Design - R&D Interaction in the Development of Contemporary Ceramics with a Cultural Identity

Aysel GÜLER
Assistant Professor of Çanakkale Onsekiz Mart University, Turkey

She has got a degree of Proficiency in Art from Hacettepe University (Turkey) in Rhythm in Ceramics. Since 2002, she has had experiences in historical ceramic, researches and publication in technology and design, national and international projects. She gives lectures on art and design theories, design, ceramic design and ceramic technology.

Hacettepe University(Turkey)에서 Rhythm in Ceramics로 예술 학위 수여. 2002년 이후로 역사적 세라믹, 기술과 디자인의 연구와 발표, 국내외 프로젝트 경험이 있으며, 예술과 디자인, 디자인, 세라믹 디자인 그리고 세라믹 테크놀로지를 가르칠。

Yücel BAŞEGİT
Assistant Professor of Çanakkale Onsekiz Mart University, Turkey

He has had his M.A. in Tulsa University (USA) and a degree of Proficiency in Art in Anatolian University (Turkey) with his thesis titled "the Influence and Reflections of Turkish Islamic Ceramics on Contemporary Ceramics." He gives lectures on Industrial Ceramic Design and Design. He was awarded with "the First Prize" in two different branches in "Multi-Piece Dining Set Form Design Competition" and "Porcelain Turkish Coffee Kit Form Design Competition" organized by Kütahya Porcelain Corporation (2004).

Tulsa University(USA)에서 석사학위, Anatolian University (Turkey)에서 논문 "터키의 이슬람 세라믹이 현대 세라믹에 미친 영향과 고찰"로 예술 학위 수여. Industrial Ceramic Design과 디자인에 강의하고 있으며, Kütahya Porcelain Corporation(2004)이 주최한 "Multi-Piece Dining Set Form Design Competition"과 "Porcelain Turkish Coffee Kit Form Design Competition"에서 각기 다른 두 분야에서 일등상을 수상.
ABSTRACT

The importance of culture and cultural products, which can be said to exist so long as ‘modern-traditional’ elements are together, was recognized at the end of the past century, when the impoverishment of the modern world had started to be noticed. The issues of tradition and cultural originality were neglected in Turkey in the process of industrialization in 20th century, and it was only towards the end of the century that the awareness that cultural richness is a value to be cherished arose. In the 21st century, various national and international projects are made in the name of revitalizing the cultural heritage. However, production in the form of reproduction cannot achieve cultural continuity. The originals survive but imitations and reproductions are stillborn. If tradition and culture involve, besides history, a yearning for improvement, then a project of revitalization of historical ceramics would be able to achieve cultural continuity only by keeping the good qualities and developing and improving others.

Turkey has a rich and diverse heritage of ceramics culture, thanks to its geographical position as a natural bridge between Asia, Europe, and the Middle East. Research conducted in recent years in the ceramics centers of the country indicates that products of high design and technical quality are rare. This paper proposes that if Turkey is to revitalize its historical ceramics, which is an important cultural heritage, with a contemporary-original identity so that they can inspire new designs, the following are needed:

• Creation of regional and periodical repertoires of all ceramics work produced in Turkey from the Neolithic ages to this day, and research into the products, production technologies, socio-cultural dimensions, and periodical transitions involved,
• "Imitation" of these products to generate scientific knowledge,
• "Re-making" of the products with tradition,
• "Contemporary production" with some innovation, and
• "Innovative production" so that new ceramics products are developed.

These were identified as the steps of a method for designing ceramics with a cultural identity. Although the products to be created are design products, the process of their production involves design know-how and artistic and scientific sensitivity. R&D activities have a direct effect on design quality, and...
1. Introduction
The negative effects of products and lifestyles stereotyped due to globalization have popularized the phenomena of cultural authenticity. Facilities provided by scientific and technological developments have made national and international projects directed towards the preservation, revitalization and maintenance of cultural heritage widespread. It has been observed that portable ceramics of cultural heritage have been a subject of revitalization projects, but that these projects are aimed at reproductive production. Turkey which went through a lot of destruction due to the First World War during the first quarter of the 20th century started to become industrialized in the post-war period. Towards the end of the century, cultural richness started to be recognized as a value. Several successful projects of reproducing historical ceramics have been carried out in our country, as well.

To Ismail Tunah, culture is a structure that integrates ‘tradition’ as required by its historical nature and ‘contemporaneity’ as required by its liveliness. It is not possible to reconstruct a new thing without tradition or solely based on tradition. Living with the traditional is not to take certain forms of structures as a model. Traditional forms are an embodiment of the perception, thinking, mood and appreciation styles unique to every age and every society. To Moisej Kagan traditional folk creations have been artistically refined though experiences of long years inherited from one generation to the other, and each remaining component have found the chance to get mature. Crystallized artistic solutions have become varied though the narration by each crafter. Therefore, aesthetic values have a higher influence on folk creations than on art. The complementary views of both thinkers shed light on the way to be followed in order to maintain the cultural heritage. Reproductive production is required to retain traditional forms and gain knowledge about and have an understanding of the past. However, it is not sufficient for the maintenance of cultural continuity. If it is carried out through contemporary technology, it cannot reflect the spirit of the age and cannot contribute to cultural production either today or in the future.

The subject of this text titled the Relation Between Design and R&D in the Development of Contemporary Cultural Ceramic Products has been derived from a National R&D Project set between 2007 and 2010 and titled 'the Evaluation of Ceramics, Movable Cultural Heritage through Scientific Knowledge: Pilot Province Çanakkale'. In line with its goals and qualifications, the project has been planned under the joint undertaking of five institutions, two universities, one research institute, one company of ceramic raw material and Ministry of Culture and Tourism that would make use of the project results for the public weal. Within the scope of the project, the projects preferred have been those that are sufficient in terms of such qualities as “Research and Experimental Development (R&D), ”Developmental Project,” “Technology Projects”, “Technologically New and Improved Product” and “Making Technological Innovation Process.” The R&D quality of the projects has been evaluated according to the Frascati Manual (2002) of OECD.

Prior to the proposed project, researches have been supported by a smaller project. Together with the project team, investigations have been carried out in ceramic centres, research centres, museums, markets that sell ceramics in Turkey and common problems have been determined. During the investigations, the scope of the projects has been shared with experts and their views have been reflected in the R&D project. The general problems determined in ceramic centres in Turkey are as follows:

- lack of sufficient quality and quantity of material in traditional production,
- inability to obtain products sophisticated in terms of technique and design,
- failure to improve processes of production,
- lack of knowledge in production and consumption.

The goal of this text is to draw attention to the relationship between Design and R&D in the R&D project prepared on proposal. According to Article 63 in Frascati Manual, R&D “Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications." “Design is a plan or idea developed to solve a problem. Design is firstly an idea in one’s mind; however, this idea also includes the dynamics to give shape, and it becomes excluded and concrete as a form given shape during this formation process.” When these two definitions are combined, the systematic and creative work based on knowledge in the process between an idea and concretization of an idea is simultaneously both R&D and design. Design is more extensive, a holistic process and a result. R&D is the projected activities applied for the improvement and trial of the specific processes or features. R&D is not an idea or a result. It is not a goal, but the tools that take one to the goal. Design may partially include or may not include the R&D activities defined in Frascati. The fact that design is dealt with in such a way and excluded from R&D in Frascati can cause each design to be approached with a reflexive forecasting.

The concept of design focused on the whole qualities of a product can create the potential to solve all the aforementioned problems. While the 21st century is characterized as the era of design, it can be seen that
the concept of design is ignored. Also, an awareness into the way R&D activities and processes direct the qualities of a product is belated.

2. The Relation between Design and R&D in the Development of Contemporary Cultural Ceramic Products

When the objective to maintain ceramics that are cultural heritage is combined with the problems encountered in ceramic production and with the R&D criteria, the project is qualified as “Technologically New and Improved Product” and in parallel with this improvement as “Making Technological Innovation Process.” In the project proposal, Çanakkale has been chosen as the pilot province for applications with its R&D related problems and its rich cultural heritage. In this province, ceramic works produced since Neolithic Age until today have been classified according to their periods. A work-detecting form has been prepared to determine the periodical features of works, the differences and similarities between periods and their compliance with the purpose of the project. The R&D works, the pilot-application plan and other activities have been determined according to the work itself.

A phase method having three stages titled Duplicate Production (DP), Re-production (RP) and Contemporary Production (CP) has been determined for the transition from reproduction into contemporary cultural ceramic works. The goals of this method and its targets to be reached:

- **The Creation of a Regional and Periodical Repertoire**, to shed light on the product and its production technologies, socio-cultural dimensions, periodical transitions, to produce ceramic works that bear the traditional nature of their origins and whose formal features are preserved to a great extent,
- **Duplicate Production**, to produce the historical samples of ceramics in an authentic way and under the conditions of the period they belong to,
- **Re-production**, to produce ceramic works that are which bear the traditional nature of their origins and whose formal features are preserved to a great extent,
- **Contemporary Production**, to produce ceramic works that bear traditional features but are designed according to contemporary conditions and functions,
- **Innovational Production (IP)**, to create ceramic works that have a new quality and bear different usage trends at the end of all the processes.

In the processes above, the interdisciplinary steps to reach the targets have been handled in line with R&D approaches suggested in Frascati Manual. The criteria to distinguish R&D from other activities have been made clear through the following statement: When the main goal is to make additional technical amendments on the product or process, the work done is included in the definition of R&D. In Article 64 in Frascati manual, the R&D activities are classified in three main groups in parallel with their qualities:

- **Basic research (BR)** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research (AR) is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development (ED) is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

In phase works of product and process development, the relationship between R&D levels ([BR], [AR], [ED]) and design in the activities and outputs evaluated within the scope of R&D can be shown in each stage.

**Duplicate Production: The Relationship between activities and outputs of R&D and design**

- Archeology (archaemometry, ethno archeology, restoration) requires ceramic works based on disciplines of art history. It can be summarized as typological analysis (determination of formal features (AR)), technological analysis (determination of the product’s structural features and production technologies (AR)), functional analysis (determination of the intended uses of vessel forms and their socio-cultural data (BR) (AR)).
- Research of raw material (AR), preparation of raw materials and structures suitable for its origin (ED)
- Reformation, drying and firing the work in accordance with the production technologies of the period it belongs to (ED)
- All outputs, structural improvements (raw material, mud, glaze, undercoat, paint) (ED), technical drawings, repertoire of form and pattern, reports, analysis reports, other related materials are all evaluated within the scope of R&D.

DP is reproduction of historical ceramic works or items from product into raw material with information about it regained through a backward discovery. The definition of this ceramic archeometry in discipline of design is considered as a mechanism of design composition. Moreover, technological analysis to characterize the work may not yield the complete results. Analysis applied on the work in DP will determine the archaeological work’s degree of decay and deformation based on time and natural conditions.

The process of DP is to gather information for other processes. It also creates a given repertoire of the works of cultural heritage specific to the region. In DP, a permanent annotation explaining the purpose of the work will provide maintainability of the work and prevent misuses.

**Re-production: The Relationship between Activities and Outputs of R&D and Design**

The products that have a tradition and through which the gathered information and the characteristics of traditional forms and patterns will be improved without
imperfections and will be maintained traditionally as Re-production.

- Improvements can be applied in the structural features of the material, technical and technological processes and adapted into current conditions (ED).
- The product can be modified in its function and size as long as it reflects tradition (AD), (ED).
- RP is a process throughout which formal and functional design will be intensively carried out. How and to what extent the traditional components can be used will be shown with its alternatives (AD) (ED).
- Improved materials, reports of analysis and process, repertoire of form-pattern, drawings, publications are all outputs to be evaluated within the scope of R&D.

Contemporary Production: The Relationship between Activities and Outputs of R&D and Design

It includes ceramic materials such as mud, glaze, undercoat, paint and ceramic products improved for contemporary requirements and through data gathered in processes of DP and RP. These are products that evaluate the novel and traditional works in contemporary ones without corruption.

- The material, its production processes, improvement and redevelopments in the product are carried out (AD), (ED)
- Improved and redeveloped materials, ceramic works, reports of analysis and production, publications and drawings are gathered within the scope of R&D.
- A new contemporary repertoire that maintains culture and tradition as a source of aspiration is created.

Products of Innovative Production: Science and design will create ceramic works that can form a new material, a new quality and a different usage habit unique to present day during the first intensive process. As a matter of fact, there are works that were produced in the past and forgotten but have outstanding qualities.

3. Conclusion

Design is a concept that encompasses all scientific, artistic and cultural disciplines. This study devoted to the improvement of cultural ceramic products is a result of an interdisciplinary work that includes Ceramics, Archeology-ethno, archeology-archeometry, Art History, History, Sociology, Geology, Mine, Material Science, Industrial Design, Industrial Engineering, Graphic, Marketing, Statistics and IT. Moreover, the disciplines of Anthropology and Futurology have been highlighted as important for cultural studies. Design forms the basis of every research of any level in all disciplines and concretizes it with structure. R&D includes the activities that provide design processes with required qualities. It is required not only for ceramic producer but all also for all branches of production to think of design together with R&D.

This study proposed for the development of Cultural Contemporary Ceramic Products actually proposes to preserve, regain and reconstruct the cultural identity of a society. In social sciences, it is an important innovation of ED that can vary from society to society within the scope of R&D.

Using Some Patterns in Typology Studies Related with the Project Proposal: Ottoman Empire Period Traditional Çanakkale Ceramics

Fig 1. Jug. Late 19th century. H. 36 cm. The Suna & İnan Kıraç Mediterranean Civilizations Research Institute, Çanakkale Ceramics Collection, Antalya, Turkey.

Fig 2. Technical Drawing of figure 1: Assist. Prof. Buket Gürel, 2008.

Fig 3. Jug. Late 19th century. H. 33 cm. The Suna & İnan Kıraç Mediterranean Civilizations Research Institute, Çanakkale Ceramics Collection, Antalya, Turkey.

서론

세계화로 인한 정형화된 제품의 파리스트일의 부정적 영향이 문화적 고유성(cultural authenticity)이라는 현상을 보급시켰다. 과학과 기술의 발전에 가까운 시대들이 난리에 빠져있는 문화유산의 보존, 부활, 관리의 목표로 하는 국내외 프로젝트가 만들어졌다. 이들 프로젝트는 정형화된 내용을 목표로 하고 있는 것이 축적되었다. 20세기의 1/4분기 동안 일찍 세대전을 인해 많은 파괴를 겪은 시대는 이러한 정형화된 프로젝트들이 나타나기도 한 실정이었다. İsmail Tunalan에게 있어서 문화는 구조로, 이 구조가 역사적 특성이 요구하는 "통령과 생각력이 요구하는 "동시대성"을 통합한다. 전통 없이 또는 오로지 전통에 의거하여 새로운 것을 제작하는 것은 불가능하다. 전통과 개혁을 맡는 것은 특정 형태의 구조를 모호로 삼는 것이 아니다. 전통적 형태는 모든 시대와 모든 사회 특유의 인식, 사고, 분위기 그리고 평가,스타일의 구체적표현이다.2 Moissey Kagan에 있어서 전통적 문화유산들은 한 해마다 새로운 해의 경험을 통해서 창작적으로 개발되어온 것이다. 그리고 남아있는 모든 소유는 창조가 기회를 마련한 것이다. 각 지역의 이야기(narration)를 통해 구체화된 예술의 속성을 다양하게 했다. 그러므로 아직 가치가 예술보다는 민족 창작물에 더 많은 영향을 미쳤다.2 이들 사람의 상호보완한 관계는 문화유산 보존을 위해서야 할 방법으로 조명해준다. 복제 가능한 생산은 전통적 형태를 유지하고 과거의 의식을 보존하고 과거를 이해하는데 필요하다. 그러나 문화적 질서는 유지하는 데는 중분하지 않다. 만약 그것은 현대 기술로 베타하면 그 시대의 정신은 변할 수 없으며 이것이 미래의 문화창조에 기여하지 않다.3 전통 문화적 세라믹 개발에 있어서 디자인과 R&D의 관계는 제목의 과학적 제목을 통한 이용 가능성을(portable) 문화유산, 세라믹의 평가: 시대 지역 Çanakkale3이라는 제목으로 2007년에 2010년 사이에 계획된 국내 R&D 프로젝트3에서 제시할 것이다. 이 프로젝트는 목표 Responsive Design - R&D Interaction in the Development of Contemporary Ceramics with a Cultural Identity  Ays ¸e GÜLER / Yücel Fig 5. Jug. Late 19th century. H. 35.5 cm. The Sunsa n Kınai Mediterrenian Civilizations Research Institute, Çanakkale Ceramics Collection, Antalya, Turkey. Fig 6. Technical Drawing of figure 5: Assist. Prof. Buket Gürer, 2008. Fig 7. Lion Cup. Late 19th or early 20th century. H. 24.5 cm. The Sunsa n Kınai Mediterrenian Civilizations Research Institute, Çanakkale Ceramics Collection, Antalya, Turkey. Fig 8. Technical Drawing of figure 7: Assist. Prof. Buket Gürer, 2008.

1. 제작

- 전통적 제작에 있어서 축적된 새로운 결과의 양
- 디자인과 다양한 형태를 새롭게 창출하는 방법
- 제품 개발과 실험
- 프로젝트의 성공적인 역량

2. 현대의 문화적 세라믹 작품 발전에서의 디자인과 R&D의 관계

문화유산의 세라믹을 지속하며 회복하는 비전이 세라믹 작업에 대한 문제와 R&D 기준이 결합될 때, 프로젝트는 "기술적으로 새로운 발전된 작품"으로서의 작가와 구체적 기술적 작업과 모든 작품이 창의적 해법을 만드는 것"으로서의 작가를 갖는다. 프로젝트 개념에서 R&D 관련 문제들은 전체적인 문제를 가지고 있는 Canakkale에서의 작업적 지역으로 이동되었다. 이 지역은 신기각 사례로부터 시작되어 만들어진 세라믹 작품들이 시에따라 분산되어 있다. 작가들의 시대적 특성을 제안된 지역과 다르며, 그 프로젝트는 분명히 전환을 결정하기 위한 작가와 작가가 변화한 작업이 있었다. R&D 사업, 특정 세라믹, 그리고 가격들만이 작가들이 작업에 따라 결정했다.

복제와 현대의 문화적 세라믹의 작품으로의 변환을 위해, 복제 제작(duplicate production DP), 복제(reproduction RP), 그리고 현대적 제작(contemporary production CP)이라는 제작 의심적방법이 결정되었다. 이 방법의 목표는 다음과 같다.

- 지역착오와 경제적인 배경의 조사는 제품과 제작 기술, 사회문화적 특징, 경기둔화 변화를 조명하기 위함이다.
- 복제 제작(duplicate production)은 역대 세라믹의 샘플을 제작한 방법으로서 그리고 그들이 속한 시대의 조건에 제작하기 위함이다.
- 복제는 오리지널의 제작적 특성을 가지며 형태적 특성이 상당히 보존된 세라믹 작품을 제작하기 위함이다.
- 현대적 제작(contemporary production)는 전통적 특징을 가지고 있으나 현대적 조건과 기능에 따라 디자인된 새로운 작품을 제작하기 위함이다.
3. 결론

다지안은 과학, 예술, 문화 분야를 통합하는 개념이다. 문화적 세라믹 제품의 전략적 이해는 이 연구는 세라믹, 건축, 과학, 과학분야에 대한 과학적, 예술적, 사회학적, 철학적, 환경, 재료과학, 산업디자인, 산업디자이너, 그레피, 미술, 통계학 그리고 IT를 포함하는 다양한 분야의 결과이다. 다지안은 인류학적 이해와 미래의 문화적 정체성을 위한 것으로 강조되어왔다. 다지안은 모른 분야, 모든 캠프에 대한 더 나아진 지식은 그것을 구조적으로 구체화한다. R&D는 다지안과의 관계에 중요한 과학적 핵심이다. 다지안은 R&D의 범주 내에서 사회학적 강조할 필요가 있다.

문화적 현대 세라믹 제품 개발을 위해 제안된 이 연구는 현 사회의 문화적 정체성을 보존, 회복, 재구성할 것을 제안한다. 사회과학이 왜 이건은 ED의 중요한 부분이며 R&D의 범주 내에서 사회학적 다각성을 수용할 수 있다.

Reference

4. TUBİTAK Marmara Research Center, Material Institute was a partner of the proposal Project. The Project R&D qualifications are evaluated according to the Frascati Manual 2002 and confirmed by the Center's Project experts.