Design from the Standpoint of Economics/Economics from the Standpoint of Design

John Heskett

Introduction by Clive Dilnot

As many readers of this journal will know, the design historian and economist John Heskett died in February 2014. A selection of his papers is currently under preparation for publication by Bloomsbury Press in London in Summer 2015. Design History Economics: A John Heskett Reader will attempt to present a range of Heskett’s work, published and unpublished. Among his unpublished papers are extensive worked-up notes to a seminar given over many years in Chicago and Hong Kong on “Design and the Creation of Value.” As a part a tribute to Heskett’s standing in the field and his work in history and economics of design, Design Issues is pleased to publish a fragment of this seminar (which is currently being edited for publication in its entirety later next year).

The seminar “Design and the Creation of value” arose as part of Heskett’s attempts to teach graduate design students, especially those involved in product development and innovation, some rudiments of economics. The “Business of Design” has been well-accepted for many years. Since the early 1990s schools like the Institute of Design at Illinois Institute of Technology (IIT) in Chicago have emphasized the contribution of design to economic value with almost theological zeal. Nonetheless, the specific linkage of design and economics is still rare. This might seem of academic concern but the failure to engage with economic theory is at the very minimum one of the contributing factors that in relation to management and business theory—let alone economics itself—the basis of design’s claim to (economic) value-creation can rarely be sustained.

If value is not really thought in these contexts, it is even rarer that economics is taught to designers not, simplistically, as an unexamined modeling of what, economically, now is, meaning kind of business-lite version of neo-classical economics (which in fact has little useful to say to design) but through the critical examination of the history of modern industrial economic thought.

2 As Suzan Boztepe of the University of Copenhagen recently pointed out to me in an e-mail discussing Heskett’s work, the recent plethora of quasi-popular books on design success and the value of design in business beyond the product—books like Liedtka’s Solving Problems with Design Thinking: Ten Stories of What Works (New York: Columbia Business School Press, 2013); or Tim Brown’s Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation (New York: Harper Collins, 2009) or Roger Martin’s book The Design of Business: Why Design Thinking is the Next Competitive Advantage (Boston, MA: Harvard Business Press, 2009) (and there are others like Vergant (2009); Zec (2011) —focus much on stories and on the general case that ‘design driven innovation’ is a third alternative to market pull or technology push innovation, and has the potential of creating radically new products but do not confront design with economics per se. More surprisingly the issue is dodged, even in academic studies of design management: See for example, R. Cooper, S. Junginger, and T. Llokwood (eds.), The Handbook of Design Management (New York: Berg, 2011) where, as she puts it, ‘one would expect to see something on design + economics but doesn’t.’
If the latter is rare, not at all attempted, so far as I am aware, is what is almost its converse, i.e., not only the confrontation of design with economics, but also its reverse, the confrontation of economics with design.

The seminar “Design and the Creation of Value” attempts all these things, hence its potential interest, both substantively and methodologically; an interest emphasized by the avowedly historical perspective that Heskett takes on these issues.

John Heskett studied economics and economic and social history at the London School of Economics in the 1950s. While working as a design historian in the UK from the 1970s to 1989 much of his interest in economics remained latent—although it undergirds his first book *Industrial Design* (1980). Indeed, it is perhaps this that is one of the factors that makes the latter so emphatically a work of design history—and one of the first within the modern formation of the field.¹

Heskett’s move to the United States in 1989, first to work on projects with the Design Management Institute in Boston and then to take up an appointment at the Institute of Design at IIT in Chicago—where the question of the economic value of design was then being given a new primacy—gave him the opportunity to begin a more serious engagement with design policy and design and business issues. As his teaching and writing in these areas developed (often relatively informally—for example, through the series of columns he wrote in the early 1990s on design and business for the now defunct design magazine I.D.) he felt the necessity to engage design and economics and economic thought more directly. Part of this was pedagogic: the felt need to persuade designers who themselves wished to engage seriously with business to think also in economic terms—to teach them a degree, at least, of economic literacy and to make them acquainted with some basic concepts in economic thought. But Heskett did not think this relationship abstractly nor did he see economics in mathematical terms. He rather saw the history of economic thought as a lexicon of (historical) concepts that, from a design perspective, could help inform the understanding—and therefore the public articulation—of how design creates value.²

“Value” in this case is a double-edged sword: It might be understood, through an economic lens, as merely economic value, and at its crudest as only monetary (“monetarization” in the current jargon). However, seen through the lens of design, and more particularly the through the lens of the product considered not simply as a unit at the service of economics but as a point of integrity and source of values in its own right,³ then value cannot be reduced to simple monetary value. Indeed, Heskett understood that at the level of social exchange and demand it is the presence in

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² History, or better a “historical perspective” as Duncan Foley says of his own book on economic thought *Adam’s Fallacy: A Guide to Economic Theology* (Cambridge, MA: Harvard University Press, 2006) ‘as a happy way to organize a set of complex ideas into a coherent and understandable story,’ one that provides ‘a kind of map on which students could locate the landmarks of economic language and ideas.’ See Foley, p. xii.

³ As several essays in the forthcoming Reader show, the concept of ‘produce integrity’ was vital to Heskett’s understanding of the creation of value through design. Heskett discussed the relation of “value” (economic) and “values” (more than economic) in an unpublished paper, “Value and Values in Design,” which will be reproduced in the *John Heskett Reader.*
Two centuries of the acute commodification of everything—including today, outrageously, the most intimate aspects of the self’s identity—have obscured the degree to which, for the subject, the commodification of things is the very least of a product’s attributes. If economics in its current form is an inescapable horizon and medium of our times—which is why it must be confronted and cannot be evaded—nonetheless as a ‘world-view,’ even at moments as an aspirant metaphysics, let alone an (inverted) ‘ethics,’ it is frighteningly incomplete. Economics thus requires contestation by that which exceeds it even as it incorporates it. Design, surprisingly at first glance, is one such site. Heskett’s text recognizes and comments on this fundamental truth.

The question of “design and the creation of value” is thus intellectually complex. It cannot be addressed entirely in economic terms, but it cannot be addressed without economics. This conundrum presents an intellectual opportunity and it is this that gives the short extract from Heskett’s seminar published below its interest.

In “Design from the Standpoint of Economics/Economics from the Standpoint of Design” Heskett directly and dialectically confronts design (and value) with economics. The text comes at the point in the seminar where Heskett has critically reviewed a range of economic theory (particularly, though not only, from the Austrian School) and immediately before he directly addresses the question of how to model design’s contribution to the creation of economic value. In this extract (sections #8 and #9 of the original seminar) what Heskett shows is that the relation design/economics is not external, not a separation, “design” and “economics,” but internal; the one is implicated in the other. Economics, and the understanding of economics, has implications for design, forcing design to confront the degree to which it is, in fact, an economic activity and therefore must also be theorized from this perspective. Especially as pedagogy, design all too often evades this reality. But if in its process and outcome design is necessarily bound up with economics, then designers should know something of this field—should at least have an acquaintance with the broad strokes of its thinking.

Considered overall, “Design and the Creation of Value” is an introduction to this idea. The extract below is the particular point at which Heskett tries to most directly confront design with economics. But it is also, and this is the originality and incipient importance of the paper, the point at which he tries to confront economics with design. Heskett notes, in the paper, the risk, even the apparent absurdity, of the latter: “To suggest that the fragmented and often ill-defined field of design can usefully augment economic theory—the most powerful and well entrenched of the social sciences—might seem overly ambitious, likely to have as much effect as a flea-bite on an elephant.” Nevertheless, the relationship is not wholly one-sided; economics, despite its stature, does not remain inviolate in relation to design. It is not inviolate because, as the crash of 2007–8 confirmed, particularly in its neoliberal form, economics is painfully limited. The failure to recover
from the crisis, particularly in Europe but also in the USA, has shown that not only the conceptual but the practical limitations of those who adopt its precepts as their lens upon the world is acute.

Thus, economics, while inevitable—how else do we get a handle on a world which is structurally and essentially made over in the name of economics and its interests?—is neither sufficient nor adequate. It needs to be challenged in its precepts and its inversions. Design—and the valuation of product integrity—is a small, but for all that not insignificant, means of so doing. If, to confront design with economics and economic thought is to ask the former to “up its game” with respect to the world’s it necessarily engages with, conversely to confront economics with models of value that exceed what economics can comfortably contain is to ask economics to become more adequate to the complex actuality of the world: a world which is economic (today more than ever—economics as all but the ‘metaphysics’ of this moment) but which is not only so.

Heskett’s paper therefore points to a necessary project for design studies. Economics, to repeat, is that which design studies cannot avoid—except at the cost of neutering or removing from thought, a serious, perhaps indeed the prime, condition of existence of design. But not only this, the paper points also to something broader, to a larger project of design studies by which we might understand what I once called “the disciplines of design.” In using this phrase I meant to indicate design’s implication in other disciplines and fields both within the university and within practice. “Implication” means here the manner in which design now not only may draw on a specific discipline or field of knowledge but also provide perspectives on that discipline or field. In this instance, economics confronts design with some truths that designers like to evade. But, equally, in Heskett’s arguments, design demonstrates truths concerning the creation of value that much if not most standard economic theory finds difficult to incorporate into its models. The point is that here, as in other such relations across fields, the relation is internal not external. It is not therefore design and economics but the implication of the one in the other. Substantively, this means a double necessity—to look at design through the lens of economic theory in its historical development, but, on the other hand, to “put the flea to the elephant” and insist that design’s quantum of truth concerning things (no matter how “fragmented and often ill-defined” the field may be) can nonetheless usefully augment economic theory.

What is being suggested here therefore—and this the wider methodological important beyond this instance—is that we need to go beyond the hopelessly unproductive relations of “and” in design “and” … relations. Whereas the conjunction indicates separation and a priori distinction between fields—and further implies

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that while they merrily dance around each other both maintain their existing identity and form—the project that Heskett effectively argues for here is wider and more courageous. It is the courage to try to let one discipline “invade” and think the other. What is presented below is by no means a wholly successful resolution of this question. It begs as many questions as it answers. But it is perhaps an indication of the beginning of a larger intellectual project.

At the end of one of his most profound essays Heidegger offers an insight that has never yet been sufficiently taken up in thought. Speaking of the question of “dwelling” and of how this relates at once to building and to thought he says: ‘perhaps this attempt to think about dwelling and building will bring out somewhat more clearly that … building and dwelling are, each in its own way, inescapably for dwelling. The two are however insufficient for dwelling so long as each busies itself in separation instead of listening to one another.”

The thrust of Heidegger’s argument is clear if nonetheless difficult to think. Disciplines, or fields, in our time do not generally “belong” to one another in the ways in which Heidegger is intimating they might. Yet perhaps our ‘learning to dwell’ (the real theme of Heidegger’s essay) and in this case to dwell as necessarily (though not only) economic beings, requires that we begin to be capable of such listening and such belonging. Heskett’s seminar notes, highly limited though they necessarily are, point us in this direction, at least in relation to these fields.

Clive Dilnot

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**Design from the Standpoint of Economics/Economics from the Standpoint of Design**

(….) All the major fields of economic theory are far more complex and rich in depth and detail than is depicted here. The purpose of the foregoing chapters has been to provide a basic understanding of each in broad terms in order to assess their implications for design.

The greatest problem in considering what economic theory explains about design, specifically or by implication, is in the context of neo-classicism, which in the Anglo-American world dominates both academic and applied economic practice. A frequent criticism of it from other theoretical perspectives focuses on its assumptions regarding the static nature of products and markets. If markets and products are as constant as depicted in Neo-classical theory, this at best reduces design to a trivial activity concerned with minor, superficial differentiation of unchanging commodities, a role, indeed, that it does frequently perform. At worst, it contradicts the whole validity of design.

In contrast, a central assumption of design practice is that every designer is in some manner concerned with the future: this is an innate feature of the discipline. Whether working at
drawing boards, in workshops, and increasingly at computers, many designers are concerned with enlarging the boundaries of possibility. Whether expressed in terms of a brochure for publication in one month, a product for production in a year’s time, or a system that might take several years, designers’ concepts will become the products, communications, environments and systems of the future. The only reason for generating these future concepts is that they will be different and, hopefully, better. Design, in other words, is about envisioning change, a condition not readily embraced by Neo-classical models. Basically, therefore, Neo-classical theory is concerned with explaining what is, and is not fundamentally concerned with what might be.

As soon as the possibility of change is admitted into economic models, however, the perspective shifts and it becomes much easier to relate design to economic theories. For example, the holistic nature of Friedrich List’s concepts of the role of state policy in promoting productive powers specifically acknowledges “the art of design” as one of the factors capable of profound influence in improving manufacturing industry.

This continuity of this idea was apparent on several levels by the early years of the twentieth century, following the unification of Germany in 1871 and its rapid industrialization. In terms of policy, the involvement of the German Imperial Government in the applied arts had numerous facets. It provided, for example, a ‘Standing Exhibition Commission for German Industry’ under the Ministry of the Interior, which included representatives from the Foreign Ministry, the Prussian Ministries of Commerce and Education, and other interested parties. This was responsible for the presentation of official national exhibits at major international exhibitions. Usually, a state official was appointed as commissioner responsible for an exhibition, and direct government funding was provided. Subsidies were also available for exhibitions where a direct state involvement was inappropriate. With Germany’s emergence as a major political and industrial power, such events were given high priority in the first decade of the century, as a means of impressing the world outside with the nation’s strength and achievement.

In addition to exhibition organization and promotion, an English electrical journal noted in 1907 that commercial attaches were being appointed to German consulates: “It is the duty of these commercial attaches to increase Germany’s foreign trade, and these experts of trade and commerce are always in direct communication with all the leading manufacturing and exporting houses of the German Empire, and make frequent trips to Germany for the purpose of personal conference with them.”

Another initiative of the Reich government was to appoint Hermann Muthesius, an architect in the employ of the Prussian government, to the post of cultural attach at the German Embassy.
in London—apparently at the suggestion of Kaiser Wilhem II. From 1892-1902 Muthesius reported regularly and wrote widely on developments in British architecture and design. Following his London appointment, he returned to be placed in charge of all applied art education in Prussia and appointed leading reformers to head the major schools within his remit. A constant theme in Muthesius’ lectures and essays was the close linkage of cultural, social and economic concerns in terms very close to those used by List.

Another prominent figure in elaborating List’s ideas was a liberal politician, Friedrich Naumann, who founded a journal *Die Hilfe*, in 1894, in which he frequently wrote about the applied arts. Most notably, in 1904, he published an important article, ‘Art in the Age of the Machine,’ which called for industrial methods of production to be used to create new forms expressing the spirit of the time, and the need to positively harness the potential of mechanization.

Quality work and good form were therefore advocated by Naumann as indispensible elements of achieving social unity domestically and international commercial competitiveness. Establishing such standards meant that appreciation of quality must be encouraged in the home market, an aim which could hardly be achieved by oppressing workers, paying them low wages and housing them inadequately. Good wages and working conditions were therefore a necessary precondition. In a book, *Neudeutsche Wirtschaftspolitik*, (New German Economic Policy) published in 1907, Naumann elaborated these ideas. In reviewing the book, Anton Jaumann observed that Germany’s competitive position was characterized by possession of few natural resources and dependence on imports of raw materials that had to be paid for by manufactured exports. How could it then survive the intense levels of international competition?

We must bring goods to the market that only we can manufacture. We cannot in the long run compete in cheap mass-production. Only quality is our deliverance. If we are able to deliver such excellent goods that can be imitated by no other people in the world and if these goods are so excellent that everyone wishes to buy them, then we have a winning hand.9

Nothing, concluded Jaumann, injured the commercial reputation of a nation as much as the label, “cheap and nasty.”

Naumann was also involved in foundation of an association in 1907 to promote design, the Deutscher Werkbund. At its founding meeting in Munich in October, 1907, Fritz Schumacher, a leading architect and designer, gave the opening address and posed the question: why was a new organization necessary? His answer was essentially a restatement of List’s ideas as reformulated by Naumann. Art, he said, was not only an aesthetic, but also, a moral power, but both were combined in the most important of powers:

economic power. The best creative and commercial spirits of the age should therefore unite to re-establish a harmonious culture. Once again, the unity of national cultural attainment and commercial success in international markets was strongly asserted.

The importance and continuity of the ideas originating with List requires a volume of their own to give an adequate account. It can be argued, however, that the productive powers of Germany, as understood by List, have been an innate factor in enabling Germany to overcome the chain of events it has faced in the last century: a demoralizing defeat in the First World War; a horrendous financial inflation and collapse; the Great Depression; the illusions and ultimate shame of its embrace of fascism; the problems of destruction and loss of territory following the Second World War, and the daunting tasks of reconstruction and reunification that followed.

The example of Germany also played a very important part in the modernization of Japan, where individualism has similarly played a less prominent role in the country’s economic progress. Although the direct role of List’s ideas in that country requires clarification, the role of state policy in initially establishing design competences and encouraging their application in Japanese industry and commerce has been a remarkable example of how, indeed, a government can encourage the development of productive powers. In the mid-1950s, there existed virtually no formally trained professional designers in Japan. As the result of policies introduced by the Ministry of International Trade and Industry (MITI), it was estimated that the country had 21,000 industrial designers alone by 1992. Their development has been an integral part of the success of Japanese products in international markets in the intervening period. Policies on the Japanese model were introduced in Korea and Taiwan and similarly have played an important role in their economic growth in the late twentieth century.

If List’s ideas have been important on a macro-economic level, other schools of theory also have implications for design in micro-economic terms. In this respect, the dynamic view of economics and change advocated by adherents of the Austrian school is particularly valuable. As Ludwig M. Lachman points out, “All economic action is of course concerned with the future, the more or less distant future. But the future is to all of us unknowable, though not unimaginable.” As stated previously, design is similarly concerned with the future, and also faces the risks and limitations in the challenge of imagining what is as yet unknowable. The actions involved in design too, as Mises points out, are determined by thought. In shaping these future ideas, moreover, Carl Menger’s insistence that the satisfaction of consumers is the primary function of economic activity and Hayek’s emphasis on freedom of choice and the possibility of improvement are of enormous significance in ideas of user-centred design.
which will be discussed later. Although generally silent about design in specific terms, therefore, the ideas of the Austrian school reverberate with implications that potentially open paths to a broader understanding of what the economic role of design can be. Institutional theory also provides a contextual richness that similarly offers opportunities for a reconsideration of design’s functions. At a general level, it raises important questions on the role of design in society and as generator of the specific forms of a culture. More specifically, theories such those initiated by Coase on transaction costs offer rich possibilities for discussion of how in such fields as information and communications, the role of design can powerfully enhance competitiveness.

The alternatives suggested by attempts to expand Neo-classical theory, particularly New Growth Theory’s inclusion of technology as a core factor in understanding how business actually functions, also has intriguing possibilities. Of especial value is the argument that technological knowledge, both coded and tacit, has in-built value from its capacity to derive innovative ideas from practice. This opens the door to a consideration of design also contributing to the processes of generating innovative ideas, (although the balance between coded and tacit knowledge in design may to tilt to the latter). Innovative ideas, of course, are by no means the sole perquisite of designers and, indeed, can originate from a broad constituency. Whatever the source, however, all will need translating into tangible form or definable process, and it is this translation from concept to specificity in terms acceptable to users that is the particular skill and contribution of design.

To summarize these varied possibilities in current trends of economic thinking, three clear areas of concern for designers in the context of production can be stipulated, (these will be discussed in more detail later):

1. Their work must be capable through innovation of contributing to creating new economic value.
2. Given the crucial role assigned to technology in New Growth Theory, an ability to understand technological opportunity and act upon it is required.
3. They must function within institutional structures of various kinds that enable and constrain their endeavors.

More important in the context of innovation and growth, is the role of designers as originators, or contributors to the origins, of totally new products capable of significantly changing existing markets, or even of creating new ones, and therefore of generating new economic value. If a vital role of design, as suggested here, is the translation of technological possibility into specific form, a close harmonization of design and technology is essential.
Concepts of designers being only concerned with superficial visual form completely underestimate the degree to which a working understanding of technology, as a minimum, is necessary to function as a designer. Without the ability at least to have dialogue with, and work in close relationship to, technological specialists, designers will be necessarily confined to the trivialities of what is often called “felt-pen design.” To adequately understand technological opportunity therefore requires technological competence. Design on this level is capable of being involved with the total product concept, not just visual appearance as a last-minute additive.

The third strand of economic theory, institutional structures, impinges upon design in innumerable ways, even when design is not specifically considered as an element in their workings. For example, laws, such as those in the U.S. on product liability, or those in Germany on recycling packaging materials, profoundly affect design practice. Other factors, including the general cultural climate of a society, the way design is manifested in public and private institutions, whether and how design is taught at all levels of the educational system, and the immediate context of the firms in which or for which designers work, are just a few of the institutional influences that merit consideration.

Specific attempts to explain design in an economic context have generally emphasized the level of its role in national economies. This focus on the macroeconomic level has produced a number of useful generalities, but few significantly convincing arguments about how design can be effectively applied in the specific context of practice in the business arena. Richard Nelson’s stress on activities at the level of the firm as a means of understanding innovation is relevant in this regard.

Since the dominant arena of activity for designers is at the level of the firm, whether working as a directly employed in-house designer or as external consultant, the major emphasis in discussing the role of design will need to be at the level of the firm, or the microeconomic level. A consideration of the functions and processes at this level can reveal some contributions of design to innovation not generally considered in any economic theory.

**Economics from the standpoint of design**

To suggest that the fragmented and often ill-defined field of design can usefully augment economic theory, the most powerful and well entrenched of the social sciences might seem overly ambitious, likely to have as much effect as a flea-bite on an elephant. Yet, when one moves from the concerns of theory to those of practice and considers the extent of the creation of designs in the world of business and their implementation in everyday life, it must sure
be evident that there remain large gaps in economic accounts of how products and services are produced, sold and used. Discussion of these matters can, hopefully as demonstrated by previous chapters, be enhanced by reference to economic theory but their importance also requires consideration of design in its own terms. It also raises many questions of the confusion caused by often radically different emphases in and explanations of the world provided by varied disciplines and their concepts and procedures.

Perhaps the greatest problem in explaining design is its confusion with art. In many publications intended for the general public there is still a tendency for design to be equated with art, which is probably one of the greatest sources of difficulty in developing a better understanding of what design is and what it can achieve.

An example is an article that appeared in the The New York Times Magazine of Sunday, 1 Dec. 2002 (see Figure 1), in which some artists were commissioned to rethink an object of everyday life. Among them was an artist/potter, Jonathon Adler, who applied his creative talents to that essential item, the toilet.

Note the terms to which Adler gives priority: cheerful, cute, fun, playful—all clichés of a society fixated on entertainment, having nothing whatever to do with the essential functions a toilet has to perform, or perhaps it should more accurately be said, the functions we all have to perform on a toilet! He does indeed mention that functional issues need to be addressed, but whether he is competent to do so is unclear—the likelihood of him being able to do so is low. Above all, do we really need something as fundamental as this to be brought within the boundaries of whimsical fashionable and cycles of change? What does Dior’s New Look in the field of women’s fashion of the post-Second World War period have to do with present day ceramic toilets? If this is the level at which it is being presented in an intelligent newspaper, what hope is there that design will ever be understood in all its complexity, diversity and richness?

Nathan Rosenberg, in examining the problems of technological innovation, shrewdly attributes some of them to what he terms “a frequent preoccupation with what is technologically spectacular rather than economically significant...” A parallel observation is possible about some aspects of design innovation, with in
In this case the preoccupation being with what is visually spectacular rather than economically significant. Above all, a major objection to this reduction of design to personal whim is that it reduces the complexities of practice to a very simple level, which involves severe distortion of the activity. Basically, the example of the toilet cited above is treated in the following terms (see Figure 2).

The attitudes and approaches manifested in the above exercise ignore several basic facts about design as a form of practice:

- The main arena in which design is practiced is business. There is a tendency for some designers to try to ignore this basic fact of their existence, which is yet another aspect of the problems in giving design credibility, but it will not conveniently disappear.
- As a business activity, design must be judged in terms of contributions to profitability. If it cannot contribute, then it cannot be regarded as of any use in business.
- Business is also a social activity. Both its internal organization and the needs it meets in society depend upon social consciousness and functions. Some business managers educated in the tenets of Neo-classical thinking try to ignore this basic fact of their existence, but it too will not conveniently disappear.
- Making profits is not a self-contained activity determined within a firm but depends upon satisfying customers’ needs.

In contrast with Adler’s terms, note the emphasis I am giving here on business, profitability, social activity, and customers’ needs. Moreover, design, considered in these terms, is a complex, demanding activity, as depicted in the diagram below (see Figure 3).
The above does not include every consideration and method needing to be at the command of a designer, or as is often likely, a design team, but it does give some idea of the spectrum of competencies necessary to them to function effectively.

Since the dominant arena of activity for designers is at the level of the firm, whether working as a directly employed in-house designer or as external consultant, a consideration of the functions and processes at this level can reveal some contributions of design to innovation not generally considered in economic theory. As noted earlier, in the context of production (see Figure 4), at least three major points of emphasis of value-creation need to be taken into account:

1. Through design-led or enabled innovation design makes a contribution to creating and adding new economic value. (cf. The role of designers as originators, or contributors to the origins, of totally new products capable of significantly changing existing markets, or even of creating new ones, and therefore of generating new economic value).
2. Similarly design can assist the ability to grasp technological opportunity and act upon it in ways that can help produce genuine innovations as against technical inventions.
3. Functioning within social and institutional structures of various kinds that enable and constrain their endeavours designers can facilitate the translation of these constraints and social possibilities into value.

In addition, however, if value is determined by customers, as Carl Menger emphasized, then not only the context of production needs to be examined, but also the context of use. One of the greatest challenges confronting designers is that they have to bridge the constraints and requirements of these two very different contexts.

Also of significance in stimulating innovation and growth is the role of designers as originators, or contributors to the origins, of totally new products capable of significantly changing existing markets, or even of creating new ones, and therefore of generating new economic value. If a vital role of design, as suggested here, is the translation of technological possibility into specific form, a close harmonization of design and technology is essential. [...] To adequately understand technological opportunity therefore requires technological competence. Design on this level is capable of being involved with the total product concept, not just visual appearance as a last minute additive.

The second context in which designers must function, the context of use, requires in contrast a very different set of requirements and constraints (see Figure 5).
Of fundamental importance in this context is the factor of utility, which in design terms relates to the capability provided for users by a design, or in other words, what it enables them to do. In addition, designs assume meaning and significance in people's lives, which may stem from alignment with the beliefs and symbols current in the outside world, or may be of private significance to particular individuals. A third factor is variations in the systemic nature of the context of use. This can be subdivided into the physical systems, such as the electrical system or TV broadcasting system, and cultural systems, such as patterns of belief and behaviour that are embedded in a pattern of life. These latter often have a profound effect upon how what aspects of utility or meaning people will consider significant (see Figure 6).

The priorities of production and of use differ radically. In the context of production, the dominant value is profitability, expressed in quantitative terms. In contrast, in the context of use the main emphasis is on values, in terms of satisfaction expressed in qualitative terms.

This distinction between value and values and their relative importance is the cause of enormous confusion in businesses and can frequently be a source of failure. Value is primarily defined in monetary terms. Money is both a measurement of value in markets and a store of value, or wealth. In some parts of the world, the primary expression of value for a firm is its share price and shareholders can often be considered their primary customers. A focus on monetary value, in terms of costs, prices, profits and capital, is a fundamental and unavoidable means of measurement in considering any aspect of business activity, design included. The point, however, is that solely focusing on financial measures or share price can ignore the means by which they are achieved and defined – or how and why they are established, enlarged and maintained. The argument here is that profitability cannot be
understood without examination of these deeper causes, which inevitably involves a consideration of values in a wider sense than the numerical alone.

As a consequence, one of the problems of discussing design in terms of the practices of Neo-classical economic theory is the way the latter has become dependent upon mathematical concepts and methodology. Similar problems also exist with the dominant practices of modern corporate administration and for much the same reasons—management has also become based on quantitative calculation and financial methodologies. This numerical emphasis is widely perceived by designers as a major obstacle to understanding how design functions. Setting aside the irrational aspects of what can often be an exaggerated, defensive reaction, and the deficiencies of some designers in clearly articulating their ideas, there is nevertheless considerable substance in such attitudes.

An illustration of the severity of such problems can be found in David Halberstam’s book, *The Reckoning*, which compares the fortunes in the post-Second World War period of the second largest car companies in Japan and the U.S., Nissan and Ford. He describes the conflict at Ford between a new generation of managers armed with powerful statistical tools who gradually took over the firm’s management in the 1960s and ’70s, and the engineers and designers who lacked any means of quantifying their work. Ford had long been run by one man, its founder, Henry Ford, and the company was indeed in desperate need of effective management systems.

Out of that need grew the immense power of the finance people. A powerful, confident, modern bureaucracy was being installed at the Ford Motor Company, sure of its skills, sure of its goals. It knew how to take care of itself, to help its own, and at above all how to replenish itself. For there was no easy way to replenish real car men, no graduate school readily turning out designers who were both creative and professional or manufacturing men who could run a happy, efficient factory. People of instinct and creativity, really talented ones, came along only rarely. The great business schools of America could not produce genius or intuition, but they could and did turn out every year a large number of able, ambitious young men and women who were good at management, who knew numbers and systems, and who knew first and foremost how to minimize costs and maximize profits.10

Halberstam’s explanation of the educational and commercial advantages of what is fact codified knowledge explains in large measure why it was adopted so avidly, and it must be

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repeated, such abilities were badly needed at Ford. What happened as result, however, was that other disciplines became subordinated to the methodologies of the new generation of managers—they were forced to communicate their work and ideas in ways that were not just inappropriate, but ultimately dysfunctional, to a point where, in the late 1970s, Ford almost went out of business.

The terms Halberstam uses to describe the “real car men”—creativity, talent, genius, intuition—are in fact all aspects of tacit knowledge, which is such an important element in any form of creative practice and most certainly in design. Competence grows from constant experiment on the basis of trial and error, resulting in cumulative experience, which becomes in-built, integral, and not easily rationalized. There are innumerable stories of designers who have completed a project in a manner that satisfies every criterion required by their client, and yet have still woken in the night to do more work on it, because they instinctively know something is not yet complete.

Tacit knowledge can neither be explained in terms of rational decision-making, nor be summarized easily in quantitative terms. If the management of a firm does not have understanding of, and sympathy for, the particular nature and virtues of tacit knowledge, it will inevitably be easy to make designers appear incompetent by demanding conformity to practices alien to design. Under such circumstances, it is hardly surprising that design is often not taken seriously. At the same time, the resentment of designers becomes more comprehensible.

Advocating a greater understanding of tacit knowledge on the part of management should not, of course, absolve designers from extending the boundaries of rational analysis and quantitative explanations that can communicate understanding of their practice. There is much to be done on this level. Without codified basic assumptions and methods, it is difficult to communicate knowledge to successive generations as a starting point. Halberstam’s point that there was “no graduate school readily turning out designers who were both creative and professional” is still true to some extent. Design education too often involves each generation metaphorically reinventing the wheel, albeit at a comparatively low skill level. There is much emphasis on “creative” ability, but without technical substance, economic relevance or institutional awareness and it is difficult to conceive of progress in any meaningful sense when small value is placed on the accumulation and codification of collective experience. The result is an inability to cope with new demands resulting from current, widespread change. In particular, when tackling large-scale complex problems
of a systemic nature, individual insight and subjective beliefs are often totally inadequate to grasp all the dimensions of the problem being faced. In such instances, methodologies and techniques using logical analysis, quantification and computers are a necessary step in comprehending the nature of the problems involved, providing a platform for creative design solutions at a high level.

The evolution of new approaches in education and methodology are therefore of enormous importance for design. There is a vital need for designers to be more specifically prepared for the decision-making processes involved in complex innovation, combining high-level creativity based on technological competence with business awareness and able to plan how to use a spectrum of design abilities with other disciplines.