Students Redefine Collaboration Using an Intelligent Wall-An Academic Experiment for Industry
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“It hurts my feelings when he erases my work.”
-Patrick Coughlin, Co-Founder Arttwo50

This case study examines the impact of an intelligent wall on collaborative problem solving for project development with new graduates. Collaboration is perhaps one of the most misunderstand and underappreciated qualities of any business. Individual minds are capable of brilliant, complex ideation, but companies that leverage the power of many minds working in conjunction have a vast advantage over those that are unable to do so. Nowhere in the word is this more evident than in the hotbed of ideas that is Silicon Valley.

Some new directions for group effectiveness are proposed. These include:

a) explicit recognition of the face-to-face group as the most powerful tool;
b) focus on how the functions of the wall influence performance; and

c) experimental interventions during user practice which create non typical patterns of iterating on a solution as an approach to studying effective design practice.

Findings suggest that solving complex problems on the wall establishes a fun, empathetic connection among users and redefines collaboration.

Lessons learned from a co-founder case study contribute to the understanding of collaboration with implications for new design aimed at improving performance of groups in organizations.

Introduction

Today, effective collaboration is perhaps one of the most misunderstood and underappreciated qualities of any business. Individual minds are capable of brilliant, complex ideation, but companies that leverage the power of many minds working in conjunction have a vast advantage over those that are unable to do so. Nowhere in the world is this more evident than in the hotbed of ideas that is Silicon Valley.

One young start-up team in Silicon Valley understands particularly well what goes into fostering effective collaboration. Ethan Appleby and Patrick Coughlin, two founders of Arttwo50, are well aware that collaboration is essential to not only developing truly great ideas, but also to pushing through roadblocks when they are encountered. Ethan and Patrick know that collaboration means building on the ideas of others, which innately requires those involved to be willing to embrace an idea originating in someone else even when it is at the expense of one’s own vision. This is vulnerability, and it is surprising how uncomfortable the modern business world is with it.

Leaders at all levels of organizations feel pain around how to efficiently create an environment of adaptive change [1, 2]. Scholarship has contributed to our understanding
of how cultural factors and the regional advantages of Silicon Valley contribute for breakthrough impact [3,4]. While extensive observation of executive level communication, small group development in organizations, and learning on design teams in classes illustrate innovations in industry and academia [5, 6], it is unique to consider innovation through a cloud driven, collaborative, visual workspace solution. Successful organizations passionately talk about generating environments of creativity to get beyond the obvious [7] and deliver something new. Recent changes in technology have the potential to transform the future of the workplace. What if the result is a work life that matters [8] and a one of a kind way to renew job satisfaction by creating vulnerable opportunities for connection?

The Experiment

In the beginning of May, 2013 our team of three conducted usability and active observational research studies with a multitude of engineering graduate candidates from a west coast university; and recent graduates and leaders from industry on the Bluescape wall located in San Francisco. Throughout the phases of study, we prompted multiple users to identify, frame and solve an existing and relevant workplace problem both separately and then collaboratively, using the Bluescape intelligent wall. Of all of the real-time collaborative sessions we observed throughout the course of our experimentation, we never observed such a tangible, nor significant transformative effect upon problem solving as with the co-founders of Artwo50.

We chose the co-founders, Patrick and Ethan, because they are representative of a recent graduate population that appears to fit the myth of the persons behind the quintessential start-up. They are close friends and deeply passionate about their cause and the mission of their company. Our team believed, that it would be relevant to observe whether significant barriers to vulnerable engagement remain and existed in real time on Bluescape, despite the close nature of their friendship and previous work experience.

In this experiment we observed the two best-friends and cofounders, who spend the majority of every waking hour together, doing the same thing they had been doing for just about every waking hour of the past three weeks: attacking the most real and pressing problems facing the future of their budding company. We had framed this problem within the pervasive vernacular of Silicon Valley VC’s: the key issue. This key issue had been at the crux of their attention, the driver of their efforts for the past few weeks. And in fifteen minutes, they had redefined the problem.

Founder Background

In April of 2012, Ethan Appleby, was a management consultant working in the UAE when he took a trip to Dubai to support a colleague presenting at a, ‘Start-Up Weekend’ event. At the last minute, his friend got a bad case of cold feet and withdrew, leaving his time to speak at the event vacant.
In the moments before his friend had been scheduled to speak, Ethan thought to himself about a problem very real to him at the moment. Shortly before, Ethan had moved into a new apartment but struggled as he tried to decorate it and make it into a personalized home. He realized he had outgrown and moved beyond feeling as though typical college posters were appropriate, but knew how annoying and confusing art galleries could be, not to mention expensive. At the same time, most online retailers seemed to sell the same prints over and over and over, and Ethan knew he did not want something unoriginal. How was he supposed to find art that was original, not overly expensive, and that he identified with? It was actually a fairly daunting question.

So, on the spot in Dubai, Ethan elected to take his friend’s slot at the conference, and shared a challenge with the audience: how could original art be made more accessible? Astounded, he won! After the conference, he realized that this was a question he was passionate about, and that if solved, would help not only a large demographic of potential buyers, but many aspiring artists as well. Ethan could feel momentum begin to build behind the idea, and started the process of building a team. Not long before he had reconnected with his friend, Patrick Coughlin, who he had met working in the Middle East. Patrick had been working in counter-terrorism for a private contractor, but recently had chosen to change his life track and pursue an MBA at Stanford University. They met for a friendly ‘how do you do’ over a drink in Washington, DC. Ethan thought, “He is the perfect fit,” and asked the question, “What do you think about being a co-founder?” Little time passed before Ethan, Patrick, and two other cofounders (who specialized in UX and coding respectively) formed the team behind what would become Arttwo50.

As their vision started to shift towards becoming a reality, the team faced its first major problem: their vision was too broad. They hadn’t yet thought through the best way to simplify the art buying experience, and were still exploring the option of offering multiple price points and multiple platforms. Among entrepreneurs, attempting to tackle too large a scope is affectionately called trying to boil the ocean, and at this point this is exactly what Ethan and Patrick were trying to do.

The success of entrepreneurs comes down to how well they tackle and pivot to resolve key issues facing their endeavor. Through discussion with their coding specialist co-founder, they realized they could have a dramatic effect on how original art was accessed by selling their art at one price point and solely on the iPad platform. Arttwo50 launched its website in November of 2012, and in January of 2013 artists began uploading art they wished to sell. Just a month later, the team went into overdrive to design the app through which they would sell. Extensive wire-framing and iterating were aimed at improving the app experience for both buyers and artists, and they developed a suitable algorithm to suggest particular pieces to potential buyers.

At this point, the team had built up a great deal of inertia going forward, and although they were turned away from an incubator (primarily, they were informed, because their work would not complement the development of other participating and accepted teams), they embraced their position and moved ahead as planned. In July 2013 they successfully launched their iPad app in the Apple App Store.

This was where Ethan and Patrick were in the life of Arttwo50 when they had the opportunity to use Bluescape, an intelligent wall, a scientific yet artful development from one Haworth and Obscura Digital collaboration, for a work session. They had already
faced and dealt with the challenges of finding an idea, finding a market, building a team, and rolling out their product, and thus began a new phase in the life of their company. Now they were faced with the key issue of finding, acquiring, and holding on to buyers.

**The Narrative**

Ethan and Patrick jaunted into the war room with a less than expected sense of wariness that often accompanies being an experimental participant, no less one with a futuristic technology framed by vivid allusions to the movie, Minority Report. The office at Obscura Digital—the coolest office space in the world—and not just by our own assessment, only further solidified the setting of polished futuristic. Their fascination with the incredible office dissipated off of their faces as they revealed a synchronized sense of confidence as they offered out their hands for a firm shake that felt somewhere in between a marine salute and the first day of school. We are ready to begin.

It was clear from the offset that Ethan and Patrick were a special set of co-founders. As we gathered around the conference table they unfolded the intertwining narratives of the origins of their product and their company. They met while working outside of the United States. Both, for different reasons, and with memorable focus, felt the impact of big life changes and career transition.

They shared a fraternal camaraderie of close friends, often completing one another’s sentences. For the last few months they had spent the majority of every waking hour together, attacking the most real and pressing problems facing the future of their budding company. They passionately tag teamed a narrative around the need they had observed and that their product was filling. Their story had been refined by countless hours of development and feedback from the efforts necessary to raise the capital they had acquired and assemble the team they created. But this is not to say it felt stale, it was full and incredibly engaging. However, as compelling as it was, it was not why we had brought Patrick and Ethan in.

The ‘key issue’ or ‘issue at hand’ is a term deeply engrained in the pervasive vernacular of Silicon Valley VCs. It speaks to that one, most pressing, make or break problem that the future success of a company hinges upon. This is what we were here to talk about. We would soon find out theirs, as we dove into the weighty realities that the success of ArtTwo50 rested. We would soon find out that a single key issue had been at the crux of their attention, the driver of their efforts for the past several weeks. We would see firsthand how it had been conceptualized, communicated, and tackled. First we would find out where they stood on this individually.

I walked out of the war room, and Patrick followed me into the lobby with strong and terse steps paired with poised enthusiasm. Before we had even sat down we were, once again, deep in conversation about ArtTwo50. It was clear that, despite his deep understanding of business, he was strongly product focused. He continued a much versed but ardent narrative weaving together the beginnings of the company and the need the product was solving for. His anecdotes of commonplace Ikea posters rang entirely too
clear in my memory. He had an unwavering belief in the desire for affordable original art both within himself and countless others like him. I struggled, both against the current of his enthusiasm and my own desire to learn their story, to redirect the conversation towards the objective of this preliminary conversation: having Patrick define the key issue facing Arttwo50.

I dovetailed off of his discussion of their imminent launch and current challenges they were facing, “What is that one make or break thing you have to solve in order for you guys to have success.” He instantly adopted a sense of solemnity and swiftly responded looking dead into my eyes, “buyer acquisition.” A few moments later he leaned back and qualified, “Do you mean like the key issue right now, like in this limited window?” I assured him that that was fine. We came to discuss that the key issue of this moment would likely not be their key issue six months down the line. He elaborated that he and, “Ethan been troubleshooting this key issue for the last several weeks.”

I leaned into the discussion, pressing Patrick to explain why buyer acquisition was the key issue facing Arttwo50, and to expand on their current efforts to address it. And just as swiftly and succinctly as he had identified “buyer acquisition”, he outlined their efforts of “throwing money at social media sites,” namely, “Facebook, and Twitter.” He vaguely expelled the virtues of the ease of doing so, emphasizing the importance of the demographic data that accompanied these expenditures. That was however the extent of the granularity in which it was discussed. It was as if the conversation was over before it began, but the lingering feeling of unease made it clear that pairing of problem and solution were not as cut and dry as his words wanted to communicate. In the moment of discomfort he turned the conversation to the pervasive challenge of transforming a product into a company. But before we could dive in any further, our time was up, and we hurried back into the war room with the others.
I sat down at the side of the conference table in the center of the war room as Patrick joined Ethan at the opposing ends of the giant array of multi-touch enabled screens that we had come to know as the wall. The pair of cofounders looked like neighboring
French louver doors, framing a one hundred and sixty acre garden within the wall behind them. They stood there, arms crossed and sporadically pacing as their contagious enthusiasm was muddled by the looming universal fear of being put on the spot. “Alright, you each just identified the key issue facing ArtTwo50 and what efforts are being taken to address it. You will each have five minutes to present to each using Bluescape.” Patrick, already with the Bluescape pen in hand, was up first (see Drawing one).

At first, he half-joked, as he pointed to Ethan, “It hurts my feelings when he erases my work.” With no hesitation, Patrick leapt into a presentation. He turned to Ethan and said, “Our key issue is buyer acquisition.” Ethan vigorously nodded, arms still crossed, and tersely interjected, “Yeah, this is what we have been grinding on for the past three weeks.” Patrick took a step towards the center of the board and vigorously scribbled a sentence on the wall. He left his pen where it had completed its first work and rotated himself outward and away from the wall like a door swung ajar. He was oriented halfway between his friend and cofounder at the other end of the board, and halfway between our team at the conference table like a stage actor cheating out towards the audience. He looked at Ethan and said firmly, “This is what we need to figure out in the next few days.” He leaned back into the board scribbling,

-who they are
-how we get them

Suddenly he realized that on Bluescape your words are never erased – they are just moved! “Wait, we can just keep moving and moving-on and not erasing?” he smiled. To my great surprise he did not dive into the solution strategy anchoring on allocating marketing funds to Facebook. He developed a rhythm of darting back and forth between the wall and his audience, writing small text with energetic staccato gestures, before returning his line of sight to Ethan with deliberate and increasingly deliberate sentences and arms open and echoing the cadence of his voice. He oscillated between speaking to both us, and Ethan, and to Ethan alone. Ethan stood, arms still crossed nodding and engaging with Patrick, but with his line of sight slowly gravitating away from his cofounder and towards the collage of words and need phrases Patrick had left on the wall. Patrick returned once again to the vastly accumulated body of words on the board and he started to draw. He drew a face on the wall, chuckling as he did, and then connected three phrases to it with arrows. Ethan joined the chuckle as his eyes focused on this quick visualization of the person, the buyer that they would hope to acquire. And then something really cool happened.

Not a moment had passed after Patrick had completed this gesture when Ethan uncrossed his arms, abandoning his role as a passive audience member, and jumped into the conversation and onto the wall. He started to draw on top Patrick’s depiction and was a few words into a sentence when he stopped abruptly, and turned towards the conference table.

“Can I get blue? Can I get my own color? I want to build off of Patrick’s drawing”
All bets were off, and the rigid structure of our segmented experiment was out the window, but it didn’t matter. Ethan drew another face and said, “Let’s build off this guy. We have Dave the artist.” He then began to draw arrows connecting this figure, the artist he was referring to, and to his needs. He launched into a rhythm of writing and talking almost perfectly mirroring the one Patrick had just established. Without really thinking about it, he had observed the visual structure Patrick had created as describe the buyer and his needs, stolen it and applied it to the ‘artist’ in the same plane side by side. And now they were ready to have a different kind of conversation. A dynamic change in behavior was emerging (see Table 1): The Switch, through the Dialog, the Block as Laugh, The Zoom Out, The Return, The Shift, The Tag Teaming connection, and then the Build: A Sensory Trigger.

Table 1

**Dynamic Change through Vulnerability**
A pattern of working together emerges and the lines of Communication open.
You draw the problem for your colleague and throw it on the wall for:

1. **THE SWITCH**
One responds to another, Ethan responds to Patrick and says that Patrick is really good at disagreeing with all of his ideas. The other picks it up.

2. **THE DIALOG**
Standing and turning to be side by side, opening at angles at the wall together. They find and use the wall as a storytelling tool.

3. **THE BLOCK AS LAUGH**
The zing and fun-ness factor of the phrases and drawing connecting for laughs. Get them to laugh at the wall and they care together.

4. **THE ZOOM OUT**
"You hurt my feelings when you erase what I say," caused frustration and defensiveness with lots of stuff up on the wall. Until they were able to move it all out for a collective sigh of relief.

5. **THE RETURN**
Closing in. Zoomed into one specific area for a potential new way of thinking.

6. **THE SHIFT**
In problem solving, they pivoted.

7. **THE TAG TEAMING**
Building off of one another and collaborating.

8. **THE BUILD: A SENSORY TRIGGER**
They remember how the wall working session made them feel as they moved more quickly towards a solution. Can’t wait to return to work on all again.

When we met Ethan and Patrick, they already had a clear understanding of how startups progress by identifying a current key issue, testing a solution, and pivoting as necessary, but they had been stuck thinking about how to balance a delicate situation in which they tried to align buyers and artist’s needs. When asked individually about what the pressing
issue was for Arttwo50 at the moment, Ethan and Patrick both identified buyer acquisition, but were still synthesizing a clearer understanding of what exactly this meant. Bluescape gave them an opportunity to work past this initial understanding of the problem. At first, as they figured out how to utilize Bluescape’s features, they made sure they were on the same page in thinking that buyer acquisition was a big part of whatever the key issue for Arttwo50 currently was. But as they stood at the wall ideas began to flow, and they began to move deeper into understanding the real factors influencing this key issue, and how they could work past it successfully. What emerged to them was that buyers were not the only group they had to be concerned with. They were just as dependent on the artists whose art they were selling having satisfactory experiences with Arttwo50. BlueScape’s infinite space allowed them to create a skeleton Gaant chart without realizing it, which revealed to them that even more than just being concerned with these two crucial groups, the happiness of one group was an influencing factor on how Arttwo50 developed.

DRAW, WRITE, AND BE HEARD AS YOU CREATE TOGETHER

Arttwo50 co-founders paint a picture of how Bluescape provides a platform that lowers the risk factor of sharing one’s ideas. Its foundation is the notion that always having more space to work with means no one’s ideas must be removed to accommodate new developments. Rather, ideas can be truly built upon, and the workspace will grow to accommodate the proliferation of ideas as opposed to traditional workspaces that confine users to only displaying a small set of their ideas. As Ethan and Patrick worked together on the visual workspace solution, how important this fundamental difference was made strikingly clear. Other users tell a similar story. Brian and Niles, graduate students at a west coast university, also report how they went from the abstract to the creative yet also concrete as their ideas were elaborated on the wall: Niles statement to Brian indicated a creative comparison, “Ok I thought of how it might be like other things I use and that held me back. Yours is better because I can now see the way you delineated the problem and were able to step back with the wall, and make it all come to life with your words and drawings.” And when paired groups of graduate students responded to the prompt, “Put your resume up on the wall,” they too were able to step back, reflect through dialogue, zoom back out, and through a sensory trigger, build off of each other’s work. “This is a fun way to take a new look at our story, shift, and redefine what we are working on!”

REDUCE COGNITIVE LOAD

Bigger can impede better when size refers to the number of members on a team or memory load. The Bluescape wall helped the Arttwo50 co-founders reduce the problem at hand into understandable, sizeable chunks. While they are a new company, and wrestle with the issues of success and growth with each new on line art acquisition, the concept of ‘too much information’ (T. M. I.) has special meaning [9]. With the paintbrush in one hand they are ready to tackle every potential artist or buyer question. In contrast, when the paintbrush is in the other hand, choosing one specific direction after months and
months of pushing through roadblocks and data collection may feel overwhelming and questionably viable.

MAXIMIZE THINKING POWER

Too often, today’s trends of globalization and networking are viewed as abstractions that do not apply to local environments. The reality is far from this view though, as companies that excel and challenge the status quo are built on strong lines of communication from top to bottom. A company that is unable to do this simply is not reaching the full potential of the brainpower it employs. Like we learned from Patrick and Ethan, Bluescape not only helps companies founded on this principle to continue to leverage the minds behind them, but can help open the communication-collaboration lines at companies that are under-utilizing their thinking power. In the competitive economic landscape, under-utilizing the brainpower available is not only wasteful, but more often than not is an indication of trouble and stagnation ahead, and in today’s world, if you are not getting ahead, you are falling behind. Patrick and Ethan are user examples that demonstrate how the wall facilitates brainpower. Other examples for Arttwo50 co-founders show a collaborative problem-solving impact (see drawing two). The wall’s long focal range offers both an on-going storytelling tool and an almost infinite space for leading, delivering, and conducting an optimal problem-solving session.

NEW DIRECTIONS FOR GROUP EFFECTIVENESS

Some new directions for group effectiveness are proposed:
a) the paradox of the face-to-face group as the most powerful tool;
b) focus on how the functions of the wall influence performance; and
c) experimental interventions during user practice which create non typical patterns of iterating on a solution as an approach to studying effective design practice.

Observing Patrick and Ethan problem solve on the Bluescape intelligent wall substantiates the power of face-to-face collaboration to facilitate generative creativity, while concretizing the opportunity of new technologies to supercharge collaborative process. Patrick’s words provide us with a snapshot in time and painted a vivid picture of the vulnerability of his co-founder experience, “When you erase my words it hurts my feelings, but on Bluescape my words are not erased, they are just moved.” Using the intelligent wall shifted their focus. Fifteen minutes working together on Bluescape trumped weeks of failed attempts at convergence back at their start-up office, located in San Francisco. More important, despite the close nature of their friendship and successes of their working relationship, the significant barriers to vulnerable engagement that had existed, were diminished in real time on Bluescape.

Let’s appreciate what the contradiction - of the duo working well face-to-face at their start-up headquarters and also side-by-side at the wall - contains. The root is that the individual is one part of the whole of the group (of two). For the co-founder group to be
whole they must function well separately, yet work together exquisitely. Vulnerable moments emerge. Might an opportunity for renewed understanding of their co-creating and problem-solving style exist? Is remote work a viable result?

The functions of the visual work space solution affords good ways to use big sweeping motions as the two or more work side by side. Drawing and writing with only small wrist movements, in contrast to ideating and building something with whole body moves, affords making smaller vs. longer focal range solutions together, for improved problem-solving respectively. While the capacity to sketch, write, pull up information on the web, and permanently save notes and ideas to be reviewed later is a valuable asset, it’s the combination of all the factors together that provides the potential for actionable outcomes.

Actionable outcomes were influenced by experimental interventions that occurred in multiple ways. First, an open process team approach created an optimal atmosphere for interviewing. Development of usability observations and prompts and recognition that the space enhances a story telling form during user practice, created non-typical patterns of iterating on a solution. And, while the prompts and observation technique were planned in advance, developments during the sessions impacted the approach. Some degree of ambiguity became a benefit.

Preliminary evidence suggests that while ambiguity preserves the opportunity for surprise and creative potential in design, it is one element that adds value for optimal observational sessions, in this case a co-founder group, yet it may cause confusion. In this context, it would be encouraged to conduct a multiple meeting visit with at least two follow-up sessions.

Finally, if the results offers support for our approach, then there is the possibility to construct interventions along these lines that will help people in many contexts to improve the problem-solving stories they tell each other on teams, get effective, create engagement across the stages of their design process, and achieve inventive action. For example, such interventions could be organized into a multiple module format, as a short module session for founders iterating on an idea, engineering design students participating in problem-based courses, and leaders of project-based learning courses in and outside of industry. Implications also exist for corporations seeking a fresh perspective or a way to meaningfully understand and unlock creative confidence [10] across early and middle developmental stages of a project, during research and problem solving, well before any final presentations. And, both academic and industry groups may benefit from finding ways to invite the possibility for tackling key issues with the intent for transformative work, through use of the intelligent wall/workspace solution.

Ask anyone working on a problem, “What is the key issue at hand?” In response, you will not hear a detailed outline formalizing how one individual mind showed capability for brilliant, complex ideation, instead, you will hear a story of collaboration. Like the story of co-founders Patrick and Ethan, companies that leverage the power of many minds working in creative conjunction have an artful and vast advantage over those that are unable to do so. Nowhere in the world is this more evident than in the hotbed of ideas that is Silicon Valley.
Drawing 2  Ethan shares a sigh of relief as they solve the problem together.
References


