Faithapps.net: Measuring the Dispersal of Religious Smartphone Applications

Faithapps.net: Mesurant la dispersió d'aplicacions religioses de telèfons intel·ligents

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The study of the relationship between religion and smartphone applications is a virtually untouched area of scholarship. The first problem that presents itself when studying this area of religion in new media is that there is no measurable method for categorizing, calculating, and organizing smartphone applications that pertain to religious belief and practice. The second problem is that the majority of all current scholarship in the area of religious smartphone applications centers on the iPhone. This is problematic because iPhones only make up a portion of all smartphone use in the world and thus only represent a portion of available religious smartphone applications. With this in mind I was able to devise a method for accumulating and organizing religious smartphone applications across all four major smartphone platforms. My findings exceeded expectations as I was able to accumulate over 30,000 applications that pertained to religious belief and practice that spanned 81 world

L'estudi de la relació entre la religió i les aplicacions de telèfons intel·ligents és un àmbit pràcticament verge de la investigació. El primer problema que es presenta en l'estudi d'aquest àmbit de la religió en els nous mitjans és que no hi ha un mètode mesurable per classificar, calcular i organitzar aplicacions per a telèfons intel·ligents relacionats amb la creença i la pràctica religioses. El segon problema és que la majoria dels estudis actuals dins l'àmbit d'aplicacions religioses de telèfons intel·ligents se centren en l'iPhone. Això suposa un problema perquè iPhone només representa una part de l'ús total de telèfons intel·ligents al món i per tant és també només una part de les aplicacions religioses disponibles de telèfons intel·ligents. Partint d'aquesta base, vaig idear un mètode per agrupar i organitzar les aplicacions religioses de telèfons intel·ligents en les quatre plataformes principals. Els resultats van superar les expectatives ja que vaig reunir més de 30.000 aplicacions relatives a la creença i la pràctica religioses, abastant

religion search terms. With an organized structure in place I was able to find out which religions are represented and how often they are represented in comparison to each other. In addition to these findings I was able to see which archive categories are most popular, as well as cost averages, and maturity rating averages.

81 termes religiosos de recerca d'arreu del món. A partir d'aquestes dades, vaig poder determinar quines religions estan representades i amb quina freqüència en comparació l'una amb l'altra. A més a més, vaig poder comprovar quines categories d'arxius són més populars, així com el cost mitjà, i l'avaluació de la seva vigència.

Key words: *application dispersal measurement, religious smartphone applications, faithapps.net, religion and internet communication technologies.*

Paraules clau: *mesurament de la dispersió de l'aplicació, aplicacions religioses de telèfons intel·ligents, faithapps.net, religió i tecnologies de comunicació a internet.*

As new communication technologies have emerged over the centuries, people of religious faith have attempted to utilize these technologies to expand their outreach to the masses and leave their mark on the world. From the Lutheran church's usage of the printing press in the 1400s and beyond, to virtually all major religious traditions using television and radio to reach followers, organized religion has found new and creative ways to push the boundaries of how it functions in tandem with technology. In 2012 Marc Andreessen, the co-founder of Netscape Navigator, said, "The smartphone revolution is under-hyped, more people have access to phones than access to running water. We've never had anything like this before since the beginning of the planet" (Thompson, 2012). As Andreessen suggests, smartphones are among the most prominent of new technologies to be employed by the masses. With this in mind it is not unreasonable to assume that religious practitioners have been utilizing smart devices to reshape how space and community function with regard to religious belief and practice. Although Andreessen's outlook on the proliferation of the smartphone may be exaggerated, his excitement about this bold new technology changing the world could not be truer.[1] Never before have smartphone users been able to blur the boundaries between public, personal, and private space simply by the type of communication devices they keep in their pockets, conjoined with the applications they choose to experience.

This paper's primary goals are firstly, to showcase my own homegrown method for harvesting and organizing data that will show the dispersal of smartphone applications across the four predominant app stores. Secondly, this paper investigates the dispersal of religious/faith- based smartphone applications across the four main mobile operating systems, Android, iOS, Windows 8, and Blackberry,

which represent the four preeminent platforms in the world. Although very similar in their usability from a user standpoint, the difference lies in what is available to them, the demographics of users who are using the devices, and their own unique user interfaces (UI). By establishing a method for accumulating data to analyze the dispersal of these applications I will be able to measure dispersal by categories such as religion, sub-religion, cost, maturity rating, and archive category. These categories play out in a comparison approach when looking at cross platform application access. With these findings in mind I will be able to get a better understanding as to what each platform offers, which religions choose which platforms, and which types of applications could potentially be found in abundance on each platform.

I chose to center my method for measuring application dispersal around religious/faith-based smartphone applications because of the evolutionary nature of the relationship between religion and technology. Organized religion will utilize the smartphone just as organized religion has utilized the World Wide Web. To realize this early on in the adoption phase of such a young technology would make it possible to measure which religions are utilizing smartphone applications as a communication technology as well as which platforms are being adopted more frequently by which religions. If this method proves to be successful and could be recreated over time, one could speculate that patterns showing adoption rates and platform migration percentages would begin to take shape. These patterns would allow for a unique insight into the relationship between organized religion and the followers of these religions. Additionally, my academic background has focused on institutionalized religion utilizing new media to enhance the relationship between the religion and the practitioners of religion. This puts me in a good position to analyze not only a broad scope of religions but to analyze the technologies that are being utilized.

This is not to say that certain types of scholarship have not already been undertaken to look at religious smartphone applications and religion on smart devices. For example, Wendi Bellar (2012) does just this in her thesis *Pocket Full of Jesus: Evangelical Christians' Use of Religious iPhone Applications,* by looking at which factors Evangelical Christians consider when choosing an app, how they use that app, and how their expectations compare to the actual experience (Bellar, 2012). Rachel Wagner (2013) has also contributed an essay titled "*Religious Authenticity and Identity in Mobile Apps"* to Heidi Campbell's book *Digital Religion: Understanding Religious Practice in New Media Worlds* (2013), which looks less at the motivations behind the use of these applications, and more at the selection of applications and the categories that they exist in (Wagner, 2013, pp. [199-206]). What this existing scholarship lacks is the focus on the multiple platforms that exist. In both cases there is a clear emphasis on how this experience would play out on an iPhone. I am broadening my research to including multiple platforms because looking at how iPhone users use religious applications only tells us just that: how and why iPhone users use religious and spiritual centered applications. Although there is some overlap in general use, there are distinct differences not only in the demographics of the users of different platforms but also the applications that are available on them. Looking at one platform is going to only tell part of the story and by looking at the four major

platforms in North America and comparing and contrasting them I will be able to gain an insight that has not been found so far.

Before I discuss my findings on the dispersal of religious smartphone applications, what can we say about platforms and the people that use them? How do the four different platforms play a role when it comes to the demographics of users? To answer this, techcrunch.com posted findings from a Forrester Research report in 2012 that outlines how the different platforms could be potentially divided up with regard to age, gender and average household income. The reason why I say "potentially" is that I was unable to gain a copy of the findings directly from Forester Research. What this means is that, although offering valuable information about the ages and economic situation of users, there is no way to know exactly how the Forester chose the poll base and how random they actually were. Nonetheless, when it comes to Generation Z which comprises those aged 18-22, Apple has the highest user numbers, making up 16%. Blackberry was only adopted by Gen Z 5% of the time while Android and Windows Phone were being used respectively 14% and 13% of the time by people aged in the same category (Etherington, 2012).

The next two age categories, Gen Y (ages 23-31), and Gen X (ages 32-45) make up the majority of all smartphone use on all four platforms. For Apple, iOS is being used 34% of the time by Gen Y and 32% of the time by Gen X. Blackberry found its greatest success in these age ranges as Gen Y makes up 27% of adoption ratios and Gen X makes up 43%. The same can be said for Android and Windows as their Gen Y users take up 30% and 26% of those two platforms total percentages and those in the Gen X category take up 33% and 36% of total percentages —keep in mind these are totals for each subsequent market share, for example out of the 4% market share Microsoft has in North America, 36% of those users are aged 32-45— (Etherington, 2012).

As the report continues, in the last three age groups which are Younger Boomers aged 46-55, Older Boomers aged 56-66, and Golden Generation aged 67+, the percentages drop off significantly. For iOS, only 10% were younger boomers, 6% were older boomers and only 3% were within the golden generation. For Blackberry the same story holds true with 16% being younger boomers, 8% older bloomers, and only 1% of blackberry users of the Golden Generation. Following suit is Android and Windows Phone with 14% and 13% being of the younger boomers generation, 8% and 10% being those who are older boomers and only 1% and 2% are of the golden generation (Etherington, 2012).

These demographics also extend to gender, with males more likely to be using smartphones on all platforms. They make up 57% of total iOS users, 51% of Blackberry, 57% of Android and 54% of Windows Phone users. Hence, those who identify themselves as female took up 43% of iOS' total usage, Blackberry at 49%, Android at 43%, and Windows Phone at 46%. The most interesting statistics to come out of the Forrester Research findings was on household income. The household income of iOS users was $105,200, $95,400 for Blackberry users, $89,300 for Android users and Windows Phone users had an average household income of $81,100 (Etherington, 2012).

Another article that took a look at the household income gap comes from comScore and offers some additional economic statistics on the income of iPhone users

from its original launch in 2007 right through to 2012. When it comes to the average household income of original iPhone users from 2007, 48% of total users reported having a household income of over $100,000. This trend has continued over time, and as of 2012, comScore reports similar findings to that of Forrester Research. The household income of 42% of iPhone users still sits above the $100,000 mark (Radwanick, 2012).

So what does this have to do with religious smartphone applications? Although there are no current statistics to help correlate a connection between smartphone users and religious smartphone applications, these statistics can be framed in the perspective that if the average user out of any given generation were to use religious/faith based smartphone applications they would be subject to the dispersal of those applications as outlined by my findings below. Without explicit correlation between age/gender/income differences across platforms my findings are self-contained and are separate from the users. The above statistics help give an overall understanding of some of the socio-economic divides that are in place when looking at who might be using these applications, the likely age of those persons, and the potential household income of those that are participating in the capitalistic potential of religious smartphone applications.

HOW TO SKIM AN APP STORE

Before I go into detail about my dispersal findings it is important to understand how those findings came to be. To mine data from the four application stores I had to devise a method for grabbing the information. By utilizing Microsoft Office 2013 developer tools, I wrote a series of commands that made Excel interact with Windows so it could go out into the World Wide Web and skim the app stores. How the process works can really be broken down into four parts. First the user starts the macro which has Excel ask the user what they want to search. In the case of skimming the app store I had a pre-existing list of 81 sub-religion search terms that could be compiled into 16 main religion categories. The next step in the macro opens up Internet Explorer (IE) and navigates to whatever webpage is pre-programmed in. Because of this and the nature of skimming a webpage I had to have a customized version of Excel for each app store. After opening the market website the macro navigates to the search box and supplies the website with the term that the user chooses in the beginning. Once the website returns the results for that particular search term, the macro goes down the list app by app and tracks each application link to the "link" spreadsheet.

Once all the links were accounted for the second stage of the macro initiates. Much like stage one, the macro returns to IE and navigates to each link that was listed on the "link" spreadsheet. Once that particular app's personalized site appears, the macro parses through the sites source code and grabs all the important information. Examples of the columns of data being harvested were app name, cost, developer name, description, star rating, maturity rating, version number, country compatibility date, current version release date and language support. Vendor meta-data from all app stores were compiled into a master list of over 20 columns

of specialized information that pertain to any given app. Once stripped of data the macro stopped running and I began the manual organization of the raw data files. Stage 3 entailed organizing all the sub-religion lists into main religion spreadsheets that included two additional columns, the main religion category I placed it under and the search term or sub-religion that was used to compile the list. These individual main religion lists were then compiled into a master list that held all the data for each app store. Once a master list was compiled, I then used a few Excel equations to calculate my data and return the findings that I will address later in this paper. One final stage involved completely organizing the data which I had accumulated and compiling one final master list out of all four platform specific lists. With all four platforms combined, my Excel robot was able to compile over 30,000 application entries which equates to over 600,000 individual cells of data in under three weeks. To put this in perspective, my first attempt to collect data on smartphone applications was a manual entry attempt. It took me three weeks to compile 900 apps with far fewer columns.

LIMITS OF MY RESEARCH

There is one last aspect of my research that needs to be discussed before I go into detail about my findings and those are some of the potential problems with the data itself. First, when it comes to the 81 search terms, I compiled the list primarily out of the different sub-religion categories I came across while manually entering apps found on iTunes under the search "religion". I then rounded out the list based on my knowledge about the main groups that these sub-groups were found under. Secondly, in an automated system of grabbing data there will be situations where the same applications get pulled multiple times under different search terms under one platform. For example, different popular generic religious cannons may appear under similar search terms. Again, due to the automated nature of my research there will be situations where the market delivers results that do not belong. Examples of this may be developer names or e-book names that share a search query. I did attempt to look through each spreadsheet for vast sweeping anomalies which I sanitized from my sheets prior to compiling. For example, when searching "New Age" for iPhones I came across over 100 apps that were misplaced due to the name of the development company and thus needed to be manually removed. These anomalies were far easier to track down under results that pulled back small amounts of data versus large categories that brought back over one thousand results. This presents a small risk of the results being skewed.

The final potential problem with my data that needs to be kept in mind when looking at these results is that due to Apple generally funneling all app downloads through iTunes, a different approach to their app store needed to be taken. Since the Excel macro systems revolved around using websites to crawl through the data, the scraping mechanism took place through a website called uquery.com which links itself up to iTunes using Apple's API so it is able to return iTunes search results in a website-oriented environment.

Although this should pose no real issues with the results it does mean that it is the uquery.com site itself that is parsing the search results, not iTunes. This has the potential to skew the results in one way or another.
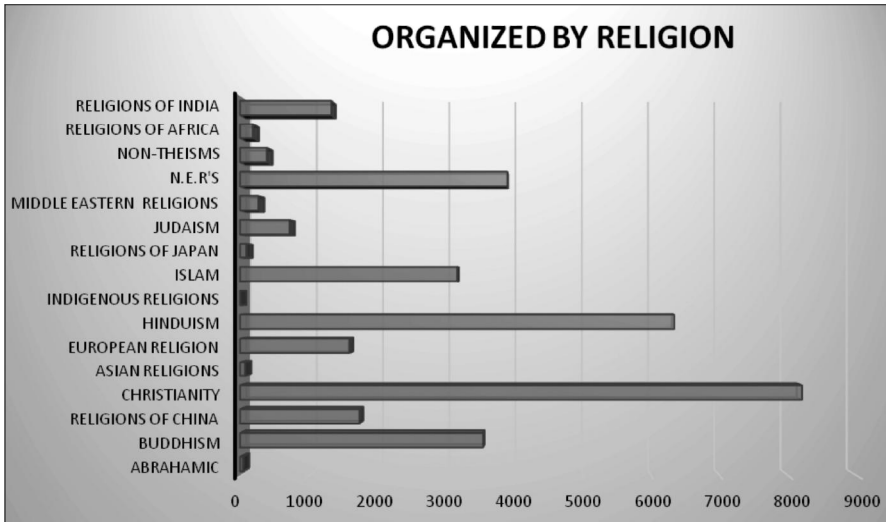
To understand my findings one must first know the search terms that were used. Firstly, the main religion categories were Abrahamic, Buddhism, Religions of China, Christianity, Asian Religions, European Religions, Hinduism, Indigenous Religions, Islam, Religions of Japan, Judaism, Middle Eastern Religions, New Emergence Religions, Non-Theisms, Religions of Africa, and Religions of India. These sixteen workbooks were compilations of my 81 search terms which were: Abrahamic, Agnostic, Anglican, Animism, Antiquity, Atheism, Baha'i, Baptist, Bhakti, Calvinist, Catholic, Celtic, Chan Buddhism, Chinese Folk Religion, Ancient Chinese Religion, Christianity, Confucianism, Coptic, Durga, East Asian Religions, Ancient Egyptian, Ethiopian Orthodox, Ganesh, Goddess Worship, Greek Polytheism, Hanuman, Hasidic Judaism, Hare Krishna, Ancient Hindi, Hinduism, Hoodoo, Hutterite, Humanism, Islam, Krishna, Mormon, Jainism, Lutheran, Jesuit, Methodist, Lakshmi, Naqshbandi, Jehovah's Witness, Mahayana, Judaism, Neo-Paganism, Latter Day Saints, New Age, New Emergence Religion, Nichiren, Nirankari, Evangelical, Orthodox Judaism, Paganism, Pentecostal, Presbyterian, Protestantism, Pure Land Buddhism, Raelism, Religions of Africa, Rinzai, Roman Polytheism, Sai Baba, Satanism, Scientology, Shia, Shinto, Shiva, Sikhism, Spiritism, Sufism, Sunni, Taoism, Theravada, Tibetan, Unitarianism, Vishnu, Voodoo, Wicca, Zen and, finally, Zoroastrianism.

As I have compiled a list of certain religions that is not all-encompassing, the scope of my research will be confined to these 81 belief systems. As I will discuss later on in this paper, I propose a third version of my approach to studying the dispersal of religious smartphone applications. This new approach would use web-based technology to do the data mining and would use a database orientated interface to compile, sift through, and present the data. With a system like this in place, the searching of a new religion would only be confined to adding the term once and allowing the system to manage updating the content on all app stores.

MAIN RELIGION DISPERSAL

The above chart shows how religious apps are dispersed across all four platforms combined. What is most surprising is that I am not really surprised by the results. For example, the queries with the highest volume of applications are Christianity followed by Hinduism, New Emergence Religions, Buddhism, and Islam. With the exception of New Emergence Religions, the other four are some of the most popular religions in the world. To see them as being represented as the largest amount of religious smartphone applications was interesting. Some of the reasons that some religions have larger total numbers than others can be traced back to the sub-religion searches that I will outline later on in this paper. Since Hinduism and Christianity have a more diverse

Fig 1.1. Search queries organized by main Religion categories

ORGANIZED BY RELIGION

pool of searches to grab from, they effectively get more opportunity to bolster their results. In the case of Hinduism specifically, it has the unique ability to multiply its entries because of the fact that it is a polytheistic faith. If a developer made an app that was tailored for a specific deity, the developer could then duplicate that app for each deity in the Hindu pantheon, thus allowing the total number of apps to be larger but the actual uniqueness of the entries to be less so. Another aspect of my initial findings worth noting was the low number of non-theisms. With close ties to science and technology, I found it interesting that the applications' stores have not been utilized to the same extent as embraced by non-theisms on World Wide Web and social media.

When it comes to analyzing the Main Religions category from a comparative perspective, some interesting trends begin to emerge. The first thing I noticed was that Christianity had the highest numbers across the board on all app stores. This is not surprising given that it was number one in total results but interesting in that there was no real variation from store to store, unlike some of my other findings. This is most likely due to the fact that it is a predominantly Western religion, as were the application stores I used for my research. Smartphones and their stores as well as the programming languages are predominantly Western in origin. The second result that I found interesting was with the category of Hinduism. Although large in all markets it showed its highest level of adoption on the Android market place. This could be a result of Android based smartphone manufactures aiming their sights at emerging markets such as India. The same type of anomaly appears when looking at Islam on Blackberry. Although relevant on all markets it is the second highest volume of apps on Blackberry, falling behind Christianity by just five apps. The last anomaly I am going to discuss is with the category

of Buddhism. Buddhism, although represented as fourth highest in total volume of apps, paints a different picture when broken down into smaller number of apps. On Android, Blackberry, and Windows 8, Buddhism apps fall far shorter in volume, in some cases coming in fifth or sixth for total volume. The difference lies on Apple's iOS where it came in second for total number of applications, beating out all other main religion categories by hundreds of results with the exception of Christianity.

SUB-RELIGION DISPERSAL

When it comes to the number of applications that fall into sub-categories the explanations for some of the anomalies I just mentioned become abundantly clear. Firstly, although Islam came in fifth place for total main religions, when analyzed as a sub-religion category it had the most total apps under one search term (2606) beating out all other major religions that had a higher volume in the main religion category. The same anomaly was seen with Zen, which came in second place behind Islam with just 1898 apps under one search term. Although Islam had the highest total apps under one search term, it is interesting to note that it was eclipsed by the other religions once their different sub-religion searches were combined. The same disproportionate representation can be found with a few other results; for example, Krishna takes up the most results for Hinduism, Catholicism takes up the majority of all Christianity results and Goddess Worship pulled back the largest total apps under a sub-religion for New Emergence Religions. So with this in mind one thing became abundantly clear: that each religion is specifically represented in high volumes by a dominant Sub-Religion.

Some interesting findings came to light when comparing sub-religions and platforms. The Android platform had the most equal amounts of dispersal. Android showed a larger number of apps coming out of virtually all individual sub-religion searches compared to the other app stores which showed pockets of niche apps in certain Western or Eastern religions. Further findings showed that although "Christianity" as a search term showed large quantities of apps across all four stores (most of which came out of Android and Blackberry), Catholic as a search takes up the largest quantity of Christian apps on iOS. When it comes to the uneven dispersals of Buddhism and New Emergence Religions, both have the highest volumes on iOS. In both of these cases, Zen and Goddess Worship show lower quantities than Islam, dominating the dispersal across the board on all 81 search terms and showing only average if not sub-average amounts of quantities on all other platforms.

Some other interesting findings I came across once I normalized my data were Operating System dispersion, Cost dispersion, and Target Audience dispersion. There is the potential for star rating dispersion, but with an average of 4.5 for all the apps I feel that there may be a problem with how star rating is being calculated and sanitized. This seems to be too high a rating and should be scrutinized.

Fig 1.2a. Search queries organized by Sub-Religion categories

ORGANIZED BY SUB-RELIGION

Sub-Religion	Value
HARE KRISHNA	118
ZOROASTRIANISM	105
ZEN	1898
WICCA	125
VOODOO	607
VISHNU	756
UNITARIANISM	40
TIBETAN	408
THERAVADA	62
TAOISM	571
SUNNI	115
SUFISM	163
SPIRITISM	106
SIKHISM	364
SHIVA	675
SHINTO	102
SHIA	266
SCIENTOLOGY	32
SATANISM	270
SAI BABA	377
ROMAN POLYTHEISM	190
RINZAI	5
RELIGIONS OF AFRICA	190
RAELISM	404
PURE LAND BUDDHISM	14
PROTESTANTISM	154
PRESBYTERIAN	219
PENTECOSTAL	174
PAGANISM	284
ORTHODOX JUDAISM	70
EVANGELICAL	187
NIRANKARI	5
NICHIREN	34
NEW EMERGENCE RELIGION	21
NEW AGE	344
LATTER DAY SAINTS	650
NEO-PAGANISM	3

Fig 1.2b. Search queries organized by Sub-Religion categories

ORGANIZED BY SUB-RELIGION

Sub-Religion	Value
JUDAISM	651
MAHAYANA	56
JEHOVAH'S WITNESS	126
NAQSHBANDI	16
LAKSHMI	634
METHODIST	306
JESUIT	78
LUTHERAN	294
JAINISM	540
MORMON	568
KRISHNA	1193
ISLAM	2606
HUMANISM	80
HUTTERITE	1
HOODOO	30
HINDUISM	567
ANCIENT HINDI	423
HASIDIC JUDAISM	4
HANUMAN	752
GREEK POLYTHEISM	691
GODDESS WORSHIP	1456
GANESH	736
ETHIOPIAN ORTHODOX	36
ANCIENT EGYPTIAN	68
EAST ASIAN RELIGIONS	77
DURGA	634
COPTIC	122
CONFUCIANISM	547
CHRISTIANITY	1322
ANCIENT CHINESE RELIGION	420
CHINESE FOLK RELIGION	43
CHAN BUDDHISM	147
CELTIC	405
CATHOLIC	1776
CALVINIST	17
BHAKTI	264
BAPTIST	1385
BAHA'I	103
ATHEISM	127
ANTIQUITY	383
ANIMISM	20
ANGLICAN	228
AGNOSTIC	162
ABRAHAMIC	45

OPERATING SYSTEM DISPERSAL
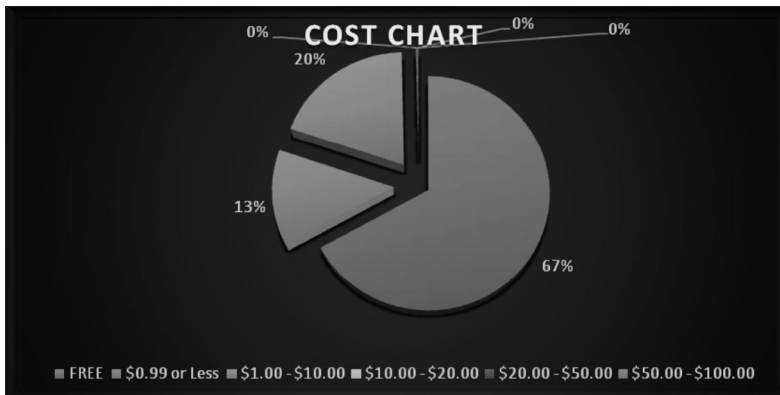
Fig 1.3. Search queries organized by OS

When it comes to operating system dispersion it's not necessarily surprising that the Android OS, which has the largest store, had the highest percentage of total apps with 49%, followed by Apple with 40%. What intrigues me most is that Blackberry —which is on a very real spiral out of the smartphone game— was highly represented in the news articles I came across while researching my thesis, especially within Middle Eastern traditions, yet they had the lowest percentages with only 4% of total app dispersal. Windows 8 store had 7% which shows signs of early adoption. As a development platform it had the lowest market share of users on its devices. It might be worth noting that if Microsoft's market share grows there is potential that you may see a decline coming out of one of the other three shares, most likely Blackberry. If this holds true, one could continue to hypothesize that if this project could be replicated in real time over a long period of time, one could see religious app developer's technological adoption rate. Unlike the websites today, app stores are a measurable phenomenon at this time.

COST DISPERSAL

With cost dispersion being broken down in individual app stores there were signs of more variance but once they were combined within a master list, the variances became so small they were could not be measured in terms of percentages. With this information we know that the majority of apps that pertain to religion are free, however those that charge are 13% likely to be less than a dollar and 20% likely to be between $1.00 and $10.00. From an individual platform perspective, some of the differences can be large. For example iOS, which arguably generates some of the most profit for developers, emphasizes a pay-to-use system that can be reflected in how costs are dispersed. On this platform it shows that roughly 47% of apps are free, 23% are less than $1.00, and finally 30% cost between $1.00 and $10.00. This is quite different from the Android platform, which shows 81% apps are free, 6% of apps being less than a $1.00, and 13% of apps being between $1.00 and $10.00. The other two platforms fall in the middle, offering a balanced cost ecosystem.

Fig 1.4. Search queries organized by Cost

TARGET AUDIENCE DISPERSAL

Fig 1.5. Search queries organized by target audience

Target audience gleans some interesting data by showing us that religion is 68% likely to be rated E for everyone. That being said, when it is not, it is more likely to be of low maturity compared to the rest of the ratings combined. As I mentioned in the last paragraph, it would be interesting to see how different religions would stack up against one another on the micro scale once the results could be sanitized completely and placed in a database. From a comparative standpoint the same polarizing takes place with target audience as with cost. On one side you have Apple and Blackberry which show 87% and 79% of apps being for general use, compared to Android and Windows 8 with 53% and 68% of apps being for general use. A huge division also takes place directly between Apple and Android in the dispersal of apps with a low maturity rating. On one side you have

Apple with a 7% low maturity rating compared to a 35% low maturity rating on Android. What this tells me is that when a potential user is looking for an app for religious purposes they are five times as likely to find an application that should not be taken too seriously on Android compared to iOS.
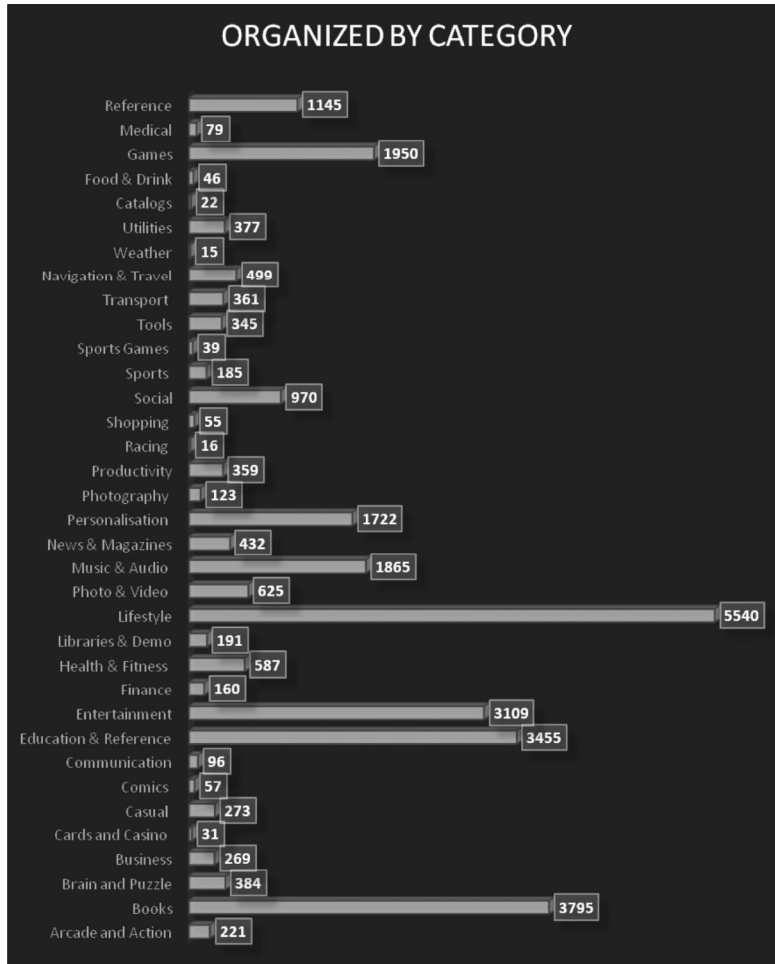
CATEGORY DISPERSAL

Earlier I briefly described what normalizing or sanitizing data would entail but with the last three graphs and most importantly with the chart for Category a lot more normalizing went into the results. For example, Apple may call a category "Entertainment + Technology", which would have been normalized to simply Entertainment so that all of the app stores had normalized data; apples to apples if you would. With the Category graph a lot of normalizing had to take place. Although most likely accurate, it would be negligent to rule out that some data would have been lost in the transfer. This same frame of thought should be applied to the previous two graphs.

As one could have guessed, the top five categories that the applications were filed under by the app stores were Lifestyle (5540), Books (3795), Education & Reference (3455), Entertainment (3109), and Games (1950). This is unsurprising because all of these categories correlate to key components that I believe play a role in how religion is dispersed across any technology, with the exception of Games. I am surprised that Social only had 970 apps considering the role that community and social interaction tend to play in most religious traditions. I suspect that most of the apps in these categories are solo experiences. They are meant to enhance a person's religious experience rather than connect them to others to have a shared religious experience. I also found it interesting that although Entertainment came in fourth place it was a close fourth to Education & Reference which tells me that when it comes to app dispersion by category, apps are almost as likely to be intended for entertainment purposes compared directly to those intended to spread a particular religious view or teaching through the category of Education. Two other categories that are important to note are Music & Audio (1865) and Personalization (1722) because they may identify with concepts of sacred space. Music, because the playing of religious music on the device would be a stepping stone to creating sacred space on the device itself that the user interacts with, and Personalization would be an even greater step towards creating sacred space on the device because one would be personalizing one's personal space to identify more with whatever sacred belief and practice the user may have.

Within Category there is quite a variance from app store to app store. This leads me to believe that certain apps seem to be in more abundance on certain stores, creating a beacon for content of a specific type. An example of this can be seen with Windows 8, which has the highest numbers of apps within the category of Books, followed by Lifestyle and Entertainment (the latter of the two being close in percentage). What is interesting is that all of the other categories are very small percentage-wise, creating a specific grouping of apps that are available on this particular store. Blackberry shows similar form with the highest

Fig 1.6. Search queries organized by market category

ORGANIZED BY CATEGORY

Category	Value
Reference	1145
Medical	79
Games	1950
Food & Drink	46
Catalogs	22
Utilities	377
Weather	15
Navigation & Travel	499
Transport	361
Tools	345
Sports Games	39
Sports	185
Social	970
Shopping	55
Racing	16
Productivity	359
Photography	123
Personalisation	1722
News & Magazines	432
Music & Audio	1865
Photo & Video	625
Lifestyle	5540
Libraries & Demo	191
Health & Fitness	587
Finance	160
Entertainment	3109
Education & Reference	3455
Communication	96
Comics	57
Casual	273
Cards and Casino	31
Business	269
Brain and Puzzle	384
Books	3795
Arcade and Action	221

volume of apps being part of the Education and Reference category, followed by Books and Music & Audio. Interestingly, within Blackberry's category dispersal Lifestyle was virtually non-existent but on all other app stores, Lifestyle always held a large sum of dispersal. Lifestyle was the absolute highest in Apple's app store (by quite a lot) which leads me to believe that Apple –and, to a lesser extent, Android– leads the charge in carving out the category of Lifestyle as the largest category of app dispersal on the combined chart. Surprisingly, the second highest category for iPhones was Games, followed by Education and Reference. This indicates to me that, when searching for religious apps on iTunes, one is just as likely to come across apps that are in the vein of sharing knowledge as games or timewasters. Finally, when it comes to the Android market place, Books, Lifestyle, and Personalization had the largest sum of apps followed by Entertainment and Education & Reference. The Personalization category was interesting to see

because in all other stores this category has generally held a small percentage of apps. With Android being emphasized as the most customizable operating system it is not surprising to see an emphasis on apps that emphasize customization. What is surprising is that there is a clear market for religious smartphone applications in this category. This niche of apps very well may not exist on other markets as it seems developers are creating content based on the strongest elements that Android —as a platform— offers.

BRINGING IT ALL TOGETHER

In regard to my findings, there are a couple of important points to keep in mind. First, there is no absolute way of knowing exactly how these applications are being used. Similarly, due to online anonymity, there is no way to know how many people are using these applications. The only exception to this is the Android market place. Even with Android, however, the range of total downloads is more vague the higher the number gets. In order to have a really solid foundation to build on, this project would need to be replicated using a more resourceful programming language such as Python. In tandem with a database, one could duplicate what I have done above but put a system in place that utilizes certain sanitization methods to ensure the list, in its entirety, could become sanitized permanently. With duplicates removed and the ability to update findings, measuring the dispersal of religious smartphone applications is a completely achievable goal. Unlike the web, which has been spinning out of control to the point that entire pockets of the web exist (called "deep web"), that are virtually impossible to trace, smartphone application markets are more controlled and are a measurable phenomenon. With a more permanent way of measuring the dispersal, the types of information that could be compared are limitless.

Will mobile internet and, by extension, applications, ever replace the hardwired internet and clunky PC/laptop culture or the brick and mortar institutions they represent? I think not, but the relationship will change, and in a lot of respects, it already has. A dichotomy will exist where activities that are mobile friendly and activities that are not will be the dividing line, and lifestyle will play referee to which players are on which sides. Virtual worlds do not play out kindly in a mobile atmosphere (at least not right now) and with the world population rising and space becoming a very real issue, converting physical space into virtual space is a necessary step in our technological and social evolution. This is where the power of mobile truly thrives.

With this in mind, religious studies' scholars do not know definitively if there is a correlation between the rise of the mobile revolution and religion. In fact, it is entirely possible that there is almost no market for religious smartphone apps. Without developers divulging their bank statements and without users coming forward to express their use of religious smartphone apps, there is no way of knowing for certain if a relationship exists and to what degree. With a potential 30,000 apps across all app stores, however, I doubt that religion being practiced on or in tandem with smart devices is an isolated occurrence. In a capitalist world

one would think that if there were no money in religious apps, there would be fewer developers turning out these products, much less cornering an entire market of human religious belief and practice. From firsthand experience I can state that surviving in the internet communication technology market can be an expensive endeavor, and as the old adage proclaims, it takes money to make money. For even a fraction of the application development companies to survive and thrive they need either large amounts of one time purchase revenue or recurring ad space/subscription revenue to keep the lights on and the conduit to God alive.

With a little time, participation from the academic field, and a more permanent form of method collection, this data has the potential to be a very powerful source of information. Questions such as which developers are leading the charge on the mobile spiritual revolution, or which religious institutions are paying preferential treatment to which operating systems are but a mouse click away with just a little proper planning and funding. I realize that the broad strokes nature of a master list of all operating systems does not allow for a proper OS to OS, religion to religion comparison. With bold sweeping totals that include all market places, I can comfortably give the findings as they are, confident that any misplacement of data has a superficial effect on the greater totals. Anything requiring comparison between platforms or individual search queries and their findings should not be taken as absolute. Are my aforementioned findings regarding comparison wrong? Not at all, but they cannot be verified reliably without the proper database infrastructure in place.

Just as the internet continues to evolve, the potential for technology to move beyond the smart device is limitless. With the rise of technologies such as Google Glass and other smart accessories, the potential for even more integration with mobile tech and religious belief and practice is highly probable. What if one could literally see Jesus everywhere one looked, or could get directions for participating in Hindu prayer through smart band technologies so that proper prayer motions could be taught and perfected? These ideas are not 24th century concepts; these are very real potential application ideas that could be created anytime in the next few years. As sensors become smaller and virtual reality begins to overlap with physical reality to create all-new augmented reality experiences, it is not a matter of if, but rather when.

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Notes

[1] The wireless industry estimates that there are well over a billion active smartphones worldwide, but that number is rising exponentially every year.

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