Intentional Bodies: Virtual Environments and the Designers Who Shape Them*

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This article examines the ways virtual environment software is explicitly designed with particular visions of identity, communication, and community in mind. This social context of software is considered with a particular focus on the ways various forms of embodiment are encoded in systems. Rather than simply framing software as a primarily technical product, this article analyzes the way software engineers and designers shape architectures and systems as conduits for social values and norms. Considerations of responsibility, identity, legitimacy, and sociability emerge as central factors in design practice.

INTRODUCTION

LARRY LESSIG, in his book *Code and Other Laws of Cyberspace*, takes up the question of whether the Internet, in its various forms, presents us with a technology that is somehow inherently democratic or liberating. Challenging simplistic claims about this medium, he asks us to critically consider the ways in which the net has been, and continues to be, actively shaped. He suggests that it is through software code and underlying architectures that the values we find online are made real. How, as he puts it, '. . .the software and hardware that makes cyberspace what it is regulate cyberspace as it is' [1, p. 6]. His formulation leads him to argue that code is at a very deep level 'law'—that it profoundly structures the Internet.

In a related work Johnson [2] explores the question of how 'the object-world of technology' might be seen as residing in the 'world of culture' and the power interfaces have in shaping our ways of knowing and communicating. These calls to consider how underlying mechanisms influence possibilities (and limitations) counter many popular understandings of what networked systems are about. Techno-utopics often claim that the Internet and cyberspace move us *inextricably* toward freer systems and modes of being. Lessig rightly problematizes this story by pointing out the ways code brings with it values, and within those value systems are particular forms of embedded control, regulation, and interaction. Underlying our networked lives are architectures that present a range of possibilities and constrictions. As he puts it [2. p. 6]:

> This code presents the greatest threat to liberal or libertarian ideals, as well as their greatest promise. We can build, or architect, or code cyberspace to allow

those values to disappear. There is no middle ground. There is no choice that does not include some kind of building. Code is never found; it is only ever made, and only ever made by us. As Mark Stefik puts it, 'Different versions of [cyberspace] support different kinds of dreams. We choose, wisely or not.'

Virtual environments are one small corner of the networked world that has gotten its fair share of attention over the last several years [3–6]. These spaces (whether MUDs or graphical environments) have tended to be analyzed from a user perspective, i.e., what are people doing there, what forms of identity are emerging, and what kinds of social interactions are occurring. While this focus has been enormously important in giving us a sense of how these worlds are 'made real' and richly inhabited, most of the literature has not examined the underlying structures work like Lessig's asks us to consider. How, in fact, software and design shapes the world in advance of the user's arrival (as well as the dynamic relationship between users and software) is an important question that we must begin to address. While users are often creatively and quite actively pushing back on the systems they encounter, we have to acknowledge the ways software and systems set out in advance a range of experiences and possibilities. There is always this 'other context' in which users are living.

This underlying structure of virtual worlds as expressed in software does not simply appear by magic, though it may at times certainly seem like such to the user. It would be problematic to make software the sole and primary actor in this story. Code, graphics, systems architecture—all of these arise from somewhere, from human agents. In this regard, the role designers and programmers play in shaping these spaces is fundamental. If code embeds possibilities and constraints, it does so because someone made it so. It is an object not outside of human actors (despite it sometimes

seeming to have an independent nature), but emerging from a tangled mix of individual personalities, organizational structures, design imperatives, and economic considerations. Located dead center to this is the programmer and designer. They function as key agents in the design, construction, and implementation of virtual spaces. In any given world someone, somewhere, has coded or designed the objects in that space. Decisions were made and implemented regarding how communication would occur, what the nature of social life and interactions might be like, as well as much deeper questions about what kinds of identities and bodies might be present. Winner [7] has insightfully suggested that indeed 'the things we call "technologies" are ways of building order in our world. Many technical devices and systems important in everyday life contain possibilities for many different ways of ordering human activity. Consciously or not, deliberately or inadvertently, societies choose structures for technologies that influence how people are going to work, communicate, travel, consume, and so forth over a very long time' (p. 32).

Turning our attention then to the people on the back-end of these environments—the programmers, designers and world builders who actively work in the space of socio-techno construction— are central to a critical examination of these spaces. In the following I will focus on the role the digital body (be it text-based or graphical) plays in online multiuser spaces and some of the issues designers encounter when dealing with these 'intentional bodies'—specific forms of embodiment designed for a virtual world. Through my extensive ethnographies of several virtual worlds I explore how design issues come to play a significant role in the daily practice of online identity and community. Over the course of several years I have interviewed (both in person, on the phone, and via e-mail) a variety of people involved in the production of both non-commercial text-based worlds and subscription graphical space. I additionally participated in several conferences catering to the virtual world design community and have actively followed discussions on various development lists. I will draw here on my interviews with not only programmers, but people involved in the art design and administration of several environments, examining how they explicitly (and sometimes not so explicitly) build structures of embodiment that facilitate particular value systems and ways of being.

DESIGNING LIVES, DESIGNING BODIES

The ways in which designers come up with an idea and implement it is a complicated process. While they may clearly be thinking about the weighty issues involved in embodiment and even debating the matter within their communities (many e-mail lists and discussion venues have existed over the years in which designers have carried on fascinating debates on world building), the results do not always reflect it. For example, without fail, all of the designers I spoke with had a high regard for individual identity. There was generally a concern that worlds be built so as to allow a diversity of people and experiences. As one designer said to me, 'The first rule of thumb we had was "diversity in all its forms is better than any kind of monastic or singular representation". And that is because there is a diversity of people we're attracting to this place so we want them to be able to . . . make their own choices regarding their avatar.' Yet I was often struck in my interviews by the disjuncture between what designers intended and what actually got produced. How was it, for example, that designers who had ambitious, often utopic, visions of worlds full of diversity found themselves producing a product that constrained embodiment in ways even they were not satisfied with?

There seems to be two initial facets that are tied to this slippage:

- organizational and economic issues;
- the force of technical momentum.

ORGANIZATIONAL FACTORS

As Borenstein and Brooks have both wisely pointed out [8, 9], software engineering often takes place in complex organizational situations that can have significant effects on the product. Despite recent developments in commercially available massive multiuser spaces (i.e., games like EverQuest or Asheron's Call) typical virtual world companies/groups were relatively small in nature and the influence of one or two people could drastically alter the shape of the space. Quite often considerations tended toward the hit-or-miss variety. As one designer put it, 'At best, there might be a few e-mails or random notes on a page somewhere. No discussions were ever formalized or well documented' and that generally 'in-world issues were not discussed with the whole team. For example the body changers [devices that allowed people to change bodies and genders, for a price] were a mutual decision formed over several months and some random conversations playing out the different possibilities.' This kind of decision making process is indicative of projects that are moving quickly with a small core group of developers. The influence of a handful of people can be even more heightened when a project is trying to get off the ground and launch. As another designer put it, his world was like a 'boat that we just built and it was rolling down the shore and we were just trying to paint it before it hit the water'.

While questions about how the world would operate and the nature of avatar bodies were often discussed in some form, the structure of the

organization and the character of the project can tend to produce a more ad hoc decision-making process. One designer I spoke with very clearly explained how, for example, the first bodies in a particular world came to look in spite of almost every team members' disagreement. In this case, the former art director had played an enormous role in how the bodies of the world looked. The designer said:

> His [the art director] design desires . . . I don't know how to say it—a lot of him was in those designs. Not anybody else. So they really reflect a lot of his personality . . . And, the complaints that you may have heard about 'Gee, the average female's kind of busty and she's wearing these stupid pants', that directly is because a guy designed it. I mean it really is. We all sat around and said 'That sucks' and it's like, yeah, well, this is how he wanted it.

The original art director left the project and a new one, more sympathetic to the critique made of these first bodies, took over. Again the force of one individual intervened. The new art director noted that, 'They [the female bodies] all lost pixels along the bustline everytime I redrew them.'

While non-commercial virtual worlds such as most MUDs (multiuser dungeons) are exempt from the concern for revenue, I have found that they actually share some commonalties with their graphical commercial counterparts. Organizationally, there is generally more diversity in how the spaces are structured. Some MUDs are operated with a very strict top-down approach in which the wizards or administrators maintain a strong vision of what the world should be and set policy and program accordingly. In other spaces, users are allowed more freedom to create and build, or develop story lines.

Despite some organizational flexibility, there is still generally a small group of people who make the core decisions about the underlying structure of the space. MUD administrators must still address in some way the question of how players can embody. Technical considerations play out in that while most varieties of MUD software come with some stock designations for players (in object-oriented MUDs for example, the most popular core database comes with a generic player, builder and programmer) it is ultimately the case that the wizards of any given world (a world administrator with special powers to control and edit the database) either explicitly or implicitly make some decisions about what players should be allowed to do. For the most part this comes in the form of considerations about what kinds of player types, or classes, are available. MOOs for example set out parameters for embodiment in part via objects like the default player class and feature objects or the range of class offerings. The MOO wizard will have to decide what class all players are initially created from. Will a newcomer be allowed to build? To program? Are there particular features the players should have, like certain social verbs?

Based on decisions about the initial functionality the default player and feature objects are set.

Beyond the default class, however, is a decision about whether or not additional player classes can be built by users and their level of accessibility. Some worlds provide numerous player classes to choose from. Others specifically prohibit the design of additional classes, often for reasons having to do with maintaining control over a space, either social or technical. As one wizard told me, 'If you encourage the creation of PCs you end up with a pretty confusing array of choices . . . and as it is on Lambda [the oldest and largest MOO] the wizards totally lose control over what the [player classes] do.' In the case of more open MUDs, individual programmers often build new player-classes or feature objects based on their vision of presence in that space.

TECHNICAL CONSIDERATIONS

What is particularly interesting about this example is that while initial organizational factors dramatically affected the outcome, technical issues (and their attendant economic consequences) quickly stepped in. A major overhaul of the graphics wasn't easily accomplished. Aside some rudimentary tweaking of the images, larger factors influenced the design process:

> By the time it passed on to another person, it was too costly to try and rip things out and start over. There's a lot of that that goes on. There's a lot of avatar design that goes on that just winds up . . . half of it is already there and it's too costly to fix it so it needs to go in anyway or it can be tweaked a little bit but you know, it's got to go in anyway.

The cost of changing fundamental pieces of code can be quite high and companies are often not willing to incur it, especially when the reason does not seem to have a direct and immediate bearing on the revenue of the product. The economics of software design stretch from the high cost of redoing systems to the kinds of financial support an organization is willing to contribute to a project. Virtual worlds products often suffer from an initial lack of funding or labor resources. Combined with the high cost of undoing and remaking pieces of the product, economic hindrances can loom large. While both designers and customers repeatedly acknowledge the limitations of the bodies in this particular world, the product continued to generate revenue and so the concern did not fall into a 'make or break' category.

In addition, once a product is up and being used on a daily basis, the possibilities for shutting it down for major overhaul drop to nearly zero. As one developer said:

> It gets compounded by the fact that when you're dealing with a virtual world, something that's live like this, and you put it out there you no longer have the luxury of tearing things out and redeveloping

them cause they're already there. And if nothing else you at least have to smoothly integrate changes and that's always a difficult thing . . . and it's even more difficult when you've got people who are emotionally wrapped up in how this thing works. And from the engineering perspective they just want to tear it out and start over, [but] from the user perspective if you tear it out its suddenly gone and one of the things we found, you know, you can't take away something from people without giving them something back otherwise you've changed the context of their world. It really upsets them.

Even if graphics can be slightly altered there is still a fundamental way in which initial world designers and the architectures they implement will always have a deep, implicit connection to the artifacts that make up the environment. Without drastic revision, the mark of the originator lingers and the power of legacy systems is quite notable. The question of tools, languages, palettes, and architectures is important because they define the parameters by which producers can shape and mold the world. Early decisions can seriously affect the technological trajectory of product. For example, one designer who would love to see a broader range of bodies available in their world commented to me however:

> The whole notion of new bodies is a real can of worms, something that we'd love to do but not under the current tools we have to do it with. A lot of the early decisions were made without knowing what the state of the art technology was [and] the project is currently still living with some of those poor decisions.

Technical limitations can include issues around languages used for development (and the structures embedded in those languages), reliance on proprietary versus open systems, how animation engines get employed, whether systems allow for 'upgrades,' and base assumptions about platforms, processing and network connections. Even something like a world's color palette will have an effect on what is there. As an art director put it, 'It's hard to do grim and gritty when all your colors are bright and cheerful.' Aesthetic considerations become tied to embodiment possibilities and the legacy of the software can hinder a product long after its initial development. Once a system is populated with users, it becomes particularly difficult to revise much (especially if those users are paying customers and won't tolerate any system downtime). Technical workers often get allocated to managing the daily, more mundane aspects of the world to 'just keeping it going'. If the toolkit originally decided upon is out of date and even hindering the project, the question of who could take time out to work on it is tricky, and doing so may be seen as a 'luxury' that cannot be afforded. In most virtual world commercial ventures, resources are scarce and deeper questions about forms of embodiment often take a place to more pressing daily concerns.

EMBEDDING VALUES

Beyond the organizational, technical, and economic factors that come into play, there is a fundamental fact that worlds are generally designed with something in mind. Kling nicely points out the ways computerization in general rests on 'social and value-laden claims' and recounts Paul Goodman's formulation that 'technologists, including computer specialists, are primarily social activists who act, in practice, as moral philosophers' [10, p. 32]. While such a statement may at first glance sound particularly provocative, in my work with virtual worlds designers I found many active social theorists. In large part the nature of constructing intentional worlds and simulations puts at the forefront an explicit regard for social design (versus, for example, the task of developing a generic database program). Graphics and player classes carry with them a 'world vision'—of both a particular designer and often the organization as a whole. At some point thought was given to what the space would look like and what the users could be and do. As one art director put it:

> It [the art and design] goes through all sorts of filters but in some sense I have a great deal of influence . . . So, you're not only wandering through my concept of what I want to do, my concept of what the user wants to do, my interpretations of what I'm told the user wants, but you've got [each] power-that-be's personal likes and dislikes for whatever art I present them with. It goes through lots of different filters.

These 'likes' may range from aesthetic choices to deep value systems. As one manager put it, code is 'where the designers heads are at'. Users find themselves engaging with a world that has been created with a particular vision of community, identity, and social life. While some worlds are certainly much more open than others (having less defined visions) ultimately all spaces carry with them values embedded by designers via code.

There are several prominent themes that emerged in my discussions with designers about the kinds of spaces and artifacts they were building. Sometimes explicitly, sometimes not, most world builders wove-in considerations about three aspects of online life. While they play out in varying ways, they express themselves as prominent themes:

1. Immersion.
2. Identity and social responsibility.
3. Legitimacy.

Untangling these from each other is a tricky thing to do. The definitions and parameters of one fold in on the other. But central to each of them are questions about 'What do we want this space to be and not be?' and 'How can we shape user experience?'

Immersion

The consistency of identity many designers of virtual environments seek is often tied to an

understanding of social relationships in which 'being able to have a history when you meet somebody helps you connect with them faster and you can progress with whatever relationship is being built.' This focus on the 'people' aspect of the world, on its relational quality, is central when design decisions are made. As one designer put it:

> If there's any one aspect about these worlds, whether they're text or graphical, is people aren't connecting to computers; that's not why this should be done. This should be done to allow people to connect to people and whatever affords, whatever gives the greatest ability for another person to connect, whether this is through body language or voice or text, gestures, whatever. That's all for the good. That's for greater connection.

In one world, seeing the space as a communication medium privileged emotive gestures of the face, which in turn resulted in a conscious decision to give the avatar a larger head, even out of proportion with the body. Exaggeration of expression became key and so the look of avatar heads were made to fit into this larger framework. Not only were the types of bodies allowed in this world informed by broader social considerations, but their very aesthetics were tied to a high value placed on relationships. As one designer said, 'The crucial tenets were to give people as rich and interactive experience as possible. Give people as many handles, as many ways to be expressive.'

This is probably seen in its most extreme version in OnLive! the virtual world in which avatars take the form of just heads. Again, there was a clear design imperative linked to a vision of sociability and communication that lead to the structuring of space this way. Combined with its focus on incorporating audio as the prime communicative tool the world was constructed with some deeper models in mind. As Steve DiPaola, the director and lead architect for the project writes on his webpage [11]:

> Given the finite CPU/polygon/bandwidth resources, we needed to invest them in the most natural form of socialization first: face-to-face communication (especially given our interest in verbal communication). The body with its hand gestures and body language is secondary for human communication and can be added as our resource limitations improve. The goal for us is what we call 'binding the pair'—binding the real person at the computer with his virtual avatar in cyberspace so he experiences this feeling of telepresence, of really being there. You cannot believably bind a person with an inanimate object or a texture-mapped photograph that does not emote. You need to have an expressive, lifelike avatar. We try to achieve 'life' and believability with avatars that have autonomous blinking and facial movements (e.g. 'breathing'), that lip sync to their voices and can display (at user control) a range of emotions.

As this perspective shows, often the vision for immersion and interaction is closely tied to a larger understanding of what virtual reality should do. As one MUD designer put it, 'Reality is the goal, unless it interferes with fantasy. I do think an environment needs physics, some kind of laws, something to effect and something to be effected, before you can "feel" a body.' In turn he has designed with this vision, saying, 'I've striven to give people bodies here, yes. A sense of being somewhere. Virtual reality must have laws, consequences, some kind of cause and effect, some cohesion.' So, for example, he has spent a lot of time creating a complex role playing system which includes forms of injury, unconsciousness, and even insanity. This is a particularly interesting take on developing immersion and experience in that the body is coded in a way to firmly place it in a world whose laws it is subject to. This same programmer also played an important role in the implementation of social verbs and a method of emoting, drawing in his views on how interactions are best fostered. As he told me about his MUD, 'We don't have social verbs here [e.g., shorthands like smile, hug, etc.]. Only pose. I don't like them. They make one lazy. . . They cheapen the sentiment. A simple smile is better than a f∗∗king three-page spam bug.' Such judgments, about what good and valuable social interaction is, about how immersion might best be fostered, about the range of experiences the user should be afforded, are constantly being made by world designers.

Identity and social responsibility

As many designers know (or at least find out quickly once they start building a world), considerations around how to foster sociability and communication are intimately woven with even deeper issues, ones that go to the heart of what living online entails. While we can abstractly talk about these concepts as they relate to online life, we have to examine how they are codified and legitimized either materially or through practice. It is not enough to simply say that there is community online or that people deal with varying notions of personal and social responsibility on the Internet. Or that 'cyberspace' offers an infinite arena of identity play. What are the ways in which these issues come to have grounded meaning? What I am suggesting is that in these virtual worlds the bodies themselves explicitly become vehicles for building, conveying, stabilizing, and often challenging, identity and community. Designers are generally very aware of this function of the body and quite often program and build with particular value systems in mind.

While the designers I interviewed were consistently clear in their desire to allow for maximum freedom for users, this desire was often mitigated by an assessment that personal identity intersects with responsibility, accountability, and community. For example, in one of the worlds, name changes cost 'virtual' money and the price to change one's name rises exponentially each time it is done. The decision to structure things this way

was explicitly linked to a concern for accountability and responsibility. One of the designers said:

> This was part of the method of limiting identity changes. Although we wanted people to be able to experiment with their self-image, we knew that making it very easy to change allows people to avoid social responsibility. Responsibility for one's actions was a 'design' choice we made for the community—to reduce the need for authoritarian imposition of order and to allow a greater ability for the community to use self-regulating methods. We figured that personal reputation would be one of the most valuable commodities in [this world] (they cannot create objects, but they can create an identity and reputation for that identity). We did not wish to set a hard limit on identity changes, but we put barriers—if it matters enough to a person, they would go through the hoops to make the change. This is the same philosophy behind the increasing name-changes—first two are free, third is 10T and it doubles thereafter. It's a balance between the freedom of changing names to anything at anytime or allowing troublemakers to avoid public censure by changing identity.

Designers I spoke with were quite aware of the kinds of issues virtual environments pose to not just identity, but community life. The fluidity of identity in many of these spaces raised issues regarding the continuity of knowledge a community holds about people and the kinds of informal structures that help guide and regulate social life. While some worlds will not seek to step in and refashion the technology or environments structure to account for this, many will. The same designer continued by saying:

> Persistent identity builds reputation associated with an individual: As stated above, if a person has a history (good or bad) it helps the community as a whole sort out who are a benefit and who are a detriment. From a community builder's perspective, this was good because we figured the community would determine and change its own unwritten social rules faster than we could possibly identify, document and enforce them.

Designers often walk a fine line between involvement in the management of the social life of the world and opting to let the users sort issues out for themselves. In this case, some design decisions were made (charging for name changes) in recognition of what were seen as underlying principles of identity and social responsibility. Yet changes were not completely prohibited, allowing users to acquire new names if they had the money and went 'through the hoops'. Interestingly, this path of regulation was also made in recognition of the fairly dynamic nature of the community and the subsequent relative futility in trying to police it.

In that world, the values of freedom of identity and social responsibility (often seen as competing) were weighed and some level of design intervention took place. A basic preservation of openness remained, though at a cost to the user. An educational text-based world took a much stronger approach on this matter. There, naming policies 'plainly ruled out any fantasy names whatsoever.

The only thing that was sort of allowed were nicknames that were . . . I don't know, on a case-by-case basis.' The standard was 'getting a name that reflects your real-life personality'. Naming in this space was clearly tied to a concern for a persistence of identity (as was the lack of a morphing feature, something I will discuss below) and a certain kind of 'legitimacy'—as one designer put it. Naming became a marker and reminder of the 'seriousness of why [the users] were there.' This space was geared toward educational enterprises and the world designers made explicit decisions to foster a certain atmosphere and quality of interaction by regulating identity. As I was told, 'The name has an incredible influence over how people act. We found out if people got a firstname/lastname combination they'd be a lot more sober than we'd seen them elsewhere [on other MUDs].'

Legitimacy

Such a strong regulation of names is not the norm for the most part in the MUD world. But this space was also unique in that it was attempting a specific goal (creating a serious educational community) and reasoned that personal identity was closely tied to not only social responsibility but legitimacy. Designers normally consider larger visions of community (i.e., 'What sorts of activities do we want to see happening here?' and 'What kinds of interactions do we want to foster?') to structure the possibilities for how users are going to live in that space. The regulations on naming are quite often accompanied by a consideration of the sorts of bodies allowed in the space. Bodies are closely tied to the issue of legitimacy and social interaction. In the case of the Schmoo player class originally on LambdaMOO, the introduction of a class that allowed for clothing removal and morphing raised basic issues about what forms of behavior were legitimate in that world. By legitimate I am not talking about what people can do. Of course before the Schmoo PC people were having netsex and playing with multiple identities. The issue was not that the behavior was introduced through the class, but instead that it was somehow made legitimate via its formalization in code. As Dibbell writes about the introduction of Schmoo [12, p. 215]:

> You can imagine, therefore, the shiver of exquisite distaste that must have passed among the programmers upon their learning that the noble pursuit of hacking code had been perverted to the goofy ends of the netsex crowd. It was as if a forbidden legitimacy had suddenly been granted to the gauche subculture of the nonprogrammers, as if their tacky value system had been hardcoded into the very ontology of the MOO. Which come to think of it, it pretty much literally had been—and at a frighteningly high level of the ontology to boot. With the creation of Schmoo, you see, netsex was no longer just some shady activity relegated to the private rooms of the disenfranchised. It was an identity, of all things, and worse than that, it was an identity honored by the highest authority in the land: the database itself, which now recognized a

netsexer (in the form of a child of Schmoo) as surely as it knew a wizard from a guest.

While Schmoo and netsex is a particularly dramatic version of the legitimacy question, it is nonetheless a good example of the kinds of ways the bodies in the world have meaning and provide or constrain possibilities. In one graphical world this issue played out in early decisions about what kinds of avatar heads to allow people to use. The world focus was to be on the 'waking world' or offline connection between people. In addition, offline businesses (like bookstores) were going to be brought into the space as potential partners. The business decisions for that space led designers to feel that particular heads would not foster the kind of atmosphere those commercial partners might want. An early manager told me:

> We're only having human heads and that was an intentional decision on my part as well as it was a decision that was discussed among all of us. We are marketing [the world] as a waking world extension, we're marketing it this way to commercial partners who will bring in their people to become customers for us . . . When you market it as a real world business location we felt it was important to have human heads. That somehow doing business with a broccoli head isn't quite the same thing.

Interestingly enough, it wasn't so much that the world designers themselves saw the conflict in using 'broccoli heads,' but that they understood potential partners attached particular meanings to spaces in which people were allowed to use non-human avatars. They did not want the space to be seen as a gaming world but taken seriously as a viable business affiliate. While this example takes on a somewhat humorous bent, with the notion of a world filled with broccoli heads, it does illustrate a much deeper point. Ultimately, the form of the bodies in this space became closely tied to ideas about which bodies held legitimacy.

Even in worlds that aren't earmarked for business purposes, the question about how bodies should look arises. For example, in the non-business version of this environment you were able to be an alien or a cat, but gender always remained tied to only two choices—male and female. Unlike some MUDs in which gender could take several additional forms, here the choices were more limited. Stone recounts this decision as one in which the designers might have liked to have expanded the choices, recognizing the 'problems of the binary system of gender within which we live,' but the parent organization didn't want to 'take that kind of risk in a business situation' [13, p. 5]. For other designers on the project though, the decision to limit to two genders was tied up in larger questions of responsibility and persistence of identification. As one of them put it:

> There is a lot of 'gender' wrapped up in identification of others in our society. Since the idea was that others needed to be able to identify an individual to assign a reputation to that person, gender was an easily remembered identifier and we figured that putting a limit on it would assist reputation-as-social-restraint.

The designers were not averse to people engaging in gender play. However, since everything in the space is acquired primarily though tokens, changing one's avatar body (and gender) required a visit to the 'body shop' where for a fee one can select a new body. Consideration was given then to deciding how much a body should be priced at. On the one hand, limiting body and name changing via fees was a way of regulating the amount of 'mischievous' identity changing that would take place.

Increasing body price would tie a person to an avatar body type for quite a while which made them easily identifiable. Usually, the people concerned about an immediate body change were those attempting to avoid negative reputation. (Experience proved this to be the case most often with names—those wanting to change NOW were attempting to avoid something.)

Yet there was also a desire to allow people a broad degree of flexibility when it came to personal identity and their avatars. The value of diversity and experimentation was constantly raised in my interviews with designers. They did not want to prohibit people from trying different forms, just doing so within appropriate bounds.

> Initially, with only two genders, there were two avatars per account. We figured anyone wanting to experiment with gender would be able to use a different avatar. We felt we had the room to increase the price without punishing too many who wished to experiment. (Hindsight apology—it wasn't the maximum affordance for gender-play, but in the grand balancing act of varying rights and privileges, if there was 'some' way of accommodating varying needs and desires, then the compromise was accepted.)

This 'hindsight apology' is interesting in that the designer, while recognizing it was not the best situation for gender play and experimentation notes that those considerations had to be weighed against larger social concerns. While he suggested the price probably could have been lower, 'Over time, we simply never got around to changing the prices as it was something deemed minor—we had few complaints.'

UNINTENDED CONSEQUENCES AND INSUFFICIENT CRITIQUE

While designers and world administrators often think through the implications brought by the systems they create (for example, in the case of limiting body changes), there are also instances where the limits of the system seem to not have been dealt with sufficiently or produce unintended consequences. As was previously mentioned, the handling of race in virtual environments is probably one of the biggest minefields around. Designers seek inclusiveness, but it is a particular (and familiar) form. McDonough has made an

important contribution to an analysis of race in these worlds by talking about the ways designers 'inscribe their vision of the intended user through the avatars they provide' [14, p. 17]. He has shown how, for example, the use of a Rastafarian character has emerged in several worlds as the primary black male avatar. He links this to Paul Gilroy's analysis of the ways this subculture has been marketed to whites. McDonough then suggests that 'The appearance of various Rasta avatars is the logical extension of this marketing effort; it provides a multicultural appearance, but one that is non-threatening to a white audience. The Rasta avatars present an image of black male identity which is hip, inoffensive, and unlikely to remind white participants in the virtual environment of the racial strife and problems which exist in the 'real world' [14, p. 18].

On the one hand, there is often a strong commitment to some vision of diversity. As a designer told me regarding one product, 'We have broad ranges of skin color because it was early decided that was the most important part of our product. Being able to get a lot of different skins . . . So our range of browns is strong.' Yet when I inquired about why most of the heads were what we might think of as Caucasian, why there were so few heads in this environment that had Asian or black features, I was given a fascinating (if not troubling) explanation by several people. As one designer told me, 'If you color a head white it looks white, if you color a head black it looks black . . . A few of them are built with deliberate racial characteristics but I have found that coloring far and above colors, forgive the pun, how people see the head rather than any given facial characteristics.'

Now this is a tricky issue. Certainly a recognition that skin color affects how features are 'seen' is critical in thinking about representations of race. But it doesn't tell the full story. There are, in fact, instances where you would want to create a range of hair types, facial features, and the like to convey diversity. But this world's strategy of handling race was to simply suggest all heads could be any race given how they were colored. As both Nakamura and Kolko [15, 16] have pointed out though, there is quite often an underlying implicit vision of 'whiteness' embedded in racial presentations and world design online. And this fact has not been lost on non-white members of this particular community. As I was told:

Our biggest problem with the racial-oriented heads, or the racial-oriented partners like Net Noir or Spike Lee, is getting across to them the fact that color makes men. You can take any head and color it and it will be interpreted as that color . . . They tend to say 'How come we don't have black heads?' and it's just sort of 'Duh' . . . I have trouble getting this across.

What strikes me as most interesting, and most troubling about this anecdote, is that even in the face of being told by their members and partners of color that there wasn't enough diversity with the range of heads in the world, the concern was discounted by suggesting that they simply didn't understand how things, in particular bodies and avatars, worked in that space.

Alongside this kind of underdeveloped critical analysis are the ways in which designers come to confront unintended consequences in their worlds. Danet [17] recounts how the gender designation 'Spivak' (in reference to a naming system devised by mathematican Michael Spivak) came to be included as an option at LambdaMOO. This choice has provided not only LambdaMOO users an opportunity around the binary gender system, it has developed into a not uncommon option at other MOOs as well. Rather than having to select simply male or female, the inclusion of the Spivak gender allows users to adopt a designation resulting in alternate pronouns like e, em, eir, eirs, emself. While Roger Crew, the designer who incorporated the category into the system, was aware of issues surrounding the use of gendered pronouns there was nonetheless an unexpected outcome of his design. She quotes him saying [17, p. 141]:

I wrote some code and then introduced several extra 'genders' (pronoun sets) to test it out, including, as something of a joke, various gender-neutral 'genders' and, as even more of a joke, sets of pronouns that were in fact plural and/or non-3rd-person, thus totally violating the actual grammatical notion of gender. Nevertheless, some of these caught on, including—much to my dismay, actually—the Spivak 'gender'.

While the initial design impulse came out of simply wanting to create a test set with which to explore some coding, the inclusion of this alternate system inadvertently resonated with (and perhaps even produced) user desire to extend the gender system. Given how much the Spivak designation has come to be a fixture in many MOOs, this programming decision represents a powerful example of not only the kinds of unintended consequences to design, but the power of structures once established. The ability of the world architecture to shape bodies and interactions long after the initial design is striking. As one designer remarked:

Once it starts going . . . it won't stop. It will go its own direction. You can kind of, you can knock it one way, you can guide it a little, you cannot change its direction. The bet you can hope for is maybe it should go this way, maybe it should go that way and then you find out whether it does or not. And that's it. So absolutely it is a thing in and of itself. In fact, it's more than it originally was because there's so much input from so many people.

Given this dynamic, clear critical forethought to the design of these spaces is crucial. As we have seen, the construction of bodies is laden with hopes, values, and limitations. Stone has written that computer engineers, in building these worlds, are 'articulating their own assumptions about bodies and sociality and projecting them onto the codes that define cyberspace systems' [18, p. 103].

What these spaces are, what is implicit in them, and what is made real through their use must be examined. Morningstar and Farmer have spoken of virtual world designers as 'facilitators' aiding user experience and suggesting the paradoxical nature of such involvement, 'In this way we were able to have considerable influence on the system's development in spite of the fact that we didn't really hold the steering wheel. . .' [19, p. 289]. One art director told me, 'What we are doing is providing tools for other people who think that they aren't creative to be creative.' These avatars and text-based forms are tools for embodiment, tools for identity, and tools for social life. Understanding technical artifacts as created through and embedded within broader social frameworks is key. Given the deep ways design shapes possibilities and limitations on experience, social interactions, communication, and embodiment, we must begin to give serious attention to not only the structures and software underlying these systems, but to the technologists who are actively building them.

Finally, we might further inquire as to the possibilities for broadening the range of people allowed to act as 'moral philosophers' of these virtual environments. Rather than suggesting that somehow we might manage to free technical artifacts from social contexts, I'd propose that instead we need to move to participatory design models so that a diversity of worldviews and value sets is represented. In a recent article on the development of massive multiplayer games the idea of bringing design decisions to the user community at large was explored. Led by experienced virtual worlds designers Raph Koster and Rich Vogel, the online game Star Wars Galaxies offers users an opportunity actively to shape the design of the world via a website which was used to 'not only advertise the game, but to share gaming ideas with fans, solicit fans' opinions about design decisions, and establish a tone for the community. Not only are they posting frequent updates about game design, but they're also fielding questions, and engaging in heated debate about mud design with their players' [20]. While the designers maintained 'a strong stand on issues central to the nature of the community' it is nonetheless a fascinating first step in opening up the design process to a range of stakeholders. Given the potential richness of virtual worlds and the depth of experience to be found in them, making sure all participants have an active voice in their construction will be central to their growth and development as evocative communication spaces.

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Intentional Bodies: Virtual Environments and the Designers Who Shape Them*. T. Taylor. Sociology. 2003. This article examines the ways virtual environment software is explicitly designed with particular visions of identity, communication, and community in mind. This social context of software is… Expand. Virtual reality is rapidly altering the landscape of design. Learn how this advancing technology is opening new worlds for modern design trends. Many designers and tech innovators predict virtual Reality (VR) will be the next probable step in the digital revolution. VR immerses individuals in a completely artificial, digitally-generated environment. VR headsets or glasses are the most common method. Image by contributor Rido. VR is completely immersive for the user. But, other related forms of digitally-enhanced reality aim to create a more seamless experience for the user by blending the real and virtual worlds. Augmented Reality (AR), for example, overlays digital objects onto the real-world environment. Pokémon Go is probably the be See more ideas about virtual environment, history class, body art painting. Circle Around A Woman Body Painting Circle Around A Woman Body Painting A circle around a woman who was like a greek god myths. The circl Fan Art Illustration Game Art Art Video Game Art Game Inspiration Creepy Illustration Art Video Games Artwork. Limbo by 2dea for the latest computer games at great prices multicitygames.com. ☜… GEORGE MELIES and the first movie-stars ☜…. CHE MARAVIGLIA!! wunderkammer. Neven Mrgan's Blog. Designer, game maker, and writer in Portland, OR. One of the good ones. Game Art Art Childrens Illustrations Creepy Illustration Art Inspirational Pictures Stop Mot The designers of NASA's Visual Environment Display workstation cited the goal of putting viewers inside an image; this meant figuratively putting users inside a computer by literally putting them inside an assemblage of input and output devices. By the mid-1990s, Mark Weiser at Xerox PARC had begun to articulate a research program that instead sought to introduce computers into the human world. A virtual environment is a tool to maintain separate space for a project with its dependencies and libraries in one place. This environment is specific to the particular project and doesn't interfere with other projects' dependencies. For example, you can work on project X which is using version 1.0 of library Z and also maintain project Y which is using version 2.0 of library Z. How Do Virtual Environments Work? The virtual environment tool creates a folder inside the project directory. By default, the folder is called venv , but you can custom name it too. It keeps Python and pip e

How Do Virtual Environments Work? The virtual environment tool creates a folder inside the project directory. By default, the folder is called venv , but you can custom name it too. It keeps Python and pip executable files inside the virtual environment folder. When the virtual environment is activated, the packages installed after that are installed inside the project-specific virtual environment folder. Advertisement. Â All you can do is to open the Python program and check for all the packages that you have imported in your program and install them one by one. A virtual environment provides an easier method to keep track of the packages installed in the project. Once you have activated the virtual environment, it provides the facility to freeze the current state of the environment packages. Virtual environment software refers to any software, program or system that implements, manages and controls multiple virtual environment instances. The software is installed within an organization's existing IT infrastructure and controlled from within the organization itself. From a central interface the software creates an interactive and immersive experience for administrators and users. Â Intentional Bodies: Virtual Environments and the Designers Who Shape Them*. T. Taylor. 2003. Corpus ID: 12580338. This article examines the ways virtual environment software is explicitly designed with particular visions of identityâ€¦ Expand. 1998. 1998. Device-Independent Navigation and Interaction in Virtual Environments. These design considerations concern the way avatars look, what they can do, the way they can be used for communication, the context in which they are created, how many avatars can be created and in under what kind of governance, who owns the avatar, and how to plan avatar design. References. Becker, B. and Mark, G. (2001) Social Conventions in Computer-mediated Communication: A Comparison of Three Online Shared Virtual Environments. In "The social life of avatars", Schroeder, R. (ed.), Springer, UK.Â Taylor, T. L. (2003) Intentional Bodies: Virtual Environments and the Designers Who Shape Them. Int J. Engng Ed. Vol 19, No. 1, pp 25--34.Google Scholar. Taylor, T. L. (2004) The Social Design of Virtual Worlds: Constructing The User And Community Through Code. Download Citation | Intentional bodies: Virtual environments and the designers who shape them | This article examines the ways virtual environment software is explicitly designed with particular visions of identity, communication, and | Find, read and cite all the research you need on ResearchGate. Â The playground is a limiting factor but also allows player interaction using physical bodies, thus allowing for a very rich communication using tone of voice, body language and the use of player chosen/created clothing. Taylor [8,9] argues that all of these communication channels help embodiment. Intentional bodies: Virtual environments and the designers who shape them. TL Taylor. International Journal of Engineering Education 19 (1), 25-34, 2003. Â Boundary spaces: Majestic and the Uncertain Status of Knowledge, Community, and Self in a Digital Age. TL Taylor, B Kolko. Information, Communication and Society 6 (4), 497-522, 2003. 53. 2003. The social design of virtual worlds: constructing the user and community through code. TL Taylor. Internet Research Annual: Selected Papers from the Association of Internet â€¦, 2004.