THE FUTURE OF THE DOMESTIC OBJECT 2025

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ABSTRACT

In the current techno-social digital era, objects are significantly shifting in how they are made and for what purpose. Objects that are mass-produced are starting to be engaged in social networks and provide additional value by being technologically connected to a social network. Business models around ownership of goods are starting to shift, from the individual ownership of products to a sharing model with a community. Given changes in function, ownership and technology, how might designers create domestic objects that will remain relevant over the next ten years?

This paper examines how standard product design processes may accommodate foresight methods and future-state considerations. Two foresight methods are explored: 1) horizon scanning which identifies changes in the broader contextual landscape and 2) comparable scenario development, derived from the three axes of function, ownership and technology, presented here as the F*OT Cube*.

INTRODUCTION

This paper examines how a nested framework process informs how product designers can approach designing product for the future. A nested framework process is a series of applied research methods used in combination. This approach is important because it allows new ways to approach complex problems. What foresight methods allow us to anticipate are the needs of a consumer in a rapidly changing technology landscape. By considering nested framework processes and foresight methods this paper intends to anticipate how new innovations can be developed.

Foresight methods are used to inform and navigate the yet undefined future ecologies of the domestic objects, as they become technology engaged. Examining the tension in the movement of function, ownership and technology, the *FOT Cube* model was designed as a process innovation method to define polarities, navigate the complexity of these movements and their possible co-mingling. The *FOT Cube* model acts as the framework of eight worlds that may exist in a decade.

The *FOT Cube* is made up of a three-axis formation. The functional axis examines the value of an object and why one object is chosen over another to complete a task. In this axis designers explore how to create meaningful additional value. Further investigation seeks to understand what objects do and, how they are being tasked for multiple purposes. The Ownership axis identifies changes in the purchasing patterns and ownership of objects in western consumer culture. Discussion of how this impacts object design is informed by economics, as well as the shifting polarities between the individual ownership of a product

versus its sharing with a community. The Technology axis discusses how technology and its applied tools are changing design and the polarity of designing objects with technology to considerations for designing networked objects.The intention of the *FOT Cube* is to be a part of designer's process with innovation product design as part of the comparable scenario development or "World Design" process. It also presents a process for designers to create meaningful additional value in object design.
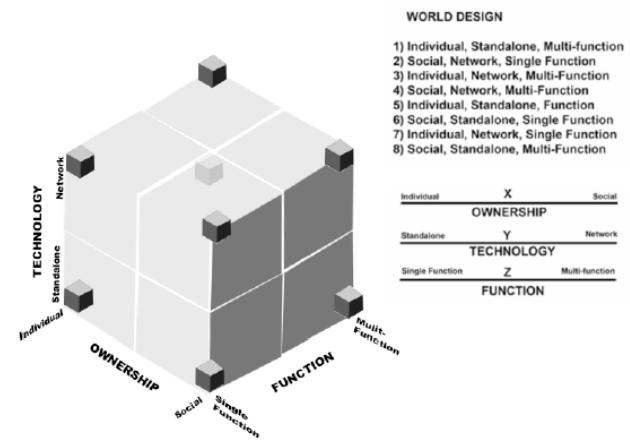

Fig. 1. *FOT Cube Model*, © Slavica Ceperkovic.

METHODS

In designing a new process for innovation for product designers, foresight methods are used as tools to think through the complexity of the shifting models of function, ownership and technology, in order to attempt to anticipate how to design for possible futures as well as understand implications of domestic objects over time. The time horizon of 2025 is significant because it allows us to see potential impacts of current trends and to look beyond current barriers of current day technologies. My methodology utilizes the following: foresight and my contribution to the discourse, the *FOT Cube*, in order to examine the future of design, usability and technology engagement.

FORESIGHT as Method

Foresight horizon scanning and matrix development are used in this research as a method to develop possible futures of objects in 2025. The year of 2025 was chosen as it is far enough in the future to understand the implications of the horizon scan in a meaningful way and to think beyond current technologies as barrier. As a research method, foresight can be used to create insights, learn demands of new markets and develop implications for action in complex territories. By using foresight methods to

develop new products, a context is created to directly enable creativity within the constraints and frameworks in design. The generative phase of foresight is the foundation for a process of inquiry. It consists of gathering, analyzing and synthesizing of existing knowledge, in order to codify knowledge into a new vision of the future. Rafael Popper indicates three main stages of this generative phase: Exploration, Analysis and Anticipation. [1] Exploration provides an understanding of main issues, trends and drivers. A driver is the understanding of what is propelling the trend. Analysis is an understanding how the main issues; trends and drivers influence each other. Anticipation examines previous considerations and aims to develop possible futures.

Popper indicates trend extrapolation and impact analysis are long established tools of forecasting. [2] This offers valuable insight as a proven method of inquiry. Denis Loveridge articulates the "Steep V" acronym examining trends in social, technological, economic, ecological, political and values based categories, which aids in understanding trends by looking beyond a niche scope. [3] Trends are established by gathering signals of shifts, which may build into a larger trend. Signals provide detail to trend insights that could point that can be further developed for larger scale scenario development for policy processes. Further, Rafael Popper articulates the "Foresight Diamond," which is used as a framework to examine qualitative, semi-qualitative and quantitative methods extrapolated to creative, interaction, evidence and expertise based methods. This is significant because it articulates additional methods that can be used in the brainstorming process.

The FOT Cube as Method

The *FOT Cube* has been created through this research as a new method of inquiry. It generates a structured framework to investigate new object design and challenges via its consideration of techno-social networked technology as part of the product design process. The *FOT Cube* guides designers in considering how their product situates itself with regards to function, audience and engagement. Developing a strategic conversation about the future of objects, my research has led me inquire the ideation process for product designers, in order to invent a new process. When creating new products in a rapidly changing technological environment.

Kees Van Der Heijden states that a matrix approach is appropriate in situations of considerable uncertainty. [4] In terms of understanding the inter-relationships of driving forces, typically, a two-by-two matrix of critical uncertainties is used to generate several plausible scenarios for plausible worlds. The cube model, developed as a 3-axis framework considers the polarities in function, ownership and technology in product design, to act as grounding points of considerations for product designers. A cube can examine the 3-axis of polarities to create eight possible future world scenarios, which are to act as a guide for re-imagining the product through different lenses. These scenarios are valuable because they generate a well-rounded view of the possible world the objects are designed for.

Perhaps, as Heijden elaborates, the matrix model maximizes the range of scenario outcomes and the potential impact. The cube model however, can redefine the foresight process in a significant way by allowing on a guideline on elaborated worlds, thus maximizing outcomes. The nature of the choice for scenario dimensions, are what is high-impact and highly uncertain for a large range of possible impacts. [5] I chose to investigate the cube model to elaborate on possible futures within a stable framework. Trends thus texture and develop the world's design to present possibilities of future uncertainty.

As stated, additional criteria are implemented through a variable set of trends. These design criteria allow us to imagine objects in new ways from its origin to predicting its future. The contribution of the *FOT Cube* to product design is to incorporate the techno-social, shared ownership and technology networked functions as considerations in product design. In considering the 3-axis, the left side direction of ownership, technology and function are heavily rooted in traditional design and its history. By incorporating all facets of 3-axis, function, ownership and technology, the *FOT Cube* examines singularity versus multi-function with the individual and the social and standalone and networked.

ß Single function – FUNCTION – Multi-function à
ß Individual – OWNERSHIP – Social à
ß Standalone – TECHNOLOGY – Networked à

The left side of the axis could reflect historical and some current day products. Those objects specifically designed to have a single function, to be owned by an individual and have no connection to a network. The consideration weighted on the right hand of the axis pull consideration of objects into the future, shifting the product into multi-functionality, shared ownership, networked connectivity. This shift pushes products to a tipping point, changing products into techno-social products with multi-functional services. It fundamentally changes how products are conceived, fabricated and distributed. In the perceived threat of 3D printing and the masses creating individual, standalone objects, with single functionality, the cube proves new ways to ideate and conceive of intelligent objects and its potential use for mass distribution.

Trends, Impacts and World Design

Using horizon scanning, trends were defined, as well as articulated through graphs, charts and creative output, in order to generate discursive options. The process of identifying a trend requires identifying signals in the present day within the last five years and classifying larger underling currents to encapsulate a larger trend or issue. A listing of trends used as part of this world design process is articulated in the appendix.

Trend implications on the axis were recorded based on the potential impact on the object's value either in its function, ownership or technological engagement.

	Single Function	Multi-Function	Individual Ownership	Social Ownership	Standalone Technology	Networked Technology
Computer knows best	•	•	•	•		•
Nomadism				•	•	
Co-Op Life				•	•	
Born big brother	•	•	•			•
Because my body tells me so	•	•	•			•
DIY Tools	•	•	•			
Grow something	•	•	•			
My house hugs trees	•	•	•			
Power up	•	•	•			
Make me some lemonade	•	•	•		•	
Crowd source everything				•	•	•
Having fun standing still	•	•	•		•	
Regulated garbage	•	•	•			
Knock it off	•	•	•		•	
Dissolving monuments	•	•	•			•
Delayed marriage	•	•	•			•
Stackable homes	•	•	•			•
Experience based gifts	•	•	•		•	

Fig. 2. Trend Implications on Axis © Slavica Ceperkovic.

IMPACT ON WORLDS

This was further categorized into the eight possible world design scenarios. Once logic of the world was defined worlds were named.

Worlds are set in the future year of 2025. These worlds were designed based on the polarities of the axes of ownership, technology and function. The implications of the trends texture the world design of eight possible futures. It is important to place the timeline far enough in the future to imagine new technology possibilities outside of current toolsets to imagine new possibilities. This is structured more abstractly, to create possible worlds and futures as an ideational construct for designers to approach new worlds with its own logic to design for. An articulation of the eight worlds designed can be found in the appendix.
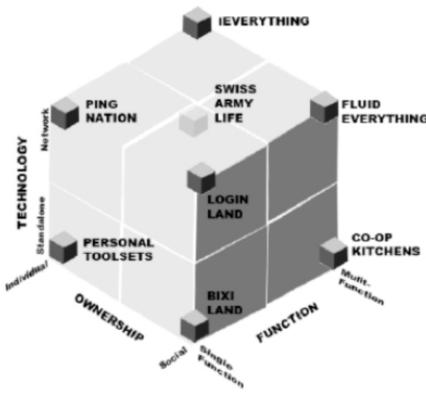
Fig. 3. Future World States, © Slavica Ceperkovic.

Eight possible worlds as a source for potential future for objects to inhabit create a rich basis to ideate and brainstorm possible objects an identified problem. It is important to note that, if an intended problem is focused on only one polarity (e.g. single owner, one function), all worlds may not need to be explored. As the perimeters of the worlds are firmly set, additional questions can be asked to start of the ideation process.

CONCLUSION

What world design offers in the object design process is the understanding of where the objects live and how notions of home could change. In today's society, a shift from mass consumption to niche consumption has changed the function and economic ownership of products. Mass production has shifted to mass product services with consumers engaging with products for a longer period of time and continually paying to enhance objects. Technology will always be a variable and its standard is a moving target that is rapidly developing. I have examined why we purchase the way we do and the important consideration of the techno-social future. How objects integrate with their own online presence and lifespan can exist long after the object itself disappears. In other cases, objects could take years to get to market and how approach contemplating its techno-social relationship to an audience when chances are, new platforms are yet to exist.

The methodology of foresight and the *FOT Cube* aids in understanding how designers can approach this complexity and create clear boundaries in understanding how the object could operate in various worlds and its possible co-mingling.

Developing a trend list of current signals in the changing ground of social, technology, ecology, economic and value factors challenge both the object and its design in the future. By developing eight worlds, although it allowed a certain complexity in how to consider an object, it creates difficulties and problematizes the parameters in the design idea process. Although Heijden elaborates that this model to maximize the range of scenario outcomes and potential impact, its complexity is often difficult to navigate and differentiate when in the moment of creation of design ideas. What my contribution of the *FOT Cube* allows for is an integrated and holistic view of objects and usability in order to create a framework for ideation. By creating this process no one world can or would dominate but rather a multiplicity of overlapping of worlds would exist.

In closing, using foresight techniques leads to a new language construct in how designers can approach object design in the complexity of a techno-social age. By incorporating the *FOT Cube* model, designers can move beyond current approaches and gain a complex understanding to innovate products for consumers of the future.

Areas for Further Inquiry

This paper articulates a process for the understanding of design for future products may need to incorporate is an ongoing, service-based model for products engaged with a community and articulate the designer's responsibility to consider post-delivery phases of

that product. The intention of the *FOT Cube* is to be nested with other methods such as foresight and world design in other product development process frameworks. Once the problem has been framed it is anticipated that this process should be used as a generative brainstorming method that should lean into an iterative prototyping and testing phase resulting in a final product design.

APPENDIX A: ARTICLUATION OF TRENDS

Social Trends
Computer knows best: This examines the growing trend of North Americans finding their significant others through digital online services and how courtship practices are changing.

Nomadism: This trend examines the impact of decreasing value of home ownership in the United States. A migrant working class may change buying patters and decisions and the duration of stay based on employment and entrepreneurship opportunities.

Co-Op Life: As urban centers become increasingly dense, consumers' patterns are starting to shift to shared models of ownership and rent time with objects that were once owned.

Technology Trends
Everyone is big brother: Technology is becoming increasingly omnipresent from the increased public surveillance in dense North American urban centers by law enforcement to the emergence of wearable consumer cameras such as Google glass™.

Because my body tells me so: Wearable biofeedback devices have started to emerge in the consumer marketplace as fashionable accessories. This device driven method of self-monitoring movement has built new communities online as well as big data statistical database of consumer personal body performance.

DIY Tools: "Do it yourself" maker culture has grown from hobby projects to becoming an industry. Through maker channels such as Etsy ™, individuals can develop and distribute products to consumers without third party distribution such as storefronts.

Economic Trends
Make me some lemonade: New micro funding models has acted as a catalyst for new market of micro-entrepreneurs and new niche market demands.

Crowd Source everything: This trend examines how crowd based services have become increasingly powerful in the marketplace. From audience participation in developing content for merchandisers to leaving recommendations on social networks, crowds have influenced how products are made and inform consumers choices.

Having fun standing still: In economic strained times, North Americans are changing their patterns of purchasing goods and experiences with a focus on improving home surroundings and local experiences.

Ecology Trends
Grow something: Locally grown and one hundred mile diet movements have brought the question of buying food closer to home and have in addition created hobby farms of small gardens in dense urban centers.

My house hugs trees: Environmental sustainable housing has become a feature set in new urban developments. How a home integrates into its environment and leans into borrowing power rather than demanding it had become a growing demand.

Power up: With increasing demand of power from consumers, global electricity demand is projected to double from 2010 to 2030.

Political Trends
Regulated garbage: As government becomes more involved in the waste economy, garbage will increasingly regulated in how consumers can dispose of products in a cost-effective way.

Knock it off: In the current uptake of 3D printing, products are easily replicated and printed on demand. Piracy has shifted from the black market to the home market, where users can share schematics to print objects at home.

Dissolving monuments: With the increase of an individual's digital footprint, rights to dissolve or preserve their online presence are still in question with lawmakers. Virtual possessions such as digital music, email address or other digital properties dissolved are inconsistent in how they can be preserved, passed on or dissolved.

Value Trends
Delayed marriage: This trend examines the growing trend of North Americans delaying marrying until much later in life.

Stackable homes: This trend examines the trend how dense urban centers are growing faster than their suburbs for the first time in decades in the United States.

Experience based gifts: This trend examines how experience based gifting over object-based gifts are on the rise.

APPENDIX B: ARTICULATION OF EIGHT WORLDS

World 1: Swiss Army Life
Swiss army life is a world where individual own objects that can do many things and are developed using high technology but remain off the grid.

Characteristics: Multi-function, Individual Ownership, Standalone Technology

Trends that impact this world are: DIY Tools, My House Hugs Trees, Power Up and Make me Some Lemonade.

In the year 2025, this world we see that criteria for objects at home are highly individualized, can accomplish multiple tasks and is not connected to the owners social network. With easy access to 3D printer individuals on an as needed basis print objects. With the ability to easily print and customize whatever object you would like as part of small manufacture runs, scarcity is not an issue in this world. Objects have become more sophisticated go beyond one basic function and can accommodate multiple would be able aid in more than one task. Although self-consciousness about waste, a greater issue on how to effectively recycle objects and transform them into new object for themselves has become value in this world. It in fact, makes your objects more unique and individualized. One main issue in this world as textured by the "Power up" trend, is that with power at a premium, objects have no or very little battery life and often man powered if energy is needed to complete its function.

World 2: Login Land
Login Land is a world where all objects are developed for communal use and designed for one primary function. It is important to note that this object is always online and networked to a social network.

Characteristics: Single Function, Social Ownership, Networked Technology

Trends that impact this world: Computer knows best and Crowdsource everything.

In the future, marked in this research as 2025, we see that objects at home are intended for more then one consumer. Objects in this world are shared for a reason and are produced by a large company and mass distributed. Given the digital support, this would be considered a luxury item. It is something that could exist in common spaces within a home environment and the digital enabled value to push content from our networks into our homes creating personal billboards is a key feature. The product is also networked to the internet and is intended to have a single function. The value of an individual's social network is integral to the design of objects in this world. Users of objects are always required to log in to use the product. Experiences with the object are consistent consumer to consumer with the only variable being the techno-social content.

World 3: Everything
iEverything is a world where objects have multiple uses, designed for specific person in mind and connected to a network at all times.

Characteristics: Multi-Function, Individual Ownership, Network Technology

Trends that impact this world are: Born big brother, Because my body tells me so, Having fun standing still, Stackable homes and Delayed marriage.

In 2025, in this world we see that objects at home are designed for one person. This is a gadget-based world, where the more an object can do to help you, the better. Although objects are designed to be integrated into social networks, this is an intensely private world. It is important that this object helps an individual on day-to-day tasks and be integral to their routine. As privacy is an underlying concern in this world, a consumer might want passive signals to engage with their network. Objects would be developed for people on a budget and is mass-produced to keep costs low. The lifespan of this object is very long and would be integrated into personal habits that could be measured over time.

World 4: Fluid Everything
Fluid Everything is a world where objects are communal, have multiple functions and are connected to a grid.

Characteristics: Multi-Function, Social Ownership, Networked Technology

Trends that impact this world: Experience based gifts.

In this world we see that objects at home are shared and have the capacity to work together. Domestic objects in this world are connected to a network and designed for more than one function. This world is filled with unique experiences and is constantly shape shifting. All objects are seamlessly integrated from one object to the next and always on. This object is shared, connected to a network and is mass-produced. It is not a hand made object and it is the delight of using the objects in combination that make them unique to the user. It is important to note, that only one trend impacted this world as an object that is social in ownership, networked and has multiple functions. Creating unique socially owned networked experiences with objects might be an extreme consideration in object design.

World 5: Personal Toolsets
Personal Toolsets is world where objects have a specific single use for a specific individual. This is not a shared object. Objects can be developed using a high-end technology, however it remains off the grid.

Characteristics: Single Function, Individual Ownership, Standalone Technology

Trends that impact this world are: Grow something, Regulated garbage and Experience based gifts.

In 2025, this world we see that objects are designed for an individual, that they do not have any embed technology to connect the object to a network and have a single purpose function. Little has changed in this world in terms of object design since 2013 outside of technical processes in designing the product. What propel the objects into the future are the influences on trends. Experiences are integral to object design. Toothpaste for example

could have a unique taste. Object can be hand made or mass distributed. Money is not an issue in consuming goods however; customers are environmental conscious, which is reason for a shift in product design.

World 6: Bixi Land
Bixi-Land is a world where objects have one function and designed to be shared. It can be constructed by technology, however it is not connected to a network.

Characteristics: Single Function, Social Ownership, Standalone Technology

Trends that impact this world are Co-op Life and Nomadism.

In 2025, objects in this world are communal and shared. There is no concept of ownership with a community access is standard mentality of inhabitants in this future. Objects do not have any connection to online social networks or capabilities and are purely intended for a single function in the home. Objects could be expensive or only used occasionally and therefore shared for to be accessible. Inhabitants of this world are transient and the value of objects and home have shifted in that products do not have a sense of preciousness attributed to an individual owner and can easily passed on. Uniqueness of the object is not important as its ability to accomplish one task effectively. The notion of "Home" is changing in this world and could be a short-term rental, hotel or staying at other people's homes as temporary locations.

World 7: Ping Nation
Ping Nation is a world where objects are individual owned, have one specific function and are connected to a social network.

Characteristics: Single Function, Individual Ownership, Networked Technology

Trend that impacts this world: Delayed marriage, Regulated garbage and Computer knows best.

In 2025, this world we see that objects are designed specifically for individual within the home. Objects are connected to the internet and social networks and are intended for one function within the home environment. Objects are simple in its design with limited functionality and being connected to a network becomes an important consideration in how objects are designed. The network recommendation highly influences objects and objects are fixtures within the home and are kept for a long duration as opposed to a short period of timed. Items in this world are mass-produced and could be considered a luxury-based item. Owners of these objects are environmentally conscious and products have minimal impact on the environment and could be made of recycled materials.

World 8: Co-Op Kitchens
In Co-op kitchens objects have the capacity to do many things and are designed to be shared. Although objects can be designed with technology tools this product is not connected to a network.

Characteristics: Multi-Function, Social Ownership, Standalone Technology

Trends that impact this world: Nomadism and Co-op life.

In 2025, this world's objects are built to be shared and have multiple functions. These are to be considered universal objects within the home. It becomes a standard where everyone has one and it's has no technology network capabilities. Objects in this world are mass-produced and are inexpensive. The owners of these objects are transient, so consistency of an object in one household would easily translate into another household.

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