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Sustainable Producing Process using 3D Printing

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Abstract- This study is Sustainable producing process using the 3D Printing based on sustainable design. Generally, an approach of sustainability is strong to environmental aspects. 3D Printing technology has been in the spotlight of fabrication field as the new sustainable producing system. Additional, the progress of 3d printing will bring results to the personalizing producing system. It means that it can be produced from necessity. Also, it enables to producing part of discontinued models. The power of these advancements prevents over producing and reduces the lifecycle of product. Namely it reduces the term of works and saves the cost curtails the product lunching period. Therefore, it is the solution to the energy problem and resource saving. The guides line for sustainable producing is required to be controlled the problem of environment and social constraints. This research walks you through a few guidelines. And it offers the practical ways of doing sustainable system centered at the 3Dprinting producing system.

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I. Introduction

Over-consumption and over-producing is caused Social Problem such as environmental Problem and industrial pollution. It becomes a menace to survival of human and society. Accordingly, Society faces a plethora of problems and Design should be conscious sustainable issue. 3D Printing is additive manufacturing skill. 3D printing needs to 3D design digital file for producing product. So It enables more rapid producing and any figuration. Also, It means that it is possible to personal manufacturing. It means that it is possible to reduce the producing and waste of sources of production. Thus, it requires to guidelines of sustainable design for personal manufacturing using 3d printer.

II. Sustainable Issue and Sustainable Producing System using 3D Printing

Generally, the sustainable design issue is used in various terms such as green design, ecological design, green design, and ecosystem. But The fundamental aim is to provide solutions to the possibility that we can preserve and pass the current environment. Sustainable design should include the environment issue and society and include fairness, stability, and viability. This should exceed the limits of the economic aspects stemming from industrial factors and the economic structure of the market. the substantiality of design guidelines is extracted through existing research, Key-factors of sustainable design and the substantiality for definition of sustainable design. New sustainable design strategy for a time of changes will be suggested based on the understanding of new manufacturing process. New sustainable design strategy was focused on the role of producer and Technology in supporting of the government and the technology. This sturdy is expected to be applied to as one of the methods in solving the substantiality, design issues in Digital Fabrication. Digital fabrication period and 3D printing technology This time is Digital Fabrication period with the rapid growth of internet and computer. 3D printer technique development and Rapid prototyping system contribute to Digital Fabrication and shifted production base to personal and flexible small quantity production base. 3D Printing producing system can be easily design by using 3D scanner and 3D Program development. It is possible to produce a product at one go in any shape. It means to be possible to be in low cost without manufacture by several moldings or using many kinds of equipment. The This matters mean that the Person can various participate in all steps such as plan, design, manufacture, production, and sales as well as production industry's new arrangement, supported by progressive. 3D Printing 3D printing process needs basic technology in the modeling, printing, post-processing. First Modeling process is to compose object's shape in 3D computer design programs like CAD programs Also it requires a technology to convert the object into data for 3D printing by scanning or designing the object. It is the process to analyze data into so many thin layers and forms by brining digitalized files. The process improves resolution and production time, shoots the jet of raw materials to be suitable for location, according to data analysis and additives raw materials.

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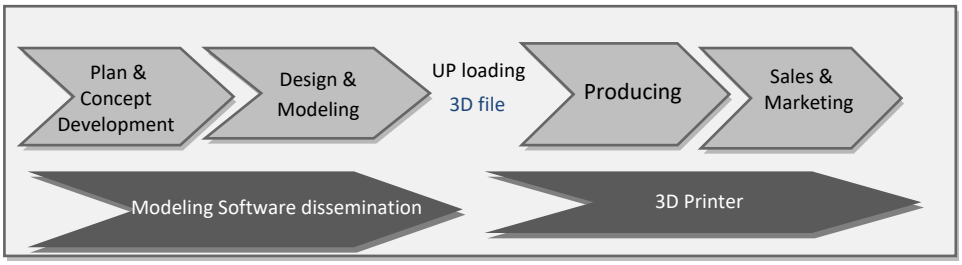

Figure 1: Producing system using 3D printing.

This changes will give individuals empowerment in overall manufacturing system, and this will lead changes throughout the manufacturing process. it means that area of design is expanded to personal manufacturing from designer and it needs to guidelines of sustain nable design for personal manufacturing.

a) Sustainable issue In Digital fabrication period.

Sustainable approach of design and industrial field has been studied during and after a generation by Victor Papanek, William McDonough, Ezio Manzini and so on. It confined conception of social, economy, and environment. Nowadays Sustainable design include meaning of Eco design, Environmental design, and ecology design. It is aimed to maintain the nature and provided a new value to the environment issue. Also, focus on the influence on next generation. Sustainable design should include the macro concept of thinking about ecological systems, including organizational systems, human beings and society with the relationship between human beings and society and interdisciplinary services. To extract detailed elements for sustainable design, the three main issues presented above were identified as economic, environment, and social.

Main factor		Practical Factor
Economy area	Use of efficient resources	The minimization of resources Use of single Materials Recycling/ reuse
	EfficientDesign	Modularity Light weight Unification of package contents
Environment area	Decrease of Environmental pollution	The Minimization of Waste Reducing Environmental pollution and Environmental Compliance Dispose of waste disposal regulations Use of natural materials Use of non-toxic Materials
Social area	Social	Extension of product life Ergonomics design Universal design

Figure 2: The macro concept of thinking about sustainable issue

In the economic arena, it is able to choose the use of efficient resources through the use of minimal resources and the minimize use of energy. Environmental considerations enabled us to minimize environmental impact and extract ecological designs. From social point of view, it was compressed as a main factor for human beings and designer social responsibility.

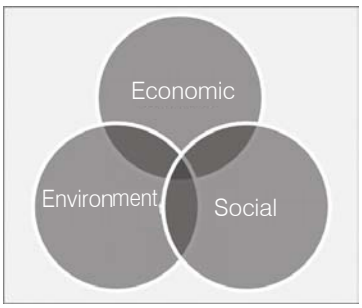

Figure 3: Practical factor of sustainable issue

Namely, the conception of sustainability comprises economic meaning, environmental issue and social meaning. Therefore, producing system using 3D printing Producing system is to take care of several factor of sustainable Producing.

In terms of technological aspects, the producing using 3D printing has already been cost- Efficiency and resource - Efficiency. Realization of 3d printing Producing resolves low cost for raw material. Also, it can reduce industrial waste. 3D Printing can produce by 3D digital file. So, this technique enabled the production based on needs and simply parts' producing. Thus, the system can extend the lifecycle of the product and can be realized by parts-producing. Also, it can be predicted and suggested the problem on excessive manufacture of products based on simple and easy way. Consequently, it can be reduced of wasted energy and energy consumption problem.

However, problems such as the use of materials with environmental pollution (plastics, etc.) have not been solved. 3D printing producing may be caused by harmless gas from machine in manufactural area. It causes a serious problem in human survival and environmental pollution. In personalized manufacturing era, with the aim of approaching strategy for each sustainable design. Each person's role will be extended as the practical part of sustainability. The most important

element can be addressed by an approach that encourages personal recognition and social awareness. In other words, a person must produce a sense of responsibility to achieve the sustainability of their sustainability with maintain attitude to concern the social issue. It needs something that is both educational system and educational center systematically.

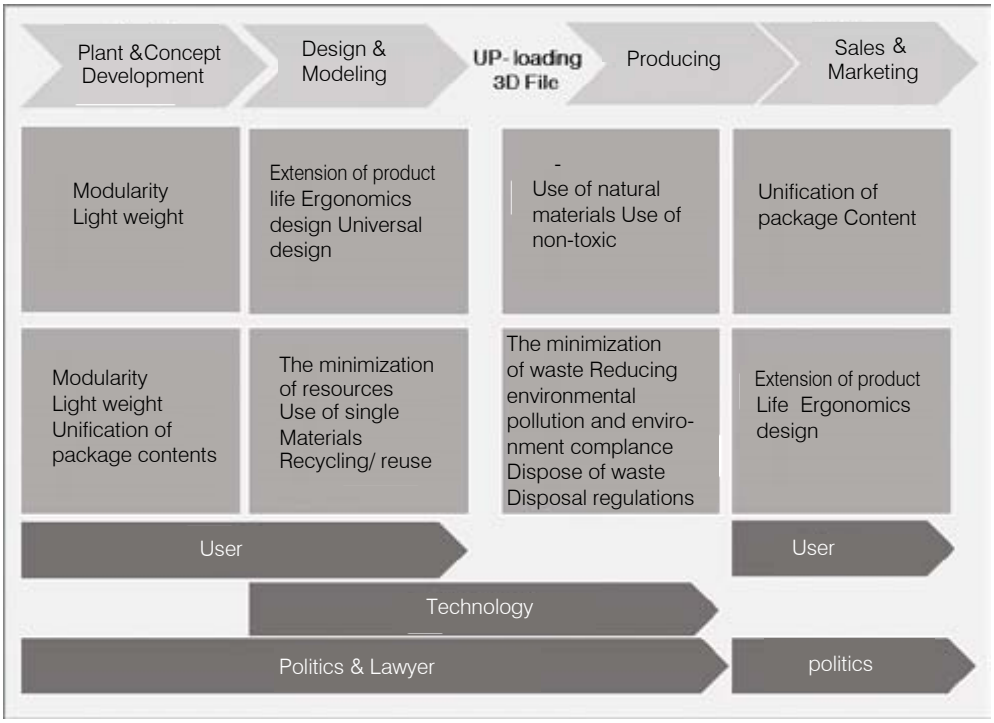

Figure 4: Practical factor in 3dproducing process

Technically speaking, it should be to be supported by technical development about air pollution system. Also, it should be obliged to control the air pollution. Also, research and use of eco-friendly materials should be studied. Not only technical research, but also legal policy constraints are required. Such as Politics and Laws is in regard to environmental problem, obligation duty for using environmental material, restrictions of bad gas exhaust.

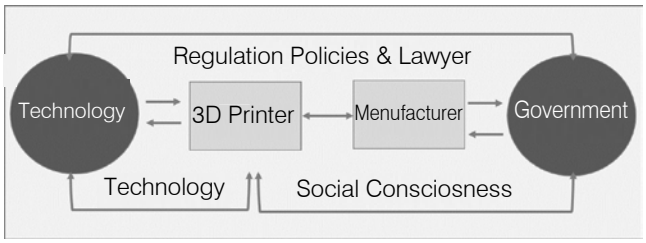

Figure 5: Roll of practical factor

III. Conclusion

In existing manufacturing systems, sustainable design has been highlighted by sustainable management by economic logic Under the prevailing system of economic logic. This is based on mutual relationships and complementary arrangements in the areas of business and consumer, consumers and consumers. Sustainability has led to sustainability growth in sustainable design. Moreover, it is a competitive approach to sustainable corporate sustainability. However, the actual entity of the digital manufacturing era of the digital manufacturing era will be producers. Namely, in digital manufacturing system the role of an existing firm has been played, and the role of designers for sustainable designs has been extended to individuals. Such phenomena should be mutually complementary and complementary under the policy support, institutions and regulations.

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