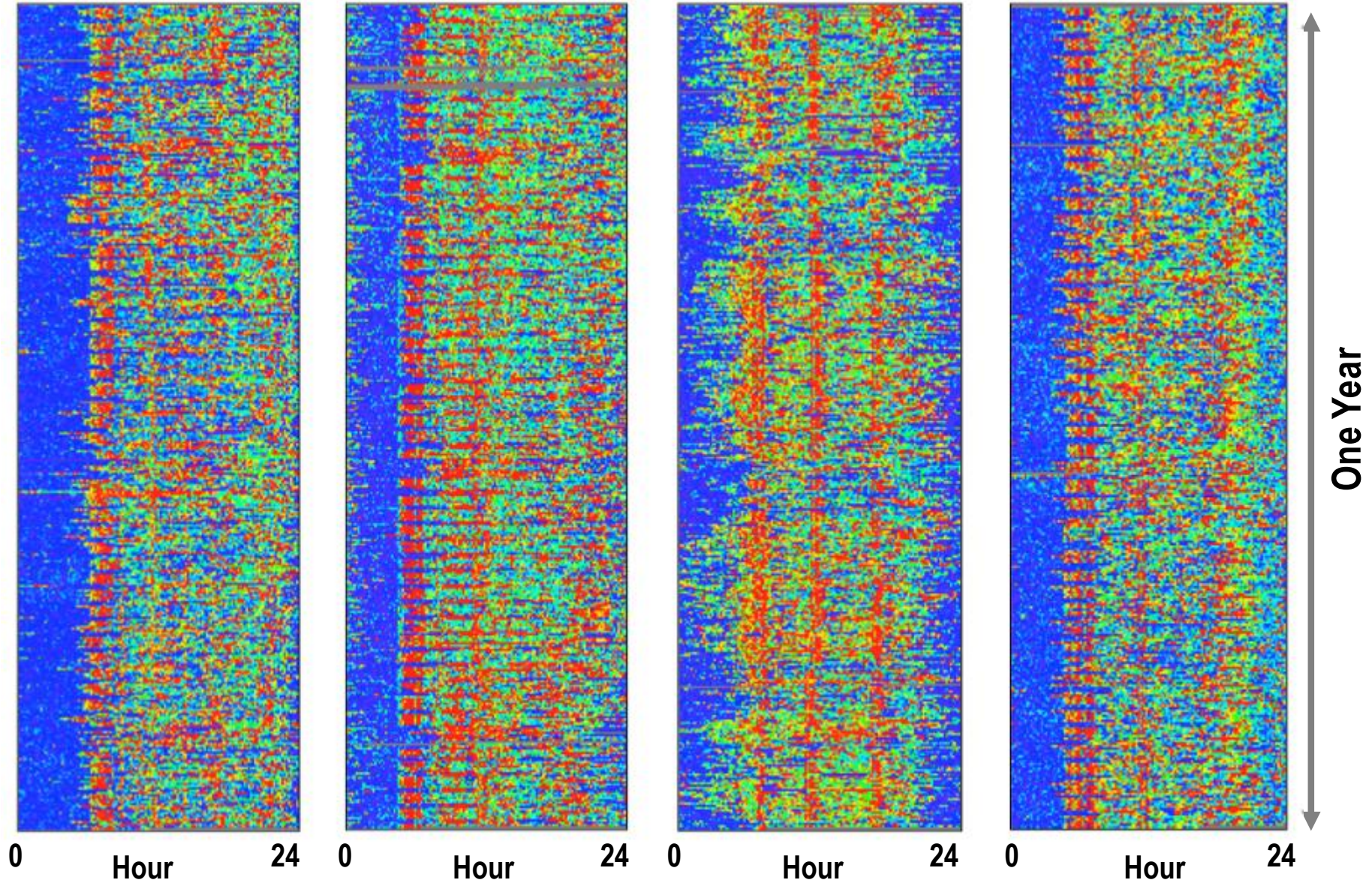
"Life Tapestry^(R)" of Four Persons

A

B

C

D



1,000,000 Days

Collected Human-Behavior Data Last 13 Years

Happiness

Does it depend on individual, era & culture?

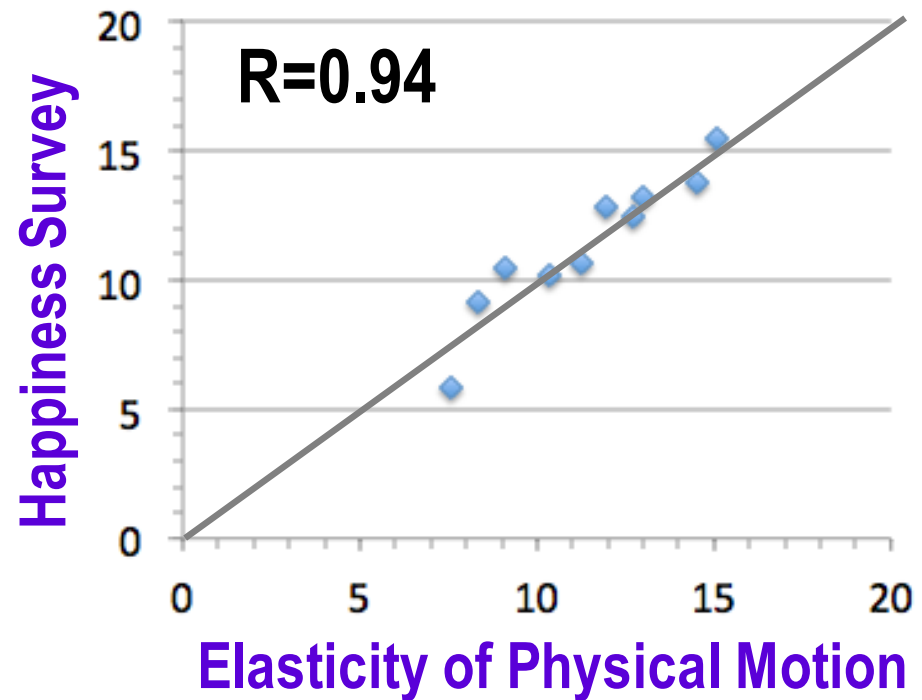
Universal Aspects of Happiness

| | Unhappy State | Happy State |
|----------------|---|--|
| Mood | <ul style="list-style-type: none">• Depressed• Negative | <ul style="list-style-type: none">• Bright• Positive |
| Task | <ul style="list-style-type: none">• Unfocused• Unengaged | <ul style="list-style-type: none">• Focused• Engaged |
| Human Relation | <ul style="list-style-type: none">• Feel helpless• Feel disliked | <ul style="list-style-type: none">• Feel helpful• Feel liked |
| Physical | <ul style="list-style-type: none">• Appetiteless• Sleepless | <ul style="list-style-type: none">• Eat delicious• Sleep well |

Elasticity of Motion Represents Collective Happiness

Happiness Questionnaire

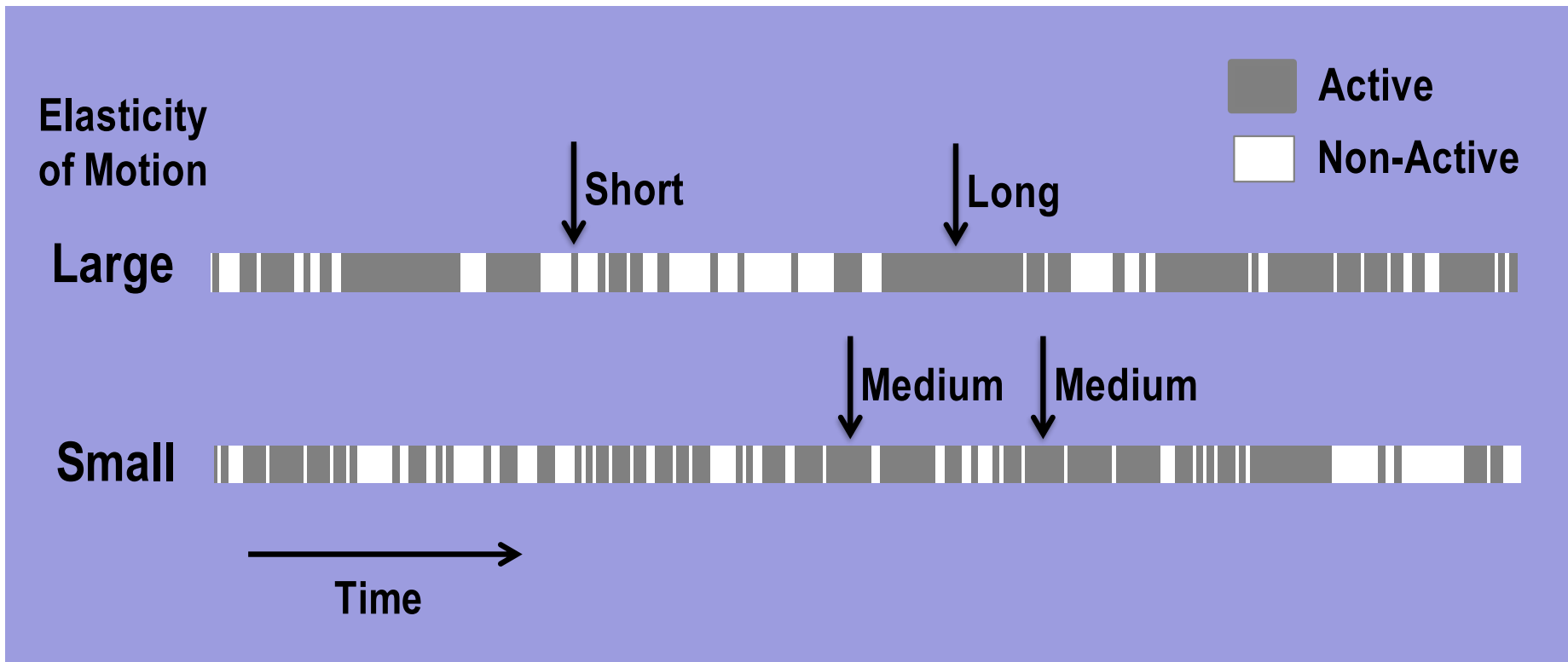
20 questions on last week's happiness, enjoyment, solitude, sadness, etc.



5 billion records: 10 organizations, 468 persons, 5000 man-days

Hidden Pattern behind Happy People

Elasticity in Motion Length



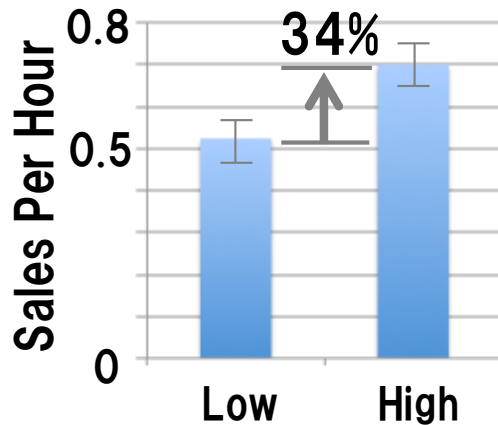
Making Others Happy

Quantified

Making Others Happy

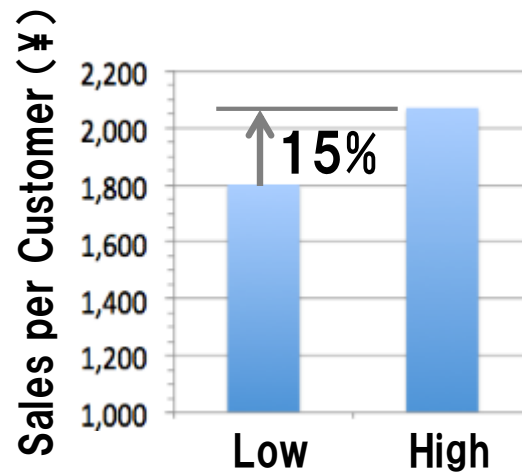
Productive

Call Center



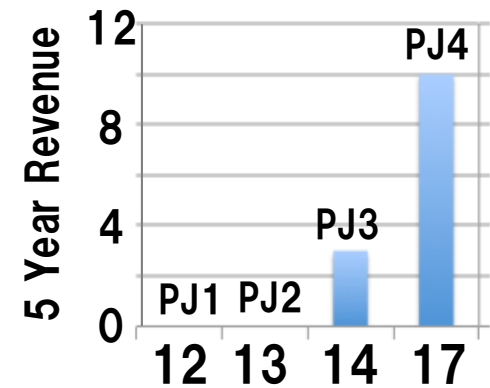
**Making Others Happy
= Diversity of Motion
(Daily Average)**

Store



**Making Others Happy
= Diversity of Motion
(Daily Average)**

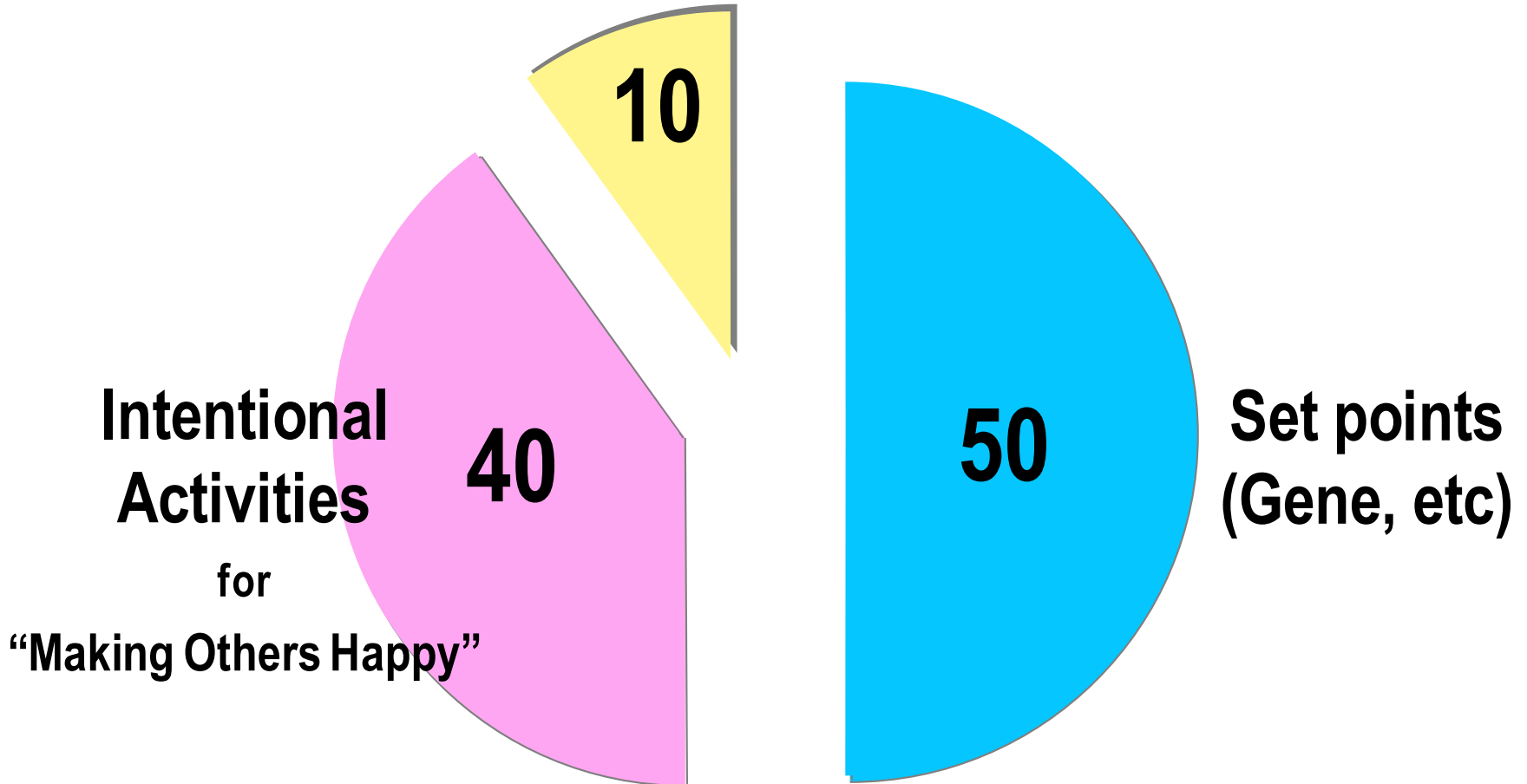
Development Project



**Making Others Happy
= Diversity of Motion
(First 2 Month)**

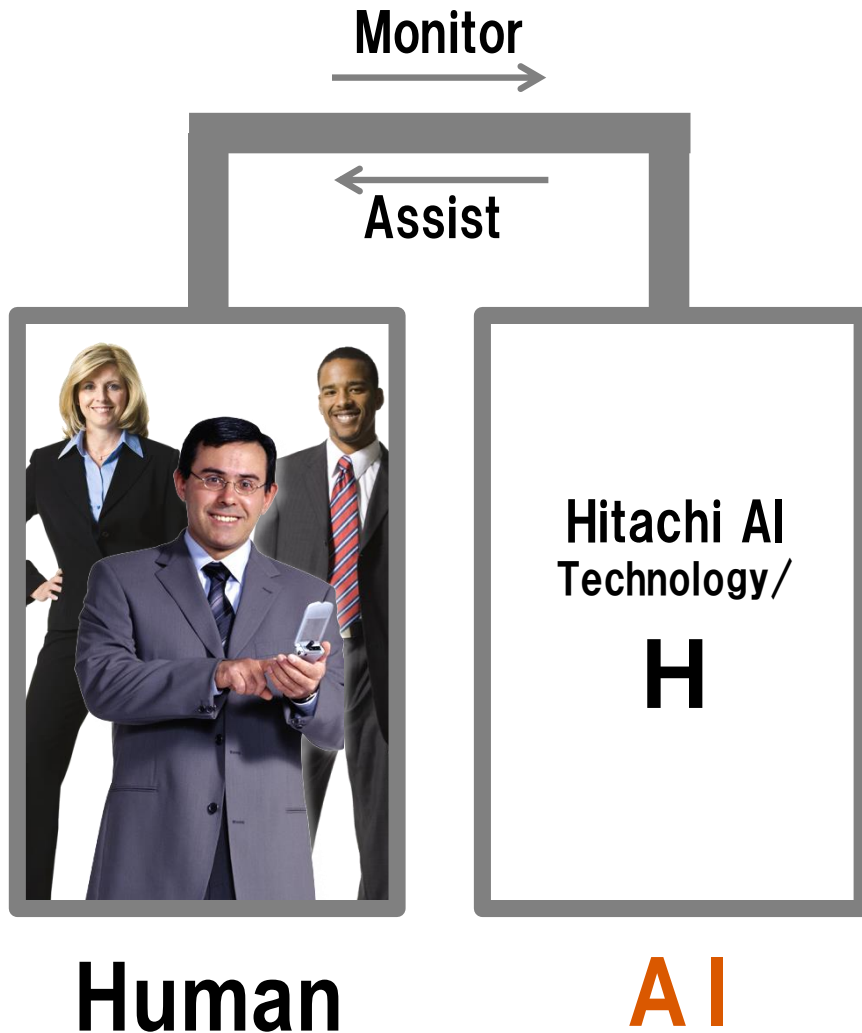
Origins of Happiness

Situational
(Money, Health, etc)



S. Lyubomirsky, et al, Rev. Gen. Psychology, 2005

Empower Human



**Support Organizational
Learning & Growing**

- ◆ **Outcome is Collective
Happiness**
- ◆ **Daily Advice by AI for Better
Communications**

Dashboard for Supervisor

Internet1
Internet2
ラウンド施策

受注目標(---): 0.63

● コミュニケーションサポート対象者リスト

| № | G | 名前 | 受 | コ | 指導 |
|----|---|--------|------|------|----|
| 1 | ▼ | 今野 友紀 | 0 | 0 | 0 |
| 2 | ▼ | 宮森 有希 | 0.1 | 0 | 0 |
| 3 | ▼ | 仲野 咲奈 | 0.45 | 0 | 0 |
| 4 | ▼ | 浅 結子 | 0.5 | 0 | 0 |
| 5 | ▼ | 志田 優斗 | 0 | 0.33 | 0 |
| 6 | ▼ | 坪田 栄三郎 | 0.15 | 0.33 | 3 |
| 7 | ▼ | 若松 円希 | 0.46 | 0.33 | 0 |
| 8 | ▼ | 雨宮 奈緒子 | 0.35 | 0.5 | 2 |
| 9 | ▼ | 矢部 晃一 | 0.48 | 0.5 | 1 |
| 10 | ▼ | 含本 耕一 | 0.56 | 0.5 | 0 |
| 11 | ▼ | 岩 正敏 | 0.58 | 0.5 | 0 |
| 12 | ▼ | 横川 由英 | 0.76 | 0.5 | 0 |
| 13 | ▼ | 鹿島 成康 | 0.24 | 1 | 0 |
| 14 | ▼ | 森脇 隆則 | 0.37 | 1 | 0 |
| 15 | ▼ | 森脇 隆則 | 0 | 1.4 | 0 |
| 16 | ▼ | 上野 真穂 | 0.32 | 1.5 | 0 |
| 17 | ▼ | 野村 秋夫 | 0.26 | 2 | 1 |
| 18 | ▼ | 植村 正毅 | 0.49 | 2 | 0 |
| 19 | ▼ | 都築 幸一 | 0.51 | 2 | 0 |
| 20 | ▼ | 平岡 一 | 0.49 | 2.6 | 0 |
| 21 | ▼ | 菅井 篤夫 | 0.47 | 3 | 0 |
| 22 | ▼ | 宮本 昭治 | 0.6 | 4.33 | 0 |
| 23 | ▲ | 河原 周二 | 0.66 | 0 | 0 |
| 24 | ▲ | 横川 由英 | 0.76 | 0 | 2 |
| 25 | ▲ | 阿部 遼哉 | 1.04 | 0 | 0 |
| 26 | ▲ | 岡崎 聖助 | 0.79 | 0.2 | 0 |
| 27 | ▲ | 清野 晋作 | 0.74 | 0.25 | 0 |
| 28 | ▲ | 高倉 蒼 | 0.72 | 0.33 | 0 |
| 29 | ▲ | 花田 大輔 | 0.64 | 0.5 | 0 |

● Internet1の受注率と活発度 (2週間)

表示期間: 2013/06/15 までの 2週間 表示

Daily activeness & success rate

● 期間平均

Meeting Activeness Sales

d1: 2013/06/02 (日) ~ 2013/06/08 (土)
d2: 2013/06/09 (日) ~ 2013/06/15 (土)

● Internet1の施策提案-コメント共有

● 岩下 正敏 (2013年以内)

149日前 (13/06/01 16:36)

■6月施策
褒賞施策を実施する。
AM中に1.0クリアしたらおかし贈呈。
AM中に1.5クリアしたらストラップ贈呈。

● 最近のコメント

まへて見る

星 杏 - 13日前
ずいぶん明るくなった。前向きで訴求も身についてきている様子。ほめました。
@雨宮 奈緒子さんの指導

星 杏 - 13日前
姿勢が大切と指導。うつむいて話す声がかもり、暗い印象を相手に与える。相手に見え...
@坪田 栄三郎さんの指導

永井 幸二 - 13日前
電話を通して相手に声は、自分の声よりもワントーン低くなりますので(聞く聞こえ...
@横川 由英さんの指導

永井 幸二 - 13日前
お客さまの質問にあわせている様子が見受けられる。質問を聞いたら、「oo!」についての...
@野村 秋夫さんの指導

永井 幸二 - 13日前
回答の文は口語体で、理解度の低い方や高齢の方には聞き取りが難しいと感じておき...
@坪田 栄三郎さんの指導

大淵 貞治 - 13日前
お客様の指導コメントが「お礼」の言葉が多...
@矢部 晃一さんの指導

大淵 貞治 - 13日前
6/18 受注しようと思っせてしまっ一方的になりがち。落ち着いて一呼吸おいてから...
@武田 孝夫さんの指導

松井 康朗 - 13日前
訴求がずいぶん上達した。お客様が無言になっ...
@武田 孝夫さんの指導

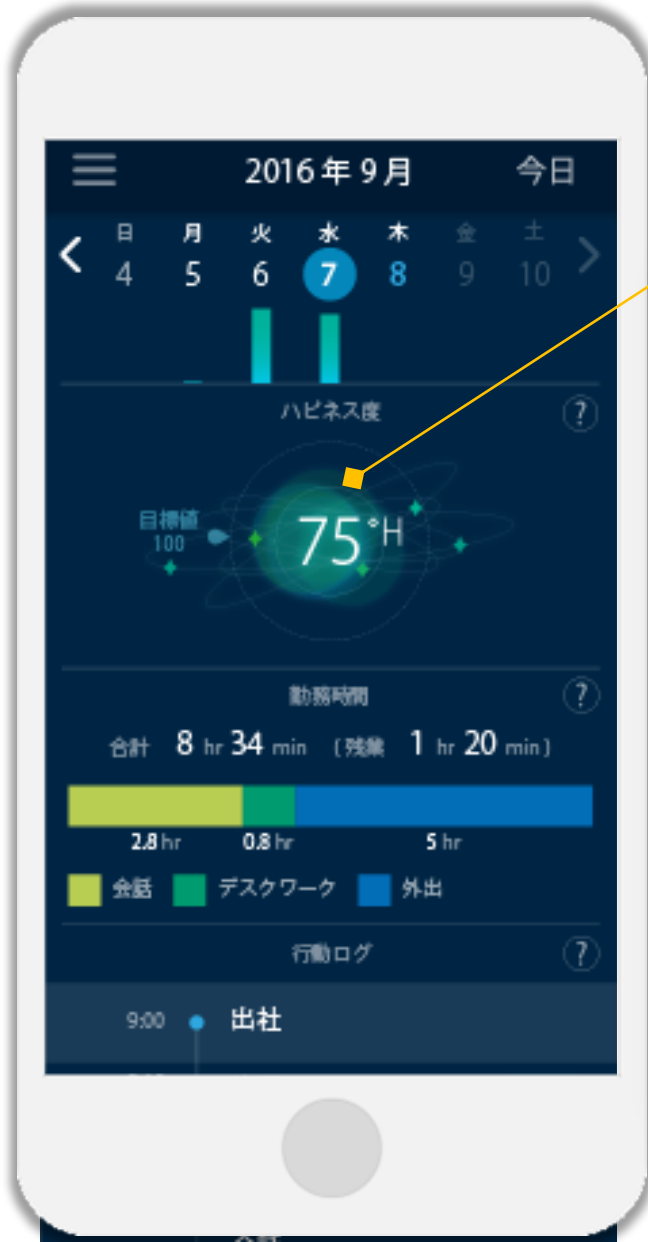
松井 康朗 - 13日前
この施策は、直近の新人を対象に集中してSVフォローを実施することで知識・経験値を...
@ラウンド施策

松井 康朗 - 13日前
6/23 受注低迷で伸び悩み苦戦。粘りが以前より少なくなっている様子。
@横川 由英さんの指導

Sales Success Rate 27%↑

Employee Happiness ↑

Happiness AI Application



★ Activation Visualization

★ Type Diagnosis & Advice



★ Evidences

Hitachi Utilizes AI

600 Sales Employees in Hitachi Group Use AI
(2016.6.27 News Release)

Olympic of Making Others Happy

Measurement of Making Others Happy Now by **Smart Phone App**



Smart Phone App “Happiness Planet”

46

Daily Trend of Making Others Happy

Ranking of Making Others Happy



September 2018

175 teams

1623 people

100 organizations

App Helps Improve Making Others Happy

Daily Challenge Menus

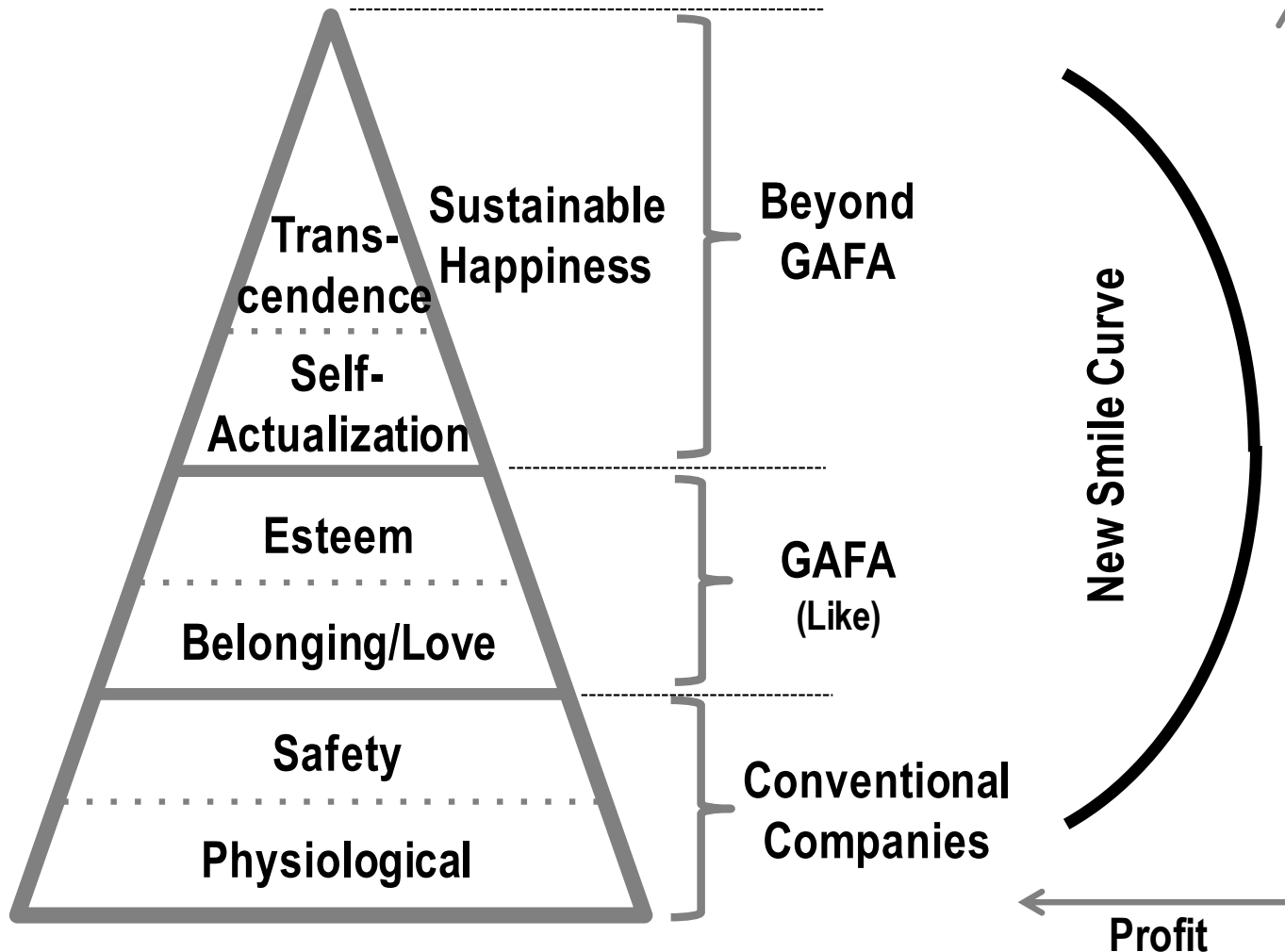


Automatic Rating by Making Others Happy

Select and Visualize



Sustainable Happiness Beyond-GAFA Opportunities



A. Maslow "Hierarchy of Needs"

**Our planet is made
happier, scientifically**



Key is "Making Others Happy"



“Making Others Happy” is Quantified

**"Making Others Happy"
makes oneself happy**



A woman with long dark hair and bangs is walking in a modern building. She is wearing a brown V-neck top, a white cardigan, and grey trousers. She is carrying a brown bag. The background shows large glass windows reflecting a blue sky with clouds. A blue text box is overlaid on the right side of the image.

**One who makes others
happy is productive**

**Billions of people having
smart phones are
welcome to this move**

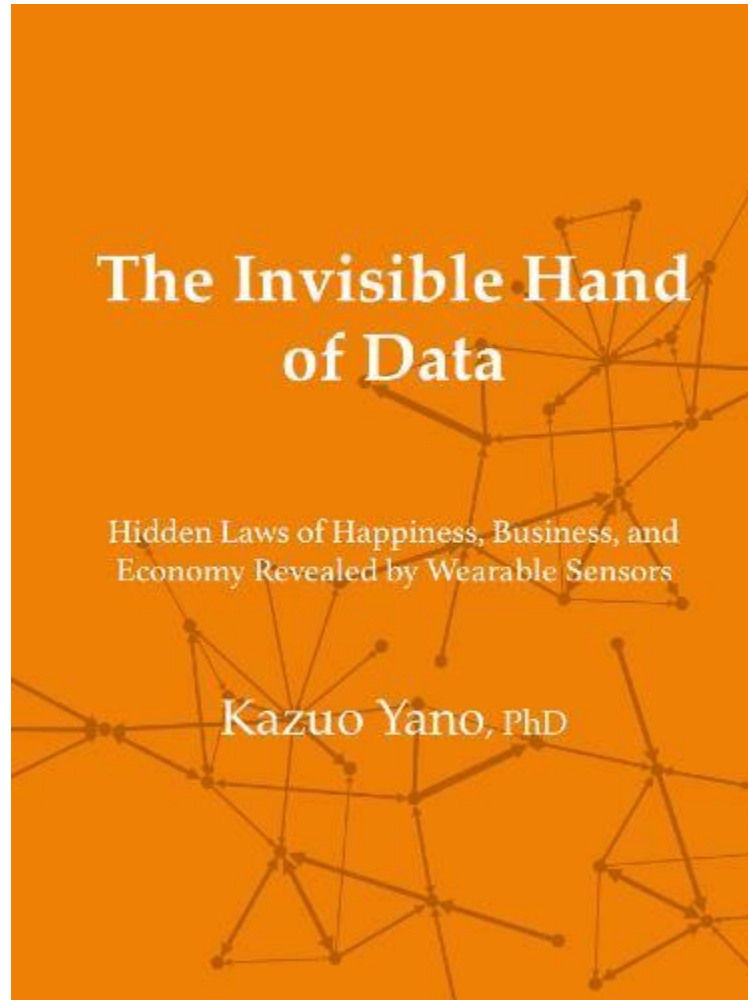


Conclusions

1. AI releases us from **standardized rules** for unceasing **experiment for learning** for limitless new possibilities.
2. The highest objective of learning is the **happiness of the people** towards **technology for powering good**.

The Invisible Hand of Data

Hidden Laws of Happiness, Business & Economy
Revealed by Wearable Sensors



English version is **now available** (April, 2019)

“The Invisible Hand of Data”

Top-10 Business Books in 2014 in Japan

- ① Zero to One (Peter Thiel) 17pt
- ② The New Geography of Jobs (Enrico Moretti) 14pt
- ③ The Key (Lynda Gratton) 13pt
- ③ The End of Competitive Advantage (Rita McGrath) 13pt
- ⑤ Seeing What's Next (Clayton Christensen) 12pt
- ⑥ The Leadership Challenge (James Kouzes) 11pt
- ⑥ The New Digital Age (Eric Schmidt) 11pt
- ⑥ Give & Take (Adam Grant) 11pt
- ⑨ **The New Invisible Hand (Kazuo Yano)** 9pt
- ⑨ Creating Innovators (Tony Wagner) 9pt
- ⑨ Courage to be hated (Ichiro Kishimi) 9pt