Approach to disaster prevention using ICT in Japan

Nov.19,2018

HITOSHI MURATA

Future City Development Division

NEC Corporation

\Orchestrating a brighter world

NEC brings together and integrates technology and expertise to create
the ICT-enabled society of tomorrow.

We collaborate closely with partners and customers around the world,
orchestrating each project to ensure all its parts are fine-tuned to local needs.

Every day, our innovative solutions for society contribute to
greater safety, security, efficiency and equality,
and enable people to live brighter lives.

Corporate Profile

Parent Company	NEC Corporation（日本電気株式会社）
Established	July 17, 1899
Head Office	7-1, Shiba 5-chome　Minato-ku, Tokyo 108-8001 Japan
Representative Directors	Chairman of the Board Nobuhiro Endo President and CEO Takashi Niino Senior Executive Vice President and CFO Takayuki Morita
Capital	¥397.2 billion (Fiscal year ended Mar. 31, 2018)
Consolidated Net Sales	¥2,844.4 billion (Fiscal year ended Mar. 31, 2018)
Major Operations	Public Business, Enterprise Business, Telecom Carrier Business, System Platform Business
Number of employees	109,390 (As of Mar. 31, 2018)）
Number of Consolidated Subsidiaries	303 (As of Mar. 31, 2018)

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Self-introduction

Until 2012 : worked in Space development and High performance computing
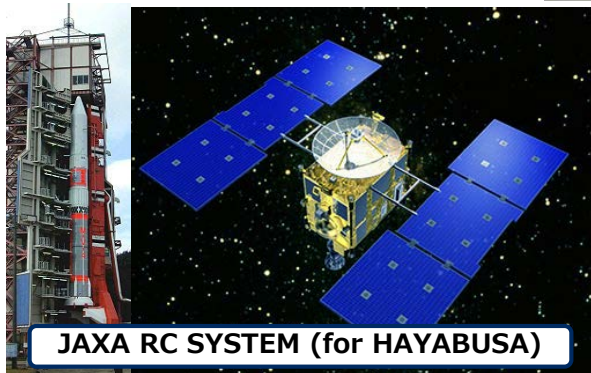2012-now : work in Development of future smart city management with IoT
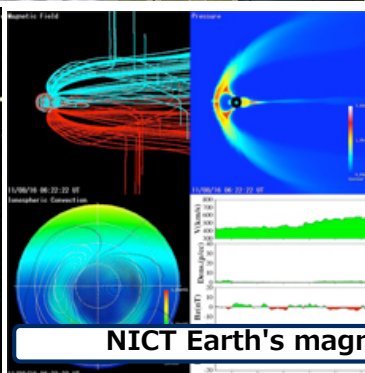

JAXA TANEGSHIMA RCC

JAMSTEC EARTH SIMULATOR(1ST)

EARTH SIMULATOR(2nd)

JAXA RC SYSTEM (for HAYABUSA)

NICT Earth's magnetosphere simulator
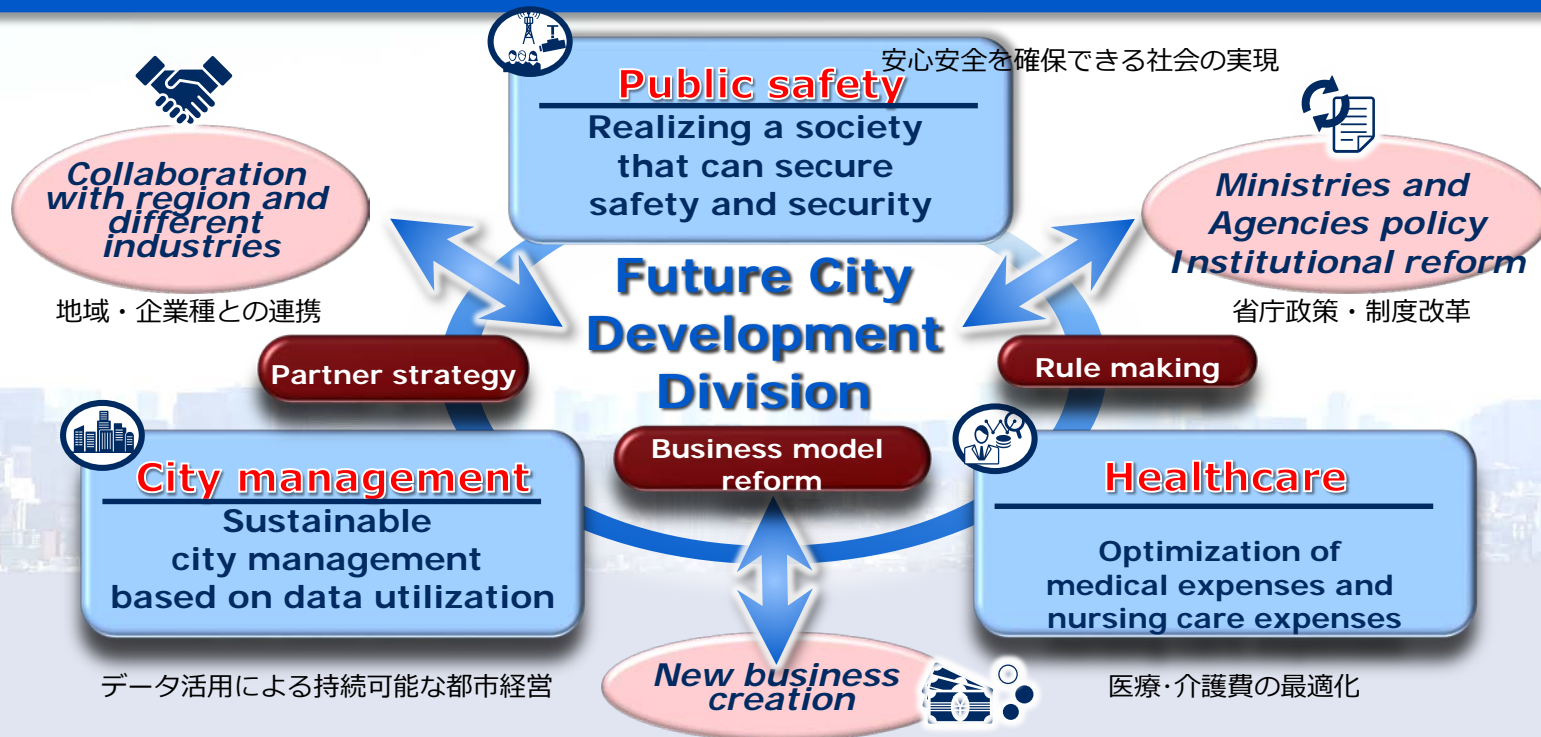
RIKEN RICC PC cluster

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Future City Development Division (Our Goal)

We overcome shortage of future social security resources and realize a sustainable society.
We will proactively pursue safe, secure and affluent future cities.

将来の財源不足を克服、持続可能な社会を実現。安心安全で豊かな未来都市づくりを遂行します。

安心安全を確保できる社会の実現

Public safety
Realizing a society that can secure safety and security

Collaboration with region and different industries

地域・企業種との連携

Ministries and Agencies policy Institutional reform

省庁政策・制度改革

Future City Development Division

Partner strategy

Rule making

Business model reform

City management
Sustainable city management based on data utilization

データ活用による持続可能な都市経営

Healthcare
Optimization of medical expenses and nursing care expenses

医療・介護費の最適化

New business creation

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Approach to disaster prevention using ICT in Japan

◆ Cases of Research Institutes :研究機関の事例

◆ A Case of municipalities : 自治体の事例

◆ An Example of Private Companies : 民間企業の事例

◆ How to use SNS : SNSを利用する例

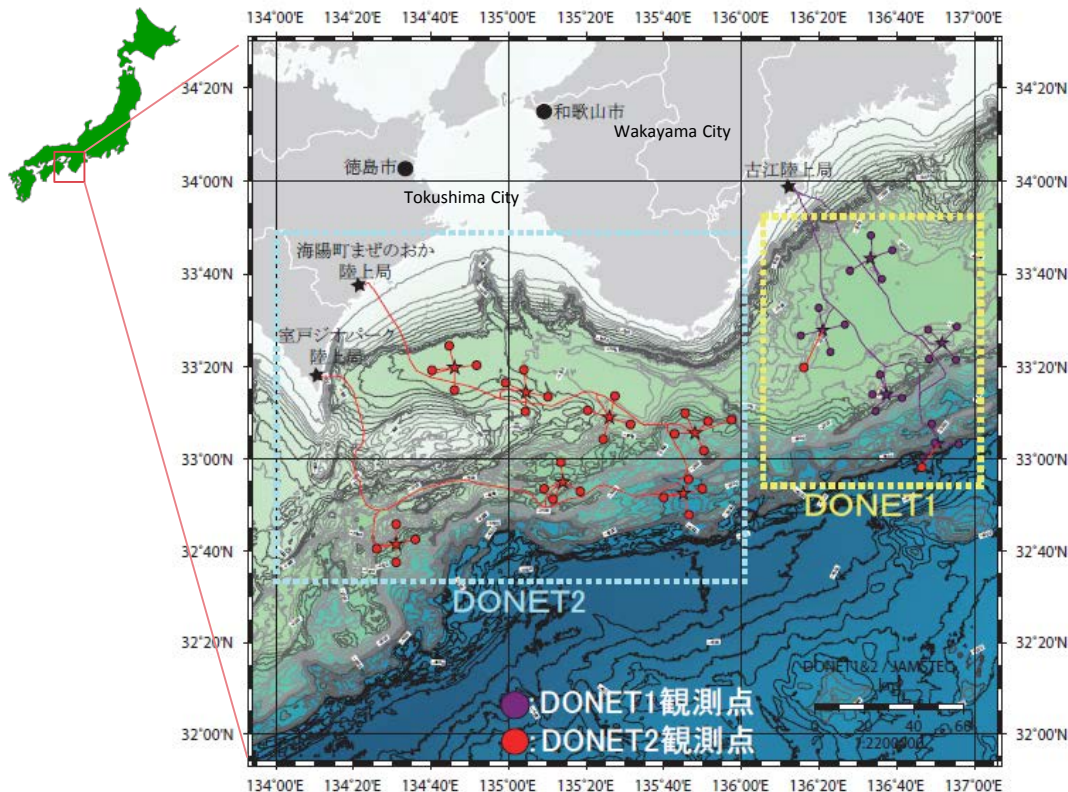◆ Problem for us to survive : 生き残るためには

Cases of Research Institutes

研究機関の事例

# Example of tsunami disaster prevention research by JAMSTEC

DONET（Dense Ocean floor Network system for Earthquakes and Tsunamis）

※JAMSTEC (Japan Agency for Marine-Earth Science and Technology)

DONET is a system that constantly monitors the earthquakes and tsunamis that occur in the Nankai Trough in real time by observation equipment network installed at the ocean floor.

地震・津波観測監視システムDONETは海底に設置された観測機器ネットワークによって、南海トラフで発生する地震・津波をリアルタイムで常時・監視するシステムです。

From JAMSTEC HP
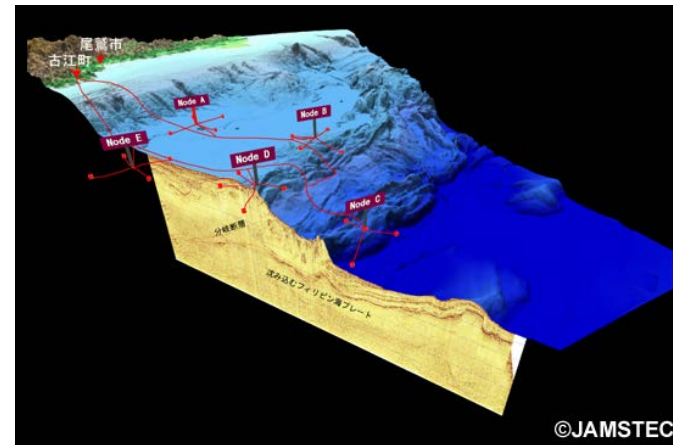
DISAANA(Disaster Information Analyzer)

※NICT (National Institute of Information and Communications Technology)

Enter keywords of disaster information that you want to know

Set the search period

Answer (on map)

Answer (List)

地図データ©2016 Google, ZENRIN

From NICT HP

DISANA analyzes the current posting on Twitter in real time and designates an area.

対災害SNS情報分析システムDISANAはTwitter上の現在の投稿を
リアルタイムで分析し、エリアを指定します。

It automatically extracts problems and troubles related to the disaster occurring there, extracts the answer candidate of the question from the post from Twitter.

発生した災害に関連する問題やトラブルを自動的に抽出し、
Twitterから投稿の質問の回答候補を抽出します。

It can be displayed in list or map. You can easily obtain the information of the disaster that is happening right now.

リストまたはマップで表示することができます。今起こっている
災害の情報を簡単に入手できます

A Case of municipalities (Takamatsu City)

自治体の事例（高松市）

An example of disaster reduction approach with IoT in Takamatsu City

The information will be released on the web next year

FIWARE

Water level of rivers and seawalls

Water Level Sensors : 水位センサー
installed in rivers & waterways :河川、水路に設置

Tide Level Sensors : 潮位センサー
installed in revetments : 護岸に設置

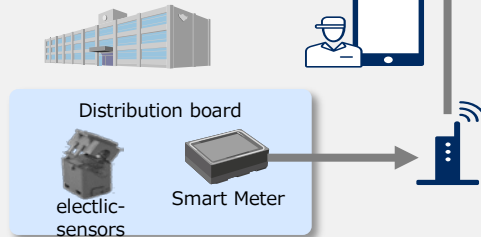**Disaster and water level information from Kagawa Prefecture : 香川県からの防災情報**

Information of evacuation shelters

Smart Meters :スマートメーター
Open or Closed. Judgment from usage information

Smartphone Application: スマホアプリ
City Staff send information to the disaster operation center

Rivers & Seawalls @Takamatsu city

information from Kagawa Prefecture

Evacuation Shelters

Distribution board

electlic-sensors

Smart Meter

Data visualization(データの可視化)

Dashboard @Takamatsu City

Early measures based on realtime data visualization

- **Using for disaster reduction against flooding and inundation**
  - 冠水や洪水の減災のために使用
- **It makes more accurate evacuation order to citizons**
  - 市民により正確な避難指示をだす

From Takamatsu City HP

IoT Oriented Data Driven Platform Service

for Smart Cities & New Business Creations based on FIWARE

Recommended for

- Cities aim to revitalize economy and create new industries
- Cities aim to save cost and improve finance
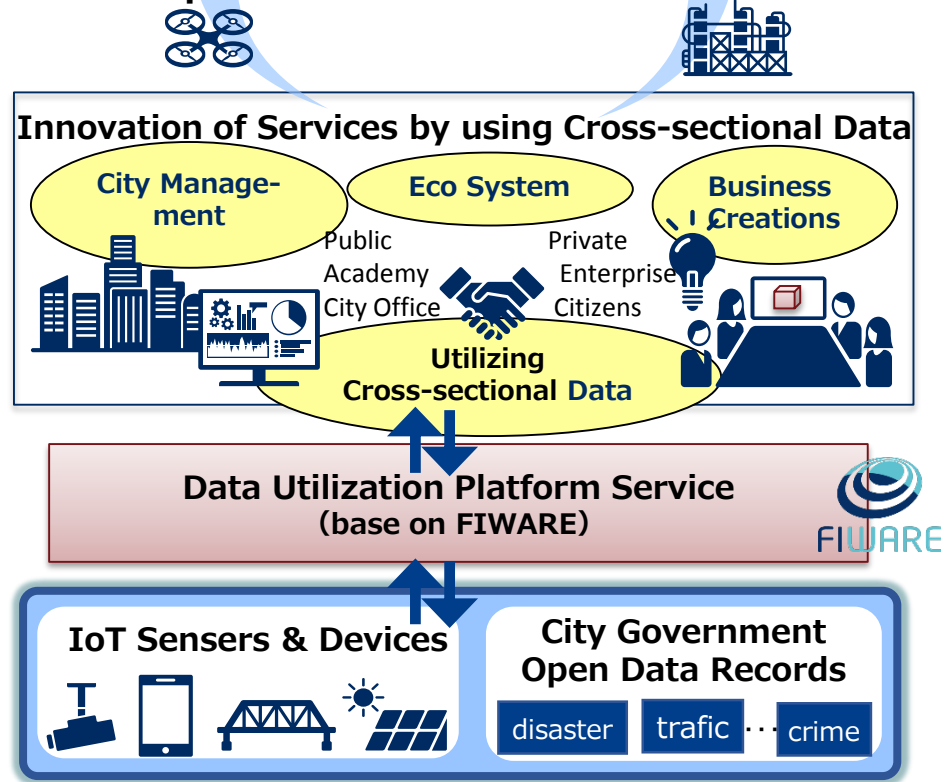- Enterprises aim to create new services and to analyze Big Data

Features and Benefits

- Visualize the city status
  - Identify problems and values with collected data
    - assist in solving the problems in the area
- Form IoT Ecosystems
  - Utilize the analysis of various data
    - help the best governance and cost saving
- Promote sharing information
  - provide knowledge to utilize the stored data
    - stimulate the data utilization in business sector for new service creation

Customer Value Proposition

- Visualization of area data → Reveal and share regional issues
- Information sharing beyond industries supports the formation of an ecosystem of industry,academia,public and private sectors

Expand to other cities and fields

Innovation of Services by using Cross-sectional Data

City Manage-ment

Eco System

Business Creations

Public
Academy
City Office

Private
Enterprise
Citizens

Utilizing Cross-sectional Data

**Data Utilization Platform Service
(base on FIWARE)**

FIWARE

IoT Sensers & Devices

City Government Open Data Records

disaster   trafic   ···   crime

An Example of Private Companies

民間企業の事例

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In 2005 the Japanese government, through a special committee of the Central Disaster Management Council, drew up and began circulating a set of "Business Continuity Guidelines," and revised it in 2009 and in 2013. The government sets a target of convincing almost all large companies and 50% of medium-sized companies to draft BCPs.
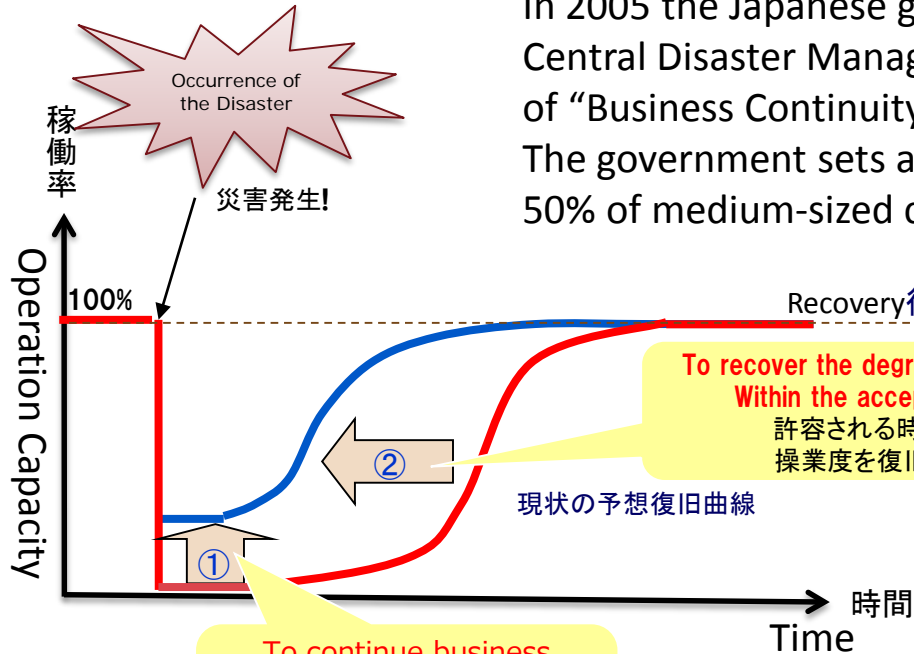
政府は、中央防災会議の専門調査会において、平成17年に「事業継続ガイドライン」を作成し、平成21年、平成25年に改定を重ね、時流に即した普及啓発に取り組むとともに、BCP 策定率の目標を「大企業のほぼすべて、中堅企業の50%（各地震防災戦略・新成長戦略実行計画(工程表)）」に設定し、企業によるBCP 策定及びBCMの促進を図っている。

Occurrence of the Disaster

災害発生！

稼働率

Operation Capacity

100%

Recovery復旧

To recover the degree of operation Within the acceptable limit
許容される時間内に操業度を復旧させる

②

現状の予想復旧曲線

時間
Time

To continue business above the acceptable limit
許容限界以上のレベルで事業を継続させる

①

―――― Present anticipated recovery curve（現状の復旧曲線）

―――― Recovery curve after BCP implementation（BCP後の復旧曲線）

Example of Recovery from Earthquake(2011.3.11)

An intensity of lower 6 on the Japanese scale of 7 in Ichinoseki City

NEC Network Products.ltd Ichinoseki factory. (NEC Platforms .ltd now)
It was possible to avoid the collapse , because we had relocated the equipment of production line
from the 2nd or 3rd floor to the 1st floor and reinforced the leg parts before the day (Mar.11.2011)
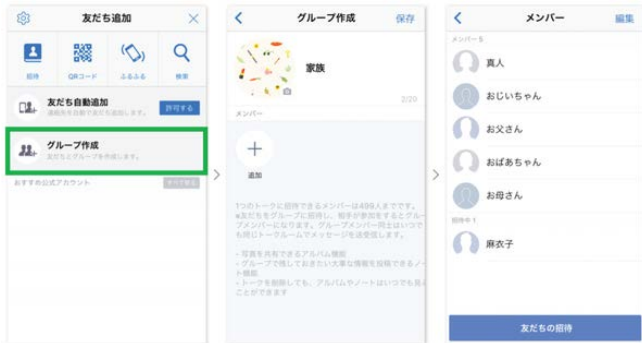
How to use SNS
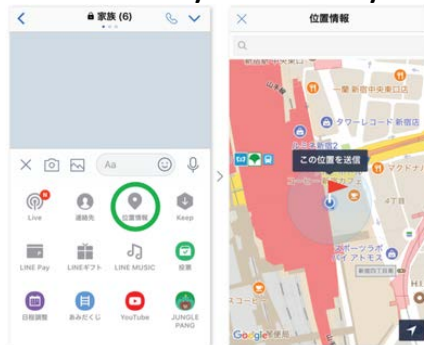
SNSを利用する例

An example of disaster reduction approach with SNS

LINE(The most popular SNS in Japan) provides convenient function

We can create a family group

It informs your family about where you are

We can record important information in the share note
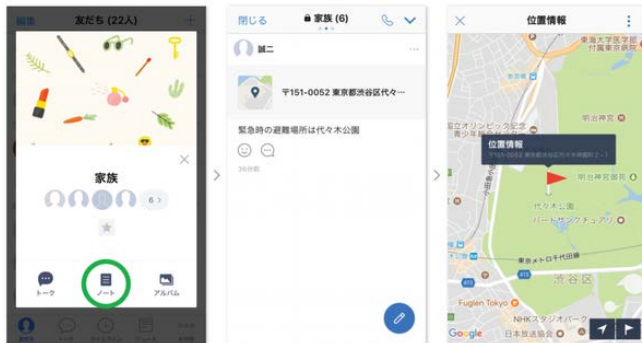
LINE has emergency function

In case of emergency, it forces you to check your safety.

非常時、ラインアプリは強制的にあなたの安否を確認します

Let's create your family group

Create a group

Create Group name "My Family"

Select Group members

My Family

My Son
My Father
Me
My Mother
My Wife
My Daughter

家族のグループを作って、メンバーを選びましょう

We can keep an important message on the top
大事なメッセージを上部に残せます。
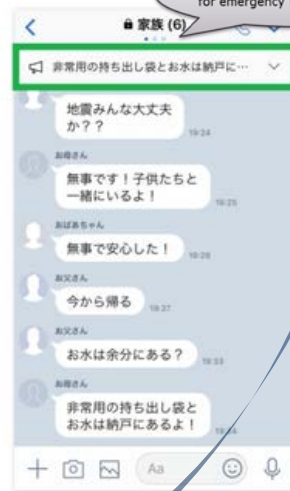
There are some bottles of water and bags for emergency in the storeroom!

There are some bottles of water and bags for emergency in the storeroom!

We can record important information in the share note
ノートを利用して、大事な情報を家族で共有できます

Push
"NOTE" Button

And, you select
the meeting place
on a map

The meeting place is
marked on the map.
The group members are able
to share those information.

It informs your family about where you are
自分がどこにいるかを家族に知らせます
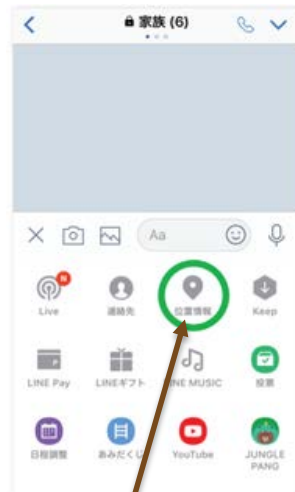
Push
"Location information"
Button

It informs your family
that you are here.
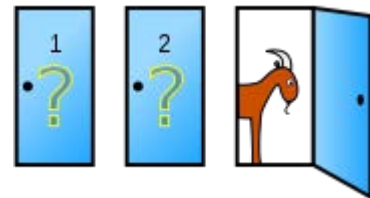
Problem for us to survive

生き残るためには

What is we need?

"We'll need to make decisions based on new & right information and conditions"

≒70%

Even if the conditions change, about 70% of people do <u>not change</u> the decision

条件が変わっても、約70%の人が
選択肢を変えない

©Wikipedia

Monty Hall problem

> 95%

When the conditions change, more than 95% doves will <u>change</u> their decision.

条件が変わると95%以上の鳩は
選択肢を変える

Takeharu Seno (Associate Professor, Kyushu Univ.　2016)