

# VIEW OF JAPANESE GRAPHIC ARTS INDUSTRY IN THE 21ST CENTURY

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## ABSTRACT

The graphic arts industry in Japan has reached the top level in the world in aspect of the production volume and the quality. The authors have already reported the prediction of delivery amount of Japanese graphic arts industry by computer simulation. In this paper, we summarized the view to the year of 2020 in the printing industry and the graphic arts related industries and clarified the role and the force of graphic arts industry in the higher information society in the future. We also discussed the solution methods of fostering of human character and the secureness of human power.

### 1. Introduction

The authors of this paper have reported the prediction of delivery amount of Japanese graphic arts industry (printing industry, photomechanics industry etc.) in the 21st century in "2025 Technical Information"<sup>(1)</sup>, "Paper and Press"<sup>(2)</sup> and "The Fall Conference of SPSTJ"<sup>(3)</sup>, etc.

This report added the production amount prediction of printing machines and printing papers, etc. based on these data and clarified the roles and forth of graphicarts industry in the higher information society to come in the future.

Further, the fostering of human character and the secureness human power are important themes for the graphic arts industry to achieve the additional development, and this paper sum-

marized the view in the future including the solution methods of these problems.

### 2. View to the Year of 2020

The delivery amount of graphic arts industry in Japan is estimated to reach 15 trillion yen in the year of 2000 by the Ministry of International Trade and Industry has been discussed by the graphic arts industry.

The authors of this paper estimated the delivery amount up to the year of 2020 from the delivery amount actual record date of graphic arts industry from 1971 to 1987, using the time-series analysis.

As a result, the delivery amount proved to reach 15 trillion yen in the year of 2000, 27 trillion yen in 2010 and 46 trillion yen in 2020<sup>(1)(2)(3)</sup>.

As reported already, the delivery amount of graphic arts industry in Japan has high correlation with the GNP (Gross National Production) , and this is also true in the graphic arts industry in America.

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Therefore, from the actual records of GNP from 1965 to 1988, the author predicted the GNP values up to the year of 2020 similarly to the case of graphic arts industry.

As a result, the GNP values could be expected to reach 601 trillion yen in the years of 2000 and 1,711 trillion yen in 2020.

The correlation matrix for the predicted value of this GNP and the estimated delivery value of graphic arts industry proves to be 0.97 and it could be clarified that the graphic arts industry depends heavily on the GNP.

Consequently, it is not an overstatement that the vitalization of Japanese economy leads to the prosperity of graphic arts industry.

### 3. Printing Industries in the World

Willkomm<sup>(4)</sup> has taken the statistics and made the analysis of printing production amounts in 187 nations over the world.

The printing production amounts in 187 nations over the world in the year of 1989 can be classified as follows by 5 great continents, and reached the level of 241,6 billion dollars in 187 nations in total:

- (1) European Continent (34 nations) :  
96.1 billion dollars (39.8%) .
- (2) American Continent (43 nations) :  
85.1 billion dollars (35.2%) .
- (3) Asian Continent (42 nations) :  
53.8 billion dollars (22.2%)
- (4) Oceanic Continent (14 nations) :  
3.7 billion dollars (1.5%)
- (5) African Continent (54 nations) :  
2.9 billion dollars (1.2%)

The rankings by nations in the production amounts in the year of 1989 proved to be the 1 st for America (including Canada) with 77.4 billion dollars, the 2 nd for Japan with 40.8 billion dollars, the 3 rd for Germany with 18.9

billion dollars, the 4 th for Old Soviet Union with 18.1 billion dollars, the 5 th for France with 11.8 billion dollars, the 6 th for England with 10.9 billion dollars and the 7 th for Italy with 10.1 billion dollars.

The total production amount of these 7 nations reached 188 billion dollars, which means that these nations occupy 77.8% of the total production amount over the world.

On the other hand, the population in Japan is 123 million persons which is 2.4% in the population percentage out of 5,136 million persons or the total population of the world, but occupies 17% of the world printing production amount.

No sufficient quantitative data are available as regards the printing quality, but Willkomm's data indicates Japan as the 1 st ranking and America as the 2 nd ranking.

The authors had the chances of observing the European and American printing industries at the exhibitions of Drupa 1990, Print 1991, TPG 1992 and Expo 1993, and discussed the production and quality with them at the local sites.

From these experiences, the authors guessed that the emphasis is placed on the production in America and that the importance is focused on the quality in Europe.

In the case of the Japanese graphic arts industry, the quality control is thoroughly done and the emphasis is placed both on the production and quality.

### 4. Rapid Progress of Graphic Arts Related Industries

The basic research in Japan is poor and the emphasis has been placed on the research and development until today.

However, because of the development in each of industries, the tendency that the basic research being occupied in the investment to

research/development is expected to reach 20% on average in the year of 2000.

The publishing and printing industries have a low percentage of basic research at 2.8% (1988) as compared with that of respective industries.

The publishing and printing industries should preferably carry out the unique basic research by themselves.

On the other hand, according to the order reception tendency by machine models of industry machinery, a printing machine and the like can be pointed out in the field high in the growth percentage in the year of 2000.

The production amount of printing machine (excluding those in the field of news paper) in 1989 reached 280 billion yen and is estimated to reach 882 billion yen in the year of 2000<sup>(5)</sup>.

In the prediction of computer simulation at the author's laboratory, the production was computed to reach 897 billion yen in the year of 2000.

Out of these machines, the offset printing machine elongates conspicuously and the production of this machine can be anticipated the level of 702.5 billion yen (78.3%).

In the production transition up to 2000 of printing and bookbinding machines, the elongation of printing machine and the photomechanics machine is high.

Moreover, the elongation is delivery amount of graphic arts industry has high correlation with that of printing machines, especially the offset printing machines, and the growth and development in the field of offset printing machines can be anticipated.

## 5. Securance of Human Power and Fostering of Human Character

The securance of human power and fostering of human character are urgently required also

in the graphic arts industry which is growing up to the 15 trillion yen industry in the year of 2000.

As a result of investigating the employment situation at the graphic arts education organization in Japan, the employment to the graphic arts fields lowered to 33% in 1990 from 69% in 1986 in universities, and thus the university graduates outflow to the other industries.

In addition, the number of applicants to the graphic arts education organizations is currently decreasing year after year, and the graphic arts education is being conducted with new curriculum which has introduced computer and design course in addition to the conventional printing course by changing the printing course into graphic arts course, image engineering course, etc.

The authors conducted a questionnaire survey concerning the contents of graphic arts education to the teachers in charge of the printing education in Europe, America and Japan<sup>(6)</sup>.

As a result, it was found out that the graphic arts education in Japan places its focus simply on the graphic arts process and that the graphic arts education in Europe and America put their emphases on the connection of graphic arts industry with education.

This type of difference in the contents of education and the education method is estimated to have a great influence on the development of graphic arts industry in the future.

## 6. Conclusion

The graphic arts industry in Japan has accomplished its growth year after year and reached the top level in the world in aspect of the production volume and the quality.

At the same time, the graphic arts-related

industry have also developed and been able to produce high quality printing machines, printing papers, films, presensitized (PS) plate, etc. contributing to the exports of these products as well.

However, the printing and photomechanics machines became high in price due to the higher accuracy and automation, and the graphic arts industry transformed into an equipment industry.

In such circumstances, the graphic arts industry needs to transform itself into an attractive industry by making an additional rapid progress of graphic arts industry to expand the range of printing, to grow up as industry suitable to the information society under the expanded printing, and to contribute to a culture industry.

#### Post Script

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