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# What Does Product Design Mean Tomorrow? Example Middle East

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**Abstract:** The Industry in the Middle East does not have a strong background of design-driven innovation, in fact, production follows mainly outdated systems. For this reason, there can be an attempt for new technologies like rapid prototyping that might transform fast into low manufacturing practices rather than only visualization of ideas. Today designs of products in the region are often copied and the main goal is to present a cheaper product. With the recent devaluation of the Egyptian pound, a major economy in the region has negatively affected import restrictions. As a result, companies tend to rely on local products and hardly invest in research or innovation. Hope appears in Start-ups and Small-Medium-Enterprises (SME), which are trying to impose themselves by evaluating different business models in order to grow and survive. A possible answer, given the situation, could be a regional network of small entities of innovation and production, using digital platforms and dislocated manufacturing anticipating a regional Industry 4.0.

**Keywords:** Middle East, Design Driven, Start-ups, SME, Industry 4.0

## 1. Introduction

“In the context of industrial and product design, prototyping is a phase that conventionally takes place at a later stage of the design process. Normally, the creative process begins with brainstorming techniques in order to map the territory outlined by the brief. Directions are evaluated and explored. Once ideas of possible designs are clearer, visualizations through sketches are produced. Only at a later stage, time and resources are invested for models and prototypes” (Innella, et al, 2006, p.2)

In an intensive workshop, Giovanni Innella and colleagues have investigated this phase of the design process trying to introduce from the very beginning the “making” of the product which needed to be designed. The “Quick-and-Dirty Prototypes”, how they call them, replaced in this way the two dimensional sketching. The aim was to materialize ideas while they are in process to show up. As a result, the authors could underline the better communication between participants a clearer presentation of the design idea and more refined and optimized concepts already during the process of creating the objects. Consequently, “making” represented a significant role in the process of developing products, while lately it has been pushed aside by intensive time investment for

digitalising and rendering products keeping them for a long time “virtual”. Thus, the issue of “designers not getting their hands dirty” with models has risen; in addition, designers are not able to show real talent in generating physical concepts, through models or at least free hand sketches.

## 2. New and old ways of “Making [in] Design”

### 2.1 Design and Industry: a short overview

The realisation of products in industry passes generally through a long design and prototyping process in order to finalise a marketable product. The decision of investing in machinery and tools, as well as moulds and extrusions regularly is a key point of entrepreneur courage. This is the moment of huge investments, therefore the product ideas need to be promising. Unfortunately, creative and unusual ideas with the related product innovation often are blocked exactly in this point.

Today, innovative technologies for rapid prototyping like three dimensional printing and laser cutting have largely reduced the impact of “blind” investment. These techniques make it possible to visualize the final shape of the product in an early stage without the need of heavy machinery. In addition, working prototypes can be tested in real scale; even marketing strategies can be generated with only few samples. Kickstarter and Indiegogo are successful examples of how sales can be anticipated from production. They create the necessary Return of Investment (ROI) before even investing intensively: through a well-made prototype in a frame of professional advertisement that generates the interest of the final customer to buy the object online. Though these customers had accepted a longer delivery time than the usual, they have received a brand new product in the market.

In environments that have a longer tradition of cooperation between both the industry and the designers, the rapid prototyping can be seen as a refined step between the ideation and the creation of the product. This is efficient to the designer in terms of providing ready-made factory prototypes. Consequently, factories are expecting to receive three-dimensional physical design proposals or at least to have the chance evaluating a three-dimensional in-house produced object in order to be convinced of the new product.

Such changes, of course, have pushed the development of new design practices using these new methods. Already in the studio, the designer prepares his proposals as a ready-made product for industry reaching even new practices such as co-design, self-production and DIY. These practices have also produced new social and professional organizations, like FabLabs, where rapid prototyping machinery is gathered. Here designers can experiment easily with form, shape and production, becoming users to their own objects to test them.

As a result, young entrepreneurs can realise their ideas at a relatively low cost level, reaching a working prototype to promote for further development and sales. This phenomenon outreaches several disciplines: particularly the electronic engineering and mechatronics sector have gained benefit. Furthermore, easy access to programming motherboards through open-source electronic prototyping platform, like Arduino, has helped the prevalence of this phenomenon. At this point, both young makers and designers meet to generate new products hoping to conquer the market.

The Middle East does not have a strong industrial background in Product Design. Imported ideas are often copied. If not the entire product, the functional idea is taken based on available technology while the main goal is to produce or assemble in a cheaper way than the imported item. Even established companies do not have the culture to invest in research or innovation and imported models of research and Development (R&D) are not necessarily successful.

Interesting example can be the market strategy of Electrolux in Egypt, which acquired lately the Egyptian company Olympic, a company that produces and assembles foreign home appliances. Electrolux was already present in the local market with the brands AEG and Zanussi, which are known as the two top class products for its category. According to the international marketing model of the company, the strategy was to put on top of the segments the main brand Electrolux pushing mainly Zanussi to a lower level. The strategy failed. According to an interview with the author in November 2016, the former Director of R&D, Eng. Bahgat Eldahesh, explained that the board had been advised beforehand not to change the market strategy as it would fail according to the local behaviour of customers. The background of this phenomenon is the social structure in the region. The B+ class people rely on available local products and are reluctant for innovation. The success of the product is still based on “mouth-to-mouth propaganda” rather than public advertisement and products are chosen on local taste and functional requirements. On the contrary, the upper class prefer expensive products directly from abroad avoiding the local market, which to them, is perceived as of low quality. This situation results in a lack of opportunities for designers in the existing market. In best cases, product design is styling the outer casing, but in general, industry is not interested in investing in innovation as long as such innovations are perceived as not profitable within the local market. An effect of this policy, local companies are not competitive on an international level.

Other industries operating in furniture have a longer history of generating their own solutions. Being more related to traditional craft, the industry could maintain a certain amount of self-generated products to distinguish themselves in the market. Another large part of it is engaged to produce furniture as supplier for larger, mainly Italian manufacturers gaining knowledge and receiving some “stylistic updates”. Nonetheless, the sector is also searching for new impulse in order to keep competitive in the international market against low cost producers from Asia. For the last main international furniture fair FURNEX in 2017, the Italian designer Giulio Cappellini and Luca Time have been invited to generate a new impulse to the industry by designing the event according to their professional experiences in Milan. This is a good sign, as eventually most of the graduates of Design Faculties and related disciplines and the region are employed in this field in Egypt.

Industrial designers, who do not want to join the community of “furniture designers”, and due to the previously mentioned limited opportunities in other industries, will need to create a different generation of designers forced to canalise their own creativity into products without having customer. Nonetheless, the challenges of a limited market will necessarily induct them to acquire new skills and methods. Parallel to the introduction of innovative technology into the market, the Middle East has still a consistent quantity of artisans working with traditional techniques, who are also able to produce and “personalize” objects at a very low and competitive cost. At this point, the chances for many young Industrial Designers in the region appear evident in two directions: using artisans to realize non-technological items, or joining start-ups and SME that use rapid prototyping technologies.

## 2.2 Industrial Design versus Product Design in the Region

There is a long debate around the distinction of Product Design and Industrial Design, which might be interesting to look at in the context of the Middle East and Northern African (MENA) region and its particularities.

“Product design is sometimes confused with (and certainly overlaps with) industrial design, and has recently become a broad term inclusive of service, software, and physical product design. Industrial design is concerned with bringing artistic form

and usability, usually associated with craft design and ergonomics, together in order to mass-produce goods". (Morris, 2009)

With this definition the discussion might get an interesting direction considering the still surviving traditional crafts in the region. In relation to Product and Industrial Design, the idea to make these crafts survive has turned into the debate of whether they should be "developed" or "revived". Should they develop by creating new products, which turn them into SME? Should they network with Institutions to promote culture and antique knowledge? Designers and Design Schools are trying to connect and cooperate, mainly on a personal level, as an attempt to experiment materials and techniques, in addition to having more in depth in cultural studies of applied history. The craftsmen themselves do not seem particularly interested in any "development"; they are convinced of their destiny of maintaining the same social and economic level. Not feeling appreciated by the local society, which prefers cheap imports from China and local mass produced pieces, touristic sales are the only form of income. This might be the reason by the way, why the relation between craftsmen and young designers turns out to be similar to "local" and "tourist", though they both speak the same language and live in the same city. The difficulties resulting from this relation, also in addition to dealing with different social levels in the same society, have been discussed in an earlier paper about Design Education in the Middle East:

"It is this approach of "getting out" of the classrooms of the universities that leads to getting to know a crafts reality and small-scale industry belonging to a completely different social level compared to the students' personal circumstances which usually belong to the middle and higher classes. The confrontation, interaction, understanding, and therefore the collaboration between these actors in different social classes become the fulcrum of what practical application in field of design education means. (Sicklinger,2014)"

Nonetheless, it seems a fertile soil for young creatives, who do not have a strong electronic and engineering background but enough aesthetical feeling to generate new forms with old craft traditions.

Moreover, the implementation of design reaches the strongest debate for the regional industrial development and entrepreneurship when it comes to rapid prototyping methods. These methods facilitate and accelerate the development of new products. While the above-mentioned creation of new products through the development of crafted designs are more related to a single crafted object or to a cultural system, the involvement of small scale production techniques follows the aim of "Industrial Design" with higher involvement of engineering components and the preparation for mass production. The difference to more developed countries is that the latter often misses implementation. Design ideas remain at the stage of working prototypes, more or less finished at a level of a product, but do not reach the market.

### **3. Implementation of Product Design in Start Ups and SME: case studies**

Tonino Paris, in his Editorial about new handcraft, creates a relation between the emerging maker scene with the traditional craft as well as industry, stating clearly:

"that makers will not substitute the industrial production in order to satisfy the individual needs of many. At the same time they are not the new craftsmen, those kind of craftsmen who made the Industrial Revolution happen generating a new way of production and products ." (Paris, 2016, p.1)

Looking at the local situation, this statement can generally be confirmed. Yet, the perspectives of actors might be different based on what has been stated earlier in this paper. Not similar to a society which is saturated with products and an industry which tries to win the war of globalisation and big production numbers, the Arabic customer is still not in need of the brand new technology, or the unique object which offers personalised features. This what makes industrial innovation difficult. Yet, this fact can be seen as a chance for start-ups and SME, as long as the expectations of their local clients are lower than elsewhere. As an additional driver, start-ups can be considered a positive factor after the Arab Spring revolution where economy has gone worse and young people do not find jobs easily. Therefore, the attempt to start one's own company in a small team is seen as a national economic value and is supported by governmental funding through incubators. However, one of the biggest challenges, in order to create a successful and sustainable economy, is product design as long as some projects need the inclusion of product design to finalize the shape for a sell-able item. Why is it a challenge? Some difficulties need to be overcome. First, the market offers differ from the desires of young graduate designers who prefer to work on aesthetical appealing yet simple objects. Second, the expectations and understanding for product design from the side of start-ups and incubators are incorrect. Product Design is often mistaken for Production Design. The latter is related to manufacturing, and would include, according to incubators, all issues of manufacture prototypes and mass production.

The author had the chance to interact with and consult three main incubators in Egypt trying out two different scenarios for integration of product design in start-ups as well as cooperate with SME, which will be discussed below.

### 3.1. Common ground

Hardware incubators, like private Ebni (<http://egyptinnovate.com/en/users/ebni-incubator-eitesal>) or governmental Bedaya (<http://www.gafisme-bedaya.com/>) in Egypt, call for application of fundable projects. To do so, often Hackathon weekends or workshops are offered to encourage ideas, to generating more tangible concepts for the evaluation of the potential projects and would select the promising ones for funding. Meanwhile, universities like Ain Shams University with its Faculty of Engineering started a successful multiple year program called iHub (<http://ihub.asu.edu.eg/ihub-team.html>) to create pre-incubation activities in order to reach the necessary level of commercial and technical strengths for the project ideas.

Consequently, around 12 to 15 projects are usually selected to be financially supported and hosted in the spaces provided by the incubator with office desks and, sometimes, further facilities like small workshops like a FabLab. The incubation period lasts from 3 to 9 months, according to the policy of the incubators. However, it has been observed that none of the projects could be finished in the expected timeframe and extensions; therefore, re-incubations are offered.

The characteristics of the project differ from one and the other. Among these, 30% rely on the impact of design driven products. 70% are either engineering related products with a professional use, where the emotional impact of product design is reduced or not necessary. Even interaction is irrelevant due to wireless technologies, data receiving, reprogramming etc. are remotely controlled.

### 3.2. Scenario (1) Start-ups: project based consultancy

In the first case, the author together with an assistant accompanied two different start up teams through a direct related consultancy agreement during the period of May 2015 to January 2016.

Using a simplified model of a design process and following a proven methodology, the proposal was built-up in a way to match different project needs. Specific approaches to product design are listed to

give teams the chance to choose the best service and are presented in form of a “catalogue with a price list”. The proposal was built up according to three different stages in the design process:

- A) Ideation
  - a) Ideation this phase includes the design brief with clarification of all crucial elements related to product design and the business idea.
  - b) There could be included some initial sketches to illustrate the first setting
- B) Acceleration
  - a) Design Concept: this phase allocates the elaboration of one or more suitable product design proposals; there could have been elaborated also proposals for a larger design system (according to project).  
This phase also includes sketches, 3D rendering and optional physical models.
  - b) Design Development: This present an elaboration of a final 3D model, mainly to be 3D printable, relating to technical drawings as support for engineering and production.  
The evaluation and correction of technical issues related to assembly are to be included.
- C) Implementation
  - a) Period of evaluation and finalizing for market:  
This adds to the possibility of retouching and/or re-evaluation of the design during the production period or implementation to market (customer feedback).
  - b) As an additional task, this phase allocates the development of promotional material, packaging and marketing supports for communication.

In order to facilitate the overview and options for the consultancy, the phases have been additionally refined into a matrix with different options and configurations. The matrix starts with a hypothetical “full program” in addition to different consultancy options have been developed with different levels of completeness.

Furthermore, it was made possible that a team chooses only part of the program and/or select different levels of consultancy for each step. According to the above-mentioned matrix, each team was able to choose the right “mix” in relation to their internal capacities and general product design requirements.

The task agreed upon consisted of developing designs for the casing of the product, and evaluating possible design implementations. The consultancy was originally programmed to last 3 months according to the incubation agreement. However, the timeframe was enlarged to 9 months reaching however not the expected and desired results. The delay has been caused by missing workshop facilities and components, which were not available in the regional market and needed to be imported. The inexperience of the team members to analyse and solve technical problems causes such delay. The Design Consultancy, as an important factor for the product’s success, has been build up as a “service” provided by the incubator and economically covered by the allocated budget of the team. The consultancy was provided through regular meetings with the teams together with elaborative presentations that showed the potentials of design strategy and development of the product.

In case, the projects exceeded the timeframe and needed to be refunded to maintain success in the development phase. Related to the Design Consultancy, a crucial element had to be considered in the particular condition of start-ups: the teams do not have an overview of the industrial development of the product and are unable to predict implementation timings. Consequently, the teams like to experiment with solutions, hoping to gain more features, making the product more interesting or finding themselves on the way in competition with a new product, that has not been

known at the start of the project. The result for the Design Consultancy was a redundant change of dimensions and repetition of work with considerable loss of time and money.

### 3.3. Scenario (2) Start ups: time based consultancy

For the cooperation with a second incubator, a different model has been developed and implemented, based on the previous experience. Out of 12 funded start-up projects, originally 10 projects have been evaluated at the beginning, but only 4 projects have been linked eventually to the Product Design Consultancy. The author had the chance to support these teams from August to December 2016. Unlike the previous approach where freelance design service was provided, in this new program, a small Product Design office has been installed inside the Incubator in order to provide an immediate support whenever needed during the consultation period without looking at specific time frames.

Contrary to scenario (1), the design studio was active 2 days a week; in addition, any design related work, support, discussion, evaluation, and/or presentation was allocated in these two days. In this way, the main issue of wasting time and money through repeating design concepts and models has been resolved. Observing the need for experimentation and constant development of technicalities as a specific character of start-ups, the consultancy has been spread over a certain period of time without a specific development criteria. The established timeframe was 3 months with a 3-month possible extension.

This model can be seen as a suitable model for design consultancy for start-ups, which results in best cases (for mainly product design driven project) to have a team member designer.

### 3.4. Conclusions comparing with SME

During the same period of time, several projects have been followed with SME. The projects had a similar kind of complexity and product category. The Consultancy for SME has been built up in the same way as proposed in 3.2., demonstrating, through successful application, that the proposed model works well.

This gave the author the opportunity to compare the developed strategies for start-ups with structured companies in the field of product design consultancy as a service. The comparison is supported by the same geographical conditions of market, available resources and technologies. The idea was to define a minimum requirement related to company structure, importance of experience and establishment of typological differences.

The teams generally consist of members with similar technical background. The results show, that a multidisciplinary approach introduced by representatives of different fields is much more beneficial than only consultancy. For instance, one member should be responsible for developing the product from an engineering point of view. As long as this is the core of a producing company, this should not be outsourced. In addition, according to the importance of product design for the project, the Design Consultancy can be allocated at the very end of the project development after realising first working prototypes. In other cases, however, where the project is product design based, it is recommended that one of the team members is a product designer and follows all steps from inside. External mentorship can be supportive in case of inexperienced designers.

## 4. What does Product Design mean tomorrow?

Product design is a need in the region. Important events in the region like Design Weeks in Dubai, Beirut and Istanbul have an always more growing appeal and attract thousands of young designers and design enthusiasts to generate the needed momentum of design. This adds to the understanding and innovation of companies and consumers, alike. Emphasising, the organiser of the Beirut Design Week 2017 will ask, “Is Design a Need?” at the next edition, and the answer will be more than obvious. However, while during the allocated conference a more challenging topic will be used as an icebreaker for further investigation on design criticism.

The paper tried to simplify the nowadays condition of product design in the region taking examples from its main economic country Egypt, defining a border to “Craft Design” and “Furniture Design” with its own particularity and needs. Yet, it will only be sustained by the design graduates from the same design majors, excluding, hence, other specializations like Fashion Design or Visual Arts.

New manufacturing techniques relating to rapid prototyping will directly reshape the designer’s approach to the market, in comparison to makers in other countries that present more sophisticated industrial production techniques and customers. The current situation in Egypt related to craft and maker scene might generate a new way of designing products. The growing chance for product designers, however, lies in the rapidly growing community of makers and start-ups taking parts in these teams as developers of products, solutions, and systems.

At this point, the discussion should be expanded, not concluded. Separating definitions and sharpening the borders between crafts and makers, as Tonino Paris is doing, clarifies the role and highlights the opportunities for each, separated or united. Related to what was called earlier “craft design”, an opportunity for product designers continues. It becomes more elaborate with designers’ own experimentations and generating their own networks and cells of production for commercializable products through online sales platforms. The designer has the chance to become his/her own entrepreneur without factory, but by putting together components from different production sites. Examples for this are *Kiliim* by Noha El Taher and Ibrahim Shams, *Upfuse* by Rania Rafie and Yara Yassin (<https://www.up-fuse.com>), *Reformstudio* by Hend Riad and Mariam Hazem (<http://reformstudio.net>), and *Reshake* by Maram Elshenaway and Yomna Seoudi (<http://reshakel.tumblr.com/>). Often recycled materials are the basic material for the products, being largely available in mega cities like Cairo and already part of a life cycle process by a large number of small family businesses. All these design entrepreneurs have in common is that they do not have their own factory or production. They mainly commission to reliable artisans their designs and start to promote and commercialise based on their own investments.

The other, yet more important and more complex, opportunity for product designers in the region lies in the cooperation with makers, start-ups and SME. Instead of a direct designer-artisan cooperation, a multidisciplinary team should build up a business idea using technology together with different levels of engineering to reach a common goal. Production in this case can use prototyping technologies, which might be fair enough for a finalized product without the need for industrialization. Products need to be considered, developed and, materialised. Similar to crafted examples, like the ones mentioned above; small production units can materialise ideas, and complex parts can be realised with low production technologies like rapid prototyping or rubber silicon moulding. Only later, and for the outer casing, the implementation of good quality surfacing might be necessary. However, these entities suffer when enough production techniques are not available, and where components hardly to be imported, or when an idea alone is not tangible.

This way of production could be understood as a mix between traditional craft and dislocated, unconventional manufacturing, based on opportunities and constraints. However, the interesting debate could reach out. If the decentralised production, using several entities of manufacturing facilities and assembly strategies, can be implemented directly into a system of IOT, joining traditional manufacturing with digitalised information technology and highly personalisable products. Already today, SME like BEEK Electronics (<https://www.gmdu.net/corp-203052.html>) or Biobusiness (<http://www.biobusiness-eg.com/>) create relation with China and other Asian countries to produce components there, keeping engineering and assembly in their home country.

Designers and Makers in the region are exploring and testing. They are looking for opportunities in a world full of economical and physical constraints, with limited resources. Ultimate solutions with external investors and differentiate production process might make reach a new welfare for the region through product design.

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