

CHAPTER 23

Marx, BIM, and Contemporary Labor

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23.1 BIM AND WORK

The real fascination of BIM is not its optimization of production, but its reconceptualization of architectural work. Architecture's professional status is shrinking as it limits its exposure to risk; its contractual divorce from building and construction pits architect against both builder and owner. Principles struggle to get heard or paid by their clients; staff work well over 40 hours a week for minimal monetary reward, virtually no security, and little knowledge of or control over their contribution to the larger design (or social) enterprise. Architectural work as we have experienced it for the last 60 years must change.

The introduction of BIM and integrated project delivery (IPD) into the workplace can, should, and will change this. They have stimulated not just a rethinking of architecture's place in the labor market but an awareness of our industry as a domain of labor.

While large architectural/engineering offices attend to management and human resources, the majority of architectural offices in the United States think only of the immediate needs of per-project staffing. If there is any thought given to how an architectural worker can move up in a firm, share in its rewards, pass knowledge on from one project to another, be trained in new techniques, or weigh in on what and why projects are taken on, it is rarely codified or shared. While the cost of procuring and managing labor takes up nearly 50 percent of the architectural office budget, we rarely discuss its implications (Tombesi et al. 2007). But this is beginning to change as the need for the information coordination that comes with BIM expands. The use of BIM, if deployed as more than a rendering tool, makes it virtually impossible to conduct business as (unmanaged) usual.

In order to evaluate how BIM management was actually managed, between July and August 2013, I interviewed by phone 15 BIM managers in large and small offices, in design-focused firms and firms specializing in technically complex "finished buildings," in firms dragged to BIM by the owners, and

in others pulling their clients and contractors to it. While almost none of those interviewed wanted to be called BIM managers (they are instead “directors of integrated design,” “digital design coordinators,” “digital design vision group heads,” “Revit leaders,” “building smart managers,” or “design application managers”) they all, for convenience sake, will be called here “BIM managers,” which covers a wide range of differing responsibilities. I asked about their educational and employment background; about their placement in the organization; about their methods for training staff; about the respect they garnered in the office; about their personal/personnel skills; about the advantages or not brought by BIM for their firm; and about their relationship to design decisions.

Yes, the BIM manager’s task is first and foremost to create an organizational framework, establish and update the BIM Execution Plan, schedule and chair meetings between team members for model consistency, back up and restore data, and maintain model security (Lareau and Nowicki 2010). But beyond this, the manner in which “BIM management” is itself managed is equally important and less obvious.

23.2 BIM MANAGERS: WHAT THEY ARE DOING

The striking interviews revealed that the work of the BIM manager contrasts greatly with that of BIM itself: where BIM makes work efficient, quantifiable, and predictable, the manager’s work is subjective, ad-hoc, and open-ended. Where BIM is valued for its informational transparency, the BIM manager is valued for his/her empathetic subtlety. Where BIM makes decision making linear, the BIM manager’s own decisions are multi-aspirational. The reason for this might be obvious—the BIM-manager is dealing with people, BIM with a building—but the specific issues that the BIM manager faces in bringing together people and building illuminates the real picture about the nature of BIM work, not just BIM technology. And the BIM managers present a complex, unsettled, and encouraging picture, one equal to the idiosyncrasies of architecture itself. Three major issues confront the BIM manager regarding design versus technology, networked tasks, and political/organizational change.

23.2.1 Design versus Technology

The first set of issues faced by the BIM manager resides in the inherent tension between design and technological, conflicting logics that BIM is not the first platform to introduce but which it exacerbates to an extreme. The aesthetic, illogical, nonlinear process of design simply doesn’t conform to a technology that is meant to streamline and quantify decision making. Likewise, design wants a coherent formal concept, whereas BIM a data-rich plethora of information. The BIM manager, in order to function in this, must acknowledge sympathies for both while not expecting a seamless synthesis.

This tension is indicated by the backgrounds of the BIM managers interviewed. All the managers except one are architects trained in design but whose concern for design was accompanied by another interest—technology, process, or quantifiability—that drew them to BIM and a technical career trajectory. After this, however, 75 percent wanted to and did return to architecture and design. For example, one began as a sculptor, then trained as and taught architecture, introducing BIM into the curriculum,

and then became a façade consultant, his interest in materials and fabrication leading him to BIM. But wanting to return to the full design of a building, he moved to a high-design architectural office. Another loved the design complexity of his thesis at architecture school, but wondered how design decisions could be made more quantifiable. Finding that in BIM and having developed that expertise as a BIM consultant, he rerouted to a boutique design office that produces highly craft architecture. Another, working in an architecture office, was entranced with the improvement in process brought on by CAD and then BIM, and made standardization his expertise, but changed offices when he felt stuck in an information technology (IT) role and divorced from the actual projects. In each case, the manager was bringing BIM into his or her specific offices via a first, pilot project.

This then raises the issue of BIM managements' most effective location: architecture or IT, embedded within a team or outside and separate. Each choice symbolizes design versus technical identity. In both small and medium-size offices, there was general agreement on the importance of being in a project, not just an expert "drop-in," the implicit idea being that the BIM manager is most effective if embedded in the design decisions. In the large offices, the departmentalization is more complex and varied. About 50 percent of the BIM managers had started in IT but had been moved to architecture, primarily so they could be working in project teams. The other 50 percent valued their ability to set standards not related to specific projects.

The largest multicity firms that not only separated architecture from IT but research and development (R&D) from in-house training don't escape the tension of in-house versus out-of-house work, coordinating both innovation and implementation R&D people while also overseeing BIM trainers in the regional offices. And while these managers worked in firms that were not "design" oriented, they still saw their work as supporting an architectural, not merely technical vision. A subset of this question was whether BIM work, as IT work, should be budgeted under overhead or under the billable, project-specific hours. The two managers I spoke to whose work was billed as overhead felt strongly that this was a mistake, since it was more expendable and encouraged a lack of team accountability.

If all the BIM managers agreed that their work was to support architectural quality, they varied on how or where BIM supported this. In certain offices, small and large, this meant not using BIM in schematics or design development so that the traditional design process (sketches, etc.) could remain undisturbed. Others felt strongly that the design advantage of BIM was missed if it was not used at the start, since BIM invites/expects upfront detail knowledge that offers a broader palette of design thinking.

The good news, in other words, is that BIM managers have architecture backgrounds that shape the context of the technological drive; the interesting news is that this background sits in provocative, if undigested, organizational contexts.

23.2.2 Networked Tasks

The second set of issues confronting the BIM managers stems from the particular collaborative and networked character of BIM work. Much has been made of BIM's support of collaboration, and indeed, the ability of engineers, fabricators, environmentalists, and so on to collaborate early in the project is important, complex, and significant; BIM managers, we know, need to be good communicators and organizers.

But the specifics of collaboration in the architectural office also require the BIM manager to reconfigure knowledge and skills. When the design work is three-dimensional, not two-dimensional; when the work is informational and not visual; and when construction knowledge is necessary for all participating in the virtual model, the task assignments must adjust. In one of the major distinctions between CAD and BIM work, inexperienced staff must be brought up to some level of expertise quickly. As one manager noted, the distinction between architect and draftsman disappears. As another put it, the collaborative, 3D nature of the model made it “a constantly moving monster” requiring different jobs to control it. If Bonneau wisely suggests thinking of job descriptions in four categories—project administrator, modeler, annotator, and detailer (Bonneau 2012)—it is the BIM manager’s job to identify and enact this.

Likewise, the task of building the BIM model is chained, not individual work, and the chain is only as strong as the weakest link. Production problems are not helped by throwing more people/drafters at the task. The linked nature of this structure contradicts the compartmentalization of most architectural offices, and BIM managers must determine how best to deal with linked rather than pyramidal organizations. As one manager said, the training can only go as fast as the slowest person, and, as a consultant, he had to be very patient and listen hard. As another put it, the team working on the BIM model needs to be small and tightly knit, and her role was to facilitate team “ownership” and continuity, not selfish pride. Another insisted that the reason a single BIM manager didn’t work at their firm was that such siloed expertise was inappropriate to communication that needed to happen at many different levels and in many different directions.

Coordination, in other words, is not merely handled by standards, charts, and critical paths, but by appreciation of the emerging entities and evolving chains of command.

23.2.3 Political/Organizational Change

The skill set needed to support this rhizomatic work structure is made more complicated by the political context in which it is embedded, and this leads to the third set of skills required by BIM managers. The firm leaders are generally of an older generation, primarily design oriented, and more experienced in construction; a younger generation, digitally evolved more than formally savvy, are the IT innovators. The nurturing of the bottom-up, of those working “on the ground,” is essential, but today’s BIM manager must operate in the politically difficult position of empowering the younger tech-savvy staff while not threatening the principals or those having moved up in the firm pre-BIM. One manager said that you not only can’t count on top-down directives for this, but you constantly need to move people “on the ground” around so they don’t plateau. Others indicated that when a project is scaling up, you have to be sensitive to and not demand much of the “CAD folks” who see BIM only as a 3D model. Another indicated that staffing needs have definitely changed, but the formula for this is not obvious, since it depends on the final product. With IPD, the model is more significant and BIM-skilled people are necessary; if not, the team can absorb less-trained people to do things that can’t erase information. Staffing is delicately handled, indirectly manipulated.

On the other hand, because staffing is not generally a BIM manager’s call, buy-in from the top is essential. The leadership role of the BIM manager is only as real as the power structure allows it to be.

Without this authority, the BIM manager cannot do the training, make productive staffing and critical-path changes, nor purchase the needed equipment. This can be hard to come by when the design partner doesn't want to or can't change his or her own working method. It is exhilarating when it is there. Two of the larger offices with seemingly the most advanced uses of BIM were those where principals required the change from CAD to BIM to happen in one day, no questions asked.

In general, beyond the specific organizational changes to work brought on by BIM, institutional and disciplinary change is just hard, and the BIM manager needs special skills. Many said that they needed to adjust the delivery of their protocols depending on who they were addressing: the principal, the project architect, the new staff member. In arguing for change, managers must identify the nature of that person's resistances: adherence to known procedures or lack of desire to collaborate, say, in the case of principals; personal ambition to please the boss and not the BIM manager on the part of the project architect; peer pressure to "design" and not merely learn software on the part of a staff member. Likewise, the protocols, while standardized in outcome, were not achievable by all in the same way. Like a sports trainer who knows that all individuals learn differently, the BIM manager must adjust training techniques. Ultimately, for all the standardization, the BIM manager essentially gives the team access to what is possible without knowing or controlling the outcome. The one BIM manager who left the technical realm of façade design to work in a high-design architecture office did so partly because, in the new office, the lack of fixed BIM protocols made the job feel organic; it had the adventure of a startup. And many managers mentioned the fact that now, more than ever, job retention is essential, and for this it was as important to make sure that those they worked with were happy as it was to make them productive. (As an aside, it is interesting to note that *all* the BIM managers loved their jobs even as many said they had "a love-hate" relationship to BIM itself. Many were shocked at their own quick rise in their firms, becoming leaders at a very young age.)

23.3 THE ENACTMENT OF ENLIGHTENED MANAGEMENT THEORY

The above description of the precarious and uncodified nature of BIM management work is meant to describe not its fallibility but rather its creativity. The story is not about BIM as an efficient tool that misperforms because of human error. The manager operates not as a technician in control of organizational rules but as a "craftsman," a practitioner of the art of management. As we move toward a future of more pervasive BIM use, the goal should not just be the streamlining of work but its staying light on its feet, ready for change. The one BIM manager who was not an architect but trained as the structural engineer—the oldest person interviewed and the only woman—objected to my suggestion that BIM would soon become pervasive and managing change would soon be irrelevant. She pointed out that it took 20 years to adapt to CAD; 7 to adapt to BIM; the next thing will come quickly and with its own timetable of new demands.

This observation and the general desire for production flexibility draws on the optimistic if not utopian management strategies of organization theorists in the 1950s and 1960s, many of them immigrants from Europe who saw the full promise of American corporate exceptionalism. Moving beyond the early

twentieth-century infatuation with division-of-labor Taylorism, these thinkers—Kurt Lewin, Donald Schon, and Peter Drucker primary among them—encourage enlightened management.

When confronting change, they suggest that one should evaluate the fluidity and complexity of the social context. While we might think that the most direct way to produce change is to increase the driving forces, in fact the most effective approach is to lessen the resisting forces. Don't conserve old hierarchies when given new tools; celebrate complexity. Listen to the wisdom of the system. Indeed, don't just manage change, encourage it. As Kurt Lewin said, "If you want to truly understand something, try to change it."

When setting management protocols, encourage knowledge that is activity-embedded, not abstract or academic. "Problem set" rather than "problem solve." Decentralize to be responsive. Defy disciplines and expand time horizons. Balance a variety of needs and goals and don't adhere to one value.

When contemplating future production, move from mass-production to mass-customization. Move from a made-in-house mindset to learning with various entities. Penetrate local markets. Avoid expanding into areas to be avoided. Produce fewer products. Prepare for "planned abandonment" and don't cling to yesterday's successes. Serve the customer, the reason for the firm's existence. Recognize that the real business of business is grasping that the essential question is not how to do things right but how to find the right thing to do.

When dealing with the worker, stay humble and be a learner. Remember that the manager's job is to prepare and free people to perform. Remember that the most intelligent and flexible in the system is the human being. Create conditions in which the individual is committed to an action because it is intrinsically satisfying, not because it provides external rewards.

It is here that Karl Marx provides background: the well-being of the worker was the heart of his socialism. His goal was to excise capitalist-induced alienation: alienation of the worker from other workers by competition for jobs; alienation of the worker from his products by the division of labor; and the alienation of worker from self by the false drives toward consumption. While *Das Capital* seems antithetical to American management, the goal for both is the same: the creative, supported, cooperative, satisfied, and productive worker. It is the same goal as the successful BIM manager.

The future work that this points to is laid out by Peter Drucker in his *Post-Capitalist Society* (Drucker 1993). Describing the emergence of a new type of worker within late twentieth-century "capitalism," he points out that in the eighteenth century, knowledge was applied to tools; in the nineteenth and early twentieth century, knowledge was applied to productivity (Taylorization), or knowledge applied to human work. Today, it is being applied to knowledge itself. As a result, a new breed of "knowledge workers" is appearing, workers who are different than previous eras because of their high level of education. These workers, Drucker says, own the means of production, that is, knowledge itself.

More than this, because the skills held by these workers—research, product design, fabrication, marketing, advertising, customer consulting, financing, contracting—allow technical insights to be linked to marketing strategy and financial acumen, the traditional distinction between goods and services breaks down. The traditional factors of production—land, labor, and capital—have become restraints rather than drivers. Indeed, no class, he points out, has risen or fallen as quickly as the blue-collar worker.

23.4 CONCLUSION: POST-CAPITALIST ARCHITECTURE

This gives us a framework for imagining the future work of architecture. Our skills, with the aid of BIM and IPD, can easily be understood as “research, product design, fabrication, marketing, advertising, customer consulting, financing, contracting” if we reconceive our mission. We should no longer assume that our work is delivering a building but rather delivering built environmental intelligence. Consistent with this, we should no longer leave the maintenance of the building to others, but embrace this as proof that our work is the ongoing stewardship of the things we put on this earth. We should no longer ignore the status of the laborers—architectural or constructional, white-collar or blue-collar, domestic or foreign—who produce our buildings. We should embrace the power given to us by BIM not merely to find the right way to do things, but find the right thing to do.

At this transitional moment in the profession, when design responsibility and financial savvy are shared among various players, the constitution of a new model for architectural practice is entirely up for grabs. Now is the time to think expansively about what we want this new practice to look like and how its organization might be linked to larger social, political, and economic formations. As new players in the management game—since we have avoided even seeing ourselves in the labor/management schema—architects are free to move directly toward an imagined ideal.

DISCUSSION QUESTIONS

1. Explain the role of the BIM manager in the office. What characteristics are needed to fulfill these responsibilities?
2. How are BIM with IPD changing the relationship of the team in architecture offices compared with CAD and design-bid-build?
3. How can existing examples of BIM management be models for future, better architectural office management?
4. Are there other qualities besides efficiency and cost savings that can be promoted by BIM?

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