Ministry of Health, Labour and Welfare
For people, life and the future

Future of Employment in Japan

Ryutaro Kubo

Employment Security Bureau,
Ministry of Health, Labour and Welfare, Japan

kubo-ryuutarou@mhlw.go.jp

Overview of Survey

〇 Fry & Osborne (2013) show that 47% of all employees in the US are working in jobs that could be performed by computers within the next 10 to 20 years.
〇 The private laboratory which contracted with MHLW (Ministry of Health Labor and Welfare) conducted a survey in 2017 to explore how companies think of the development of AI/IoT/BigData.

Overview of Survey

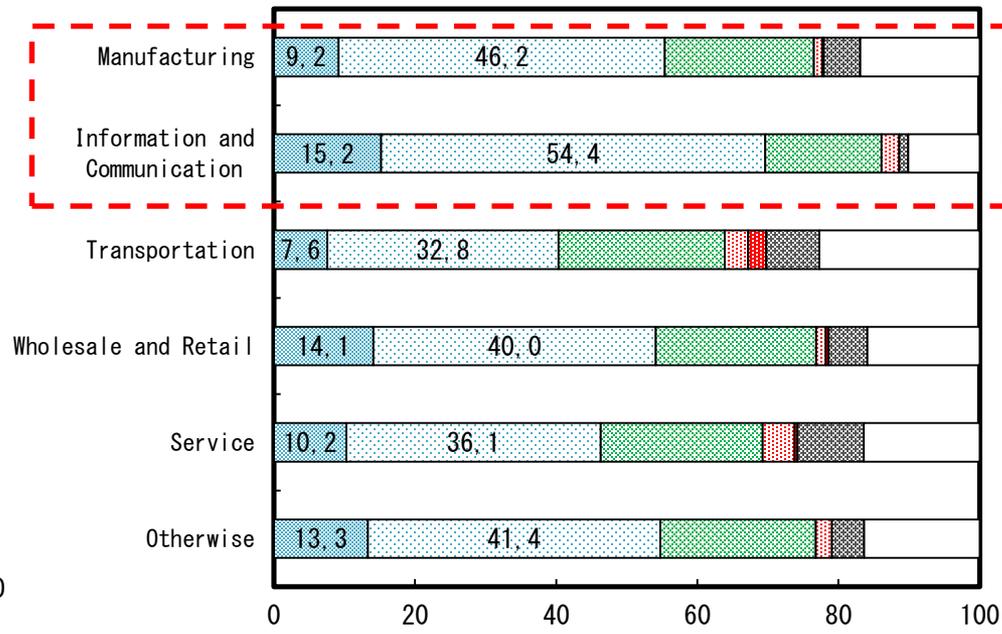|	
（１）Purpose and contents of survey	To investigate and analyze the effect of AI/IoT/BigData on the employment in Japan, and consider necessary policies.
（２）How to conduct survey	
①Target of survey	Top 10,000 large companies(except public sectors)（number of collected:1,375)
②How to conduct	Mail
③Respondent	Managers in sector of business planning
④Period	January/7〜February/13 in 2017
（３）Main terms of survey	
①Property of establishments	Industry, Scale, Year to establish, Place of head office
②Situation of introducing and utilizing AI/IoT/BigData	・The effect of AI/IoT/BigData on managing companies (recent 3 years,5-10years later) ・Idea of effect on employment ・Situation of utilizing AI (Total, Sectors) ＜For companies to utilize or to hope to utilize AI＞ ・Increase or decrease of tasks (Total, Sectors) ・The degree of replacement (Total, Partial, No affected),or creation of jobs ・Increase or decrease of the amount of jobs (Total, Sectors)
③Direction of change and actions for 2030	・Ratio of replacement (Total, Partial, No affected) ・Necessary efforts to continue to adapt to future job

Effect of AI/IoT/BigData

○ Questionnaire: Effect of development of AI/IoT/BigData on establishments
○ In the long span, companies in all industries show positive response. In particular, the majority of companies in the industry of "Manufacturing" and "Information and Communication" regard the effect as either strongly positive or positive.
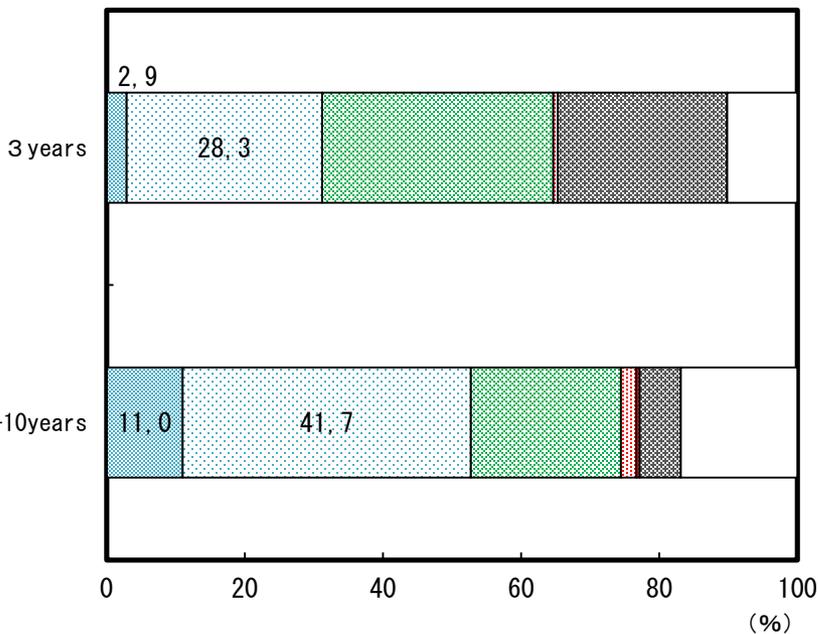
Left chart legend:
- Strongly positive
- Positive
- Neither positive nor negative
- Negative
- Strongly negative
- No impact
- Unknown

3 years: 2, 9 / 28, 3
5-10 years: 11, 0 / 41, 7

Right chart:
- Manufacturing: 9, 2 / 46, 2
- Information and Communication: 15, 2 / 54, 4
- Transportation: 7, 6 / 32, 8
- Wholesale and Retail: 14, 1 / 40, 0
- Service: 10, 2 / 36, 1
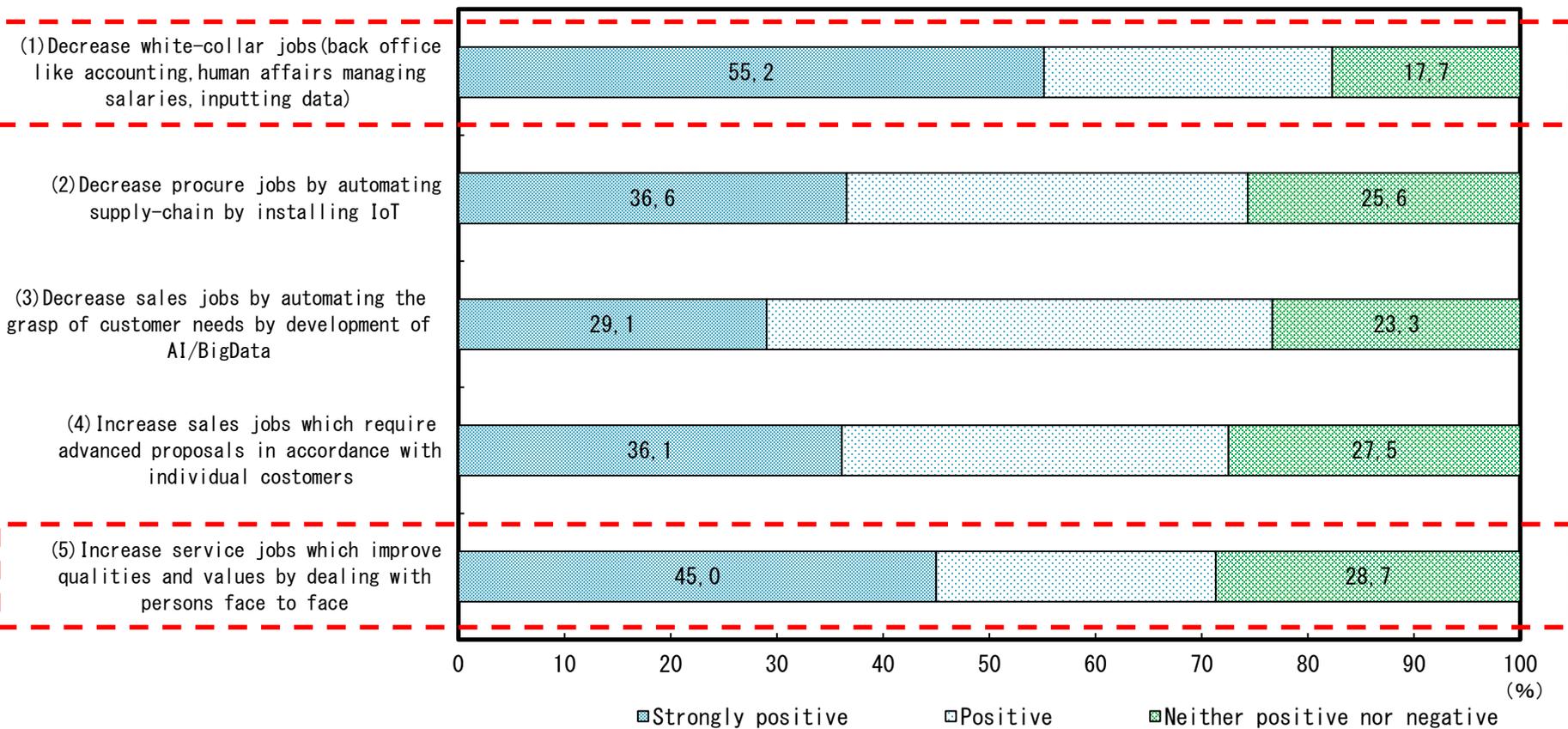- Otherwise: 13, 3 / 41, 4

Right chart legend:
- Strongly positive
- Positive
- Neither positive nor negative
- Negative
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- No impact
- Unknown

Effect of AI/IoT/BigData
(What kind of jobs will be replaced or created?)

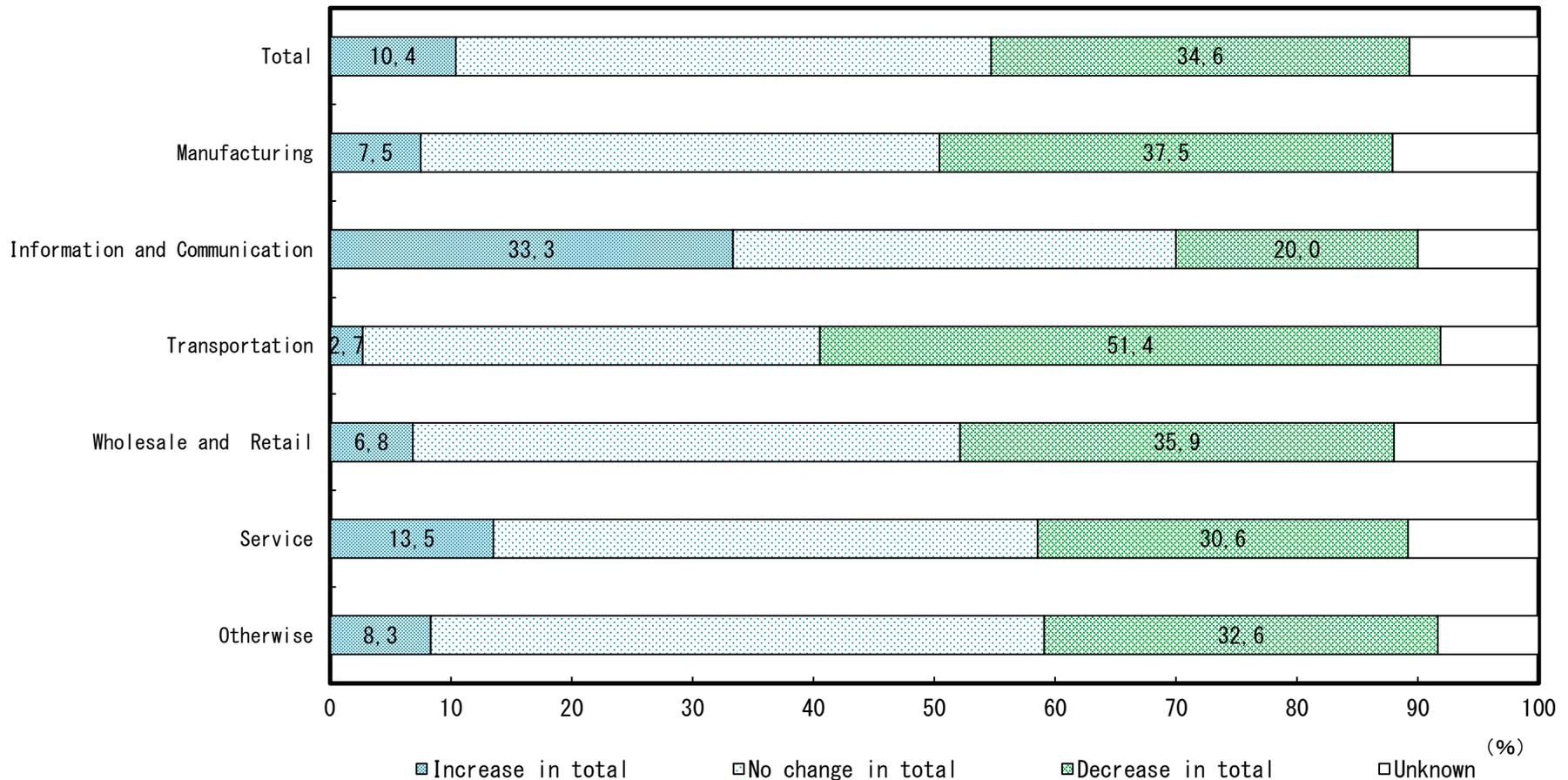○Questionnaire: Effect of development of AI/IoT/BigData on employment
○Back-office operations for white-collar workers will decrease, on the other hand, service jobs which deal with persons face to face will increase.

(1)Decrease white-collar jobs(back office like accounting,human affairs managing salaries,inputting data)	55.2	17.7
(2)Decrease procure jobs by automating supply-chain by installing IoT	36.6	25.6
(3)Decrease sales jobs by automating the grasp of customer needs by development of AI/BigData	29.1	23.3
(4)Increase sales jobs which require advanced proposals in accordance with individual costomers	36.1	27.5
(5)Increase service jobs which improve qualities and values by dealing with persons face to face	45.0	28.7

Scale: 0 10 20 30 40 50 60 70 80 90 100 (%)

☒Strongly positive   ▫Positive   ☒Neither positive nor negative

Effect of AI/IoT/BigData
(What amout of jobs created or replaced?）

○ Questionnaire: Effect of development of AI/IoT/BigData on the amount of employment
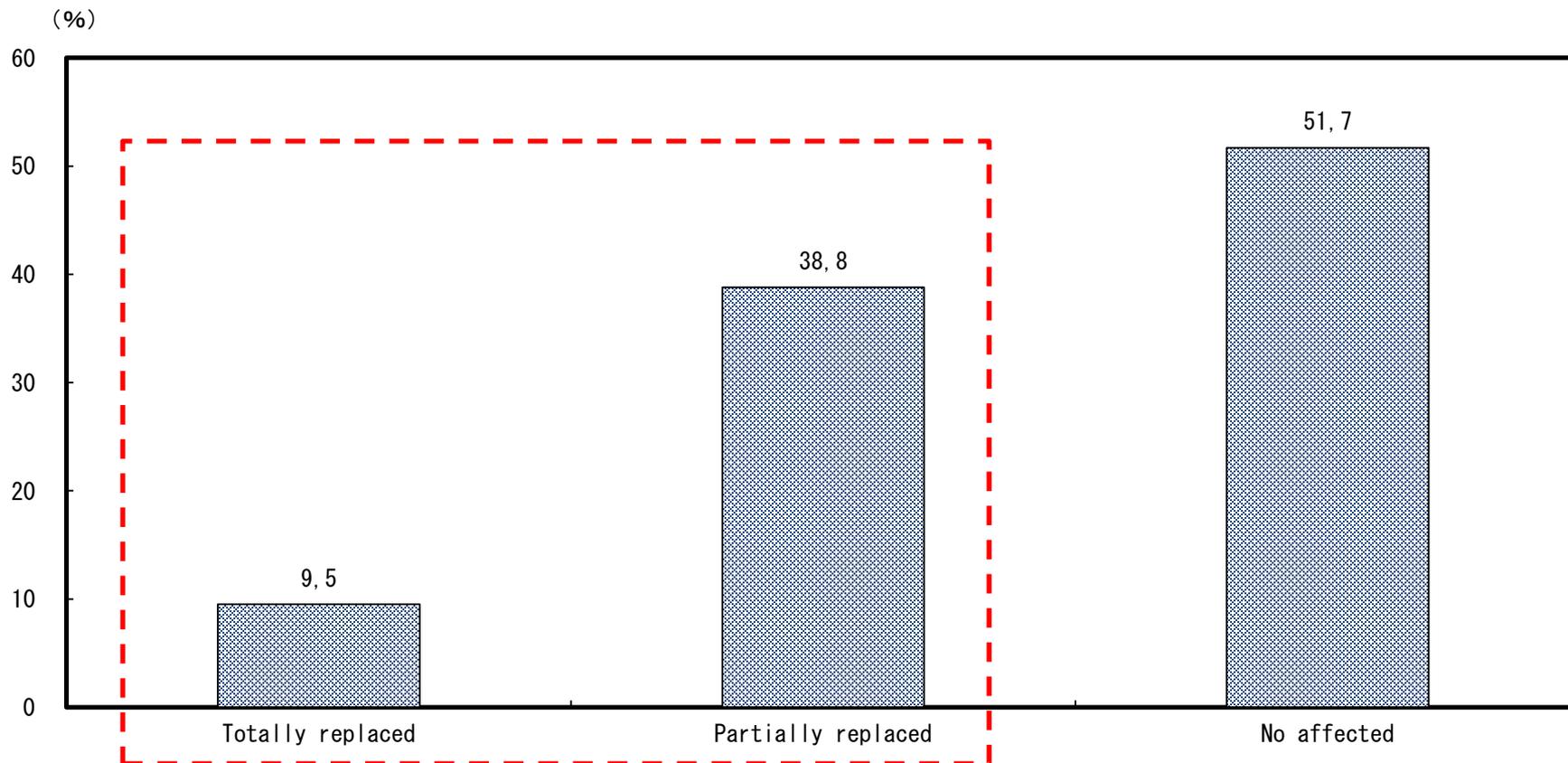○ Except "Information and communication", the amount of jobs will decrease in all industries.

	Increase in total	No change in total	Decrease in total
Total	10.4		34.6
Manufacturing	7.5		37.5
Information and Communication	33.3		20.0
Transportation	2.7		51.4
Wholesale and Retail	6.8		35.9
Service	13.5		30.6
Otherwise	8.3		32.6

0 10 20 30 40 50 60 70 80 90 100

（%）

▨Increase in total　　☐No change in total　　▨Decrease in total　　☐Unknown

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Effect of AI/IoT/BigData
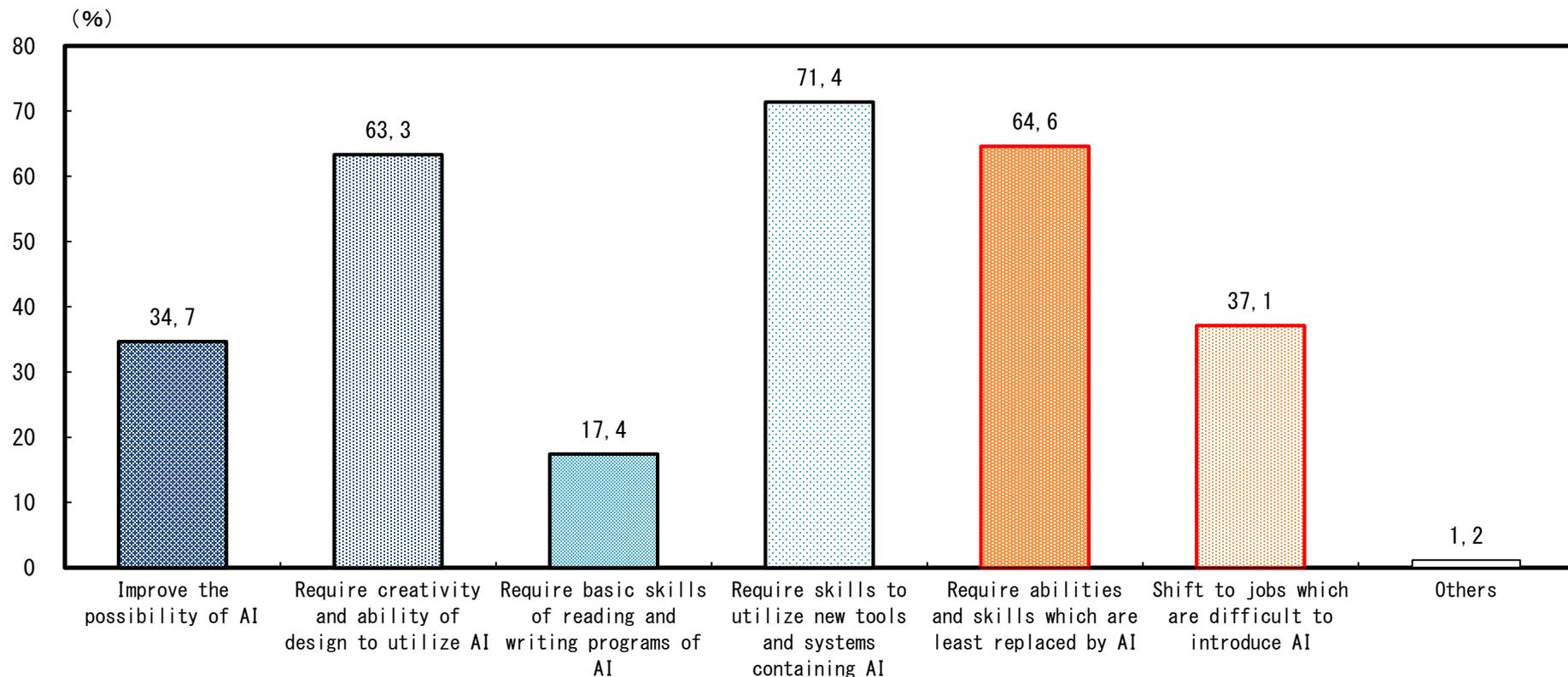## (What degree of white collar jobs(in middle age) will be replaced?)

○ Questionnaire: The degree of replacement of white-collar jobs (aged about 40 in 2017) by development of AI/IoT/BigData

○ About half of jobs (48.3%; Totally/Partially replaced) engaged by white-collar employees (aged about 40 in 2017) will be replaced by AI/IoT/BigData in 2030, when they will be about 50 years old.

（%）

60	
50	51,7 (No affected)
40	38,8 (Partially replaced)
30	
20	
10	9,5 (Totally replaced)
0	Totally replaced / Partially replaced / No affected

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Effect of AI/IoT/BigData
(What should we do to respond to AI?)

○ Questionnaire: Competencies (i.e. knowledge, skills and abilities) required for senior white collar employees to adapt to the future jobs.

○ The responds to job replacement by AI/IoT/BigData are following two patterns.

1. Require skills to utilize AI

2. Require skills which are not replaced by AI/IoT/BigData ,or shift to new jobs which are difficult to introduce AI

（%）

Category	Value
Improve the possibility of AI	34, 7
Require creativity and ability of design to utilize AI	63, 3
Require basic skills of reading and writing programs of AI	17, 4
Require skills to utilize new tools and systems containing AI	71, 4
Require abilities and skills which are least replaced by AI	64, 6
Shift to jobs which are difficult to introduce AI	37, 1
Others	1, 2

Conclusion（The effect to the amount of jobs and individuals)

○ The effect of AI/IoT/BigData on the amount of jobs and individuals

（**The effect on the amount of jobs**）
- ・The development of AI/IoT/BigData will decrease the total amount of jobs in Japan.
- ・However, it doesn't necessarily mean that a certain amount of unemployment will increase, because we predict that the labor force in Japan will decline.

（**The effect on individuals**）
- ・AI/IoT/BigData will not substitute all tasks of a job, but do partially.
- ・In order to engage in the new jobs created by AI/Iot/BigData, employees need to require new skills to utilize AI/IoT/BigData.

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Thank you for your attention.
If you have some questions,
contact me individually later