Makivism Design
Social Media Participatory Design (SMPD)

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Submitted to the Department of Architecture
In Partial Fulfillment of the Requirements for the Degree of

Master of Science in Architecture Studies

At The

Massachusetts Institute of Technology

June 2018
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Submitted on the Department of Architecture
On May 24, 2018 in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Architecture Studies

ABSTRACT:

We live in a world today where instantaneous transparency is the rule of thumb. Social media platforms such as Facebook or LinkedIn have become the primary modes of communication and connectivity amongst professional and personal circles. Building Information Modeling, or BIM, is a 3D parametric modeling software. BIM visually assists architecture and engineering design teams remotely collaborate, innovate, and connect instantaneously with colleagues clients in more productive ways to create efficient construction projects. However, BIM’s strengths in efficient transparency are often not extended to the principal stakeholders of any project: the community. This thesis will examine an intersectional interest known as Social Media Participatory Design (SMPD) or Makivism Design. SMPD is the integration of both 3D parametric modeling with social media. Network platforms, such as Facebook or LinkedIn, are the primary modes of communication and connectivity amongst design professionals and community leaders today. By implementing SMPD into the built environment sector, community stakeholders can attain instantaneous access into the design process of a project through their favorite social media app. The primary research objective of this thesis is examine whether SMPD provides the designer, or user, the knowledge and communication they need to make the informed, transparent and inclusive design making decisions needed to collaborate on community-based projects. We will determine whether SMPD has the potential to empower those who feel marginalized and demand designers and clients alike to be more inclusive.

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Acknowledgments

It goes without saying that one’s thesis is never completed isolation. My thesis would never have been achieved without the love, support and guidance without the my immeasurable advisors, readers, mentors, colleagues, friends and family.

I am very grateful to the Department of Architecture. Specifically the Design Computation Group. For it without their vote of confidence and support of me, this day would not be possible:

Very special thanks to Terry Knight and her guidance not only in the classroom, but outside of it. If it was not for her, not only would I not been able to bring change to the entire MIT Community, but my life. Also a special thanks to George Stiny, Takehiko Nagakura (co-advisor) and Larry Sass for assisting me during my journey as a Computation Design candidate at MIT. It feels like yesterday when I came to visit the Computation department in November 2015

I would also like to those outside of my department who have been instrumental to my success as an MIT grad student:

Special thanks to my advisor Caesar McDowell from the Department of Urban Studies and Planning department.A prominent thanks to my mentor of life, Dr Cornel West of the Harvard Divinity School. Both of these professor’s expertise in community development is invaluable beyond measure to my research topic and area of focus.

Lastly, I would like to thank the ones that are near and dear to me. The ones who have always been there for me throughout the years:

Thanks to my father for getting up very early in the morning to provide a roof over our heads. Although we came from hard times and there is never a such thing as a perfect parent, I was blessed to grow up in a very loving and family. My brother and I are grateful for you being there during our adolescent years.

Thanks to my late grandmother, Ida “Deer” Henderson. Deer, I would give anything in this world to have you here with me for one more day. Those long summers that I spent with you has, in many ways, made me the man that I am today.

Special thanks to my brother. Gregory Austin Jr. being of the greatest forms of inspiration in my life. I pray that you continue your quest to gridiron glory while keeping God first. I Luv, baby.

Last but certainly not least, the biggest to the greatest woman in the world; my mother Jackie Austin. Moms, I love you more than you’ll ever know. From barely getting out of
high school to excelling at one of the most prestigious universities in the world! Who would ever thought it? Although it times I clearly do not deserve the blessings I have seen, I thank God for how far we have came and what else he has in store for our family.
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Prologue

The date was March 27, 2005. I remember that day as if it were a week ago. I embarked on two journeys that would forever change my life. The first was when my brother forwarded me an invite to this site known as TheFacebook (as it was known at the time). Prior to speaking to him that afternoon, I only heard a few of my friends were using it. While he was telling me about this new global internet network known as social media, I was embarking on my second journey by analyzing what some tech experts designed the future software of practice for architects, engineers and contractors. This new phenomenon known as, building information modeling, would not only alter the way I practice design, but would be the sole factor that has kept me in this field to this day.

Since my undergraduate years at Texas A&M University in 2004, parametric modeling has enabled me to remotely collaborate, innovate, and connect instantaneously with colleagues and clients in more productive ways to create efficient construction projects. My passion for utilizing parametric as a communicative tool had become so essential part of any design process. During, my internship at RTKL in 2006. Parametric modeling enabled me to communicate my designs smarter and faster than my co-workers and fellow undergradate interns. Afterwards, I was hired as a freelance designer to develop renovation concepts for the Texas A&M Mays Business School. The visual algorithmic techniques were so visually interactive to the client, they were able to participate in the entire design process remotely. It was later published in a magazine that same year and I was awarded my first merit scholarship. For a young man who grew up in precarious environments, low income housing from my early childhood, could barely read until the 11th grade and watched five of my best friends die before the age of 19, this was a humbling and mystifying experience.

When I came to MIT, I sought to discover the potential design flexibility of Building Information Modeling. Building Information Modeling, or BIM, is the considered by many as the new tool of trade for built environment sectors. I take the view that the mediation of experience involves technology as a means of production, and that technologies amplify experience along an axis of perception. There are hearing technologies, sight/vision technologies, writing, interaction, and other technologies. The tunneling of experience/presence, or channeling of perception, conditions experience, creates a framework within which our physical and perceptual experiences are modified. Understanding that modification, and its impact on social engagements, has been one of my biggest obsessions. This thesis calls for the need of designers to be more facilitators rather than creators by using social networking communities.
INTRODUCTION

1. Why Social Media?

It feels just like yesterday when I created my first social media account. More eerily, I remember exactly what I was doing. I had just just gotten off the phone with my brother who exclaimed that Facebook was “the best thing is sliced bread. Not just a slice, but the entire loaf!” I decided to interrupt my Revit tutorial and click on the link my brother sent me. Although I was laughing at how silly he was acting, it intense passion for Facebook grabbed my attention.

At first glance I was not impressed. I had heard about Facebook and MySpace from some of my friends, but I did not get why everyone was so fascinated with this new internet sensation known as social networking. TheFacebook, as it was known at the time, was originally for college students to connect, you had to have a college email in order to join. I used my Texas A&M account to enroll, my interest began to grow. Although I initially only saw my fellow Aggie classmates on it, I was able to find out a plethora of information in a matter of seconds. I was able to uncover detailed information about my college peers such as where they were born, their relationship status and their current social and/or political interests.

My enthusiasm grew even more when I discovered some of my high school and adolescent peers were also on Facebook. I was able to determine whether my high school peers were doing to better than me or worse. Facebook let me know who attended college and where they went. Whether they were married with kids or if their love interests were “complicated,” who remained behind in the city I grew up in and who went on to greener pastures. What spoke to me more where their profile and album pictures. A few of my old football and track teammates had went on to play college sports while many of them retired with families and daily nine to five jobs.

In roughly ten minutes, I went from being agnostic about social media to enthusiastic about it. How could this be? I was completely sold on the hype surrounding social media. The amount of information I acquired in such a short time felt absolutely amazing. I was able to find out so much about a person from their Facebook or MySpace profile I would not even need to meet them. I not only became a frequent user of social media, I became addicted to it. What I would soon learn was my addiction that my addiction to social media would be shared with billions of other users.
1.1 General Usage (2005 - 2015)

Social media platforms such as Twitter, Linkedin, Facebook and Instagram have become so mainstream our society it is ingrained in how we function in our everyday lives. The average user spends two hours on social media sites each day. From occupy movements to Harlem Shake flash mobs, social media is the usual medium of choice to adequately display real world social interactions in physical places and spaces. Pew Research conducted 27 national surveys 2005 to 2015. Within a ten year span their results showed a drastic uptick of social Media users - indicated in dark blue - compared to the collective among all American adult users, indicated in light blue.

![Social Networking Use](https://www.statista.com/statistics/433871/daily-social-media-usage-worldwide/

Fig 1A Social Networking Use. Note: % of all US adults (light blue) and internet users who use at least one social media networking sites (dark blue).

1.2 General Usage (2015 - Current).

Recent data has in of American adults have at least one social media profile. More than 56% of online adults use more than one social media platform. Figure 1.2 shows where there are frequent patterns of multi-social networking platforms.

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1[^1]

2[^2]

3[^3]
Based on total population, (not just internet users) 68% of U.S. adults are on Facebook. Facebook continues to be the most widely used social media platform, with 79% of American internet users.\(^4\) Between 2016 and 2017 alone, users who are 50 years or over rose from 45% to a whopping 55%. Even the data below shows double digit increases in Twitter, Youtube and Snapchat. One of the biggest indicators for this sharp rise could have stemmed from the 2016 Presidential Election. Especially when it comes to twitter as the current President of The United States uses Twitter as a main conduit of

\(^4\) pewinternet.org/2016/11/11/social-media-update-2016/
communication to not only the general public, but also government officials.

<table>
<thead>
<tr>
<th>Sites where news usership increased since 2016</th>
<th>'16-'17</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twitter</td>
<td>74%</td>
<td>+15*</td>
</tr>
<tr>
<td>2017</td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YouTube</td>
<td>32</td>
<td>+11*</td>
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Later on in this section we will break social media usage down by race, gender and socioeconomic status. In the meantime, here are some quick demographics regarding social media usage:

1. 75% of male internet users are on Facebook as well as 83% of female internet users.
2. 32% of teenagers consider Instagram to be the most important social network.
3. Female internet users are more likely to use Instagram than men, at 38% vs. 26%.
4. 29% of internet users with college degrees use Twitter, compared to 20% with high school degrees or less.
5. 81% of millennials check Twitter at least once per day.
6. Most Instagram users are between 18-29 years old, about six-in-ten online adults.
7. On any given day, Snapchat reaches 41% of 18 to 34-year-olds in the US.
8. Instagram receives the silver medal with 32% of users, Pinterest coming in a close third with 31%, and LinkedIn and Twitter at 29% and 24% respectively.

1.2 Social Media Usage By Demographics

In the wake of Ferguson and the Black Lives Matter movement, social media has become the great public communication forum for race relation in America. This theory is supported up by recent research polls. In June 2016, Pew Research issued a report which indicated that race relation viewpoints between blacks and whites were polar opposites. For instance, when asked whether President Obama had an impact on race

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5 pewinternet.org/2016/11/11/social-media-update-2016-methodology/
relations in America ‘a majority of Americans give the president credit for at least trying to make things better, but a quarter say he has made race relations worse.” While 51% of blacks indicated that race relations were better once he took office, only 28% of whites agreed. This sharp contrast was also noticeable when asked whether President Obama made race relations worst. The results between blacks and whites were 5% and 32%, respectively.

In figure 1.9, the results are based on a two question survey asked to participants. The first question was whether “our country has made the changes needed to give blacks equal rights with whites. The results amongst blacks and whites were 8% and 38%, respectively. The results were similar when asked if America “will not make the changes needed to give blacks equal rights with whites. These results amongst blacks and whites were 43% and 11%, respectively.

Figure 1D: On views of race and inequality, blacks and whites are worlds apart.⁶

Media platforms such as Facebook and Twitter have become the epicenter of social activism. Users began to live feed any discrimination occurrences. Examples such as Black Twitter⁷ propelled race relations to garner national attention. If we are to break down the demographics along race, we see a sharp contrast of black vs white social

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⁶“On Views of Race and Inequality, Blacks and Whites Are Worlds Apart.”
media users. Black social media users (68%) are roughly twice as likely as whites (35%) to say that at least some of the posts they see on social networking sites are about race or race relations.

![Social Media Users who say that ___ of the posts they see on social media are based on race relations.](image)

Figure 1.4 above indicates the amount of social media postings that are based on race relations. Not surprising that we see blacks are more likely to create and see such posts. The case is also true regarding hispanic Americans. They fall in between the middle of white and black users where 54% say that at least some of the posts that are created and seen on social media are race related whereas 44% report seeing only a few to no posts related to this topic. Figure 1.5 below shows the %results in a recent Pew Research study.

![Social Media Users who say that ___ of the posts they see on social media are based on race relations.](image)

Of all the social media platforms, Twitter seems to more popular platform for spreading ideas about social inequality. Activism platforms such as #BlackLivesMatter and #AllLivesMatter utilized Twitter three times more than Facebook to discuss race relations.

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8 "On Views of Race and Inequality, Blacks and Whites Are Worlds Apart."
9 "On Views of Race and Inequality, Blacks and Whites Are Worlds Apart."
in America. However, no chart can be more telling than this chart below. It shows not only the breakdown by age, race and gender, but also socioeconomic status and how it relates to different social networking platforms.

![Social Network Usage by demographics](image)

**Fig 1G: Social Network Usage by demographics.**

One of the biggest trends we are seeing is the data above show that if you attended high school or some college, you are likely to use social media apps such as Youtube and Instagram. Whereas if you are a college graduate, you are more likely to like Linkedin or Twitter. Since Linkedin is a social networking site for working professionals, it's not surprising that most users are college graduates. However, what was surprising is how Twitter users tend to be college users. Facebook was the only social platform that seemed to be balanced college educated and non-college educated users. This raises my hypothesis that Facebook is one of the few social networks that crossover between professional and personal agendas.

Age demographics are what we would expect. Media applications such as Instagram and Snapchat (not listed) are expected to be the favorite amongst 18 - 29 year olds. This is not surprising as these social media platforms grew into popularity after social media gained worldwide notoriety. Catalysts such as Facebook, Twitter and Linkedin are popular amongst 30-49 year olds, the largest users of social media. That is again not surprising considering these platforms were well established since social media inception into our everyday lives.

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10 pewinternet.org/2016/11/11/social-media-update-2016-methodology/
Figure 1.7 also indicates a trend that has been evident since social media's early inception which is that most social media users are non-hispanic whites. Surprisingly, this trend has starting to rapidly reverse. As indicated earlier in this chapter, there has been a rise of social networking from underrepresented communities. This is given to the recent rise of racial tensions in here in America. Figure 1.8 indicates this.

\% of U.S. adults who get news from social media sites...

![Figure 1H: social media news use increases among older, nonwhite and less educated Americans.](https://pewinternet.org/2016/11/11/social-media-update-2016-methodology/)

Let the figure above show that if you are not white, have a minimal college education and between the age of 18 and 49, you are more likely to use social media. The rise of non-white users also reflects our earlier discussion regarding users from underrepresented communities utilizing social media platforms to advocate for social equality.

1.3 Conclusion

Through social media, you are virtually engaging and personalizing the people you are talking you. Whether its online or offline, we are always caught up on the media side of engagement. So much that we forget there are people behind these profiles. There are identities behind the profiles. Behind the identity are a story. A story that tells a narrative about what defines who they are. Instead, many times we get caught up in the media part of things. Online communication is ingrained our everyday lives so much, it almost unthinkable to perform everyday tasks without it.
2. Why BIM?

From architecture to engineering, parametric modeling has grown into the eminent way of how things are designed, since the early 2000s. Parametric modeling dimensionally defines a form’s ability to change the shape of model’s geometry immediately when the dimension value is modified. The modeling process is derived from mathematical equations. The principle is to define parameters on the components of your sketch and the different features. The components will then be parametrically driven and easily modified thanks to the tree history. More, you can mathematically define relationship for parameters that allows to modify the design of your object by changing a few values.

The process is also effective if you need to produce products with little variations. Parametric modeling is actually focusing on relationships between parameters, and between parts, assemblies and drawings. These are attributes that include length, width, depth, orientation, geometry, material, density functions, etc. Indeed, it is good to create designs that need to be modified on a regular basis. It will totally be adapted to your design intent. All the models created with this process have what we call parameters.

Parametric modeling is very beneficial when doing 3D work. It’s an effective to see how the model directly changes when something is modified, and you can easily reuse the data of a 3D model to create a new design. This is very important for manufacturing designs. It can reduce your production time as it can easily be integrated inside of your manufacturing process. This modeling process is effective for projects with a lot of manufacturing requirement and that need a high accuracy such as architecture, planning and industrial projects.

Some prominent examples of parametric modeling include Solidworks, CATIA, Rhino/Grasshopper, FreeCAD, CREO, Siemens MX and Fusion 360.

2.1 Understanding BIM

Today you cannot discuss parametric modeling design without mentioning Building Information Modeling. Also known as BIM, building information modeling is a methodology in which digital design simulations are created to manage all project information. In their paper “Exploring Integrated Design Strategies for the Optimal Use of BIM,” authors Hyoung-June Park and Ji-Hyun Lee describe BIM as “a process of establishing manageable and shareable representations of physical and functional data that define buildings through their life cycles in digital format” (Park; Lee 9).

Unlike other generic parametric modeling programs like Rhino/Grasshopper that simply creates 2D or 3D elements, BIM also “allows users to manage information intelligently throughout the life cycle of a project, automating processes as programming, conceptual
design, detailed design, analysis, documentation, manufacturing, construction logistics, operation and maintenance, renovation and/or demolition” Franco). This is because BIM projects use real time parameters such as products materials, time and cost. These are known as 4D and 5D parameters. BIM uses such parameters to develop a project’s geometry, costs, contact information, time and other characteristics. In other words, think of each BIM element as a catalog of information. The elements also have their own attributes which parametrically distinguish themselves from other ones. How much these elements variate and how they relate to one another depend specifically on the individual parameters themselves. If one of the elements is modified, the parametrics within them will determine what will automatically change with it; be it size, volume, material or time.

Most importantly, it's imperative to stress that itself BIM is not a technology but a process. This is possibly the most important aspect to understand. BIM applies to all aspects of a project’s life cycle, from the design, the estimating, the supply chain, the delivery of goods during the build, the build process, the resource allocation, the productivity requirements to meet targets and on in to the post-handover phase through Facilities and Asset Management. Aspects of BIM are enabled through various technology platforms. There are several providers of technology which supports architectural tools plus the addition of intelligent information against the model.

To better help one understand the different facets of BIM, it's important to break down the benefits it the program. Entitled Building Information Modeling For The Win, author Matt Ball breaks down why BIM has emerged at the program of choice for designers and practitioners alike. Of the 11 benefits outlined in this article, here are eight points that are crucial utilizing BIM in a productive and efficient manner:

1. **“Capture Reality.”** The wealth of information that's easily accessible about project sites has expanded greatly with better mapping tools and images of Earth. Today, project starts include aerial imagery and digital elevation, along with laser scans of existing infrastructure, accurately capturing reality and greatly streamlining project preparations. With BIM, designers benefit from all of that input compiled and shared in a model—in a way that paper isn’t able to capture.”

One of the biggest selling factors about BIM is the instantaneous capture of updates that occur any time a model is revised. Any changes made to the model are updated automatically and “creates real-time, consistent relationships between digital design data with innovative parametric building modeling technology” (Park; Lee, 9). We will discuss this later in this section, but BIM also notifies parameters of a project that are unrealistic or not. This is very beneficial when compared to other parametric modeling systems. I will use the form below as an example. This exercise was done in Revit 2019. The entire exercise took place in under three minutes.
Step 1: I drew a nine point wing in 2D.

Step two: I extruded the 2D form into 3D.
Step three: I began to push and pull the extents of the shape by its points and planes. I expanded it all the way to the point where one side of the form was almost horizontal.
However, when I tried to make pull the vertical shapes to be horizontal with the top plane, I got this error message.

Instantly, I received an error message saying that I was “unable to create form...” at the bottom right of the screen. Let this error reflect the underlying purpose of this quick exercise. The purpose of this creation is not to show the creative design capabilities of
BIM. Instead it is to show the realistic limitations of the process. This is not something you'll find with other parametric modeling platforms such as Rhino/Grasshopper.

2. **Waste Not, Want Not.** With a shared model, there's less need for rework and duplication of drawings for the different requirements of building disciplines. The model contains more information than a drawing set, allowing each discipline to annotate and connect its intelligence to the project. BIM drawing tools have the advantage of being faster than 2D drawing tools, and each object is connected to a database. The database aids such steps as the number and size of windows for quantity takeoffs that are updated automatically as the model evolves. The quick, computerized counting of components alone has been a significant labor and money saver.

While this is not a groundbreaking benefit, it's important to state that BIM was one of the first to embrace multifaceted updates in one project. Any updates in that occur in realtime is automatically updated in all views of a project, but all sheets.

The diagram show that any changes made in one views is automatically updated in all associated views.
When I grab the top of the form and shorten it in the top view (bottom left), I see the same occurrence in both the North (top left) and 3D (right) views. Moreover, these changes of this project are not only reflected in my workspace, but also other users who also are working on it. In other words, certain BIM platforms, such as Revit, allows multiple users to work on

3. **Maintain Control.** The digital-model-based workflow involves aids such as autosave and connections to project history so that users can be certain they’ve captured their time spent working on the model. The connection to the version history of the model’s evolution can help you avoid disastrous disappearances or corruption of files that can make blood boil and impinge productivity."

Since its inception, one of the selling points of BIM is its auto-archiving process.

4. **Improve Collaboration.** Sharing and collaborating with models is easier than with drawing sets, as there are a lot of functions that are possible only through a digital workflow. Much of this added project-management functionality is now being delivered in the cloud, such as Autodesk’s BIM 360 solutions. Here, there are tools for different disciplines to share their complex project models and to coordinate integration with their peers. Review and markup steps ensure that everyone has had input on the evolution of the design and that they are all ready to execute when the concept is finalized and moves forward in construction.”

5. **Simulate and Visualize.** Another of the advantages of BIM is the increasing number of simulation tools that allow designers to visualize such
things as the sunlight during different seasons or to quantify the calculation of building energy performance. The intelligence of the software to apply rules that are based on physics and best practices provides a complement for engineers and other project team members. The software can do much more of the analysis and modeling to achieve peak performance, condensing knowledge and rules into a service that can run with the click of a button.

6. **Present Perfectly.** With all of the design completed on a capture and alteration of existing reality, the model is the ultimate communication tool to convey the project scope, steps, and outcome. The fact that the design is fully 3D also means that there are fewer steps to render impressive views and fly-throughs that can be used to sell commercial space or to gain necessary regulatory approvals.

This is arguably one of the biggest benefits of using. Prior to BIM, computer drawings were usually 3D.

7. **Take It With You.** [The] capability with the cloud, as with Autodesk BIM 360 Build software, means that you have access to the model and project details from anywhere, on any device.

Similar to Facebook, Autodesk 360 can be accessed from any computer or mobile device. This is a sharp contrast to how design has been practiced for a very long time. Prior to the 360 cloud, designers had to physically carry their projects around. This ranged from a tube of hand drawings to a simply thumb drive that fits in one’s pocket. This, of course, led to the constant need to have your files backed up in case there was ever a mishap. In addition, since BIM files are usually huge in size, the only way to transfer files were to break them into smaller sizes. For instance, while at Skidmore, Owings and Merrill, one of my projects was the Cairo National Institute of Medicine. With Autodesk 360

8. **Reduce Fragmentation.** In the days before BIM, getting a truly global view of a project proved difficult—with thousands of unconnected documents in play, sometimes it took years for design teams to see the forest for the trees. By pulling all of a project’s documents into a single view, BIM enables teams to collaborate and communicate more effectively.
3. Problem Statement

One can argue the lack of social media usage by firms stem from a much larger problem. A problem that has is more entrenched in community outreach, or lack thereof, in the design curriculum. In his *Architecture Review* article, author Reinier de Graaf argues the lack of community participation as the primary reason. He states how participation design was once a rewarding accomplishments. Today it is something that he now calls “paid lip service” (de Graaf, 1). This is not surprising considering financial-driven the architecture, engineering and planning firms can be undemocratically unilateral design decisions conducted in many large scale projects today. Our discipline is often subject to political and economic endeavors. Pandering almost entirely to the needs of large-scale capital clients while ignoring community feedback for the sake of so-called expert knowledge. Professor James Corner refers to this as the “marginalization of design” (Corner, 2). Where “an increasingly unregulated, dispersed, global, and pluralistic world, projects have become more complicated, more difficult to pull off, more difficult to maintain in quality. Without kings, autocratic presidents, singular corporate leaders, or similarly-single-minded ‘clients with power and authority,’ it is very difficult to produce significantly innovative work, especially at a larger, urban scale” (Corner, 2). Thus, the question remains whether or not bim and social media can intercept and transform such elitist design practices. Can social media have more meaning than just for marketing and advertising? This is something that we will explore in this thesis.

Problem Statement: Is it possible to reconcile the two opposing paradigms of design, one being championing technological innovation and the other favoring grassroots community engagement? Can social media participation articulate the point of design around community empowerment and social awareness through digitally mediated technology that impacts our everyday lives in an information economy?

4. Thesis Statement

**Thesis statement:** Determine whether 3D parametric modeling and social networking system can be reconciled to help empowering designing of a built environment for communities.

I argue that creating an integrated system of parametric modeling with internet related tools like social networking and mobile computing will allow designers to enhance decision making capabilities in the hands of individuals who will collectively empower communities, and dismantle the traditional empire of design.
This thesis is motivated, in many ways, by the “culture of confession” society that we live in today. Where individuals of our society is demanding more transparency by asking large organizations to disclose their finances, internal practices, and systems of expertise production to the communities they are or profit from. This push for publicized transparency is by the digitally mediated platforms of social media. I argue that is should extend to the design field. Other than marketing, designers hardly ever serve as a “cultivator of community” as stated by Amanda Walter in her book, Social Media in Action. Usually designers transparently collaborate with the clients they work for, but hardly ever interact with the communities. If designers are able to harness the instantaneous dynamic of social media to empower the community to participate in the design process, could this computatively change the way we logistically practice design? We will explore a unique integration known as Social Media Participatory Design. SMPD is an integrated 3D parametric modeling and social networking system where social media platforms such as facebook or linkedin are primary modes of communication and connectivity amongst design professionals and community leaders.

The goal of SMPD is to remove the hermeneutics, or assumption, out of design via citizen participation. Instead of knowing by doing while doing without knowing, designers will instantaneously have community participation into design process. SMPD will provide the intersection of media, politics, activism, data visualization, and technology needed for designers to empower community participation. I’m envision SMPD’s system in which community stakeholders can attain instantaneous access into the design process of a project through their favorite social media app. Its methodology of allowing community leaders to gain instantaneous access and participate in their projects will be a methodology similar to DIY (do-it-yourself) system. The same way anyone can go online and create their car through a dealer’s website or create their own food order online a the grubhub app is how I envision SMPD’s methodology. Access into the design process can be done by simply using our favorite social media network via workstation or mobile app. Once created, SMPD could not only empower design making in our most vulnerable communities, but perhaps bridge the racial and cultural divide in our society today.
Inquiry Into Participatory Design

5. History of Participatory Design

Van Eyck and the “In Between” Space

It's important to mention that participatory design is not a new phenomenon. Since the days of Aldo Van Eyck, expanded public involvement has always been associated with community empowerment by what is referred to as the “in between” space. The ‘in-between’ was a notion he was familiar with in poetry since his youth, and his concern with number linked up with Bakema’s early efforts in the new Rotterdam neighbourhood projects, and Candilis’s passionate preoccupation with ‘building for the greatest number. Van Eyck’s thought about two issues: the concept of relation taking form in the ‘in-between’ and the shaping of number.

Aldo van Eyck’s work to be based on three known architectural traditions: the classical, the modern and the archaic. This is defined with a striking two-circle diagram known as the Othello Circles (Fig. 5A).

Figure: 5A: Aldo van Eyck “Othello Circles.” 12

In the first circle, he characterized each of the three traditions with a fitting paradigm: the classical, ‘immutability and rest’, with the Parthenon; the modern, ‘change and movement’, with a counter-construction of Van Doesburg; and the archaic, ‘the vernacular of the heart’, with a Pueblo village. Van Eyck argued that these three traditions are not mutually exclusive yet reconcilable by instigating a formal architectural and structural sufficiency life.

The paradigms of the three traditions are united in a large circle which stands for the realm of architecture. This clearly defined realm is connected with a different one, the reality of human relationships which is summarized in the right-hand circle by a picture of dancing Kayapó Indians. The dancers’ bodies join to form a circular - or rather spiral - human wall around an open centre that expands or shrinks as the spiral relaxes and tightens in the rhythm of the dance. Architecture has to deal with this ‘constant and constantly changing’ human reality, i.e. not only with what is different from the past, but also with what has remained the same.

Van Eyck was a part of a prominent and trendy group known as CIAM Team 10. Despite their differences, Team 10 members originally shared analytical functionalism of human interrelations and associations. The functions of dwelling, work, recreation and circulation are split up yet evolve into communication integrated city.

**Lucien Kroll**

One of the other prominent participatory designers was Lucien Kroll. Since Lucien’s manifesto seeks to use architectural intervention as a vehicle towards the regeneration of the inhabitants themselves, his work takes on an important social awareness. His masterpiece work, the Maison Medicale, so controversial it “exposed in a building political conflicts that normally remain hidden” (Jones, IX). Lucien’s practice of participatory design is prominent in two important respects. His work openly acknowledges and “confronts the disparities of political and economic power which give rise to this form of housing and urbanism, he forces participation practice to address the underlying issue of the empowerment of the poor in a democratic society” (Schuman, 349).

In setting a broad socio-political agenda for his design intervention, Kroll invited a counter-reaction from the entrenched municipal bureaucracy which was not long in coming.

**6. Social Media and Design**

We discussed in Chapter 1 how the usage of social media can be quite impactful to providing voice to the common man. One can argue there is no other medium that can
be as far reaching as social media. In their book *Social Media in Action*, authors Amanda Walter and Holly Berkley say architecture businesses should “Think of social media as the new cell phone. But unlike a phone call that is between a closed or private group, social media communications allow for outside input and influence, which will help your ideas and your business expand and thrive” (Walter; Berkley, 18). However, when architects only discuss social media, it’s usually in the context of marketing and advertising.

![Image of How A/E Firms Use Social Media](image)

**Figure 6A: Social media usage amongst architecture and engineering firms.**

Figure 3A depicts how architecture and engineering firms use social media. The figure shows a couple of factors that are not surprising. The first is that A/E firms are 100% online. After all, it’s almost impossible to conduct business today without having a webpage. The second factor is how ½ of the A/E firms only use social media for marketing and communications. What was surprising is how almost half of social media usage is used for professional services. This is much higher than I had anticipated it would be. This initially made me have optimistic thoughts that designers were fully utilizing social media’s participatory networking potential. However, what was not surprising is how professional development, networking and education were considered secondary goals instead of primary goals.

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When examining why designers are not valuing social media, firms claimed “a lack of time, resources, and understanding of social media tools, as well as intimidation by the vastness of the social media space as primary factors for not yet integrating a social media strategy into their communications efforts (Walter/Berkley, 16).” Authors Walter and Berkley researched hundreds of prestigious architecture, engineering and planning firms such as HoK, AECOM and SWA Group. Their claim for lack of social media usage is they do not have the time to fully learn how to use it. Instead, many firms are watching from the sidelines. Watching a handful of firms become social media experts by transforming their social media networks into the foremost powerful advocate of their work. Turning their archaic off-line communication techniques into streamlined networking tactics.

The University of Massachusetts conducted a survey to see how architecture, engineering and planning firms value social media as an essential asset to their business. According to the survey, 86% reported social media technology as “very important to their business and marketing strategies.” Regarding site usage, 85% of these businesses used Facebook while 59% used Twitter. We will discuss this later in the thesis, but the question remains as to how social media usage has done very little to influence design.

Conclusion

We will examine this later on in the thesis, but the question remains whether SMPD can entice designers to look beyond social media as a simple means to market their design work. To integrate social media with design as a means of bringing cultural and social awareness and perspective. However, it's important to note that SMPD, “The desired goal of [participation design] is not the promotion of working independently from or in opposition to the design professions, but rather the development of effective forms of collaboration between the two spheres that have too often been disconnected” (Ratto, 286). In other words, SMPD should not completely replace how design is practiced. Instead the goal of SMPD is to entice transitional design practices to evolve to meet the needs of the 21st century. I feel this is the prominent role social media can play in architecture, engineering and planning.
7. Rules of SMPD

This chapter entails the steps and methodologies for setting up and executing SMPD. We will discuss the requirements to run SMPD, how to step up SMPD and how to run the system.

Step 1: Requirements for setting up SMPD
In order to conduct SMPD successfully, you will need the following items:

1) A social media account. Facebook, Twitter, and Youtube are social media I recommend when using SMPD.

2) A design software. Since we argue that integrating social media and building information modeling provides maximum participation involvement, BIM is the recommended design platform.

3) Two HD monitors. Since SMPD requires users to have a desktop or laptop, this will cover one of the monitor requirements. The reason behind the requirement for two monitors is will be discussed in step two.

Step 2: Starting up SMPD
Once you have all the requirements for running SMPD, the next step is configuring it to launch. The first step is setting SMPD up to run it live. For this exercise, we will use Facebook as our social media platform. Whether it's a personal profile or a group page, setting up a live feed is similar. Figure 3A shows how this system would look. It is important to note that your Facebook browser should be on one screen and the BIM system on another. When posting something on Facebook, you will immediately see three options. You are going to select “live video.”
Figure 3A. Facebook profile display. Select “live video” to launch SMPD.

When selecting live video, your Facebook browser should look similar to the one pictured below in Figure 3B. You will see a live feed from your computer camera. Once your Facebook browser looks similar to 3B, you will see the option to either select share screen or display your computer camera. Select the share screen option on the right side of the Facebook browser.

Figure 3B. Facebook Live display options (pictured right).
Once you select share screen, three options will display in on the center of your Facebook browser (pictured in 3C below). These three options are:

1) Your entire screen. This is where you will select which screen you want to display. You want to make sure you select the screen opposite of where your Facebook browser is located.

2) Application window. This means Facebook will only live feed the application you have running in the background. For instance, if you are running Autodesk Revit in the background and you select it, only that program will be displayed on your live feed.

3) Internet tab. This simply live feeds your segment on the same browser but a different internet tab. For the sake of running SMPD, you should not use this option.

Figure 8C: The live feed “share your screen” option (centered).

Earlier in this segment, we mentioned how important it is to have two screens for launching SMPD. The reason is to prevent what I refer to as the “infinite mirror” display. Figure 8D below is an example of the “infinite mirror” display will look like. This simply means that your screen will display your Facebook browser an infinite number of times. We will cover this later on in the next step and later on in thesis when we discuss the disadvantages of SMPD. Therefore, if your Facebook browser is opened on one screen, its very important to share your design content on the opposite one. This way you can monitor the participatory feedback on one screen while facilitating the design on the other one.
Step Three: GO LIVE!
Once you've selected the screen where the design dialogue will take place, then select “Go Live” at the bottom right of the screen. Once you select “Go Live” you will see massive countdown letters and your design browser will display in your Facebook browser. If done correctly, your display will look similar to the one below in Figure 8E. The red timekeeper at the top left of the screen indicates how long you have been live on social media. You may end your SMPD session at any time by clicking the “End Live Video” at the bottom right of the screen at any time.
Figure 8E: Live Feed of SMPD.

One screen will show your design browser and the other screen will show your Facebook browser with the design browser displayed within it. This indicates that your SMPD system is set up correctly and ready to go.
8. Case Studies

In this chapter, we explore the usage of SMPD and what real time effects and results it has on a project. We will examine two case studies where real time comments lend an idea to how affective SMPD really can be. Please visit the Social Media Participatory Design Workshop Facebook page to see all posting and video correspondence.

Case Study One: MIT Residential Housing.

This case study examines the need for more student housing on MIT’s campus. There has been a call for more housing. Even after the construction of 676 beds in the Sidney Pacific Complex, housing shortage continues to be a cause for concern amongst skyrocketing rental rates in the surrounding Cambridge area. In February 2017, a petition was filed to demand more student housing for graduate students. According to the newspaper, Cambridge Day, the petition called for “1,100 housing units for single graduate students and an additional 700 for families and a plan from the institute outlining when graduate housing units will be built; it offers flexibility to build graduate housing outside of the Kendall Square area — within 1.5 miles of the parcel” (Levy). This project is known as the Volpe redevelopment.

Although the petition worked and construction for this development is underway, this massive project still leaves MIT roughly 600 units short of its desired housing needs. Therefore, this project will have at least 800 beds. The project is known as Westgate Fields. The name derives from the notion that it is located on the far west side of campus. It is located across the street from the Westgate Apartment complex pictured in figure 9A. It is also located to Tang Residence Hall, the tallest building on the west side of campus. This building is pictured in 9B. This mixed use facility will contain a high rise, mid rise and an entertainment center. The entire complex will be anchored by a private park square. Since the site is located across from extracurricular soccer and baseball fields, the private park will blend into the adjacent green areas.

14 https://www.facebook.com/groups/577626589272289/
15 http://www.cambridgeday.com/2017/08/14/mit-must-build-graduate-student-housing-before-anything-else-a-t-volpe-petition-says/
17 https://studentlife.mit.edu/housing/graduate-family-housing/graduate-residences/westgate-apartments
18 https://studentlife.mit.edu/housing/graduate-family-housing/graduate-residences/tang-hall
I created a project in which students and non-students alike can participate in a verbal and visual dialogue around creating sufficient housing. Unlike the Volpe project, this one will be located in the western section of the MIT Campus. Below is an outline of where the site will be located (Figure 9A and 9B).

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19 https://studentlife.mit.edu/housing/graduate-family-housing/graduate-residences/westgate-apartments
20 https://studentlife.mit.edu/housing/graduate-family-housing/graduate-residences/tang-hall
Trial One

Our first launch for SMPD was conducted on April 21st 2018 at 11am EST. The entire agenda of this trial was the placement of the buildings and the development of their forms.

Figure 8E: User’s view of the Case Study of site.
The first few minutes was me explaining the project and verifying the audio and visual quality. I verified the user's (designer's) view, pictured in figure 8E, of the Case Study of site during SMPD process first. If you are the user of the SMPD interface, you can terminate the session at any time. The first thing to do is to verify whether the participants can see what the user can see. I asked whether or not the participants can see my design platform on their screens. Figure 8F depicts a participant's view of the case study of site during SMPD process.

Figure 8G: Site placement of the first residential tower (north tower)
Figure 8H: Participants determining the height of north tower.

Figure 8H depicts a prominent moment during the entire case study and SMPD process. When trying to decide how tall to make the building, there was an interesting dialogue between the participants. The user had to ultimately mediate the building height.

Figure 8I: extruding the height of the North Tower (pictured in blue).
Figure 8J: finalizing the height of the North Tower.

Figure 8K: Participants determining the height of north tower.

Figure 8K depicts another interesting discussion amongst the participants. This was to determine whether or not Westgate Fields should have underground parking.
One of the users requested the site contain more than just residential buildings. He argued that having a multipurpose shopping and entertainment center would add convenient amenities for the Westgate Fields residents and the surrounding community. He also argued that an shopping and entertainment center would add financial value to MIT. Figure 8L depicts this part of the session.

Figure 8M: tower common spaces are vertically intruded and extruded
Figure 8N: participants providing “likes” during design of tower’s common space

One of the participants inquired into how horrid the winters can be while at MIT. Figure 8P depicts the installment of a bridge to link the Westgate Field residential towers.
One of the participants requested an interior dance space somewhere within the project. Figure 8P depicts the dance space (in blue) being installed on Westgate Field’s entertainment center.

We were able to finalize all three building’s forms and their site placement. We ended session one hour and twenty three minutes. Both the plan and perspective views are indicated in figures 8Q (above) and 8R (below).
Trial Two

Our second launch for SMPD was conducted on May 5th 2018 at 2pm EST. This trial's focus was the external curtain wall skin and interior design.

Prior to every SMPD, I was able to send a Facebook notification to all members of the SMPD Workshop group page. Figure 8S is an example of how a typical location would look.
Figure 8T: Exterior curtain system being placed on the north tower.

Figure 8T shows the exterior curtain wall system being placed on the north tower. One of the first tasks we addressed was the exterior skin of the building. Since the Boston area is a humid continental climate\(^\text{21}\), its subject to all four seasons of the year. This means hot humid summers and frigid cold winters. As a result, the participators requested both residential buildings have an operable exterior curtain system. It's important to mention that the operating system was developed offline in between sessions one and two.

\(^{21}\)http://www.weatherbase.com/weather/weather-summary.php3?s=90527&cityname=Boston%2C+Massachusetts%2C+United+States+of+America&units=
Figure 8U: Exterior operable curtain wall system of the south tower installed (pictured above and below).

Figure 8U depicts the installation of the exterior operable curtain wall system. The upper images shows the system being installed on the north side of the tower. The lower picture shows the operable system being installed on the remaining sides of the tower.
The images in figure 8V depicts the south tower's extruded windows being installed. The upper image shows them being installed on the north and west side of the tower. The bottom image shows the windows being installed on the south side of the tower.
Figure 8W: The formulation of the south tower’s roof and wall north wall adjustment (pictured above and below).

Figure 8W depicts the formulation of the south tower’s roof and wall north wall adjustment. The upper photo shows the exterior curtain wall system being adjusted to fit around the extruded window surfaces. The lower image shows the final transformation of the tower’s roof.
Figure 8X: Generation of color palettes for interior furniture (pictured above and below).

Figure 8X depicts the generation of color palettes for the interior furniture. In order to develop the necessary palettes, one of the participants pasted a website link in the comment section. I had to open a separate browser in to view the palette website. This part of the trial exposed one of the primary weaknesses of the current SMPD setup. Both images above and below provide a visual context during the color palette selection process.
Figure 8Y: Colors and materiality being placed on the interior furniture.

Figure 8Y depicts placement of colors and materiality on the interior furniture. Since BIM is an instantaneous updating platform, the participants were able to follow along in real time what was happening on the floor plan and perspective views (pictured above).

Final Result

Case study one was a two trial, two day SMPD process that lasted a total of three hours and forty-six minutes. Ultimately, the participants and I were pleased with how effective the SMPD process was throughout trials. We will summarize the entire SMPD process later on in the thesis, but some of the advantages were, ease of accessibility, instantaneous feedback and recordkeeping. Whereas the disadvantages were file sharing and user requirement of two screens.

Figure 8Z: Final result of Case Study One (interior perspective).
Case Study Two: Long Island Housing

This project was to add residential housing in Long Island City, NY. This was part of a studio crit from an MIT Department of Urban Studies class. For case study one, we explored a SMPD by linking BIM within Facebook. Case study two revealed another profound development that would contribute to the SMPD process. Unlike case study one, some of the example design platforms used were Adobe Illustrator.

Figure 8AA: SMPD with Adobe Illustrator as the design engine.

Figure 8BB: SMPD with Google Earth
Overall, studio Professor Marie Law Adams, her students and attending crits lauded SMPD ability for hosting public town halls. This case study was how it was able to gather community members inside and outside the studio. According to Professor Adams:

“This would work well in a public meeting context. I could see that working well to expand participation given that public meetings can be difficult for those who have obligations that prevent them from joining in person. I can see how the more building-oriented test would lend itself more directly to this type of participation.”

Zoe, the user, was able to follow along with her fellow classmates’ inquiries. She was also able to verbally respond to any feedback they had. This is depicted in figure 8CC above.

Figure 8CC: SMPD feedback between the user (Zoe) and the class participants
9. Summary

In this chapter, we will discuss the advantages and disadvantages of the system.

Advantages

1) **Instantaneous feedback.** This advantage is contributed to two factors. The first is the interactive design software being used. Whether it was Autodesk Revit or Adobe Illustrator the participators were able to follow along at ease. The second factor was social media’s live feed. The participators were able to provide real time comments on design information.

2) **Ease of Access.** This is arguably one of the biggest advantages of SMPD. Case study one had a total of nine users. Of the nine users, only three were located within five miles of the site. The other six were located in multiple states. Some participants were as far as California and Washington. Figure 9A indicates the location of all users and participants of Case study one.

3) **Remote Town Hall.** Multiple participants can tune from one location. This was obvious during case study two. While the user was presenting, she was also
receiving live feedback from the present studio crits. Meanwhile, the rest of the class was able to remotely follow along via laptops and cell phones. They were also able to not only comment on the SPMD session, but also able to see and hear user’s answers to any questions or comments they had. Please see figure 9B.

Figure 9B: Town hall dialogue from case study two.

4) **Recordkeeping.** Whether its posting a tweet on Twitter or uploading a picture to a Facebook wall, there is an instant archival record of all social media activity.

5) **Usage beyond BIM.** This is one of the most significant discoveries of this SMPD process. Since the beginning of this thesis, we have discussed how important it is to have BIM included with social media to get maximum instantaneous usability. However, this is not the case. Turns out SMPD is also effective with almost any design system. Case study two highlighted this when the user was using Adobe Illustrator, Acrobat and Google Earth. As long as you have an effective social network platform, one can argue any design system may be applicable.

**Disadvantages**

1) **Two screens required.** One of the major disadvantages we discussed earlier were how two screens were required to effectively run SMPD. If one were to use only one screen, then an “infinite mirror” would display on the single screen. Thus preventing the user and participants to partake in the SMPD process. Please see figure 9C below as an example of the infinite mirror display.
Figure 9C: an example of the “infinite mirror” display.

2) **File sharing.** This is arguably one of the biggest disadvantages of SMPD’s current state. The most effective social media networks for SMPD lack the ability to share any photos or videos during a live session. Numerous participators complained about this during the sessions. Perhaps this is something that can be remedied in future SMPD developments.

3) **Participant participation.** This is something that could also be further developed with future SMPD sessions. At the moment, it is not possible for any participant to gain control of an SMPD session and physically provide any design input.

**Result**

After weighing the pros and cons, I argue that the current SMPD system was an overall tremendous success. It maximizes the efficiency and effectiveness of participation design. In addition, if the above disadvantages were developed into advantages, one could argue that SMPD could perhaps begin to change the way design is practiced.
10. Contributions

In this chapter, we discuss the potential contributions SMPD can offer.

1) Absence of "assumption." Removes "hermeneutics" of design. This is an unfortunate trend in many design professions. We often rely on our own so-called design knowledge to determine what the community wants. We even go through great links of predict the success of a project without community input whatsoever. With SMPD we are not only reducing the assumptions behind design, but perhaps erasing them altogether. Want know whether or not your design will have an effective impact on their community? SMPD allows one to answer that question with real time community participation.

2) Community leadership by design: Would social media input from the community give designers the “buy in” they need to give the constituents the comfort they need for feeling as if their neighborhoods were not marginalized? The first step is getting the community engagement. The underlying reason for citizen information modeling is to encourage designers to dissemble traditional design practices by using social networking platforms. To create a grassroots-based system for designers to empower community involvement via social networking.

3) Design curriculum reformed. How are we taught to “see” communities we design for? Could SMPD give us a chance to reexamine how to we conduct site visits? Or how we teach design, in general? SMPD could help designers reexamine how one designs spaces. This means going beyond the mere “site visits” we partake in. If one designs a public square, they should think less about the “form” and more about the constituents. Especially members of the community who feel, and are, neglected or underrepresented.

4) Information Management: How we can create a “digital footprint” of a project’s timeline through social media networking? This comes down to not only how social media comments and tweets can help inform designers about how the community feels about a project, but document it. This way there is a record of the design process and how the community can pinpoint how they personally contributed to its fruition. All it takes is an informed community standing up for where they live and what they own.

5) Design Accountability. This is important when the client feels the project should go a different direction for what the community needs. SMPD can be that checks and balances badly needed between the client and the community. Where designers focus less on the client being “pleased” and more on getting into the living room of the teacher who lives a few blocks down the streets. If designers are able to present the “data” of social media feed to their clients about the built environment and how their community feels about it, this will entice us to create
space that fits the needs of the constituents instead of the clients. The feedback from SMPD can be an effective asset to hold designers and clients alike accountable for their decisions.

11. Future Work

My future work will be spent on creating and developing an SMPD Add-on or an integrated BIM system. Learn how to program (python, c+) so I can add Social Media to a program like Autodesk Revit. Can BIM be utilized as a tool for community organizing? One can argue this is already happening. The one characteristic that BIM encapsulates more than any other design tool is its intersectionality. Revit, for example can be used to not only design, but render, document, survey but do all of these things instantaneously! Moreover, these instantaneous tangibles can be executed amongst multiple professionals with varying practices and backgrounds. But can it be inclusive for those aren’t designers, engineers or contractors? At the moment, I argue this is not possible. However, a full-on integrated SMPD system can make this feasible.

In today’s world, the determining factor of our relationships with others rely less on spatial engagement and one is Facebook friends with another. Words like tweets, likes, followers and subscriptions have become synonymous with how successful one is. In recent months, we give more attention to presidential tweets then press conferences. People are tuning less into CNN, FOX and MSNBC and more into streaming news like Buzzfeed and The Young Turks. In other words, along with texting, social media has become the way we communicate to each other. Imagine the same amount of comments or tweets during a TYT news segment for a large community gathering space such as professional sports venues.

Figure 11A: The integration of social media into a 3D parametric modeling platform.

I argue an integrated system will increase community collaboration and empower participators to dismantle any marginalization of design. Participation in which their knowledge or feedback can be taken into account. Thanks so social media, SMPD
benefit those who are disadvantaged or marginalized such as a mother of four who is unemployed. SMPD allows designers to take her feedback and concerns into account for how a space can bring opportunity to those who never imagined it was possible.

Thus, I conclude that SMPD does, in fact, have the potential to empower those who feel marginalized and “left behind” by demanding designers and clients alike to be more inclusive. SMPD allows participants to be part of the design process and not feel excluded, unheard or systematically oppressed. In order for this to happen, designers must harness a tool that can make this possible. SMPD could possibly help bring this into fruition. It could possibly fix the racial and cultural divide in America and the world today. While this is not a unprecedented to use social media as a medium for design input, integrating it with building information modeling could set a precedence for how design is examined and practiced. Thus the future goal of SMPD is to examine the question as to whether creating an actual integrated 3D parametric modeling and social media system would computate the tools needed to change the way designers practice.
REFERENCES


