Sacred Imagery in Techno-Spiritual Design

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ABSTRACT
Despite increased knowledge about how Information and Communications Technologies (ICTs) are used to support religious and spiritual practices, designers know little about how to design technologies for faith-related purposes. Our research suggests incorporating sacred imagery into techno-spiritual applications can be useful in guiding development. We illustrate this through the design and evaluation of a mobile phone application developed to support Islamic prayer practices. Our contribution is to show how religious imagery can be used in the design of applications that go beyond the provision of functionality to connect people to the experience of religion.

AUTHOR KEYWORDS
Design, HCI, Spiritual Computing, Mobile Computing

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Research shows that people use ICTs to support religious practices such as meditation, communal worship, and abiding by Sabbath rules [1-3,5,8-10]. While this literature describes a range of techno-spiritual practices [2,5,8-10] and offers some design explorations [1,3], it provides less information for designers wanting to develop techno-spiritual applications for real world use.

We build on prior research by describing the design and evaluation of a mobile phone application that uses aesthetic representation to prompt Muslims to their five daily prayer times. In this note, we draw attention to sacred imagery's importance in the design process, and how its incorporation into a mobile application effectively connected people to the experience of religion. These findings are grounded in a real world evaluation of our system. We begin by reviewing related empirical research, design explorations, and commercially available Islamic call to prayer applications. Next, we describe our prayer application, called "Sun Dial," then highlight how and why we incorporated Islamic imagery into the system's interface. Finally, we describe our real world empirical evaluation and conclude by discussing the broader value of considering sacred imagery in ICTs designed to support techno-spiritual practices.

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IMAGES IN RELIGION & TECHNOLOGY

Scholarly literature spanning a variety of disciplines consistently shows the centrality of imagery (e.g., symbols, icons, and art) in religion. Morgan [6] shows that across diverse faiths, imagery facilitates belief by connecting people to each other and to the sacred experience of religion. Previous research in techno-spiritual practices also highlights imagery in two important ways.

First, studies show that people already make use of technology's image capabilities to support religious practices. For example, Foucault and Melican [5] describe how a Buddhist used his camera phone to take pictures of a shrine during a pilgrimage. He took these photos because he wanted to preserve the experience for his own reflection and to share it with others. In a study of sermon practices, Wyche et al. [10] found that Protestant Christian ministers regularly incorporate sacred imagery, such as crosses and the ichthys (or "Jesus fish"), into their multimedia sermons to help laity connect to what is preached.

Second, imagery is considered in design explorations. For example, Gospel Spectrum, an information visualization system that allows users to visually learn about the Bible, was inspired by Christians' early use of iconography to communicate biblical principles [3]. Another example is Ozenc's illuminated prayer rug [1]. An image of a mosque glows brightly when the rug faces Mecca, allowing its users to determine the correct prayer orientation. Like these systems, we explore imagery's role in religious ICTs, but go further by empirically evaluating the incorporation of such images into an application.

Figure 1: Khashee, mAthan, MobileAzaan, and Athan Time

Despite evidence pointing to the use of imagery in religious experience, we were surprised that commercially available Muslim call to prayer applications did not fully incorporate it. Existing systems typically rely on text and numbers to communicate prayer times (e.g., interfaces in Figure 1 represent a range of popular commercial systems). Further, we learned during our project's exploratory phase [9] that precise times are not necessarily the most appropriate way to communicate the right time to pray. Instead, Muslims described prayers as happening during a "window of opportunity", rather than an exact moment. They explained that prayer requires worshippers to transition from a secular state to a sacred one, in addition to the actual prayer time itself [10]. Specifically, prayers begin with a call, or adhan, that traditionally occurs 15 minutes prior to the precise prayer time. Following the call, Muslims prepare for prayer. This includes washing body parts (ablution) and then performing two to four ritual cycles (raka'ahs) while facing Mecca's direction (qiblah). Understanding that prayers took place during a window of opportunity rather than an exact time inspired us to design an application that relied on imagery, rather than text and numbers. We thought this more appropriately reflected the belief expressed by participants that prayers are flexible and open-ended rather than a precise and rigid event.

In this note, we extend our formative research on this topic (for details see [9]) by reporting changes made to the interface based on the outcome of a pilot evaluation. We re-evaluated a revised system with a larger and more diverse group of Muslim users and for a longer time. Results from this evaluation suggest that incorporating sacred imagery into ICTs designed to support techno-spiritual practices can effectively connect people to the experience of religion.

ISLAM, SUN DIAL, AND SACRED IMAGERY

There are approximately 2.35 million Muslims in the U.S. of which 65% immigrated to the country, 21% are native-born converts, and 14% are native-born Muslims [7]. Islam is a growing religion worldwide and reports suggest there will be more Muslims than Catholics in the U.S. in the next decade [4,7]. Further, Muslims have historically (e.g., compasses and telescopes) and currently (see Figure 1) relied on technology to determine Mecca's direction and the sun's location to support their faith practices. These factors made Islam an appealing faith for studying design and techno-spiritual practices.

While Muslims differ in traditions, schools of thought, and sects (e.g., Sunni and Shi'ite), one thing that remains consistent among all is an adherence to the five pillars of Islam (the acts all Muslims are expected to fulfill during their lifetimes). They are confession of faith, giving charity to the poor, fasting during Ramadan, making a pilgrimage to Mecca (hajj), and performing daily prayers, or salāt. The timings of these five prayers are spaced fairly evenly throughout the day, so that one is always reminded of God.

Prior to developing our application, we asked Muslims about their faith, religious practices, and technology use. We identified a design opportunity: prompting users to their five daily prayer times. In Atlanta, GA, where our study took place, the call to prayer (adhan) is not a ubiquitous part of the environment. In contrast, some Islamic countries halt television programming during salāt and broadcast the adhan's melodic chant, thus making the call to prayer more prominent in daily life. Further, the sun's location and the worshipper's geographic position determine the exact times prayers take place. Consequently they differ slightly day-to-day and from place-to-place.

We now describe Sun Dial, our mobile phone application. The system's interface resides on the background screen, or a mobile phone's "wallpaper" to provide a reminder whenever and wherever the phone is used. When developing the interface we followed rules associated with the appropriate use of imagery in the Islamic faith. For example, the Qur'an does not forbid images of Muhammad (Islam's central human figure); however, there are verses related to the prophet that explicitly prohibit Muslims from creating visual depictions of this figure under any circumstances [4]. With this in mind, we tell how we designed Sun Dial's interface, focusing on our use of two kinds of imagery: nature and mosques. Then we discuss how simplicity, another meaningful element in the Islamic faith, guided the placement of the imagery in our design.

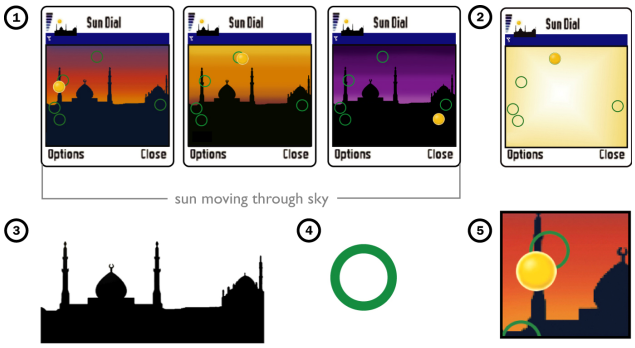

Figure 2: Sacred Imagery; 1. Nature; 2. Light; 3. Image of Mosques; 4. Green; 5. "Window of Opportunity"

Nature: Islam's ties to the natural environment manifest in many ways. For example, the traditional way to compute prayer time involves determining the sun's location in the sky. Thus, we incorporated imagery from nature into Sun Dial's interface to support this relationship to the environment. The interface uses a representation of the sun moving through the sky to alert users to upcoming prayers

(Figure 2, part 1). The sky's color changes as the sun moves from the left to the right side of the screen, thus mimicking nature. We also used the color green because it is associated with nature and considered blessed within Islam to communicate the solar positions associated with salāt (Figure 2, parts 3 & 4). Prayer times begin when the sun is enclosed in a green circle (Figure 2, part 5). Once a prayer begins, the screen flashes white, to communicate precisely when salāt is starting. This burst of white simulates light (Figure 2, part 2), another important natural element in Islam.

Mosque Imagery: We incorporated silhouettes of two mosques into Sun Dial's interface (Figure 2, part 3). Physical mosques and representations of it have significance within the Islamic faith. Mosques, or masjids, are where Muslims come together to pray, and they play an important role in building community (particularly in places were Muslims are a minority). Because of their significance, representations of mosques appear on photographs, drawings, and in various commodities related to Islam (e.g., alarm clocks and bumper stickers). Mosque depictions give these objects a sacred significance because they connect Muslims to their religion and global faith community [4].

Simplicity: Mosques' interiors, particularly their aesthetic simplicity, or the elimination of unnecessary design elements, inspired us. Everything in the mosques we visited, such as the position of prayer rugs and repeating geometrical forms known as arabesque, was carefully and thoughtfully placed. This struck us because such careful placement of imagery was not evident in the commercial applications we reviewed (Figure 1). Instead, they appeared cluttered and we speculated that little attention was given to designing them to be aesthetically pleasing. In contrast, the beauty and simplicity we saw in mosques inspired Sun Dial's sparse interface and our sensitive placement of the natural and mosque imagery.

EVALUATING SUN DIAL

To evaluate Sun Dial we recruited 10 Muslims (8 who had been all their lives and 2 recent converts; 6 men and 4 women; all Sunni) from two Atlanta-area mosques and asked them to use the application for seven days. Participants ranged in age from 20-54 and had a variety of occupations including a physician, bus driver, homemaker, non-profit coordinator, and a lawyer. We interviewed participants prior to the deployment and learned that none had used a commercial mobile call to prayer application before. Most relied on charts with prayer times printed on them, audio mobile phone alarms, and natural cues to know when to pray. During our weeklong evaluation, participants had 35 potential engagements with the system. At the end of the week, we conducted semi-structured interviews with participants. During these, we asked them questions about their experience with the system, and about how it compared to their prior way of knowing when to pray.

Here we present our findings, focusing on those pertaining to our choices about imagery. First, no user found Sun Dial to be in conflict with their religious practice and they trusted that the prayer times were correct in our system (we drew that information from islamicfinder.com, a trusted prayer time computation site). They also reported regularly using the application throughout the week.

Our decision to incorporate the sun's movement through the sky appeared to resonate with our participants as we intended. For example:

> What I liked about it was that when I was in school and couldn't see outside I could see exactly where the sun was. – *21 year old female*

Others also connected this movement to the traditions of their faith. As evidenced by this participant's statement:

> The phone reminded me of how I should keep track of prayer times and follow the natural progression of the sun, which I don't do, I let mechanical devices [referring to his watch and computer] do it… – *24 year old male*

This participant was more unusual in that he also reflected on how mechanical devices had come to mediate the calculation of prayer times in his life. An older participant commented on how he felt culturally separated from traditional prayer calculation methods when asked about the sun's movement in the interface, when he said:

> We are in a society where no one is watching the sun. *–52 year old male*

This comment and similar ones, suggest that participants found our interface useful in supporting their religious identity and reminding them of the traditions surrounding their prayer practices and their faith.

The mosque silhouettes also prompted participants to reflect on their faith. One 54-year old woman reminisced about her own hajj, when we asked her about Sun Dial's interface. Pointing to the mosque, she said:

> I went there for the hajj. I went to the mosque there. *–54 year old woman*

Other participants were reminded of Mecca, the holy center of Islam. For example:

> I guess that makes me think of masjid … the one in Mecca. – *30 year old female*
>
> It reminds me of a masjid, it actually kind of looks like the masjid in Saudi Arabia. I am not sure where you got that picture, it could be in Medina or Mecca. *–20 year old male*

By using Middle Eastern mosque architecture, we intended to evoke reflections on holy sites. For one participant this also caused him to reflect on the differences between practicing Islam in the U.S. and in the Middle East:

> …a lot of people in the U.S., we wish we could be in the Middle East or in a country that had more of this [referring to mosque], especially for me, since I became Muslim in the U.S., I have never lived in the Middle East. *–24 year old male*

He continued to explain imagery's power in his religious life by adding:

> This [Sun Dial] evokes that image of what a mosque should be…it is almost like a gentle reminder…it is like a small sign, I have Islamic art at home, when I look at it I am less likely to swear or do something stupid in front of it. *–24 year old male*

Communicating prayer times as a window of opportunity, or that it was approaching rather than an exact time appeared to be another acceptable design choice. As evidenced by this quote:

> When I did look at the phone, it was good to be reminded even though I already remembered, but it wasn't like out of the blue, it was like that is good to know. *–54 year old woman*

Finally, seven participants complemented us on Sun Dial's overall "look and feel." They frequently used phrases like, "it was very nice to look at," or "the interface is attractive," and, "it is well designed." We took this as evidence that the aesthetic we choose for the design was complementary to the aesthetic of the users' religious practices.

SACRED IMAGERY IN TECHNO-SPIRITUAL DESIGN

The majority of our participants responded to at least one of the uses of imagery in Sun Dial. Specifically, mosques and nature prompted discussions of the history, experience and practice of Islam. In addition to knowing the right time to pray, our participants also talked about how they reflected on a variety of aspects of their faith. These included thoughts about pilgrimages, living in places where mosques are more common, and being part of a global community.

By evoking these reflections, Sun Dial provided more than functionality or a prompt to the prayer times; it also contributed to users' religious experience. The religious experience turned on situating prayer in its broader context, among the pillars of faith, as being a part of living a faithful life, being part of a tradition practiced by many before, who practiced—and still do—in contexts very different to the ones that our participants were familiar with. In short, our participants were able to reflect on and connect their own experiences to bigger communities of practice—important for religious experience. Sun Dial elicited this by using imagery. In other words, our use of imagery in Sun Dial worked in similar ways to the uses of imagery in other artifacts (such as those in prayer rugs) to help connect believers to the experience of their faith.

FUTURE WORK AND CONCLUSIONS

We are continuing to iterate on Sun Dial. For example, in response to our users' comments we added an auditory adhan to prompt them to prayer times when they are not looking at their mobile phones. Further, we are conducting a longer-term evaluation for comparative purposes. Specifically we want to understand if our graphical interface with an auditory adhan —a design grounded in our understanding of Muslims' prayer practices— would be preferred over a text-based interface with a digital "beep" that resembles commercial systems.

In 2006, Genevieve Bell [2] challenged the community to design for spiritual and secular life. She argued that doing so would highlight alternative paths for technology use. We offer Sun Dial as a first step in this regard, and in the process identified sacred imagery a powerful focus for the design process. Imagery helped Sun Dial become more than an application in use; it supported our participants in their religious experiences by encouraging them to reflect on the contexts in which their faith is situated. We chose Islam for a variety of reasons, but many faiths make use of sacred imagery to connect people not just with each other, but with the experience of religion [6]. We suggest that developers carefully consider imagery when designing mobile interfaces that support techno-spiritual practices.

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