



Public Psychology Lab., University of Tsukuba

SIP-adus
Plenary Session
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Social acceptance of **A**utonomous **V**ehicles

A qualitative analysis of **Japanese newspaper articles** on AVs

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Our Research Questions 2016-2021

1. What is social acceptance? Interview survey and conceptual diagram
2. How do people perceive AVs? Risk perception map
3. People's level of approval or disapproval and its determinants
4. Does the level of approval or disapproval change before and after the experiment?
Monitors vs. residents
5. Does the coverage of AVs accidents change people's perceptions?
6. Should AVs assume pedestrian traffic violations? What do the public think and why?
7. Who are the people most likely to change their minds about AVs accidents?
8. How have AVs been reported in the newspapers? **Today's topic**
9. The NIMBY problem with AVs: I'm all for AVs, but I don't want them tested in front of my house
10. How have we embraced the car? Newspaper and TV programme analysis
11. The shift from pedestrian priority to regulation in the US: the origin of the term Jaywalk
12. An international comparison of attitudes towards AVs: Japanese power word 'deregulation'
13. In : ELSI issues of AVs in philosophical dialogue
14. In process: Is it acceptable for AVs to break traffic rules? Legal interpretation and public assessment
15. In progress: Subjective meanings of activities on the travel and their transformative potential for AVs
16. In progress: The impact of Sakaimachi's self-driving buses on the civic pride of the town's residents

How have *AVs* been reported in the Japanese major newspaper?

From an analysis of articles in the Yomiuri Shimbun

Agenda-Setting Effects of Mass Media

Bernard C. Cohen (1963)

The press and foreign policy

*the press is significantly more than a purveyor of information and opinion. It may **not be successful** much of the time in people **what to think**, but it is stunningly successful in telling its readers **what to think about**.*

According to Takeshita (1981), this article advocates and most brief explains the agenda-setting effect

竹下俊郎 (1981). マス・メディアの議題設定機能研究の現状と課題. 新聞学評論, 30, 203-218.

Maxwell E. McCombs and Donald L. Shaw (1972)

The Agenda-Setting Function of Mass Media

Examining the effects of mass media agenda-setting in the 1968 presidential election

- (1) Investigate the actual content of the mass media during the election campaign.
- (2) Interviewing 100 voters who have not yet decided which candidate to vote for
- (3) Comparing and verifying press coverage and interview results

Correlation between press coverage and interviews suggests the existence of an agenda-setting effect

Media

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Media

Newspapers, Weeklies, Magazines,
Radio, TV, Online News, SNS etc.

Why Newspaper articles?

- Readership has decreased in recent years, but...
- It's all **Text data**. → Easy to analyze.
- Some of **Old Articles** still exist as archives.
 - Long term comparison & analysis is possible.
- Sometimes, it's a **Source of Information** for the other media.
 - The propagation range is wide.



So we **Focused on Newspaper Articles**

Many Online News are Based on Newspapers

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Account of the Japanese newspaper on Twitter



More than 761K people follow the newspaper's account.

LINE is the most Popular messaging app in Japan. (It's like WhatsApp.)

You can also check the news in the same app.

LINE NEWS based on newspapers



Line and other online news are based on newspaper articles.

A lot of Japanese people would **Read Newspaper articles, not Directly, but Indirectly.**

Aim

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To clarify

Agenda on Autonomous Vehicles (AVs)
Provided to **Society** by the newspaper articles

In this study, we aim to

Understanding **Agenda transition**
for the development and introduction of AVs

In the future...

We would like to describe
how **Dominant Story** about AVs will be replaced
by **Alternative Story** in Japanese society.

Method: Source & Period

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Newspaper

The Yomiuri Shimbun Morning Edition
Yomiuri Database Service “Yomidas Rekishikan”

**Extraction
method**

(1) Search by the following terms

Autonomous-Driving and Vehicles

not Trains not Railways not Electric-trains not Subways not
New-Tram not Monorail not Linear not Coaster not Air-purifiers

自動運転 driverless car **and 車** vehicle

not 列車train not 鉄道railway not 電車electric train not 地下鉄subway not ニュートラム
newtram not モノレールmonorail not リニアlinear not コースターcoaster not 空気清浄
機air cleaning system

(2) Exclude duplicate content.

Priority 1:Tokyo Edition 2:Osaka Edition 3:Chubu Edition

(3) Exclude non-vehicle autonomous articles.

Article Period.

From 1989 – 2020 autumn

**The oldest article
about AVs was
published in 1989**

Method: Extraction of AVs related articles

Newspaper
Articles

Extraction by keyword

Autonomous-Driving and Vehicles

Not Trains not Railways not Electric-trains not Subways not
New-Tram not Monorail not Linear not Coaster not Air-purifiers

AVs
RELATED
Articles

Read each article and collect information
of **Agenda** related to AVs

- ✓ The events that made the article
- ✓ Purpose of Development and Introduction
- ✓ Development and introduction issues
- ✓ Claims/opinions (positive/negative/neutral)

Analysis and Discussion Points

Ex) **Has the purpose of developing and introducing AVs changed over time?**

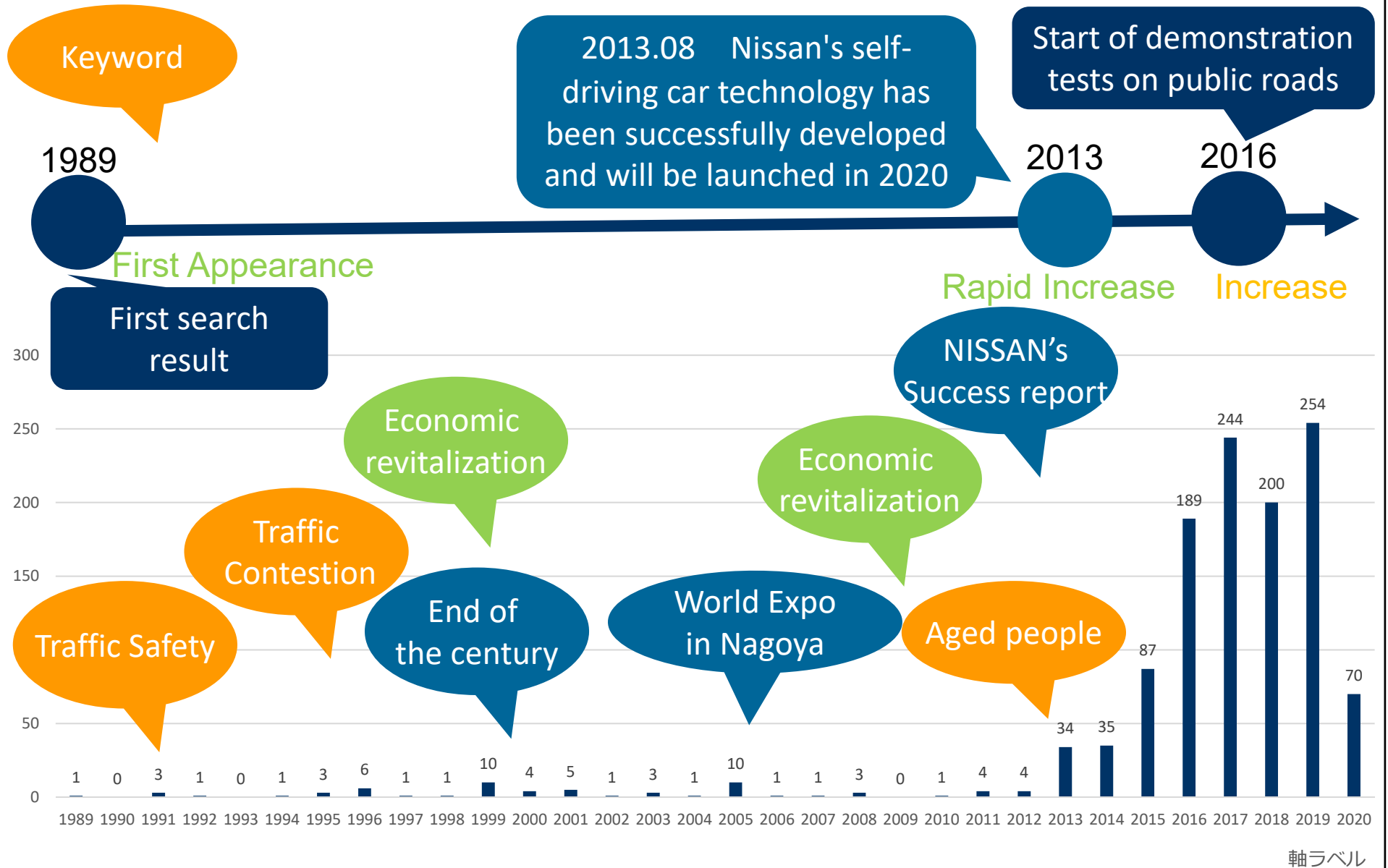
◆ Older Articles....

Traffic Safety and Congestion Relief

◆ New Articles... Economic revitalization
and International competition

Transition of number of articles & Keywords

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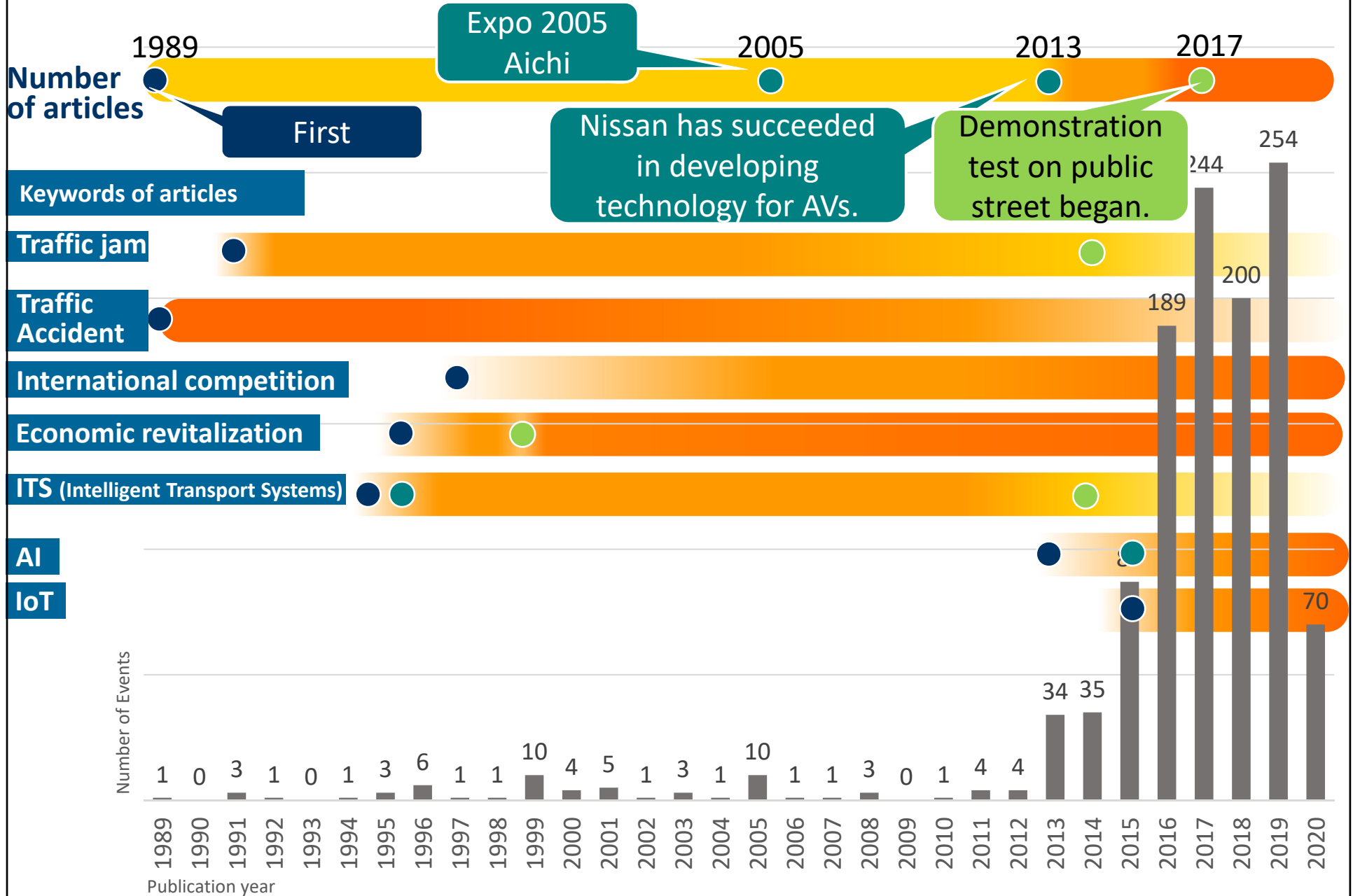


Changes in
the number of articles
and
Objectives and challenges

Number of Articles

Explanatory note

- Appearance
- Rapid Increase
- Turning Point
- Keyword a few
- Frequency of Appearance a lot



Aims of AVs Development

Group name	Contents (number of articles)
Competitive success	International competition (135), Competition in the automobile industry(131), Competition with other industries(76)
Safety	Traffic injuries (106), Safety(61), Traffic problem(1)
Economy	Economic impact (68)
Traffic congestion	Ease of traffic congestion(30)
Outing support	Outing support for Older and disabled people(50)
Bus driver shortage	Ease of Bus driver shortage (37), transport in depopulated areas(9), Driver's burden (10), Reduction of operating costs of public transport(5), Escort trips(2)
Dreams / romance	Dreams/ romance(21), Lifestyle(5)
Effective use of travel time	Effective use of travel time (5)
Other services	Various services(4), ATM(1), Vehicle allocation(3) Vending machine(1), Services by each area(1), Rideshare(2)
Protection of the natural environment	Protection of the natural environment(7)
Others	Others(25), Appealing of local area(1)

Challenges of AVs deployment

Group name	Contents (number of articles)		
Technology	Techonology(68)	International standards	International standards(25)
Social acceptance	Social acceptance (33)	Infrastructure	Infrastructures(18)
Funds	Research and development funding (90),Finance(2)		
Legal & Insurance	Law and regulations (70), Responsibility (51),Insurance(17)		
Machine replacement	Pleasure of driving (11),Driving replacement by machine(9)		
Development organization	Lack of domestic leadership(8), Speed of decision making(1)		
Side effects	Overconfidence (8),Side effects(5), Switching between human and machine(1)		
Price	Price(6),Maintanance cost(1)		
Ethical issues	Ethics(5), The meaning of human existence(1), Balance between convenience and security(1)		
Lack of human resources	Lack of human resources(5), Lack of researchers(3)		
User's knowledge	Education(3),Explanation(2),License(2),Maintenance(1)		
New technology	Significance of new technology (2), new type of traffic injury(1)		
Others	Others(20), Time of introducing(1),Time(1), Information leakage(1),Military use(1)		

**Qualitative analysis of
first articles and
turning points in AVs**

The first article

High technology: the ultimate dream come true (series)
(1989/10/31)

···"How nice it would be if cars could drive themselves automatically, at the driver's discretion. Mitsubishi Motors Corporation's HSR-2 is one step closer to achieving this **ultimate dream**···

Still a long
way from
deployment

Goal

The ultimate dream

Symbol of Future Mobility



AVs as a **Symbol** of technological development

Intelligent Transport System :

Traffic congestion information: VICS

Automatic toll collection on motorways: ETC, etc.

→AVs was clear and easy to use as an example?

- 1995-2003 AVs were often used as an example of **ITS**.
- 2005- AVs were often used as an example of **IoT**.
- 2015- AVs were used as an example of

AI, Deep Learning, and 5G.

Among ITS technologies

VICS/ETC → practical use & popularization

AVs → Under development for

more than 20 years

Communication, IT, surveying, mapping,
space/satellite

**Various industries are involved in
the development of AVs**

AVs has become a **symbol**
of the whole technology development



Qualitative analysis of **aims** of AVs development

First article regarding ease of traffic injury

[Editor's Note] High-tech cars must be in harmony with road facilities(1991/07/22)

The world's first car was a steam car built in France in 1769. The car was capable of travelling at a speed of 3.2 km/h in 15 minutes. Unfortunately, the car crashed into a wall during its test run.

It is ironic that the first traffic accident occurred at the same time as the car, but it symbolises the relationship between the two. With our newfound speed and high technology, we are still plagued by road accidents... **Automated driving systems are still a distant dream, but safe driving and crash prevention systems are already a reality.**

Theoretically, it is possible to make a device that detects people falling asleep. But what about the possibility of advanced devices taking over the full responsibility of driving? Unlike aeroplanes, **safety on the road, where many things are mixed together, must be sought in harmony between people, vehicles and facilities.**

The world's **first car** (1769) on the world's **first road accident**



An article bemoaning **the modern age plagued by road accidents**



Introducing **safety function of AVs**

Expectations for AVs to prevent accidents



Also mentions challenges of AVs

How Economic Revitalization became the GOAL.

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Point1

■ 1995-2014

“自動運転車(AVs)” was often used to explain the meaning of ITS.

ITS:

A system that sends traffic congestion and other information to vehicles :VICS
Automatic toll collection system for highways: ETC, etc.

→ Was the AVs **Clear and Easy to Use** as an example?

Point2

■ 1996-1999

The Ministry of Construction has announced an estimate of ITS economic benefits "50 trillion yen in 20 years"

The bursting of the bubble economy in 1991, the Great Hanshin-Awaji Earthquake in 1995
→ Has a dark period of recession and major disasters **Raised Hopes of Economic Recovery?**

"ITS means AVs and others" "The economic benefits of ITS can be expected"
The two elements were often listed in the same article (12 cases)

It is possible that there is a tendency
to Expect Economic Benefits from AVs through ITS.

21 International Competition and tragedy of Japanese 'Galapagos' Mobile Phones

A step towards the dominance of Japanese cars - Proposing an international standard for automatic driving to avoid the failure of "Galapagos" (2014/06/24)

The government has in **mind the bitter experience of the mobile phone** industry. **The "Galapagos mobile phone"**, which boasted advanced technology but evolved differently from the rest of the world due to its own standards that were **far removed from international standards, lost out in international competition**. As a result, the government, in its efforts to promote international standardisation, has decided to reflect the "emphasis on pedestrian protection" in its standards. The government is therefore keen to **increase the international competitiveness of Japanese manufacturers** by reflecting the "emphasis on pedestrian protection" in the standards.

IoT International Standards: Making the Most of Galapagos Lessons (Commentary) (2014/09/27)

The battle for standards takes **a lot of time and money**.
If they are defeated, **all efforts will be lost**.

Why international competition has become the aim of AVs development

Ranking of exports to the world (value) 1995-2019 No.1: Automobile

財務省貿易統計,最近の輸出入動向, 主要輸出入品の推移 <https://www.customs.go.jp/toukei/suii/html/time.htm>

lost out in
international competition
of AVs development

=

not be able to
export automobile

=

Crisis in the Japanese
economy where automobile
are a key industry

Galapagos mobile phone is
Failed to develop Japan's
independent line

No matter how safe and excellent AVs are developed, they will not last long if they cannot be made to world standards. We need to sell them to the world to recover our investment.

The newspaper provided an **agenda** of the **relationship** between **"AVs"** and **"international competition"**.

However, many of the articles did not explain **"why"** we need to **"win the international competition"** or only explained the situation that "international competition is severe".

This may lead to **confusion** between **means** and **goals**.



**Qualitative analysis of
Challenges
of AVs deployment**

Accident due to **overconfidence**

November 2016, During a test drive of a Nissan AVs, a salesperson encouraged him not to brake and he crashed into the car in front of him.

Functions of the car: not working properly due to weather and ambient conditions

But

Despite it being **dark and raining**, the salesperson in the test car **did request the customer not to brake** because he thought the AVs would be activated

The test car collided with a car at a traffic light, causing minor injuries to the customer.

The number of similar incidents is increasing every year

Drivers should not be **overconfident** about AVs: mentioned by 8 articles

The challenge is how to prevent accidents caused by overconfidence in AVs by drivers and other humans

Infrastructure development

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Infrastructure needs to be developed 19 articles in total

✕15 articles did not specify any specific infrastructure

Driving with
sensors and GPS

Low speed driving,
in town centre

Guidance by
magnetic marker

The control systems and
use of AVs are diverse

To reduce the burden
on highways

||
The required infrastructure
differs from system to system

↓
The systems and methods of AVs were vague,
making it difficult to discuss the necessary infrastructure?

In the future, it is necessary to discuss
the specific situations in which AVs can be used.

Article on the **issue of funding** for the development of AVs

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- 1994-2005 - The government has a budget for the development of AVs
- 2014- **Increasing development costs** for companies noted
- 2016- Capital alliances & joint research **to reduce the high cost of AVs development**

30 years of research
and development of AVs

Companies want to **recoup**
their development costs in profits

AVs is a **symbol** of
technological development

No country or company can get out of the AVs business

Inconsistency?

Development costs are a heavy load for companies



The purpose of the development of AVs was to provide economic benefits, but...

As of 2021, the implementation date of AVs is uncertain

The social deployment of AVs **may revitalise the Japanese economy**,
but could it lead to **financial and business collapse** before that?

Summary

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- ◆ AVs have become **a symbol of overall technological development**.
- ◆ The image of **economic revitalisation** by AVs has been created **through the press reports on ITS**.
- ◆ Lessons **from Galapagos mobile phones** are behind the emphasis on **winning international competition**.
- ◆ **Overconfidence in AVs** as a cause of accidents.
- ◆ The **lack of a specific topic on "infrastructure development"**.
- ◆ There is a **contradiction** between the *economic revitalisation* effect of AVs and *the increased burden of development costs*.

In many articles, **the agenda is presented**.
However, at least in the newspapers,
the specific discussion has not deepened
and is considered to be in its future.

Thank you for your attention



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