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The Architecture of Banal Bureaucracy: WeWork and Algorithmic Design

Debates surrounding automation today have taken on an almost metaphysical quality—an inevitability that can't be understood, let alone made sense of or intervened in. We are routinely force-fed stories about robots stealing jobs, Ballardian self-driving car crashes, (Philip K.) Dickian “human” chatbots.[1] Statistics warn of a near future in which half of all professions run the risk of becoming automated, with the construction sector typically hovering at the top of these charts.[2] Data-driven technologies are now a routine part of everyday life—fully embedded in the functioning of our economies, more bureaucratic and banal than even the most techno-fetishist fantasies of a fully automated future.[3]

These scenarios have been seeping into the production of architecture for some time. Less the formal characteristics of Parametricism, the drones that increasingly manufacture and construct boringly complex brick walls, or the ubiquitous robotic arms donning any “future architecture” exhibition, it is the everyday bureaucracy of architecture that appears most susceptible to automation right now. In analyzing today's algorithmic bureaucracy, a company like WeWork, ostensibly instituted to facilitate co-working, is an obvious starting point. The company—with a cult-like celebration of work, a perverted love of Mondays, a penchant for decorating its interiors with neon signs exclaiming “Do what you love” or “You're in the right place,” and a mission that claims “Make a life, not a living”—is the vanguard of automated office design.

Initially offering flexible working spaces in New York to freelancers and startups in the wake of 2008 and the world financial crisis, WeWork has grown far beyond its initial remit of co-working office space rental. It has evolved into a new age behemoth, offering co-living spaces with WeLive, kindergartens through WeGrow, gyms and wellness centers with Rise By We, health care through TriNet, summer retreats through WeWork Summer Camp, and incubator programs for startups with WeWork Labs. The company has spread globally, sucking 250,000 members into 503 offices across 96 cities.

A key to WeWork's growth has been the standardization of the design process within its properties, both in terms of their spatial planning and their now homogenous and domesticated design aesthetic. All of WeWork's co-working spaces follow similar guidelines with allowance for small varia-

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[1] All of these fears can be found in the following warning-like headlines: “OECD Employment Outlook 2019: Act Now to Build a Future that Works for All #thefutureofwork,” OECD, [link](#); “Uber ‘Not Criminally Liable’ for Self-Driving Death,” BBC, March 6, 2019, [link](#); Tim Adams, “The Charge of the Chatbots: How Do You Tell Who's Human Online?” the *Guardian*, November 18, 2018, [link](#); Will Knight, “How to Tell If You're Talking to a Bot,” *Technology Review*, July 18, 2018, [link](#).

[2] Data Team, “A Study Finds Nearly Half of Jobs Are Vulnerable to Automation,” the *Economist*, April 24, 2018, [link](#).

[3] Jemima Kelly, “The Tech Sector Is Over,” *Financial Times*, January 8, 2019, [link](#).

tions—be it partition systems, kitchens, wallpaper, bookshelves, bike racks, reception desks, seat-to-office ratios, or generic wall art. Offices follow the same logic whether in Tokyo, Mumbai, London, Melbourne, Mexico City, or Berlin, and this has allowed the company to scale up at such an advantageous speed that there is debate over whether it should be considered as a technology company, a generic real estate business, or a neo-hippie snake oil salesman.[4]

Whatever the classification, the image of WeWork is distinctly urbane. It is a church for Richard Florida's "creative class" complete with the corresponding spatial geographies of inner-city real estate—real estate that is located by algorithms and purchased through venture capital.[5] This process has allowed WeWork to increasingly operate as a commercial design firm, employing in-house architects, engineers, construction managers, interior and graphic designers, art directors, and 3D visualizers.

Merging their commercial design capabilities with their technology offshoot "Powered by We," WeWork now offers "a full suite of design, construction, and operations solutions to a wide range of members including Enterprise companies," leveraging its "vast experience, market penetration, and economies of scale to deliver exceptional custom designed spaces and services for clients of all shapes and sizes." According to Bloomberg, this has led the company to scale back on the acquisition of offices and "instead help redesign and run spaces that customers already inhabit." Powered by We now boasts thirty clients having designed eleven spaces.[6] They have most recently been signed up to redesign UBS offices in New York, who in explaining the decision to go with WeWork rather than a typical commercial architecture practice, claimed "the more we talked to the team at WeWork, the more we felt they had something extra to add." [7]

This "something extra" now includes a tendency to see the design and management of office space as an algorithmic process. In a paper last year for a special issue of the *International Journal for Architectural Computing* under the theme of "Complex Modelling," WeWork doubted that design professions would be the last to witness automation. Instead, they argued that automation within the design process offered "the possibility of increased cost savings, reliability, and productivity by systematizing repetitive tasks" while allowing designers to focus on more complex problems.[8] WeWork has thus been developing a number of tools to eliminate tedious architectural tasks—which, according to company calculations, occupy nearly 20 percent of architectural labor—allowing architects to "use their creativity in other ways." In WeWork speak this means freeing up time for architects to design things like an "eye-catching central staircase or covered courtyard where members can mix and mingle"—it means a pivot away from what they see as the monotonous drudgery of spatial planning and toward a vague form of practice where architects design "really cool stuff." [9] While these tools are presented to clients, shareholders, and the public as free-floating innovations, devoid of any context, they are part of a wider historical and technological discourse surrounding architecture and computation, namely Building Information Modeling (BIM).

The bulk of a typical WeWork office building is comprised of private office spaces that follow a logic of repeated spatial ratios, arranged of repeated elements, filled with repeated furniture fabricated to repeated proportions. To design an office in this way, WeWork claims, is a time-consuming and tedious

[4] Ellen Huet, "WeWork's Revenue Doubled Last Year. So Did Its Losses," *Bloomberg*, March 25, 2019, [link](#).

[5] Laura Bliss, "WeWork Wants to Build the 'Future of Cities.' What Does that Mean?" *CityLab*, March 25, 2019, [link](#).

[6] "WeWork Transforming UBS Wealth Management Americas HQ," *Newsroom, WeWork*, July 30, 2018, [link](#).

[7] Ellen Huet, "WeWork Will Renovate UBS Office in Its Biggest Design Deal," *Bloomberg*, July 30, 2018, [link](#).

[8] Martin Tamke and Mette Ramsgaard Thomsen, "Complex Modelling," *International Journal of Architectural Computing*, vol. 16, no. 2 (June 2018): 87–90, [link](#).

[9] Mark Sullivan, "This Algorithm Might Design Your Next Office," *WeWork*, July 31, 2018, [link](#).

task involving “the planning of similar, but not quite identical, offices that follow a consistent design logic”—a task, in other words, in need of remedying. Their paper “Augmented Space Planning: Using Procedural Generation to Automate Desk Layouts” outlined a solution: an algorithm and an interface that automatically lays out rooms and furniture.[10]

To implement this, WeWork translated a series of basic parameters and definitions into computer code. Under this rubric, design is a space-planning exercise that takes into account “functional and experiential considerations, building code requirements, and client expectations.” The design “task” is set as the planning and laying out of offices that include the maximum number of desks (and therefore the “optimal revenue”) while still providing a “satisfactory experience for the people using the office.”[11] This involves the layout of desks and offices within a larger workspace, referencing WeWork’s “explicit design standards” involving strict geometries and dimensions for desk sizes and chair depths. Design constraints are marked as physical variables, such as changes in a room’s shape, doors, or columns that might impinge on a standardized office layout—one that a designer intuitively resolves, but a computer may struggle to grasp.

To develop this design process, the company executed exploration algorithms. Unlike search algorithms, which locate “values of variables” within a defined space, exploration looks to design said space itself. WeWork developed a “rotation layout algorithm” to lay out desks within any given space—starting with desks against a wall, or back to back, and rotating clockwise or counter-clockwise until a suitable layout is found. The algorithm then moves each line of desks toward the center of the space per WeWork’s design constraints. Once no additional desks can be added to a row, the algorithm provides an “end cap desk” (it either uses a new desk or rotates an existing one) to finish the design. WeWork claims that this algorithm can match human design skills by 77 percent.[12] WeWork’s definition of “design skills” here becomes purely instrumental: countering their earlier claims, design is really defined as how efficiently an architect can make a space sweat or, said differently, how to provide more desks resulting in more occupants and therefore more revenue. However, a match rate of 77 percent wasn’t enough. WeWork then trained an algorithm to simulate the “thought process of human designers” in each design stage by creating rules of thumb for office layouts, feeding a computer thousands of historical case studies of office layouts to recognize patterns and behavior.

The goal of these tasks was to measure the “performance” of an office layout as a product of the ratio between an office’s floor area and the total amount of desks utilized. WeWork wanted their algorithm to match or beat the performance of human designers in relation to efficiency; to measure this they compared their ratios to 13,000 existing offices designed by architects. Using this method, WeWork claims that it achieved a match rate with designers of 97 percent, with the algorithm performing significantly better when working on the design of large-scale offices. This bizarre figure (which belies what we may understand by design) raises somewhat worrying questions, which entail pseudo methods to quantify the design process and in doing so measure the performance of the worker.

WeWork is now developing their automated software as a plug-in

[10] Carl Anderson, Carlo Bailey, Andrew Heumann, and Daniel Davis, “Augmented Space Planning: Using Procedural Generation to Automate Desk Layouts,” *International Journal of Architectural Computing*, vol. 16, no. 2 (June 2018): 164–177, [link](#).

[11] Anderson et al., “Augmented Space Planning,” 165.

[12] Anderson et al., “Augmented Space Planning,” 171.

for Revit to allow even greater efficiency within the design process. The plugin, which works by pulling the algorithm through the Revit interface, automates the planning of spaces across multiple offices and gives the designer a range of layouts to browse. To do this, the designer selects a series of rooms in plan before using the desk automation command. If necessary, the designer is able to tweak key specifications, like desk sizes or clearance distances, before the tool automatically produces desk arrangements for each office. The designer then selects the desired arrangements—a decision that concludes the design process—and the layout is imported to the Revit model with desks and chairs automatically placed within the floor plan.

An implicit thread running throughout WeWork's workings is the notion of bureaucracy—what's the most effective, streamlined method to not only administer but organize space and corresponding office paraphernalia? Taken from the French *bureaucratie*, and attributed to economist Jean Claude Marie Vincent de Gournay in the early eighteenth century, *bureaucracy* refers to a “form of government predicated upon a desk.”^[13] Administration, and the material apparatus underlying said administration, is thus entwined in the development of bureaucracy since its birth. Cultural historian Ben Kafka in his book *The Demon of Writing: Powers and Failures of Paperwork* has sought to trace a “psychohistory” of bureaucracy linking its myths and materialities.

[14] For Kafka, the baptism of bureaucracy begins with the French Revolution, where paperwork proliferates through the rise of the public sphere and the corresponding democratization of power, now held under increased public scrutiny. Kafka draws on what Marx calls the “bureaucratic medium,” a theory of the folders, files, and paperwork bound within the day-to-day functioning of the state. In the process of bureaucratic development, a “comic-paranoid style” of criticism is produced that comes to define not only opposition to bureaucracy but its subsequent English etymology, referring to the slur “official despotism.” By the time that one notorious enemy of bureaucracy, social theorist Max Weber, was writing his texts on the “modern state” in the early twentieth century, this rule by desk had prevailed—requiring a whole new professional stratum of clerks, technicians, and white-collar workers.

In the case of WeWork, the desk itself is governed by a centralized bureaucracy where it is used as the key metric to calculate occupancy and to predict growth (which they estimate to reach 1.9 million “units” globally over the next eighteen months). The wider bureaucratic tendencies of WeWork thus fall neatly into a Weberian lens of “rationalization.” Weber describes rationalization as an attempt to master the world through calculation, which had become a key feature of the bureaucratic apparatus of modern capitalist modes of production and its process of “modernization.” Weber would go to lengths to describe how rationalization had come to dominate all spheres of life, from production and the division of labor to workplace discipline, bureaucratic administrations, and emerging legal structures. It would be used in its organizational form to control information, knowledge, and communication, underpinned by instrumental claims of efficiency, objectivity, and rationality.

In its contemporary guise, academics Chris Muellerleile and Susan L. Robertson have sought to map out a “Digital Weberianism,” one that contests the idea that post-Fordism has led to a disintegration of bureaucracy and rationalization. Instead, they claim that “the social order engendered by information

[13] Nayanika Mathur, “Bureaucracy,” in the *Cambridge Encyclopedia of Anthropology*, ed. Felix Stein, Sian Lazar, Matei Candea, Hildegard Diemberger, Joel Robbins, Andrew Sanchez, and Rupert Stasch, [link](#).

[14] Ben Kafka, *The Demon of Writing: Powers and Failures of Paperwork* (New York: Zone Books, 2012).

technologies transports the logic of bureaucracy more deeply into society,” and in this process, the “techno-scientific character” of bureaucratic rationality is intensified.[15] In effect, processes of rationalization are now administered by algorithms on the back of hordes of data that mask automated decision-making processes and further abstract socioeconomic relationships.

WeWork’s automated design can be seen as a process of rationalization applied to the production of architecture, one with a clear trajectory in architectural history when linked to Taylorist ideas of scientific management aimed at eliminating inefficiencies within or in the production of space. This trajectory includes *Das Neue Frankfurt*, which sought to industrialize the construction process and rationalize the design of space, and the early modernist avant-garde, who believed architecture needed to be scientifically and efficiently planned to prevent chaotic movement within buildings (think Alexander Klein’s diagram *The Functional House for Frictionless Living*), the most economic methods used for heating, ventilation, and natural and artificial lighting. The role of computation—and the development of CAD—to further push these processes of rationalization in the present and alleviate “banal” architectural tasks can’t be overstated. Introduced in the 1960s, CAD has evolved from experimental software developed in universities that could draw crude 2D drawings linked to colossal main frame computers the size of rooms. In the 1980s and ’90s CAD would leave academia to slowly replace the drawing board in offices, forcing architects to either adapt or be left behind by this new everyday technology. Today CAD has further developed into a parametric incarnation that has reached a peak with the unfolding industry standard of Revit and Building Information Modeling (BIM).

Beneath all these developments has been an apparent rise in “productivity”: computation makes the design and drafting process more efficient, so the argument goes, by replacing the Sisyphean task of endlessly drafting and revising drawings by hand. Modeling with BIM sees the automated integration of drafting in plan, section, elevation, and 3D modeling. Standardized building materials, products, and components, through BIM libraries, can be instantly added models to automatically provide costs, replacing the need to draw mass-produced objects or calculate prices. BIM software allows architects, contractors, engineers, and various other professionals to work on a project simultaneously and, according to ArchDaily, automate processes of “programming, conceptual detailed design, analysis, documentation, manufacturing, construction logistics, operation and maintenance, renovation and/or demolition.”[16] As a form of representation WeWork emphasizes an all-seeing “totality” within the production process (in turn leading to quicker turnaround times for office fit-outs). This is reproduced in WeWork’s app interface, which visualizes and offers the user/member the entire platform of offices across the globe to choose from in an instant, which in turn allows WeWork to monitor their operations in real time. The game-like character of BIM begins to feel like an grownup version of Minecraft where different wall types, doors, and furniture are added from the WeWork database to create a smooth, globalized digital world that mimics the smooth capital flows underlying the company’s operations.

WeWork’s space-laying algorithm is one tool in the now endless

[15] Chris Muellerleile and Susan L. Robertson, “Digital Weberianism: Bureaucracy, Information, and the Techo-rationality of Neoliberal Capitalism,” *Indiana Journal of Global Legal Studies*, vol. 25 no. 1 (2018): 187–216, see 209.

[16] José Tomás Franco, “What Is BIM and Why Does It Seem to Be Fundamental in the Current Architectural Design?” *ArchDaily*, March 10, 2018, [link](#).

surge of automated BIM options that aims to make the bureaucratic processes of architecture more efficient, calculable, and less labor-intensive. It looks to cede control to algorithms in a process similar to Muellerleile and Robertson's diagnosis where an additional layer of abstraction covers the everyday banalities of architecture. This produces a mystified process that hides the social and political character of design decisions. The contemporary production of architecture is a complex global web of supply chains, logistics, labor, and legal and political infrastructures. An algorithm—either one that intervenes in project management or designs a space or building component—flattens these considerations into one streamlined option, further removing responsibilities for any decision making within the production process.

Critical theorist Alberto Toscano has (in a Marxist vein) further challenged Weberian ideas of free-floating abstraction—purely influenced through epochal change—arguing instead that the processes of rationalization are a “conjunctural” response to “shifts in economic imperatives, as well as products of the lucid strategies of determinate capitalist agents,” such as hedge and venture funds or institutes like the Mont Perelin Society.[17] With WeWork's automated tools and developments in BIM, this may mean the automation of the design and drafting process is less a messianic prophecy and more capital trying to find new sites of surplus value in the aftermath of the 2008 financial crisis. This then brings into focus WeWork's funding model. It is impossible to ignore the role of venture capital that is bankrolling WeWork's entire loss-making operation. As WeWork rebrands to WeCo and their flotation on the stock market is canceled, the staggering scale of their losses has become apparent. Since 2016 WeWork has raised \$8 billion from venture capital and \$10.5 billion from Softbank and their “Softbank Vision Fund” largely backed by Saudi Arabia. Between 2016 and 2019, they lost \$4.2 billion while generating \$4.8 billion of revenue. Last year they reported a loss of \$1.6 billion on sales of \$1.8 billion. To attract this colossal amount of money, WeWork has thus positioned itself as the algorithmic avant-garde—the tech innovator and efficiency maker at the forefront of office automation. Like with other venture-capital (VC)-funded “tech” firms, a flood of capital allows WeWork to continue its operations, undercutting its competitors and buying up rivals with the sole purpose of reaching market dominance—or that awful term “disruption” in Silicon Valley jargon. To this extent it appears WeWork is less an innovator of architectural design and more of an aggressively inserted layer between the traditional architect and the client, an innovative bureaucracy-maker.

But let's return more broadly to WeWork's promise that their algorithm frees up design time so architects can use their creativity in other ways. While this seems naïve, it does overlap with larger arguments about BIM and touches on a broader discourse surrounding the benefits of automation in wider society. The implementation of CAD and BIM tools within architecture does not appear to have produced a more creative workforce or a surge in job satisfaction. While the benefits of automation are framed in a faux-utopian guise—one which would allow us “to hunt in the morning, fish in the afternoon, rear cattle in the evening, criticize after dinner,” as Marx would say—the reality is we work longer hours, are more stressed and anxious, and are less satisfied by life. Put another way, increased productivity, the justification for automation, does not

[17] Alberto Toscano, “Culture and Admin,” *Radical Philosophy*, vol. 182 series 1 (November/December 2013), 41, [link](#).

seem to buy us more free time for leisurely pursuits or creativity, as that time is instead filled by other banal exercises. The late Mark Fisher termed this “Nubureaucracy,” arguing that although neoliberalism presents itself as the great slasher of red tape, the destroyer of the “nanny” state, bureaucracy intensifies and becomes displaced under its regime—taking a new decentralized form where the worker becomes their own auditor.[18] In another telling aphorism, Fisher describes a situation of “Market Stalinism,” in which a combination of new technologies and managerialism massively increases the stress put on workers, creating a whole new world of meta-work and, in turn, generating whole new modes of anxiety. Using a similarly deadpan comparison to the USSR, David Graeber in *Bullshit Jobs* compares the neoliberal adage of efficiency through market competition with the old Soviet joke: “We pretend to work; they pretend to pay us.”[19] Graeber argues that if we look at contemporary patterns of employment, jobs within production have been largely automated while entire new sectors of professional, managerial, clerical, sales, and service workers have expanded resulting in a self-perpetuating system that exists purely to produce more pointless layers of bureaucracy filled with more bullshit jobs. As Graeber explains, this isn’t a question of economics but of politics. We could say, then, that if the benefits of automation within architecture and society are to be socially shared—more free time and fair wages—employees, particularly those at the lower end of the workplace hierarchy, will need a voice. And this voice traditionally comes from being part of a trade union; the realm of collective action, organization, and bargaining. As a concrete demand, this squares neatly with the wider work currently being undertaken by Architecture Lobby, who over the past few years have sought to highlight the role of labor in architectural production. While the role of automated management tools and data science merging with architectural design has been discussed within the Architecture Lobby, as an emerging form of labor in relationship to value, this points to one area that could be further developed with a corresponding set of concrete demands.

In this regard, wider developments in BIM, when positioned alongside the merging of data science with architectural production and management, mark a potentially unknowable rationalization of the profession’s banal bureaucracies. WeWork’s fascination with the rationalization of the desk may reveal it as less Weberian vanguard than rearguard, using twenty-first-century technologies to solve twentieth-century problems while laying claim to being epoch-defining innovators—and yet this much-publicized “innovation” is also what undergirds its position as an extractor of new profit horizons, stemming not from the square footage of office buildings so much as the labor of those who build offices. Consequently, WeWork as a strange form of architectural practice that adds further layers of Nubureaucracy to architectural production looks set to continue. WeWork’s IPO attempt is a textbook case of a “tech” company that is being grossly overvalued to be filed with the calamitous stock market launches of Uber or Lyft; a prime example of the strange postmodern fiction of our time in which PR hype obscures objective reality. As WeWork now goes through the process of corporate restructuring, we should remember Powered by We is now WeWork’s main source of revenue, and their client base is growing, meaning the VC-fueled circus where Silicon Valley disruption is levied at architectural practice may still look to be our immediate future.[20]

[18] Mark Fisher, “Nubureaucracy and Capitalist Realism” (lecture, Goldsmith’s College University of London, London, February 10, 2010), [link](#).

[19] David Graeber, *Bullshit Jobs* (New York: Simon & Schuster, 2019), 147.

[20] Ruth Reader, “WeWork Grows Up (And Out and Everywhere),” *Fast Company*, February 4, 2019, [link](#).