

Functionalism and machine aesthetic of modern architecture



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Functionalism in Architecture was a movement during the late 19th century and early 20th century was a product of one American architect Louis Henri Sullivan who coined the term 'form follows function'. It was distinct to have exposed architecture of the existence of ornamentation and therefore aesthetics so that a structure simply expressed its purpose or function.

Both in the United States and in Europe, functionalism and machine aesthetics became existent due to the development of the era. During the 1920s and early 1930s in the United States, there was a growing machine-driven culture. The machine's influence on art and architecture reflected the machine's explosion as a valuable form of aesthetic. Both Functionalism and machine aesthetics held its own influence in modern architecture.

The arrival of the machine was to have such revolutionary significance that the following years can legitimately be termed the Machine Age. Among the great number of cultural changes engendered by this new era was the installation of a machine aesthetic in the fields of architecture and design. This was of central importance to the Modern Movement as it provided a means by which its practitioners could engage with what they regarded as the spirit of the age. The machine aesthetic can be distinguished in the work of each major figure of the Modernist pantheon; it therefore conditioned the entire range of Modernist activity.

By utilizing these aspects, the ornamentation and unnecessary forms of designs were obliterated and instead replaced by a plainer but functional look. Despite the growing movement of functionalism and machine aesthetics during the early 20th century, there still lie the differences and

comparisons between the utilizations, views, and ideas about them from America and Europe. The difference of the two places somehow manifested various approaches towards the topic.

The machine was valued for its service. Its aesthetic was promoted by those who saw a beauty in the machine — a beauty in appearance and function.

The machine aesthetic was assumed by all sorts of objects. The look of the machine was not universally celebrated, yet it was widespread nonetheless

Despite this consistency, the reasons why individual Modernists employed the aesthetic varied greatly, and to conclude that they did so only to evoke the current zeitgeist would hardly seem satisfactory.

Instead, the aim of this essay is to analyse functionalism and the several uses made of the machine aesthetic in order to determine why it was so central to Modernist theory and practice. Since the particular character of the aesthetic varied according to the nature of the interest in it (e. g. political, economic), the reasons for its use are fundamental to any understanding of Modernism.

Firstly, the idea that Modernism embraced the machine aesthetic in order to give concrete form to the spirit of the age, though not the sole motivation behind Modernist movement is valid in itself and deserves to be expounded.

The Industrial Revolution precipitated a series of immense changes which can be understood to have genuinely transformed the world. These include industrialisation, the rise of the metropolis, an accompanying decline in

ruralise, and rapid technological progress. In being plundered for their natural resources, even Third World countries felt the impact of the new era.

For many these changes threatened to create an environment that was both alien and hostile to humanity and nature. In the cultural sphere, the nineteenth-century design reformers John Ruskin and William Morris attacked machine-production for discouragement the craft skills and individuality of the worker. Since the machine took both tradition and individual attempt, it would become impossible for the artist or craftsman to take pride in their work, and the consumer, in turn, would suffer the spiritual disadvantages of no longer living in an environment that had been lovingly crafted. As a neutralizer, Ruskin, Morris and others proposed a return to traditional craft processes and sources of inspiration that were primarily medieval.

In other sectors, this reactionary measure was felt to be unrealistically traditionalist. Since the machine was, as Ruskin and Morris had argued, incompetent at matching traditional craft processes and designs, those who recognised that the machine was an beyond doubt reality were aware of the need to evolve a new aesthetic that it was suited to. This would re-establish a high standard of quality in design and ensure that designed goods were adjusted to the age, rather than being hopelessly revivalist. One such figure was Adolph Loos, whose essay ' Ornament and Crime' (1908) argued that applying decoration to a designed product was both inefficient and criminal, because eventually it resulted in the utilization of the craftsman: ' If I pay as much for a smooth box as for a decorated one, the difference in labour belongs to the worker.'

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Instead, the new aesthetic was to be derived from the new processes of mass production. The result was a simple, essentialist style that was based on geometry (especially the straight line and the right angle³). Geometry became a model, not only because geometrical forms were theoretically easier for the machine to execute, but also because of overtones that Plato, amongst others, had invested it with. In Plato's philosophy, geometrical forms were beautiful because they were elements of the eternal and absolute 'world of ideas' that existed beyond material reality.

The most concerted attempt to articulate this style was given in an exhibition on "Modern Architecture" at the Museum of Modern Art in 1932. The *International Style: Architecture Since 1922* accompanied the exhibition. Historian Henry-Russell Hitchcock and critic Philip Johnson outlined the principles of the "International" style:

The idea of style as the frame of potential growth, rather than as a fixed and crushing mould, has developed with the recognition of underlying principles such as architects discern in the great styles of the past. The principles are few and broad. . . . There is, first, a new conception of architecture as volume rather than mass. Secondly, regularity rather than axial symmetry serves as the chief means of ordering design. These two principles, with a third proscribing arbitrary applied decoration, mark the productions of the international style. 4

Advances in construction techniques and materials allowed for a shift in structural support. Whereas walls were once weight-bearing, and thus massive, support was now given by skeletal infrastructures. This change

provided greater flexibility in window placement; once nothing more than holes cut in a wall, they could now be located virtually anywhere. Thus, proponents of the International style, the architectural equivalent of machine purity, moved windows away from walls' centres, lest they suggest traditional construction.

Armed with these new possibilities, asymmetrical designs were encouraged, as “ function in most types of contemporary building is more directly expressed in asymmetrical forms. Ideally, structures were not to be arbitrarily asymmetrical, but it was assumed that the needs of residents and the purposes of different spaces in the buildings would not produce symmetrical designs — in fact, arbitrary asymmetry would be a decorative device, and thus an anathema to the Internationalists.

Machine purity was a reaction against the ornamentation of previous decades and even the Moderns. Honesty in use and materials was sought — functions should not be concealed beneath a covering, and items shouldn't be presented as something they were not. Simplicity and sterility championed the pure white of the hospital and lab. Stucco was an ideal material, as it provided for unbroken, continuous surfaces. Walls were skins, stripped down and allowing for a maximum of interior space. These interior spaces were to be designed individually, matching the needs of the resident, to “ provide for the amelioration and development of the functions of living.”

6 Rooms were to be determined by function, and the movement between rooms was to “ stress the unity and continuity of the whole volume inside a building.”

7 Book shelves and living plants were the best decorative devices in the home.

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This appealed to Modernists, whose works and writings revealed a desire to exceed the chaos of temporary solutions and preoccupation with styles that had characterised nineteenth-century design.

The aim of Modernism was to achieve the ideal solutions to each design problem in works that would be styleless, timeless and possess the same purity and clarity as geometry.

Given the widespread belief that the machine symbolised the new century, it was perhaps inevitable that certain Modernists should embrace it entirely for its own sake – purely as a metaphor, and with no concern for its practical applications. To some extent at least, this tends to be the case for most canonical Modernists, but this approach is exemplified by the Italian Futurist movement.

As this brief analysis indicates, Futurism was primarily a literary and artistic movement. It was characteristic of its paradoxical nature that a movement initiated as a response to the changing environment should possess no means of expression in the art form that most directly conditioned the environment – architecture. This was the case until 1914, five years after the publication of the first Manifesto, when Marinetti was finally able to welcome Antonio Sant' Elia into the ranks.

Sant' Elia recognised the metropolis as the environment of the new age, and accordingly pioneered designs that were replete with intimations of the machine aesthetic. His perspectives for *La Città Nuova* (1914) emphasise the geometry and verticality of his vision by juxtaposing stepped-back sections with sheer verticals. The interaction of diagonals and verticals this produces <https://assignbuster.com/functionality-and-machine-aesthetic-of-modern-architecture/>

invests his works with the same energy and dynamism to be found in exemplary Futurist paintings. In addition, his buildings are frequently surmounted by features resembling industrial chimneys or radio masts (e. g. Casa gradinata con ascensori, 1914), thus making perhaps slightly picturesque use of an iconography derived from machines.

Futurism's interest in the machine aesthetic arose from a naïve and romantic celebration of the machine for its qualities of energy and dynamism. The machine was therefore valued exclusively for the expressive potential it offered. Since they failed to grasp its practical aspects the Futurists neglected to adapt their aesthetic to technological limitations. For this reason Sant' Elia's designs remained on the drawing board.

A deeper engagement with the realities of the machine was demonstrated by those who embraced the concept of 'functionalism'. This idea played a significant role in most forms of Modernist design and theory. The central contention was that the form of an object should be dictated by its function. The Bauhaus, for example, aimed to 'originate the design of an object from its natural functions and relationships,'¹¹ so that they could be used effectively and were rationally related to each other.

Of course, the pursuit of functionalism complemented the Modernists' aim to arrive at ideal design solutions – unless objects fulfilled their purpose they could barely be ideal. This led to the notion that a designed object could be beautiful if, and only if, it functioned perfectly.

Function therefore replaced appearance as the prime principle of aesthetic quality. Artistic elaboration was eschewed in favour of clear form that both <https://assignbuster.com/functionalism-and-machine-aesthetic-of-modern-architecture/>

expressed its purpose and ensured that this purpose was satisfied. Henry-Russell Hitchcock and Philip Johnson, in their discussion of 'European functionalist' architects (i. e. canonical Modernists), wrote that, ' If a building provides adequately, completely and without compromise for its purpose, it is then a good building, regardless of its appearance.'¹²

Explanation of this somewhat radical view was found in the machine. Since the machine's appearance was derived entirely from its function it was both morally and economically admirable, which made it beautiful. Karl Ewald's writing *The Beauty of Machines* (1925-6) contained the saying, ' A good modern machine is an object of the highest aesthetic value – we are aware of that'.¹³ For evidence of this the Modernists looked to the USA, where an unselfconscious functionalism had been put into practice by pioneers like Samuel Colt and, in particular, Henry Ford. Ford brought the concept of standardisation to his car plant, with results that were seen as almost astonishing. His moving meeting line system, which involved specialised stages of fabrication and identical parts, had enabled him to dramatically increase car production. His success was such that industrialists and manufacturers across the world were adopting these methods.

Theoretically, their goods were now readily available and continually depreciating in price, even as profits soared. Paul Greenhalgh has observed that Modernists recognised the need to embrace technology for these reasons of economy and availability. It was the means by which Modernism could be promoted worldwide. In addition, the standardisation advocated by Ford would facilitate rapid construction and maintenance.¹⁴ Therefore, the example of Ford and others encouraged the Modernists to view the machine

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as the absolute ideal of functionalism. This can be confirmed by reference to Le Corbusier.

Much of Le Corbusier's manifesto *Vers une architecture* (1923) is dedicated to promoting the architectural virtues of the machine. His famous declaration, 'The house is a machine for living in,'¹⁵ often misunderstood, meant that the guiding principle for architects should be to make the house as well suited to its purpose as was a machine. This reiterated the argument that functionalism was more important than appearance. In order to progress, he believed, it was necessary for architects to abandon the notion of traditional styles and decorative effects: 'Architecture has nothing to do with the various 'styles' [They are] sometimes pretty, though not always; and never anything more.'¹⁶ This implies that he saw the aesthetic, not as just another style, but as the very substance of architecture. Instead, he drew parallels between architecture and the 'Engineer's Aesthetic', arguing that engineers were to be praised for their use of functionalism and mathematical order. As a consequence, architects were encouraged to emulate engineers and adopt these principles in order to attain harmony and logic in their designs. To reinforce this argument the illustrations of *Vers une architecture* celebrated the functional and architectural unity of Canadian grain stores, ships, aeroplanes and automobiles.

From a present day perspective his principles are better illuminated by his architecture, since these illustrations (e. g. the Caproni Triple hydroplane) seem rather old. The *Maison Dom-ino* (1915) was an early example of his Engineer's Aesthetic: three identical planes are suspended above each other by steel columns, a method of construction that frees the walls of their load-
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bearing purpose, and allows his concept of the ' free façade' to be introduced. An external staircase communicates between each level, and its location permits an unprecedented space and clarity in the plan. The components were all to be standardised and pre-fabricated, which would allow for rapid construction. This house was therefore a product of Le Corbusier's intention to apply the principles of mechanical mass production to domestic architecture.

However, a substantial body of criticism (e. g. Greenhalgh, Sparke) has argued that this functionalism of Modernist theory was not based in reality. The machine aesthetic remained just that, as few of the designs were capable of being standardised. For example, the Grand Comfort chair by Le Corbusier and Charlotte Perriand was neither functional nor standardised. It required no less than eighteen welds and three materials, making it expensive and capable of production only by craftsmanship. Le Corbusier's pavilion L'Esprit Nouveau featured door handles supposedly derived from car or aeroplane handles. These were not standardised but had to be made individually.

At the Bauhaus, Marianne Brandt's tea service (1928/30) embodies the machine aesthetic with its geometrical, angular forms, but, again, these features made it unsuited to machine production. For this reason, virtually no products of Modernism were mass-produced, at least until the style was modified and practised on an international level in what became known as the International Style. For the pioneer phase, mass production remained a metaphor that could not yet be emulated. 17

A further dimension which has not yet been discussed is the political function of the machine aesthetic.

This was hinted at in Loos' belief that it improved the domination of the worker, but here the importance was on the labour-saving potential of the machine. Loos celebrated the aesthetic because, theoretically, it reduced the hours of effort required of the worker by avoiding unnecessary ornament. This line of reasoning even occurs in the theories of the politically unsure Le Corbusier, whose Freehold Maisonettes of 1922 used mechanical applications and 'good organisation' derived from machines to reduce the need for human labour, and thus alleviate the workloads of servants.¹⁸ It did not necessarily follow in either case, however, that the machine could serve as an instrument for social liberation.

This possibility was not fully explored until the influence of Modernism had spread and produced a diversity of practitioners. To the increasingly machine-orientated Bauhaus Moholy-Nagy imparted his belief that the machine was inextricably linked with socialism because it was an absolute. He wrote: 'Before the machine, everyone is equal – I can use it, so can you . . . There is no tradition in technology, no consciousness of class or standing. Everybody can be the machine's master or slave.'¹⁹

This belief was widespread amongst Modernists, with Theo Van Doesburg being another notable exponent. Van Doesburg praised the machine as a medium of social liberation, and denied that handicraft possessed this capability, since handicraft, 'under the supremacy of materialism,'²⁰ reduced men to the level of machines. But as Charles Jencks has observed,

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Van Doesburg's enthusiasm for the machine went beyond its labour-saving potential, it was also based upon its 'universalising, abstract quality.'²¹ In Jencks' outline, the machine's impersonality enforces equality between its users, which in art would lead to the universal and the abstract. The result would be the realisation of a collective style that was universally valid and comprehensible, based as it was upon the abstract forms of the machine.

Paul Greenhalgh suggests that such an internationalism was central to Modernists' theory and was an inevitable condition of their quest for a 'universal human consciousness.'²² In order to achieve this, national boundaries had to be disposed of, as well as those between disciplines (such as fine art and design) and political classes. Greenhalgh confirms that the abstract, geometrical aesthetic appealed to Modernists because it could be used as a common language through which different nationalities could arrive at uniform solutions, thereby dissolving national boundaries. 'In its exclusion per se of language, abstraction was the aesthetic which enabled the ethic, internationalism, to be realised.'²³

Though he does not use the term, the aesthetic Greenhalgh refers to is that of the machine, since it is derived from and (theoretically) tailored for machine production. I would therefore argue that Modernists associated the aesthetic with internationalism, not only because of its abstract quality, but also because its origins in the machine imbued it with the universal quality that Moholy-Nagy and Van Doesburg recognised in this source.

The practical use of the machine aesthetic's political function is best illustrated by the Russian Constructivist movement.

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It is perhaps surprising that an aesthetic originating from the machine – the foundation of capitalism – could flourish in the political climate following the Communist revolution. Loos' idea of the machine as labour-saving device was, of course, central in resolving this dilemma, as was the social liberation and classlessness revealed by Van Doesburg and Moholy-Nagy. Also instrumental, no doubt, was the fact that, in this era, Russia was still largely a rural, peasant country possessing no heavy industry. The negative aspects of the machine would therefore have been less obvious than the myths of its glorious effects.

In this climate of rural poverty and political fervour, the machine seemed capable of transforming society, and the aesthetic became the perfect metaphor for revolution and nation-wide progress. Since this made the aesthetic an invaluable resource for Communist propaganda, many of the leading designers were commissioned to create works that mythologized the revolution.

Significantly, this situation did not only involve the government manipulating design to its own ends; many of the artists and designers were equally committed to the idea that they could serve the new society. The Constructivist movement was so named because its members saw it as their task to 'construct' the environment for a new society in the same way that engineers constructed bridges and so on. 25 Proletkult promoted the unity of science, industry, and art: Vladimir Tatlin, for example, believed design was linked to engineering, and saw the designer as an anonymous worker building for society. Tatlin's Monument to the Third International (1919-20) reflects this ethos.

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This projection for a 400m tall tower (only a scaled-down model was built) clearly represents the union of art and construction – its sculptural form of two intertwining spirals and a soaring diagonal component is rendered in a lattice construction suggestive of engineering. As well as resembling a machine, the tower actually functioned as one: it featured four transparent volumes that rotated at different speeds (yearly, monthly, daily and hourly). These were intended to house government offices for legislation, administration, information and cinematic projection.

It should be pointed out that none of these reasons for interest in the machine aesthetic were mutually exclusive, and individual Modernists did not adhere to it for any single reason. Each partook, to some extent, of most of them. The enthusiasm of the European Functionalists also involved the political interest observed in Constructivism. At the same time, an element of the Futurists' romantic fascination can be detected in the thinking of Le Corbusier, the Bauhaus, and all those for whom mass production remained out of reach.

In conclusion, as case after case demonstrates, the Modernists' enthusiasm for the machine aesthetic continued to be of an ideological rather than a practical nature. The machine was embraced as an idea by designers who failed to grasp the realities of mass production. Since their aesthetic was therefore inspired by the machine but not adapted to it, in many cases this actually impeded its realisation. This is highlighted by the examples of Futurism, Constructivism and even aspects of the Bauhaus, where numerous schemes could not be put into practice. However, the importance of the machine aesthetic within Modernism should not be underestimated; it was <https://assignbuster.com/functionality-and-machine-aesthetic-of-modern-architecture/>

practised so widely, indeed constituted an International Style, precisely because it was deemed to be the ideal and most logical way of realising the central tenets upon which Modernism was founded. These included truth, internationalism, function, atonement with the age, and so on. The belief that the aesthetic was universally valid is reflected by the great variety of uses to which it was applied, such as Utopian, political, economic etc. For this reason it is no exaggeration to say that, for the Modernists, it was not a question of aesthetics at all, but of a Machine Ethic.