Grand Canyon and Mobile Apps:

A Case of Special Collections

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Abstract

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Many visitors come to the Grand Canyon National Park (GCNP) seeking satisfaction in their experience with GCNP's geography.   A large majority of these guests are unable to experience many of the treasures that Grand Canyon has to offer, especially below the rim.   In addition the National Park Service has only so many resources at their disposal for providing experience interpretation and information.   GCNP's customers have modern technology in their hands and pockets giving them access to mountains of information, yet how can this help them to find greater satisfaction in their experience at GCNP? Research has shown when a service provider, such as the National Park Service, sets the experience stage those receiving the services find greater satisfaction.   Through the use of several historical Grand Canyon collections from Northern Arizona University's Cline Library's Special Collections department, supplemented with historic collections from the NPS and contemporary data, a mobile app has been developed and set a service stage to provide guests of GCNP with virtual below the rim experiences.   This project found that the developed app can provide enhancement to Grand Canyon customers' satisfaction with their experience.

"Although [the Grand Canyon] was first seen by white men eighty years before the pilgrims landed from the Mayflower, and although prospectors swarmed it for over 20 years before 1900, for all practical purposes, it is still unknown territory" ~ Harvey Butchart

Keywords: *Grand Canyon, National Park Service, Special Collections, customer service, customer satisfaction, service experience, mobile apps, mobile technology*

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Introduction

Visitors to the Grand Canyon National Park (GCNP) are often limited in the amount of and access to the rich information GCNP has to offer. These visitors may be limited in their time, choose certain experiences over others, are unaware of certain significant resources, or may be physically incapable of certain activities. In addition limitations are frequently due to GCNP's inability, from limited resources, to provide interpretive planning and management for the vast amount of resource-associated information. The National Park Service (NPS) that administers to GCNP's guests is often inundated with the amount of visitors and must stretch their customer service resources further and further. GCNP is aware that interpretations of natural, cultural, and historical information are often key elements of satisfaction for many who visit the National Parks and is constantly looking for ways to provide such information. Research has shown customers find satisfaction when they can experience more than what they came to see and already know (Nielson & Liburd 2008, Lanir, Wecker, Stock, & Zancanaro 2011, & Chang, Chen, & Hsu 2011).

As those who visit the Grand Canyon are customers of the NPS, the NPS seeks to provide satisfaction. In addition visitors seek satisfaction in relating the intangibility of the information with the tangibility of the geographic location they are visiting (White, Virden, & Cahill 2005). The quality and effectiveness of the methods GCNP uses to provide information can be a major part of these "Canyon customers'" experience. To alleviate the balance of visitors at the Grand Canyon and other National Parks such as Arcadia and Yosemite and the strain on their resources, various strategies have been employed and regularly updated. Still there is a need for other methods and research concerning visitor experiences with NPS resources (Hasse & Miline 2005).

Planned interpretation of a geographic area's resources is a key component of visitor experience, and thus customer service and satisfaction (White et al. 2005: 63). Historic collections, contemporary geography, and geologic chronology are only a few of the treasures of the Grand Canyon. Many Canyon customers of GCNP may only catch a glimpse of these during their visit. Often with the information they have available, the connection between the brochure and the geography is not always easy to conceive. These resources may not even be available in a form that can readily and freely be accessed. There is some irony in this because many of

today's Canyon customers carry mobile devices that give them quick access to mountains of information. For these guests, learning of the information in an outdoor setting is often improved when in combination with their mobile devices and screen interactions (Chang et al. 2011). This connection of mobile learning with outdoor geography is a positive tool for the experience. In fact in an independent study it was discovered that 84% of visitors find more satisfaction in their visit to the Grand Canyon when technological resources provide them with interpretation (Arizona Office of Tourism 2012).

Using technology to stage the experience for visitors provides satisfaction (Ellis & Rossman 2008, Daigle & Zimmerman 2004). The technology and service implications discussed lead to satisfaction with visitor service.   The basis of satisfaction is service. Dayan, Al-Tamimi, and Elhadji (2008) say satisfaction depends on the service provided (321).   Collishaw, Dyer, and Boies (2008) report past research found respondents linked their "ratings of satisfaction with the service encounter" (28). Customers find satisfaction in the services they are involved in as the services address the customers' goals.   According to Matzler, Füller, Renzi, Herting, and Späth it is essential for service entities to keep their customer service dynamic while delivering consistently high quality service (2008).   The way the service or services are provided determines the satisfaction outcome.   Collishaw et al. (2008) also say "services are designed to refresh, stimulate and entertain; to provide pleasurable emotional experiences" for customers (23).   Customers are satisfied because the service generates positive feelings.   Entities "who provide leisure services recognize [that there is a] need to create positive feelings in their customers" (Collishaw et al., 2008, p. 23).   Customers of the NPS seek satisfaction from customer service that applies to their geographic experience.

Research Statement

The purpose of this research is to examine the value and usefulness of digitizing Grand Canyon data from Northern Arizona University's Cline Library's Special Collections department, supplementing it with contemporary data and historic data from the NPS, and making it available to interested parties, particularly Canyon customers.   The investigation more specifically looks at providing the modern-technology-carrying visitor with a richer experience

and satisfaction. Additionally the research investigates the delivery mediums between the information being provided and the Grand Canyon National Park guests.

Research Questions

1. Will the digitization of the special collections' data provide a richer and more satisfying experience for Park visitors, especially for those who are unable or choose not to go beyond the developed areas of the South Rim?

2. Will the information delivery, by means of technology, interfere with the outdoor experience?

3. What percentage of GCNP's guests will use the digitized information as an interpretation tool to enhance their experience compared with those who use traditional methods or a combination or the two?

Research Hypothesis

Park guests will find their visit to the Grand Canyon satisfactorily enhanced if the rich information of NAU's Cline library's Special Collections, supplemented by contemporary and historic NPS data, can be accessed through personal mobile devices while at the geographic location.

Literature Review

Technology and Canyon Customers

Providing a Richer Experience with Technology

Past research has found technology can be a useful means for providing a richer recreational national park type experience. Technology's ability to provide information has been found to help with continuous visitor growth at various national parks and thus enhance interaction with the outdoors (Daigle & Zimmerman 2004).   Information provided through mobile devices thins out congestion by providing guests with more information portals than previous methods of static kiosks.   This can increase understandability, provide clarity, and relates well to places such as the Grand Canyon having a significant increase in annual visitation. With a large number of visitors the distribution of information can become much easier through media on digital devices. "Given the physiological and psychological benefits of leisure, their availability in outdoor settings and the efficiencies of market segmentation, media campaigns may be an effective means of influencing park visitor physical activity behavior" (Leahy, Shugrue, Daigle, & Daniel 2009: 60).   The portability, connectivity, and context sensitivity also allows for a large number of dissimilar people to have individual positive learning experiences (Chang et al. 2011). The learning experiences can come as the participants are in real-time active situations or from observation posts. This also includes task and experience learning with technology used in outdoor environments.

Other research has found mobile technology in an outdoor setting can be an optimal provider for teaching a large number of diverse people about where they are at.   Learning about the vast number of subjects and sources regarding the geographic location is enriched as opposed to what is offered by static topic kiosks (Hsien-Sheng, Chih-Cheng, Ruei-Ting, & Kun 2010). For example the visitors no longer have to crowd around a solitary focused trailside marker but can have many pieces of geography and other information related to them through their own handheld assistant. This can be helpful as education of vast outdoor environments such as national parks can be difficult for guests who visit for only a short time and infrequently. The education of outdoor information through the use of modern technology is easier than past methods including pen and paper (Chang et al. 2011). The internet and layering of information in a technological device make the learning adaptable to the present geographic position within

the outdoor setting and provides connections to related spatial data. Thus the streaming data and many layers can put several facts from many different disciplines on a single piece of hardware as desired by the user at the given moment. The learning is also interactive. In Acadia National Park technology was used to provide guest with real-time bus schedule information (Daigle & Zimmerman 2004). This allowed for the visitors to learn how to plan for their various activities and get the most out of their stay. This also allowed for GCNP to plan how to deal with the challenge of increased visitation balanced with guest satisfaction and interaction.

Other studies have found as park relevant information is conveyed through technologies such as GIS and GPS the visitors can make analytical connections they otherwise would not (Hasse & Miline 2005). The planning that goes into the information delivery allows guests the convenience of making quick geographic and multi-dimensional interactions without an exhaustive study of data. This reflects well for GCNP administration and facilitators as they can plan for ways to enhance guest experience. Research done at various national parks indicates using media, which can be distributed with technology, for planning and directing tourist activities present affirmative outcomes on recreation experience preference scales (Leahy et al. 2009). Creative, social, and nature benefits are positively influenced when media provided by GCNP is used by the visitors. As such, mobile technology bodes well for interpretive planning. Learning about a national park's geographically related data provides enriching motivation for tourist involvement in GCNP's resources. The stories and information about a place like a national park told as a result of interpretive planning and by way of technology provide benefits for guest and management (White et al. 2005, Daigle & Zimmerman 2004). It provides ways for untouchable tangibles such as protected cliff dwellings and archived histories to be examined and related to the present geographic surroundings. In this way it directs visitors to benefits in ways past methods have not. Directing visitors to benefits with technology has been successful in national parks such as Yosemite. It was found in Acadia National Park that technology was successful in planning for tourist traffic and thus improving visitor experience (White et al. 2011, Daigle & Zimmerman 2004).

Park Management

Managers of areas rich in nature and cultural elements want to make the area's resources and attractions available to all people (Pezzo 2010). This of course is a complicated task as guest adventures range from backcountry purest to amenity indebted rim viewers. Those park guests who are limited due to time, physical ability, area knowledge, or other constraints find specific satisfaction with their visit due to customer service. When management can offer accessibility tools to area knowledge and real or virtual experiences they can cater to a broader audience than those with the fewest boundaries. One of the most common boundaries of visitors to a destination is a limited amount of time and attention (Lanir et al. 2011). Additionally as more and more people carry mobile devices with location awareness capabilities managers need to be proactive in providing services catering to customers' choice of medium. No matter the customer limitations or management capabilities visitors require services, particularly information services (Nielson & Liburd 2008). As modern visitors are familiar and comfortable with current technologies they find their needs are often best met when they can access information about the area they are visiting through their handheld devices. Location base technologies allow for greater communication capabilities within management and between management and consumers.

NPS management has found the increased use of modern technology increases the power to provide better customer service (SunWise 2003, Lanir et al. 2011). Using mobile technology, scenic area mangers, such as the NPS, can be both proactive and passive in providing context aware and spatial interpretations for their customers. The management can provide readily available virtual hands-on content while customers can, at their leisure, look at what is in their hands while they look at the scene before them. A distinct advantage of digital tools is the vast amounts of information they can serve up for any location visited in the area. The disadvantage of this is area guests may be overwhelmed by the amount of information provided. Those managing can distribute information in a more efficient manner through mobile technologies as this is on level with the customer desire to use personal tools (Nielson & Liburd 2008).

In addition to disseminating information problems arising from and solved by technology in places such as the land managed by the NPS are visitor crowding and traffic congestion (White, Aquino, Budurk, and Golub 2011, Lew 2010). For instance vacationing with the family car is an identifiable American pastime. As more and more guests come with their private automobiles the area becomes saturated. To deal with this the management can use technologies

such as alternative transportation to 'direct traffic' and still please the customers. Sometimes guests are even more pleased with the new amenities. In relation to this is the concern of balancing the relationship between traffic, human and motor, and the natural environment. Similarly customer service with the goals of directing the traffic of education and the enjoyment of nature are primary purposes of an entity such as the NPS (Acland 1998). To accomplish this management develops and maintains practices which facilitate visitor and geography interaction. Often when you have vast expanses of mountains and canyons it is difficult to compact these customer service goals into visitors' short timeframe. Again integrating technology helps address this customer place interface and provides customers with more choices with their limited time. There are a multitude of relationships between customer service and visitor crowding. Knowing those relationships allows management to wield technology in way to satisfy visitor experience standards.

Managers need to know where the traffic patterns lead to, where people are congregating, and where they can affectively apply services. Current with modern society, this includes location management with keeping in mind ecofriendly and conservation concerns (Bertazzon, Grouch, Draper, & Waters1997). For a place like a national park the management system also needs to embrace an environment of ecotourism as many of its guests came to indulge in its scenic wonders and nature adventures (Eslami et al. 2011). As such many who are customers to locations of geographic character entail a moderate amount of customer service others such as purest and high end adventures wish for less of it (Sæþórsdóttir 2010). With this diversity of visitors there also is a tourism carrying capacity for any area and the organization of rationing limited amenities and facilities to be disbursement in ways pleasing to those who want it most. The management needs to find a balance so as many customers can find satisfaction as possible. This is not always easy so more diversification of services and greater customer self-independent amenities, such as with mobile technologies, can minimize negative impacts and satisfy a larger number people such as Canyon customers. Managing a scenic or wilderness area requires managing locations within the area as well as resources and movements interacting with those locations (Bertazzon et al. 1997). As customers are spatially distributed throughout an area, such as a mountain venue or a hundred acre theme park, administrators and other employees need to be proactive in activities, customer service, and planning with a geographic based system (Eslami et al. 2011). Management can produce customer service tools but unless they include

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aspects geared toward customer's individual behaviors, activities, and intentions in reference to their location the tools are ineffective (Lee & Joh 2010). Again the guests of the area are often categorized by their adventure experience and intentions and so the demand for the location product tends to be more dominant than the supply. With this in mind the aspects of the tools catering to customers need to have flexible enough engineering for individual demands as well as supply specific deliverables for specific locations in the area.

A useful tool to address these management needs is electronic technology (Acland 1998). For example while the IMAX cinema at the Grand Canyon is not a NPS business unit it takes park guests through virtual education and adventure excursions they could never do in a three hour tour. The most popular tool for location based services is GIS which often involves mobile application (Bertazzon et al. 1997). Geographic Information Systems (GIS) technologies have been valuable tools for park and recreation management for quite a bit of time (Zorica, Knaap, & Scheidecker 1999). Not only are GIS and other location based technologies essential instruments for area centered studies and administration within these areas but also key tools for providing services to visitors such as Canyon customers. These proficient and operational tools for geographic based management techniques take various types of data, connect the multitude together, and link it all to the respective locations in the area, and deliver the information to customers who desire it (Eslami et al. 2011). Using location based technologies such as GIS for management provides "a cost effective means to disseminate useful geographically referenced information" to customers (Singh, Sharama, & Singh et al. 2011: 462). The time, geography, transportation customer choice, intentions, perceptions, and activities cross analyses all need to be run through a system such as GIS and outputted to tools like mobile devices useable by both customers and management (Lee & Joh 2010). What is neat about today's technologies, particularly those such as GIS, is not only can the tools provide open doors to a wide range of customer but they can do so without compromising the authenticity, environment, or history of the location (Pezzo 2010).

Customer Education through Technology

The impact of greater Canyon customer education in outdoor recreation and tourism settings reflects on the service providing entity's ability to perform and meet demand (Ellis & Rossman

2008). While the avenues for such education are diverse the entity's continuing efforts to deliver increases both customer and provider's satisfaction with the scenic venue. People such as Canyon customers may be somewhat educated about the location product they are engaged in, however, they may be blatantly unaware about what products are in the location (McKercher & Ho 2006). Due to difficult access, misdirection, impracticality, isolation from other attractions, or just plain being unaware, guests of a location miss out on learning about and enjoying many in-depth elements of a place. In addition too much or little exposure and involvement with all there is to do in an area contributes to visitors' disinclination to learn more than what they already know about. Customer service directed to selling and educating visitors about the various elements, such as culture and history, have to be careful not only about over or under doing it but be sensitive to how the service affects what makes the location the special place it is. GCNP customers need to be served at their own pace, personal relevance, curiosity as well as educated about what makes places like the Grand Canyon grand. As dissimilar groups learn in various ways, such as urbanites with more infrastructure and purest with less, education methods meeting the needs of the most people possible are desired (Sæþórsdóttir 2010). As seems to be the trend, mobile devices are well suited for this customization of education service.

Canyon customers can create personal virtual expeditions allowing for greater access to education of a location and its history (Schrum 2008). Digital mediums can create individual experiences on level with the users own way of discovering the place they came to see. For example, using technology to explore the history of a location allows people to connect both past and place with a contemporary and familiar medium of a handheld device. The digital technologies also allow for further inquiries such as internet searches and database queries that posted trail side signs are mute to. Quivik (2009: 307) states a discernment of technology is an instrument for human interface with their surroundings and provides to better serve their needs seen or unseen. Technology (not necessarily digital) is used to help people understand their environment and is based on past or historic interactions with the environment (Quivik 2009). Technology is used by tourist to gaze into and understand a scenic area's place in the world. It not only bridges education of a location but also allows for personal entrenchment. A good example of this tourist gaze is an increasing popular trend combining geographic education with tourism (Thulasimala & DevDass 2010, Eslami et al. 2011, and Arnegger, Woltering, & Job 2010). Ecotourism is where tourists travel to places with goals and intentions of interacting with

and improving their world. While people are 'vacationing' to better understand the earth's natural environment, more and more they are using electronic devices to help them do this. They want to learn about an area's natural and human history, geographic features, how society interacts with the location, and other elements and characteristics to help them better serve the environment humanity mix. They turn to location based technology like GIS and carry handheld digital assistants as they trek across the terrain or merely gaze across GCNP rim. Acland says in his research "The tourist gaze marks an access point to the formation of knowledge about otherness" (1998: 438).

Specifically the tourist gaze is about customers developing a comprehension of an area's geography and adding depth to what they are seeing during their visit. As Bertazzon et al. puts it in terms of technology, "the creation of Geographic Information Systems (GIS), [is] the tasking of incorporating meaningful geographic dimensions and data into" what the customer is getting out of the experiences they are having by visiting the scenic wilderness area (1997: 36). GIS and other location based technologies develop the event into something more and educate guests on various spatial levels (Bertazzon et al. 1997). More and more when in the field, on-site, or gazing at vistas from a canyon rim these geographic educational experiences involve using mobile technologies. This allows for customers to feel more integrated with the location and diminishes learning challenges. Area guests can take virtual field trips without having to exhaust physical energy trekking across terrain they would rather not. Technology allows tourist to gaze into experiences and learn about sites within areas they could never do otherwise (Acland 1998). It allows for authentic education activities without having to be real hands-on actions. For example the IMAX theater technology at the Grand Canyon proves virtual explorations of GCNP for park guests who would never be able to do them either within the confines of their visit or physically in their life time.

Technology has been successfully used for self-guild tour systems in various customer service settings such as museums and art galleries (Hsu & Liao 2010). Through the use of personal digital devices the customers visiting the service venue are educated right on the spot without a tour guide employee standing right next to them (Hsu & Liao 2010). Portable devices serve as education kiosks to people such as Canyon customers who are mobile relative to a real-world place (Sylaiou, Mania, Karoulis, & White 2009). Specifically handheld and internet technology have set a new standard for the way people search for and learn about the places the

visit (Nielson & Liburd 2008). Increasingly involved in visitor information quests is spatial connections with the knowledge about the landscape particularly the history. They seek to map connections with the locations of the places they are visiting right in the palms of their hands as they look across the rims and vistas. Location oriented technologies connect the geography with the non-geographical data for the customers. There cannot be a complete education of an area without involving the spatial elements associated with it and those spatial elements cannot be conveyed without some sort of medium accessible to the visitors of the area. The preference of guests such as Canyon customers and management more and more seems to be to have the option of education though mobile technologies along with traditional mediums.

The applications of using of handheld devices are incredible but some are more effective than others (Patterson 2010, Duran, Şeker, & Shrestha 2004). Of all the available media types, maps are some of the choicest products used to educate people. The choice of colors, content, and aesthetics draws people in and teaches them more about a location then other methods alone. With today's tools map design is interactive in ways catering to various forms of learning and discovering. With the average national park visitor being past the years of youth, the need for interactive and flexible maps complemented with information such as history is ever increasing. Those seeking simple clean-cut spatial visualization merely have to glance at the screen of their mobile device while those wanting to learn more can click and click some more for deeper knowledge. Another great application of mobile devices is their ability to educate from user queries. GIS and other location base services help answer customer questions such as what is that trail I am looking at and how did it get there. Through handheld digital gadgets the area guests can make their searches personal and relevant to what they are really interested in. Management can use the spatial technology for questions such as what nature experiences will provide the greatest satisfaction for the customers and are best for the land.

Satisfaction
Customer Service

As visitors come to the Grand Canyon National Park they are essentially customers of the National Park Service and expect services. Seen from this perspective, the outcome of meaningful and quality customer service is satisfaction in visiting GCNP. Bowden (2009)

suggests satisfaction is seen as a post-consumption thought process. It is an outcome of personal decisions people have in evaluation of service experiences. Oliver, Rust, and Varki (1997) state satisfaction is a fulfillment of needs and desires. The more those needs and desires are addressed the more customers experience satisfaction and delight. Yim, Tse, & Wa Chan (2008) state as customers' satisfaction increases they show signs of affection and fulfillment of visitation expectations.

Satisfaction has different definitions and levels to it. The customers are attempting to discover if the level of satisfaction is enough for them to feel the cost is beneficial (Bowden 2009). Additionally much of the research of satisfaction looks at intentions, goals, perceptions, and different levels of utilitarian and hedonic satisfaction. When visitors come to the Grand Canyon they intend to see more than just a big hole in the ground and expect the NPS to provide them with quality interpretation of the geography they are experiencing. Those levels of satisfaction range from being satisfied with meeting basic needs to expected or unexpected delights surpassing desires (Bowden 2009). Alexandris, Kouthouris, and Meligdis state customer service is what produces the level of customers' satisfaction (2006). Chitturi, Raghunathan, and Mahjan (2008) suggest understanding the customer and guests' intentions and goals when receiving services helps the service providers plan for an outcome of satisfaction . This understanding of visitation satisfaction from a service experience is a measurement of how well customer service performs. The entity understands what services are satisfying enough for fulfilling experiences to occur and how to improve (Chitturi et al. 2008). Guenzi and Pelloni (2004) say satisfaction links customer service to fulfillment of guests' expectations and experiences. Alexandris et al. (2006) suggest the quality resulting from customer or guest service directly affects the level of customers' satisfaction.

One level location based customer service must attend to is what is known as the tourist gaze. When visiting a location such a site read about in a book, a place seen in a movie, or a locale of famed geographic wonders and pleasures the adventure is predominately visually based (Joliveau 2009). Hence the tourists will gaze at the scene off the rim of GCNP or the panorama from the mountain top. In order for the customer to be satisfied guest services have to provide the best possible view catered to by effective amenities. The customer is directed, naturally or otherwise, to site centered experiences removing them from their everyday routine. The area visitors, at various levels, already have an idea of what they want to see as they have been

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introduced to the Wild West, Mysterious Orient, or other theme. The customer service's job is to guide the guests to what they intend to behold, enhance what they are looking at, and extend opportunities to see more. On a parallel level there is an interaction quality dimension (Kyle, Theodorakis, Karageorgeiou, & Lafazani 2010). Increased and worthwhile interaction with service has been shown to improve customer satisfaction with the product experience. Sensations and memories created from experiences by customer service are factors of value moving consumers toward satisfaction (Ellis & Rossman 2008). Customer service via technology is effective because it can be individually adapted and personalized by allowing users the ability to look at information on their own terms and deciding what they can intermingle with and is relevant to them. When it comes to a spatial base commodity such as a ski resort or national park, interaction quality is essential therefore any resources or tools improving the interactive value of the experience from the location product are welcomed by guest services (Kyle eta al. 2010). These can range from highly trained and sensitive employees to independent customer manipulated kiosks.

When people visit an area, whether new to it or familiar, they are constantly making decisions and looking for answers which require direction and information (Soh & Smith-Jackson 2004). Often this comes from customer service technology in some form of a location product such as a map. If designed with pleasing aesthetics, color art, environmental cues, and understandable communication maps can positively contribute to customer satisfaction. This is also true if the maps are designed with minimal cultural discrepancies so that a wide range of customers can benefit. Navigation with a static map can be a puzzle for those without orienteering training. The inability to connect to the information found on the map can cause hindrance and dissatisfaction. The map design therefore must include route finding dynamics such as can be done with modern location technology and handheld units. To help even further with map interpretation physical signs along the trail connect people to and guild them across the landscape. It has been seen thought even with cognitive and intuitive approaches map design can be a failure and frustration for people who have no sense of direction in the first place. Other deterrents of satisfaction with maps, even with simplified technologies, might include gender, inexperience, handedness (right or left), international visitors, and age.

Customer service even at a location like a national park seeks to give guests the greatest possible satisfaction and views during their limited amount of time (Acland 1998). The kinds of

customer service and satisfaction people are looking for with scenic settings and natural wonders are location based (Grét-Regamey, Bishop, & Bebi 2007). Their satisfaction comes when the amenities cater to their personal preferences while factoring in spatial characteristics. For example do paths cleared to their personal tastes lead to nourishing vistas or are managed landscapes disappointing and inaccessible? Certain technologies such as GIS and mobile devices can serve visitor preferences and satisfy customers by helping to establish the values of mountains and canyons people came to experience. On these levels technical and artistic performance factors for staging the visitor experience require customer service to have a number of "tricks" up its sleeve including contemporary technologies (Ellis & Rossman 2008). Furthermore as customer service is dispersed to handheld devices it gives customers access to the "tricks" and area information while on the move (Singh et al. 2011). These advantages along with location based services such as GIS are well suited for areas such as national parks. GCNP guests can get information and satisfy their desires from anywhere in GCNP, at any time, and in ways best suited for their situation.

These contemporary technologies used in customer service not only provide satisfaction at the time of transaction but also are a means for feedback (Hsu & Liao 2010). Visitors of a service can use personal technologies, such as smart phones, to log in their service experience results almost instantly. This provides the service entity with information on how to provide better services in a quicker manner than waiting for a mailed, emailed, or generic online survey. It is suggests conversational feedback technologies such as Twitter (http://twitter.com/) accessed with handheld digital equipment would be very useful for outdoor scenic sites as they can connect comments with the location. Through layered technologies, such as Twitter tweets using GIS, management can distribute and customers can access information about and link to an area and locations within it easily and quickly. This is advantageous as visiting a place such as a national park is a spatial activity with a plethora of incoming and outgoing information. As such management wants to provide and engage customers in services relating to these spatial activities and information materials. As information is distributed by management guests can make complex connections or learn about hidden attractions they never would have known. GIS along with these other contemporary technologies can be used as a customer service tool where customers serve themselves. As it is made available visitors can access on their digital devices what management has already circulated. While management puts the links together it is the

customers' prerogative to access them on individual terms. The tool allows for communication and clarification of information between guests and management (Naber 2006).

At a place such as the Grand Canyon where due to the geographic size, human and geologic timelines, and numerous activities limitations abound and customer service can be most effective when it uses technology for circulating information and engaging customers (Acland 1998). For example the IMAX cinema technology at the Grand Canyon provides a tourist gaze of GCNP's vastness in a central place on massive silver screen. Thus providing a virtual experience of being in GCNP in more ways than Canyon customer's limited time would really allow. Tools such as GIS and other geospatial and location based technologies provide ways for connecting the tourist gaze with the location. Information retrieval, visual overlays, and virtual interaction using these technologies permit customer service to assist guests in their explorations at the scenic venue (Joliveau 2009). Handheld digital assistants can contain a variety of software and data, in a variety of forms such as pseudo 3D, animations, and interactive pop-ups in addition to those already mentioned. These tools provided by guest services allow for customers to discover the world around them with more depth. The customer can satisfy their tourist gaze by linking fictional story or true historical events and people to locales within an area. Of course these customer service tools must have simple and intuitive user interfaces, deliver instantaneous connections, handle ambiguities, such as the same name for two different places in an area, appropriately and be made real as the location is real even if the connected story is mythical or a ghost from the past. In addition there are three distinct benefits of spatial technologies, such as GIS, as customer service tools (Hsu & Liao 2010). First they offer a virtual window to add extra visual information layers to what guests are already seeing. This includes layers of the area's past and possible future. Second visitors can interact with the layers customizing their information search and satisfying individual curiosity. Third is the ability to link spatial with non-spatial information such as a story with a real location or disciplines like geology, botany, and archeology information with numerous sites in a place.

Intentions, Goals, and Perceptions

As the visitors engage in and gain more familiarity with an entity they have certain expectations and requirements for satisfaction (Bowden 2009). As they the make the effort to

consume the location and other products they expect at least satisfaction if not delight from their efforts (Wood 2008). This is not always straight forward as the intentions and goals customers base their satisfaction on are always Chang et al.ing. Satisfaction results when individual goals and intentions are positively compared to the attributes found in the customer service that has been experienced (Matzler et al. 2008). Customers are expecting certain outcomes such as stress relief, fun, excitement, or other positive benefits (Chitturi et al. 2008). Visitors may hear about experiences others had and will expect similar results. Even with many individual expectations the cost-benefit of delighting the customer is a goal of service providing entities (Rust and Oliver 2000). For example Canyon customers who have visited the Grand Canyon before will be satisfied in some ways and those who are there for the first time will be pleased with others.

Many times what makes customer and guest expectations vary is their experience use history, which is an accumulation of their post-experience assessments (Petrick 2002). As customers gain more experience with a service provider their goals and intentions Chang et al.e. Wood (2008) says while satisfaction and delight may indicate certain customers can be beneficial to the service provider, they can also increase demands on the entity (Wood 2008). For example the customer may find one type of service from a certain entity satisfies their expectations, whereas the same service at another entity is dissatisfactory thus the entity has to put in more effort to please the demands (Matzler et al. 2008). This is of course simply because of a personal and situational preference and experience use history. While service providers have found it wise to use segmenting to meet the expectations of customers' experience use history there is still expectations of limited resources. If guests who come to the Grand Canyon are familiar with and found satisfaction in visiting other NPS units will they find satisfaction here?

With multiple segments being satisfied differently, service providers need to be aware of each individual's goals and intentions (Petrick 2002). Segmentation and its effect on satisfaction should be cognitive before, during, and after the experience (Matzler et al. 2008). Factors such as age, gender, experience level, and socioeconomic status give different perspectives of what satisfies the customers. Dissimilar segments of people being marketed to will respond to service experiences in various ways (Petrick 2002). For example Matzler et al. (2008) explain customer age is a significant factor. The needs and expectations of customers are different at various

stages of life. Older customers may have more experience being with a certain services and are satisfied with the familiarity, whereas younger customers may explore more service experiences as they may have not yet found a service medium that continually satisfies them. In another example attributes providing special treatment may be what satisfies multi-day visitors (Matzler et al. 2008). One day visitors have different goals and intentions than repeat or multi-day customers. Single day visitors may be 'just passing through' and not require special treatment. Single day visitors may also be repeat customers, such as locals with an annual pass, who find satisfaction in the familiarity of the service provider.

With the specific location, such as a national park, being the customer's target their decision making is influenced by location context and heuristic factors (White et al. 2011, Bertazzon et al. 1997). The goal and intentions have multiple phases. Understanding guests' goals and intentions is critical for sharpening management efforts in order to satisfy the customer. In order to develop customer service tools in effective ways management needs to interpret and define for the customer what it is they are looking at when at a location. In many cases people who wish to spend time in scenic outdoor areas are seeking to satisfy specific goals and intentions while others have no definite plans other than to see what is there (Pan & Ryan 2007). What attracts them to certain destinations and determines their behavior there is the belief time spent in an area can satisfy their expectations. For example if visitations are repetitive in nature so can be the attraction and seeking. In their seeking they can have a secondary goal of escaping the everyday environment to be satisfied with a new or recurring adventure. Another secondary goal may be seeking risk or challenge even if the experiment is intellectual such as discovering history. For many a goal sought after is satisfaction resulting from simple passive relaxation. Risk in wilderness experiences provides peak satisfaction for some. For others the physiological peak comes from the risk of just learning something new about the location which was their intention all along (McDonald, Wearing, & Ponting. 2009).

Bowden (2009) states with satisfaction being unique to each guest it is difficult to have an employee handbook with exact procedures addressing how to satisfy all goals and intentions. Service providers must be able to adapt and work with each customer individually. Matzler et al. (2008) argue barriers from ability and experience deter satisfaction. Experience and skill has personal and situational distinctiveness as visitors' satisfaction is affected by both their ability and geography. The relationship between satisfaction and individualities of the service are

affected by customers' capability to experience the service. Many divergent segments of people come to the Grand Canyon but there are many who, for whatever reason, are unable to have a below the rim hiking experience and need customer service in other ways than trail maintenance.

People value entertainment even when visiting a place where interacting with or just observing the location itself is part of the desired entertainment. This is true even if the visit is for educational purposes. The goal for visiting the scenic location is enjoyment and entertainment. As such results have shown this intent by customer for enjoyment can be enhanced by technology (Sylaiou et al. 2009). This is because people such as Canyon customers are seeking destinations and locations and require instruments of interpretation to help them achieve their intentions.   They perceive maps and other forms of spatial communications as key instruments to help them achieve what they seek before, after and during the journey. At any step the map they carry can affect their perceptions of and thus satisfaction with their experience. The maps are also influencers in the visitors' decision making process. With traditional static maps there was a limit to the spatial influence. With the progressive evolution of interactive spatial content in handheld devices and other digital tools the spatial connections associated with guests' perceptions seems to have increased those limits exponentially (Nielson & Liburd 2008).

People anticipate satisfaction in life. They expect specific efforts will have certain satisfaction outcomes (Wood 2008). If the services keep providing positive experiences the customer will continue to be satisfied and delighted (Petrick 2002). However having these services be static should be avoided as the guests who use them repeatedly may not be as delighted by the same service encounters that excited them the first time (Bowden 2009). An encounter experienced for the first time may have a certain magic to it that fades with repeat experiences. Rust and Oliver explain because expectations for new satisfaction increase the difficulty for providing satisfaction increases (2000). Chitturi et al. argue providers need to be aware of the cost and satisfaction of physical, social, and psychological outcomes from the experience (2008). Bowden suggests service providers instilling excitement and smiles into each familiar experience can have satisfaction outcomes (2009). The particulars of the service encounters allow for personal involvement. In this way customers jointly create satisfaction with the service provider. Bowden says "the experience of delight accelerates the development of commitment" and thus as familiarity increases and satisfaction is updated with involvement, visitors are able to set standards for customer service they desire and expect (2009: 68). For this

reason the NPS is always looking for ways to provide better interpretation of the geography under their stewardship.

When visiting a place such as a ski resort or national park the customers' intentions are to have quality interactions with the area geography, oftentimes by way of management provided customer service (Kyle eta al. 2010). This may come as passive or active efforts in but either case the quality involved yields respective satisfactions. Visitors' goals are to be as physically or virtually in touch as possible with the location environment while receiving concierge attention. Customers with a recreation agenda are seeking a spatial relationship with a location in order to have satisfactorily meanings (Brooks et al. 2006). They perceive the time used, social and physical interactions, and active reflective processes in connection to the location as mediums to pleasing outcomes. The intentions with "particular setting attributes contribute to desired experiences and psychological outcomes" indicate the service and satisfaction has some expected tangibility to it (Brooks et al. 2006: 333). Some of the goals and intentions of wilderness customers are to find peak experiences through a mix of aesthetic pleasure and renewal with nature (McDonald et al. 2009). For some this means leaving all electronics and worldly connections behind, but for others, due to circumstances, the only way to find satisfaction in the wilderness is the customer service provided by the area management. The management can provide settings and activities triggering positive and meaningful experiences satisfying or exceeding customers' expectations. These can come in a variety of forms from guided ranger tours to apps on handheld devices

Petrick (2002) explains as a venue can have various types of people each have different ways of perceiving service attributes. In addition to customer preference fluctuations the relationship of service attributes and the resulting satisfaction is constantly changing (Matzler et al., 2008). Personal and situational individualities are significant factors for determining that relationship. "Customers are more likely to evaluate products and services at an attribute level rather than an overall level" (Matzler et al. 2008: 404). Visitors may find delight with one attribute and disappointment with another from the same organization. As such service providers need to adjust the attributes accordingly in order to keep satisfying customers (Petrick 2002). The perceived value of the attributes adds to guests' experience use history and memories of satisfaction. Perceived value is an outcome of current evaluations and experience use history. Petrick states "perceived value may be an antecedent to the outcome of satisfaction" (2002: 335).

Even if efforts adapting to customers' changing desires are not enough to keep them satisfied, they have a greater chance of doing so than keeping attributes static (Petrick 2002). Visitors to a service entity may find expectations are met or exceeded from individual attributes and experiences rather than in the Grand Canyon adventure as a whole (Clark & Maher 2007).

Cognitive of this service attributes satisfaction relationship; customers keep an evoked set of alternatives in mind (Wood 2008).Other alternatives may provide higher levels of satisfaction for consumers. The customer blind to another choice will choose to be satisfied with the status quo. While it may be counter intuitive; it is by having a set of choices environmental uncertainty is reduced. When uncertainty becomes clearer, consumers find greater satisfaction with the source clarifying the ambiguity. Wood suggests a measure of satisfaction compares past and present experiences with alternatives (2008). Wise consumers will consider many alternatives before selecting a service. Even when a customer is currently satisfied, knowing possible alternatives gives the consumer a feeling of situational control. Satisfaction in this case is dependent on the customer's view of what is available. While the NPS may not be in stiff business completion for Canyon customers, guest will often turn to business entities, such as Xanterra lodges and National Geographic's Imax at GCNP for geographic interpretation.

Service and Product

Satisfaction through Product

Products and satisfaction in scenic outdoor or vacation destination settings are in many cases unlike fulfillment from a tangible commodity. As important life experiences happen at specific locations the satisfactions coming from the event and location products act as quality milestones and can serve as connectors to the past, something that does not happen when one buys a big screen TV (Brooks, Wallace, & Williams 2006). These experiences may include small bits of education, personal connection, and simple pleasures. At the time they may be seemingly insignificant harvests but incrementally build up to a greater whole of satisfaction by way of the products. They also provide contextual understanding and satisfaction. These components of satisfaction through the product are often coupled around and boosted by the stories of other people's satisfaction experiences and education with regard to the location and adventures there. Encouraged by the word of mouth customers seeking satisfaction from their

visit to an outdoor location frequently find their goals and intentions are met by a product of their own explorations and discoveries of what is there (Pan & Ryan 2007). Of course motivations and expectations for dissimilar visitors vary but the trend among those exploring the wonders of nature shows end user pull factors as dominate contributors to meeting or exceeding goals and intentions. When the customer service provided in these settings allows for more independent consumer/product interaction, such as pulling up information on a handheld, the visitors find greater satisfaction. This is especially true as repeat users seek for more avenues satisfying their individual interest. The "consumer satisfaction often goes beyond the one-time purchase" and is a product that is an accumulation of consumed experiences large and small (Brooks et al. 2006: 345).

When people experience a place such as a national park they are looking for satisfaction from the geographic product (Duran et al. 2004). Often in today's world customers try to find what they are looking through technology and what customer services regarding the geographic product are available. When customers get to the rim of a canyon they are looking to find more satisfaction from the location than just the view. Parks, recreations, and other tourism organizations pay particular attention to the satisfaction produced from the experience economy (Ellis & Rossman 2008). Staging the experience sets up the customer for nourishing their own expectations. Generating sensations and memories from staged or programmed experiences results in a product of satisfaction for visitors such as Canyon customers. The encompassing theme of the event and locations products, such as outdoors, nature, and history is a product additive to the satisfaction of the experience (Denison 2010). Themes at destinations such as Disneyland or New Orleans interweave the guests' experience product with the stage performances of customer service. At a place such as a national park NPS services work to immerse customers in the themes of nature mixed with elements such as human history. The satisfaction with the product comes from how well the product carries the theme of the area. While the product theme may be universal at the location, those who come to a place such as a wilderness area or national park originate from and have dissimilar purposes in their visit (Arnegger et al. 2010). For instance nature-based ecotourism draws a variety of people who are looking for satisfaction from the same overall location product yet for each satisfaction means something different. For recreationist satisfaction from the product may mean testing physical strength and mental endurance against the challenges of the environment. For those guests

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looking for a diversion from everyday life or wishing to connect with the nature based commodity gratification may come from simply being there and enjoying the amenities provided.   This cocktail mix of tourists makes it difficult to have homogeneous customer service from the single location product. Interestingly enough the cast of customer service employees is its own sundry concoction. With all this ever Chang et al.ing verity and the limited resources management has to work with, amenities within the location product need to be engineered in such ways as to flexibly accommodate the mixes and be readily available to bend to what is satisfying. Fortunately technologies such as GIS and handheld devices meet the challenge with ever growing style.

How can a geographic product of like a national park, through medium of technology provide satisfaction and enriching education to visitors such as Canyon customers? The technology becomes a tool through which guests of the area have a constructed view of touring and trekking through the area (Acland 1998). This tourist gaze gives tourist the virtual experience of adventuring through the geographic area while never having to leave the trail so to speak. It is model for cultural relation and social activity influences in customer satisfaction. For example IMAX cinema provides epic visuals and sounds of what goes on in many places around the globe. The IMAX at the Grand Canyon allows visitors to experience what would take more than a lifetime in less than an hour. From river rafting, to hiking, to aerial exploration the IMAX technology at the Grand Canyon allows tourist to gaze at many of the wonder of the national park they would know nothing about by merely gazing off the awe inspiring rim. Pleasurable and exciting product enhancements of background music and first person views of shooting the rapids are delightful additions to the happiness equation. While the Grand Canyon in this example is the product guests draw satisfaction from it is the portraying technology such as the IMAX where the tourist gaze is enriched and energized. Thus it has been found people have enjoyed their experience with a location when it can be supplement by technology (Sylaiou et al. 2009). The positive feelings resulting from the technology services provided by management adds to fulfillment and knowledge of the area visited and thus to the experience. As Sylaiou et al. points out "the main purpose of the [technology] is to offer an entertaining, informative, and enjoyable experience" for all those who visit a location with expectations of enlightenment and amusement (2009: 243).

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People tend to be satisfied when they can use technology products to discover and explore other products (White et al. 2011). History and research have shown people find satisfaction when their technology guides them through adventures.   Case in point, it is popular among U.S. national park customers to travel to and through the location by means of private automobile technology. The visitor finds satisfaction when they can use their own technology and that which is provided by customer service. Even more so if they can find out where attractions are located and about those attractions (Singh et al. 2011). A location based service production provides a key for finding those satisfaction elements. A GIS specifically customized for tourists in an area not only guides the customers to scenic locations and area wonders but also provides a depth of information about such. Digital devices with these location based services and GIS allow for customer interaction and virtual experience with the locations within the visited area. Technologies such as the internet, GIS, and mobile devices expand the geographic product and in turn customer satisfaction (Duran et al. 2004). Interactive maps, information queries, and location based activity planning provided by these technologies all help to maximize the benefits by providing more depth to visitor's knowledge of the area and more breadth for their interests.

History as a Product

A commonly recognized element of tourism and nature seeking adventures is culture, particularly historical culture (Hultman 2007). The history realms include ecology, geology, anthropology, archeology, sociology, and other disciplines as branches from the central trunk of geography (Nielson & Liburd 2008). The satisfaction of the customers' visit comes from discovering what it is about the location that makes it legendary.

As visiting places such as national parks is an historic part of vacationing in America there is an experience product with many layers to it (Lew 2010). This is interesting as one significant layer is to visit places to discover GCNPs' history. It supports the ideas of history being a product customers spend time and money on and tourists experiencing history not simply observing it. For many connecting this historic national pastime with a location's earlier days brings satisfaction and lasting memories. Furthermore it shows the past is a central commodity for many places (Cipollari 2010, Grét-Regamey et al. 2007). In locations across Europe, Asia,

and other parts of the world the resources of scenic vistas and royal gorges where human history has lived are unavailable and inaccessible. Their access comes through the concept of tourists purchasing history via customer service and thus satisfaction. For these visitor sites history has two faces as an economic resource and a utilitarian identity. For other areas the awe inspiring geography is a co-product with cultural history such as with the old villages of the Alps and the legacy lodging at the U.S.'s national parks. The history commodity provides human context for the geography and explains how the context came to be. It also has a tourist gaze element to hold customers attention and deliver location associated experiences. As the past provides human context it can offer personal connections. Customers can relate events and people of the area's past with their own prior knowledge, memories, and experiences. Customers have a desire to be involved in the area they spent time, travel, and money on. By purchasing history the customers receive satisfying tangibility for their thoughts, senses, curiosities, and expectations. Hence, one of ecotourism's driving factors is "purchasing" experiences with a location's culture and history products (Thulasimala & DevDass 2010). These alternative tourists seek satisfaction and knowledge about how an area's environment affects the globe and society, how it has done so in the past, what can be done to responsibly use the area, and what is its natural state. All this at whatever level involves learning about the location's culture, history, and geography products.

History and products go together. For instance the automobile is deeply rooted in American and national park history as road trips to destinations such as the Grand Canyon have a legacy (White et al. 2011, Lew 2010). During the 1930s environmental restoration and conservation all across the United States was done in a large movement by the federally created Civilian Conservation Corps (CCC) (Quivik 2009) which includes the Grand Canyon. Thousands of workers were hired to provide environmental customer service and products through various technological means of the day to the citizen customers of the United States. Thus the CCC's work became a historic, location, and satisfaction product for those, such as today's Canyon customers, who visit the scenic areas they labored in and with. As they have exhibited satisfaction value, culture and history are key assets of a location product (McKercher & Ho 2006). While lacking as independent tourist attractions, elements such as history are part of the mosaic driving customers to visit a scenic venue or outdoor exploit arena. Even though they aren't mutually exclusive these attractions are necessary for locations to have worthwhile

significance. Culture and history are enrichment attractions defining the uniqueness of a location. They add value to customers' education about the area's context, geography, and satisfaction by humanizing the experience. Culture and history offer identity for a location (Cave, Ryan, & Panakera 2007, Pezzo 2010). As the identity is attractive and desirable people spend time and money to visit the location thus making the history and culture a commodity. The commodity is sold through customer services in order to satisfy customers' goals and intentions of a product that in some ways can be identified with. Much of this selling requires clear and understandable forms of communication mixed with some allurement about the history. The commodity also verifies the authenticity of an area and so increases its perceived value.

Many people who visit locations seek the multitude of historical tangibles available at the destination (Singh et al. 2011). Such as the seeing boats of John Wesley Powell's river expedition or the split-twig figurines left by those who once inhabited GCNP. As people hunt for these products they seek where within the area the goods are located. All this history is disseminated at specific locations. Large and small devices with location based services can act as virtual tour guides and historians to direct people to those locations and the associated history. The cultural heritage of a location has increasing been a product served up by today's ever evolving digital devices (Lanir et al. 2011). The history product draws on customers' exploring interests because of its accessibility and communication with the 21st century's cultural technology context. The communication of how things came to be at a place, who was involved and what happened makes history a product the customer can experience right before their eyes without having to trek deep into the backcountry (Nielson & Liburd 2008). As a result technology allows for the history of a place to be explored by even the greenest of adventuring tourists (Acland 1998). For example, the cinema technology of the IMAX at the Grand Canyon starts with a rendition of the Anasazi culture, and then flows to the views of early Spanish explorers, followed by the exploits of John Wesley Powell down the Colorado River in 1869. The film not only shows breathtaking views of cliffs and vistas but tells the story of GCNP and its people. The history associated with GCNP is as much a part of the IMAX film, and the tourist gaze, as the rest of the escapades shown in it. The history products distributed by the IMAX service providers offer key components to the satisfaction and education regarding the entire area visit. They gracefully compact fascinating depth into centralized technology.

Technology products are a means for exploring and discovering history products and satisfying desires to do such (White et al. 2011). Museums which often have history products have found employing technology to educate customers about their exhibits provides greater visitor satisfaction (Hsu & Liao 2010). Customers using personal digital devices can discover the history products in a more one-on-one way than with a group tour. By accessing "digital stories" people can create their own virtual experiences with a place and its history (Schrum 2008). They can explore the past as part of their destination adventure by accessing it right at their fingertips. The history and the location come together into an experience product as the visitors are standing on the rim of what they came to discover. Schrum explains how viewing a digital map from military history through one's digital device as one stands on the edge of the olden battlefield helps package that history with greater depth and more leads to other quests (2008: 1331). The history, geography, and other elements are all packaged together which means people will use tools with spatial capabilities, such as mobile devices to unwrap the package (Nielson & Liburd 2008, Singh et al. 2011). The mobile devices used to unwrap the package allow for flexibility in illustrating where, how, and what things happened. As Nielson & Liburd puts it "[there] arguably,[is] nothing [that] evokes a feeling of the past and its influence on the present more than being at a historical location while having sufficient knowledge of the events that differentiates the location as something particular" (2008: 292). Energized by maps and other spatial data these product serving devices can increase visitors' interests in and satisfaction with a location's history (Nielson & Liburd 2008). The mapping involved with culture is sometimes also seen as an economic tool to add enchantment and value to locations within an area such as a national park (Hultman 2007). The mapping is the visualization and organizing of cultural items in relation to each other with respect to change over time in a fixed location. It casts a spot light on aspects of the area where influential events have happened and relatable human undertakings have occurred. As the mapping enhances the appeal of the culture it create a certain magic and the 'actors' involved put on a stage performance. Thus mapping can be seen as a performance selling the historical culture product. The culture is already there but the mapping helps people visualize it and find it appealing. Tools such as GIS and handheld devices are what give the mapping the power to define the visualization of culture. They are also mediums for circulating the cultural definitions to those visiting and working in the area. These tools essentially put culture onto a physical platform people and tangibly interact with.

Location and Spatial Content as a Product

History products are tied to location products by the strings of the past happening at specific places. Locations are anchors for peoples' thoughts and imaginations in real and artistic universes (Joliveau 2009). When folks journey to a place they have thoughts, perceptions, and expectations prior to their visit. As these are cognitive actions there can be an element of fiction mingled with the reality. For example as adventures and tourists go to the Caribbean Islands they have expectations of sandy beaches and tropical climates but as history and media have influence there is bound to be romantic thoughts of pirates. Often fiction tied in some ways to a real location drives customers' desires for experiences there. Joliveau reminds us the *Harry Potter* tales take place in the real world Britain:

> The shooting locations for the series of *Harry Potter* movies have become
> a motivation for fans to visit the UK. Hordes of tourists are now visiting
> Alnwick Castle, where external shots of Poudlard were created, Christ
> Church on the campus of Oxford University, where the cafeteria scenes
> were shot, and Gloucester Cathedral, to discover the hallways or Lacock
> Abbey to visit the classrooms. It is important to emphasize that only the
> film can generate this kind of tourism. Indeed, the books written by J. K.
> Rowling never mention any real location apart from the 9 ¾ platform at
> King's Cross Station (which now exists between platforms 9 and 10, and
> tourists have their pictures taken there) (2009: 37).

Media such as a historical novel can refer to fictional and factual perspectives connected by a real world location (Joliveau 2009). The creative writing about a place can bring out the facts. Ergo a place on the map involved in an intriguing story magnifies the location's attractiveness. The fiction may not come from a novel but what people image the past was like and their curiosity about a location's history.

The contents of time and experience, social and physical interactions, and active reflectance in connection to the location make the location a product to be consumed by GCNP customers (Brooks et al. 2006). Visitors distinctively personalize locations as products as the

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bond between people and places grows and in the context of this study "how place meanings accumulate and how place relationships develop in the context of national park backcountry" (Brooks et al. 2006: 332). As such psychologically being in wilderness setting can give visitors a sense of place (McDonald et al. 2009). People may desire and have feelings of compatibility, extent, being away for it all, and fascination with the area. The location becomes a tangible and intangible product for positive experiences. There is a connection of voluntary and involuntary actions contributing to ones' satisfaction just by being in and discovering the natural surroundings. Locating places within a place furthers that positive experience. For some a place is special because it is venue for euphoria escape, for other people the ambience of the area provides pleasure, and yet for others a location is special because of the amenities it offers both natural and staged (Lew 2011). The best 'vacation' spots are those where special supports and enhancements add to the satisfaction of goals and intentions physically, mentally, and spiritually. These are also places where people can look for and find passive and active adventures whether it is in a hammock between two palm trees or hiking to Elves Chasm in the Grand Canyon where few dare to journey. Not only does the location product bring satisfaction in various ways for various groups of customers but also for those who deliver and study the commodity.

Locations as products are sought out travel destinations because of the multitude of attractions blended into them (Smith 2008). Elements of natural beauty combined with history, culture, and others make visiting a place like a national park desirable. Even if the area is divested of modern amenities simple word-of-mouth, which spreads easily with technologies such as Facebook and Twitter, can excite people about the characteristics of a location. For example Copper Canyon National Park, which has been called North America's other Grand Canyon, is sparse on park rangers, visitor centers, and well-funded public materials. Its fame grows continuously because its guests report on the many scenic wonders and indigenous culture found there. To add to these elements Copper Canyon is not completely devoid of modern technology. A state of the art train runs the length of the gorge and local lodging adds charm and satisfaction to the location product. Sometimes as the natural wonders at a place like the Grand Canyon become saturated with customers, people turn to other location products, such as Copper Canyon for similar and new attractions. For many locations like these modern technology allows customers to increase the scenic expanse and venture into the expanse without having to physically leave the rim of GCNP or foot of the mountain (Acland 1998). The location content

of their purchased nature product can be extended beyond what they can hike, ride, and fly to in the short time they have for being there. It can also add depth to where they can physically stand. Visitors to a place such as a national park can virtually be at any location within GCNP and learn years of history in minutes. For example the IMAX at the Grand Canyon allows park guests to expand what they see from the rim by providing a virtual gaze at adventures such as exploring GCNP's history, rafting the Colorado River, and flying the skies over a majestic wonder of nature.

Location based products are natural services for scenic and wilderness venues (Bertazzon et al. 1997). GIS outputs and other spatial technologies are used in in tourist management such as with ski industry areas for marketing and organization models. They are also used for satisfaction. Customers need trail and lift maps as well as location aware kiosks to find information about locations around the mountain and trails. These make for a more enjoyable adventure. When visitors are able to have the location base technology with them at the site they gain more of a foundational footing for where they are at. These can be in the form of handhelds or interactive service terminals. They are even more effective as location products when they have the ability of geographic querying with a database connection. Two other ways location products contribute to visitor satisfaction are enabling the development of new services and improving customer services and outreach. Bertazzon (1997) says as tourists gain a feel for a place, technologies can "help clarify their perceptions of the region and develop a more thorough awareness of site characteristics" and attributes (45). Location and its intertwined information are a tangible experience for scenic area visiting customers (Nielson & Liburd 2008). Planned destinations are of course first on the list but journeying to unexpected locations within the area is part of customers' behavior and movement in discovering a venue's secrets and gems. This happens because once an area destination is reached information and experiences related to specific sites are spatial in nature. Without the sites the information is void and without the information the sites are bland. As customers seek the specific locations and the related information behavior and movement patterns develop. This results in communication to and from the visitors with their companions and area management within spatial context. Of course this can be proactively done with mobile technologies. In speaking about location and information content in nature's products and technology Acland says it "writes a geographic

relation in which distance does not matter" and technology has a plethora of ways to make the sites within an area accessible (1998: 436).

For many tourists including Canyon customers, scenic beauty and natural wonders are public goods to be consumed (Grét-Regamey et al. 2007). Economists have developed ways to value customer services with products of visual quality but certainly there is more than visual charms to the outdoors. While it is difficult to put a price tag on such goods, spatial technologies such as GIS help to define value for the area and its location products. For example GIS can analyze and calculate slope, aspect, distance, accessibility, and a plethora of other factors in order to find out how to efficiently take advantage of the best views of GCNPs and mountains. The goal in finding value in location goods is to evaluate what effect they have on visitor's preference. For example marketers might ask people how much they are willing to pay for area services such as maintained campgrounds and trails. GIS can combine guest's preferences with spatial factors such as land-cover Chang et al.es to come up with predictive scenic assessments. GIS is a tool NPS and other scenic attraction providers can use to serve up the location as a product (Zorica et al. 1999). Geospatial technology provides the means for more in-depth information of what GCNP customers are viewing by means of spatially exploring recreational and ecological relationships, accompanying history, and attribute information. It provides a distinctive utility for planning and management for location as a product in that it can calculate quickly and robustly serve up the spatial factors and relationships involved. This includes the social and physical attributes that spatially are a part of recreation. GIS provides for connecting the location product to recreational opportunities in a physical or thematic way. These location base technologies are a great bridge between guests' activities and the location of adventure (Joliveau 2009). Tools such as GIS strengthen the cognitive geography relationship by establishing firmer ties connecting knowledge and associated location. In addition the technology adds even more information to what the customer already has especially if the tool is right in the palm of their hand. Mobile location based technology when at the chosen location allows visitors to extended and deepen their tourism experience in a personal way.

Mobile technologies provide the benefit of personalizing the location visited as they can be on-the-spot active interpreters (Lanir et al. 2011). They are means for proactive discovery and adding context-awareness when a customer's view of the scene asks for more interpretation. They help the user to become more involved in the location product by providing another level

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of information, such as regarding the cultural heritage of the place. Visitors to a scenic area are interested in the various locations within the area and what there is to know about those locations. Having technology in hand that reveals what there is to know about what they are looking at or experiencing is of value to the customers. Location based technology has a great ability to quickly link a plethora of information with a place thus making the location something more than a spot on a map (Kochan 2010). The portability of having a GIS or other tool in the palm of the hand also adds value by making those links readily available when wanted by the consumer. Management can deliver great customer service by accessorizing the location product with such technology. Since more and more people such as Canyon customers carry personal digital assistants both management and customers can find satisfaction from sending and receiving location linked information. GIS and other forms of location oriented tools, specifically maps attract more attention than other media products (Patterson 2010). In examples cited by Patterson it was seen on average visitors to Zion and Yosemite National Parks broke from their activities longer to get information from maps than other another source (2010: 8). This is especially interesting as with media-saturated and fast paced lives people's attentions spans are shorter than previous generations. Maps are great speed bumps to help people slow down and really digest information. The better the map design the more it holds the viewer's attention. In a setting such as with guests of a national park, maps accompanied with other information and means of communication can provide more satisfactory customer services than other sources alone. Elegance and aesthetics in the design of the location product can nudge satisfaction levels up even further. Simple maps are more aesthetically appealing than other forms of communication (Bertazzon et al. 1997). Appealing maps and other location base services, especially those from digital devices communicate the location product to area guests in satisfactory and delightful ways.

Research has shown and concluded an area's spatially related information disseminated through technology provides greater customer service and satisfaction. Location based technology provides both management and Canyon customers with a more enriched experience and education with a scenic area or tourist destination. Thus by using spatial tools customer service fulfills customers' goals, intentions, and perceptions of the place visited. Location products and their elements, such as history, are consumed in a pleasing and personally

understandable manner. Customers are enlightened and delighted as they can explore further depths of the area through devices in the palms of their hands.

Methodology
Overview

This project researches if bridging mobile technology with historic resources will confirm the hypothesis. It seeks to address the needs Canyon customers have for greater satisfaction and a richer experience while visiting the Grand Canyon while simultaneously attending to the NPS's need for managing park resources and customer service. The methodology consists of creating a mobile tool with the medium of historic collections and then testing the tool with a survey of Canyon customers.

The primary research tool will be a prototype mobile application (app), specifically for Apple's iPad. This is to be developed through the use of several Grand Canyon historical collections from NAU's Cline Library's Special Collections supplemented by contemporary data and other historical data from the NPS. By means of digitizing, geographic information systems (GIS), mobile applications, digital publishing software, and other technology as required the collections will be put into accessible form and connected to the geography of GCNP.

Once the prototype app was developed it was intended to be demonstrated to current and potential Canyon customers. This was to be performed at retail store for Canyon customers but unfortunately due to time and logistics constraints it did not happen and will need to done with future research projects. However whether or not Canyon customers felt a mobile app was viable as a potential enrichment tool was captured by a short survey. The survey and collection boxes were left on the counters of three outdoor stores in downtown Flagstaff and one in Williams, AZ who have a reputation for catering to Canyon customers. In this case those filling out the survey did not view the prototype app in any form. The survey also was delivered to university students in close proximity to GCNP by way of email that included a Flash Player version of the app in order to obtain a larger amount of feedback data and for the purpose of another perspective. The survey used in this project is the result of extracting common elements from models and studies used in the research of customer satisfaction. Additionally the app itself was displayed to a few individuals and brief discussions were held about what they thought of it.

App Development

The application (app) development has two main objectives and procedures:

1. Digitizing:

    The digitizing of pertinent data was done by scanners, metadata and database management, GIS, field photography, GPS receivers, image processing software, and other technology and equipment as required. This was done in three parts.

    A. The initial scanning and metadata work for the historic collections was done by personnel at NAU's Cline Library's Special Collections department which also currently houses the collections in their databases. Specifically historical photographs and relevant workable text from the collections was also digitized. The collections were then georefrenced and geographically assembled by personal at NAU's Geospatial Research and Information Lab (GRAIL). The spatial location of the photos was established from the workable text, research notes of others who had visited GCNP, and field work done prior to and during the project. The field work during the project used Garmin brand recreation grade GPS units to log the photo locations in digital format. The locations were then mapped principally using the ArcGIS software. In addition the trails the photos were located on where also digitized using the same software from data acquired from NPS websites and GRAIL databases. The personnel at GRAIL did or will transfer the processed data to personnel at the Special Collections department for archival and temporary storage while keeping a copy for continued project work.

    B. Once the collections were digitized and formatted with the associated real world geography they were made consistent with modern technology and made adaptable for future technologies using standard formats such as shapefiles, tiff images, and PDF. Using ArcGIS the point locations of the photos and the trail lines were layered on top of satellite or aerial imagery provided with the software in order to produce a map intending to be the base interactive layer. The map was then exported as a standard image for later use.

C. At the same time the locations of the historical photographs were captured repeat photography was taken in an effort to establish temporal connotation. The historic and repeat photographs were framed together using the Adobe Photoshop software and somewhat descriptive text was added to the frame. These products, referred to as 'the photos', were visual interpreters of the locations represented. At this time the focused turned to just one trail due to scope of the project being experimental and simplistic. The photos and map of the South Kaibab trail were the combined in the Adobe InDesign software. Text labeling known areas along the trail was added to the InDesign document and the photos were stacked on top of each other. The map, the photos, and the text were laid out in an aesthetically simple manner. A copy of the InDesign document was then saved and made ready for app development. This work was carried out by members both from GRAIL and Special Collections. Once the collections and other data have been combined they will or have been transferred to the afore mentioned archival and storage locations as part of the project being turned over to Special Collections.

2. Creating the mobile application (app) from the digitized data:

This was accomplished with Adobe InDesign and Digital Publishing Suite software. While in InDesign the stack of the photos was transformed into a multistate object. The points along the trail indicating photo locations where overplayed by larger circles that where turned into buttons that only appeared when touched. The buttons where then connected to the corresponding photos or states in the multistate object. The effect was to make the InDesign document interactive where when a button over the photo location point was pressed the object state or photo it was linked to appeared on top of the multistate object. The interactivity was tested by exporting the document as a Flash Player document and using InDesign's Folio Preview function both of which were successful. From InDesign the interactive document was uploaded and converted to an iPad app through Adobe's Digital Publishing Suite. The Folio Builder tool in InDesign converted the interactive document to a Folio document that automatically uploaded to an Adobe account and could be accessed from the Adobe Digital Publishing dashboard web site. At the dashboard web site the foilo was prepared for publishing and given the options of having a cover page, sharing, adding

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metadata, and other options that were not explored. Once the folio was prepared for publishing it could be produced as an app. In the case of this product and the nature of the project the folio did not go through the final processes need to make it a standard app. Instead the folio-now-prototype-app was made fully accessible and functional through the Adobe Content Viewer app download onto an iPad. Though the Adobe Content Viewer linked to the Adobe account containing it the prototype app was fully access and tested. This proved to be successful and showed the prototype could be published as a standard iPad app. During this process the prototype app was designed with the intent to be user friendly and relevant to a large range of park guests' technology comfort levels and knowledge of the Grand Canyon. It was also designed so visitors can have somewhat of a virtual below the rim Grand Canyon experience with the collections. The prototype app was formatted for the Apple iOS on the iPad for this project with intent that it will later be converted for other contemporary platforms such as and Andriod. After being created on the desktop it was of course loaded onto iPad tablets for field testing and the deployment phase of the project. The app was then ready to be deployed and demonstrated.

Models and Survey

There are numerous models which show links between customer service and satisfaction. Of the selected models discussed below each shows at one point during the customer's experience the movement of service to satisfaction. Each model is first presented individually then commonalties are discussed.

Chitturi et al.'s (2008) model called delight/dissatisfaction versus satisfaction/anger (figure 1) demonstrates that the progression of hedonic and utilitarian benefits which can be provided by customer service lead to forms of satisfaction and loyalty. They say their model uses "the term 'utilitarian benefits' to refer to the functional, instrumental, and practical benefits of consumption offerings, and we use the term 'hedonic benefits' to refer to their aesthetic, experiential, and enjoyment-related benefits' (2008: 49). The hedonic and utilitarian benefits pass through positive or negative service experiences moderating the resulting emotions and levels of satisfaction. Their model shows emotions related to hedonic and utilitarian benefits are involved with satisfaction and a higher level of satisfaction called delight. They associate

satisfaction with "low-arousal feelings associated with peace of mind from meeting or exceeding prevention goals" and define delight as "high-arousal pleasure from meeting or exceeding promotion goals" associated with feelings of excitement and cheerfulness (Chitturi et al. 2008: 51).
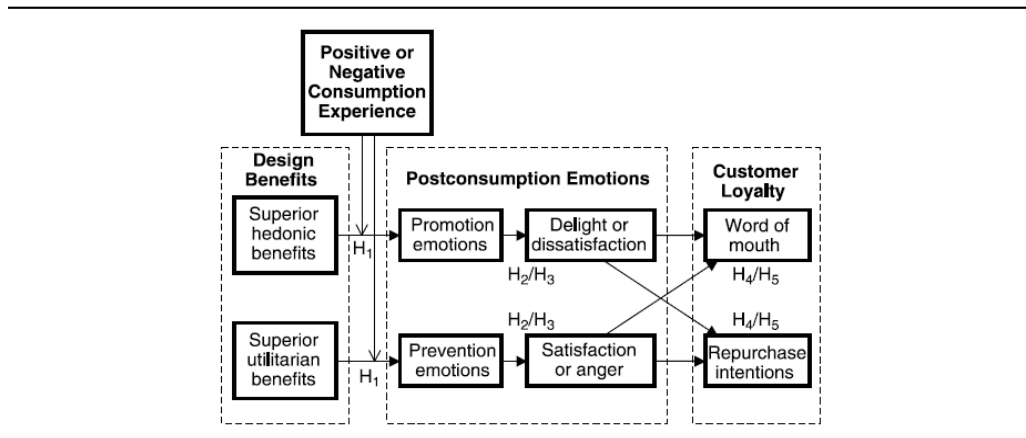

Figure 1 Proposed Conceptual Framework: Delight/Dissatisfaction Versus Satisfaction/Anger

Doorn and Verhoef's conceptual model (figure 2) shows service encounters, that they call critical incidents or CIs, have direct and moderating effects that lead to satisfaction (2008). They specifically use the term attribute satisfaction, which is satisfaction with the parts or elements of the service experience, in order to specify that satisfaction with the different attributes found in service experience is significant.

Doorn and Verhoef's model begins with attribute satisfaction and satisfaction of past experiences (2008). These lead to current satisfactions. Once the model moves beyond past experiences and attributes each component of satisfaction and customer share is continually influenced by critical incidents. They further "include [that] service recovery, [which is the entitiy's attempt to satisfy the customer after a service failure], is a determinant of service satisfaction and customer share in [the] model" (2008: 125). Service recovery has been found to be a significant factor in both utilitarian and hedonic service and satisfaction.
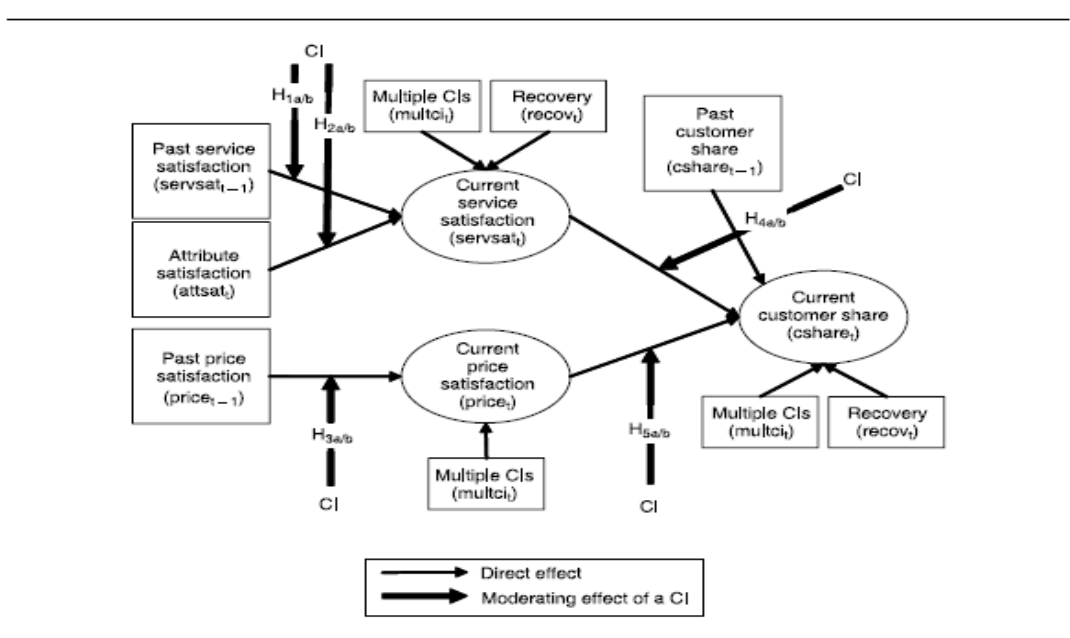
Figure 2 Doorn and Verhoef's conceptual model

Bowden's model, called the process of engagement (figure 3), shows that customers' knowledge structure, or what they have learned and understand about the service provider, may lead directly to satisfaction (2009). Satisfaction in turn eventually leads to loyalty. The model does segment between new and repeat customers but they both go through various states of satisfaction, such as delight, and have a destination of loyalty. For new customers another possible path that ends movement of customers along the model is negative evaluation. The model also shows that the path from the knowledge received from the service experience to satisfaction to loyalty is continuous and repeats.
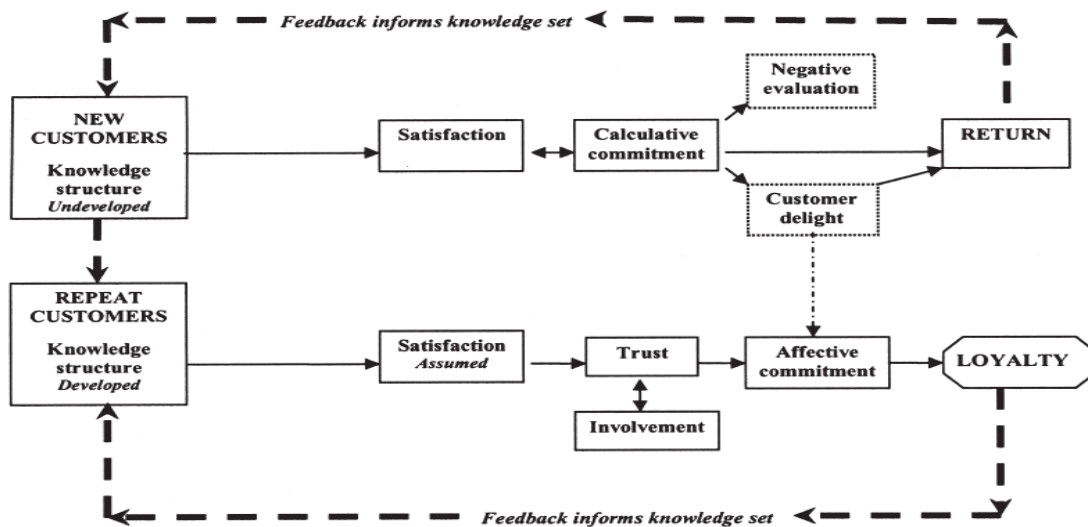
Figure 3 A Conceptual Framework for the process of Engagement

Parasuraman, Zeithaml, & Berry's model regarding determinants of perceived service quality (figure 4) focuses on how the service experienced is a factor in how people evaluate the time and money they spend in an area (1985). Positive perception of the services rendered of course results in satisfied if not delighted customers. While the model does not specifically point to satisfaction it does denote the factors the determine service quality. These same factors are what determine satisfaction; the greater the perceived service quality the more delightful the satisfaction. Also expressed throughout the model in various forms are the independent variables of people's expectations used to reach service quality. Parasuraman et al.points out "quality is a comparison between expectations and performance" and the satisfaction or dissatisfaction is a product of the comparison (1985: 42). While this model, dubbed SERVQUAL, is over two decades old and it has been seen to be unfit in certain situations it has also been successfully seen to be a standard base model in customer service research.
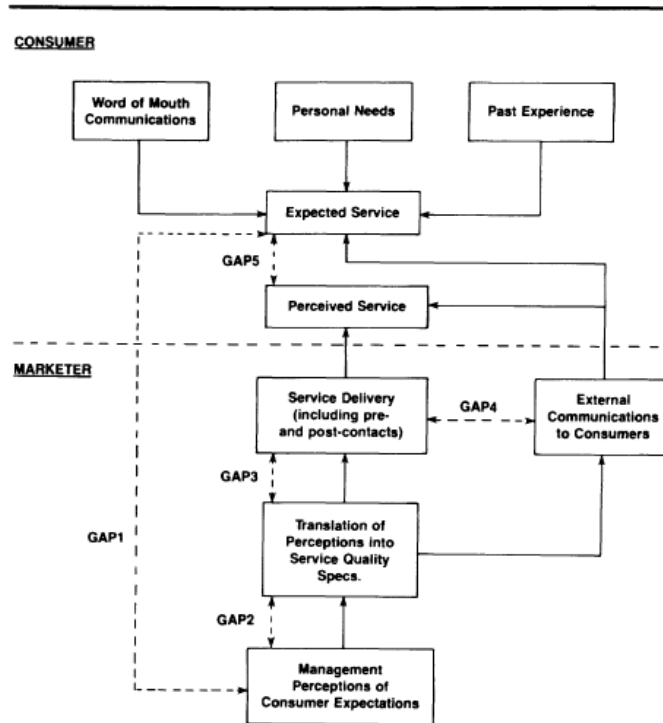
Figure 4 Service Quality Model

In Kyle et al's related or derived hypothesized model (figure 5) the focus is on customer engagement with quality interactions leading to satisfaction and products thereof (2010). Of specific emphasis is analysis of quality levels of engaging and active services with how customers are experiencing and involved in them. For instance the model looks at interaction quality. What is the quality of peoples' interaction with services provided, such as an information kiosk, and what is the resulting satisfaction? What is modeled is how certain service qualities with customer involvement lead to satisfaction and beyond. While the SERVQUAL model looks at a broad scope of variables and factors of service quality this model focuses on involvement elements. Kyle et al.have found "the provision of quality leisure services yields increased satisfaction with the service experience" and the more customer service involves people the greater outcome of not just satisfaction but delight (2010: 2).
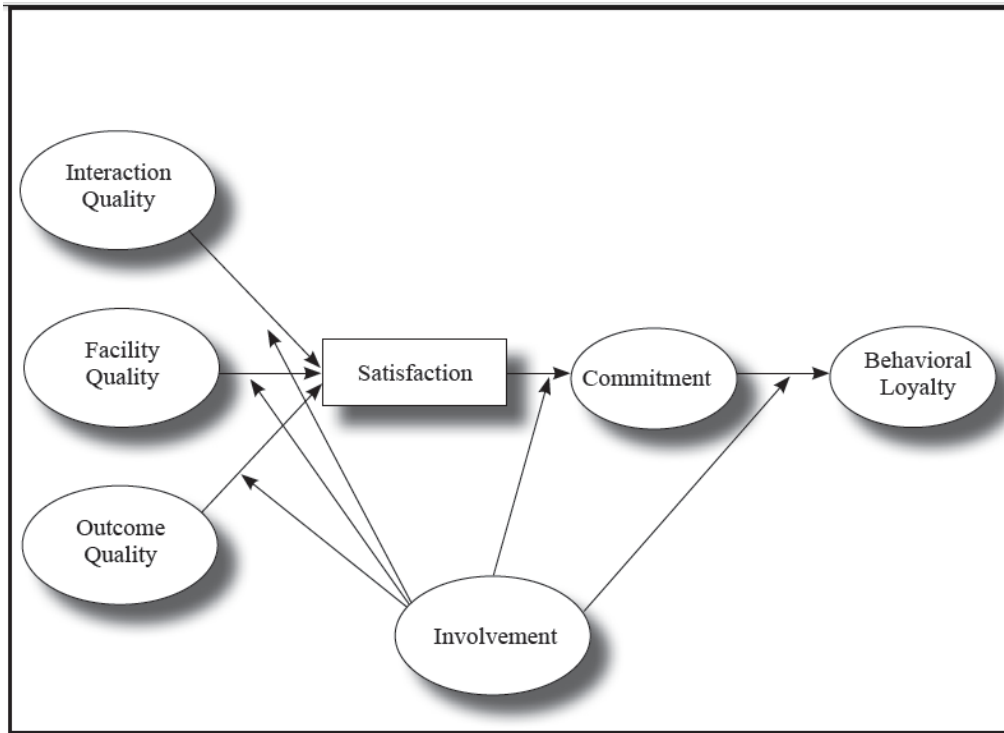
Figure 5 Kyle et al's Hypothesized model

One other model (figure 6) analogues to these afore exhibited models is the American Customer Satisfaction model presented by Angelova and Zekiri (2011). They state the model's uniformity and cross industry governmental legacy make it ideal for modeling satisfaction based off people's expectations and perceptions of services. Indeed the purpose of the ASCI is to provide a standard for which all aspects of satisfaction and customer service can be measured. This relates well to the other models in that it starts with what customers want and experience from service encounters. It also provides supporting confirmation of any study of customers and their satisfaction beginning with why the customers are there and what are the proprietors' responses to customers' presence.
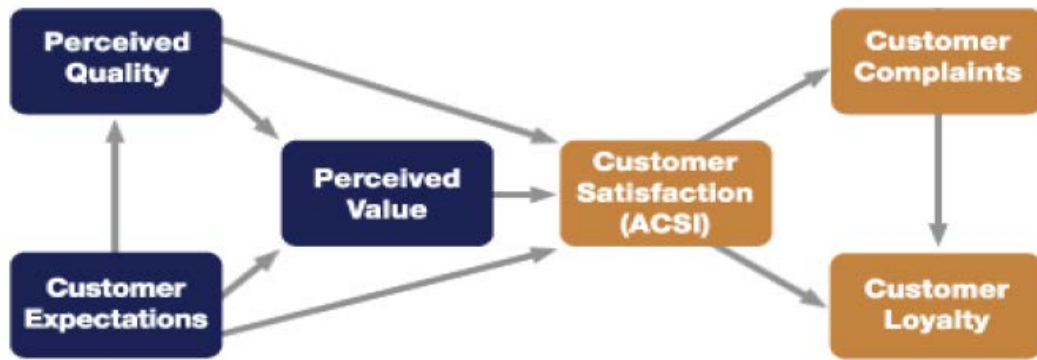
Source: www.theacsi.org

Figure 6 ACSI Model

As the basic models shown here give a foundation for how to approach studying if a service or services will lead to satisfaction and beyond, there are some specific fields from within the general model starting points with which to draw on to establish survey questions for this particular research project. It is interesting to note they all seem to tie back to the SERVQUAL model's ten major areas (figure 7) in some way. While others can be perceived as evolutions from the fields of access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles, and understanding the customer they tend to be more refined and targeted for certain scenarios. The fields within the SERVQUAL model are often too complex, broad, and general for a one size fits all.
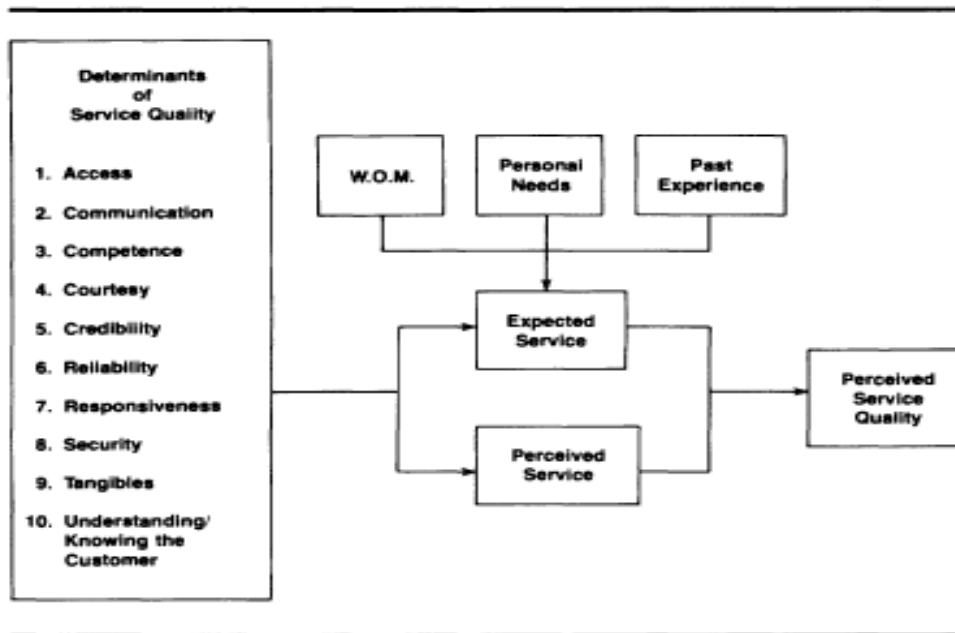
Figure 7 Determinants of Perceived Service Quality

For Kyle et al's research they measured satisfaction from service quality using context specific questions about service interactions and critical incidents, how satisfied were customers overall with their experience, psychological commitment, behavioral loyalty, and enduring involvement. Their measures found centering the research on interactions and experiences with guests services gives a greater understanding of what it is specifically customers are satisfied with. As such, if the research focus to find if visitors are satisfied with the experience is too narrow, than measures need to be focused more on what people are interacting with than the services behind the scenes (2010).

Supporting the concept of researching customer and service incident experiences Ellis and Rossman point out this is a common trend (2008: 9). They say survey instruments that include questions about principles regarding purposeful service encounter design, functional and aesthetic requirements, appropriately stage the experience, and are designed for people are congruent within the field of study. They particularly point out technical and artistic performance on the part of customer services are key influencers of visitors' satisfaction. This is complimented by Leahy et al.'s Recreation Experience Preference scale. The scale looks at

service experiences in outdoor settings and scenic venues (2009). It measures benefits area guests have while interacting with their surroundings. It approaches from the perspective of what customers find beneficial about the area rather than what services can do to make the experience

Gathering common elements from the models and measurement instruments researched, a survey was formed and used to address this project's research questions and hypothesis (appendix A). Particular common elements drawn from the past studies were focus on the service experience, what are the provided services, expectations on the part of the customer, and visitors' perceptions. The first two questions of the survey ask about services and expectations addressing if the digitization of location based data, specifically from special collections, will provide satisfactory enhancement to GCNP customer's time at the Grand Canyon. The third and fourth questions regarding expectations and perceptions will look at whether information delivered by mobile app will interfere with or enrich the outdoor experience. The last question asks about personal preference of services. That along with all of the other focus elements will give indications on what percentage of Canyon customers prefer to use personalized digitized information more than other methods provided. For reasons of simplicity the survey was trimmed down to five basic questions which is further discussed in the limitations section of the paper. The five questions on the survey all used five point Likert scales for opinion assessment ranging from negative ("not really") to neutral to positive ("definitely"). There was also room on the survey for people to write comments.

Discussions and Conclusions

Survey Results

The project survey was dispersed in two ways. Printed forms of the survey along with collection boxes and small posters were set up at the register counters of four stores catering to current and potential Canyon customers. These were collected after one week. Additionally copies of the survey were emailed to a group of university students who were current or potential Canyon customers. These emails also contained a Flash Player version of the app so recipients had the opportunity to try it which may have had an effect on their answers to the questions. The filled out surveys were then returned by email.

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Both distributions were collected and tallied up. After statistical tests had been run on both dispersals no significant difference between the two was found so they were combined and statistics were once again calculated. The calculations were representative of the 31 surveys returned. While this is small relative to the millions of diverse visitors to the Grand Canyon each year, it is a significant number for the exploratory nature of this research project.

The quantitative measures from the Likert scales on the surveys showed the questions had sample variances ranging from 0.8 to 1.7 and standard deviations from 0.9 to 1.3 signifying overall the survey answers were congenial. The first question had an average score of 4.3 with 87% of survey recipients choosing a 4 or 5 on the scale indicating most were in favor that a mobile app would add to a Canyon visit. The second question also had similar though slightly less enthusiastic results with 67% and an average of 3.9 showing participants felt an educating location based app would be more useful than a standard travel guide. There existed no strong indication either way from the results on the third question. Most people or 74% with an average score of 3 were inclined to be at or close to neutral when ask if mobile technology would detract from GCNP experience. The results from question four showed 58% of people selected a 4 or 5 with an average of 3.6 indicating while not totally committed they felt having mobile technology could positively affect their expectations and perceptions. For the fifth and last question 77% of the people in the survey, either choosing a 4 or 5 with an average of 3.9, felt more inclined to get information from the service provider through personal technology rather than traditional service offerings.

	Ranking	Not Really 1	2	Neutral 3	4	Definitely 5
Question 1: Would having a mobile app that tells you about the trails you are looking at from the rim, while at the rim, add to your Canyon visit?		3%	0%	10%	39%	48%
Question 2: When at the rim do you think it is more beneficial to have a location based app that teaches you about GCNP than a standard travel guide?		10%	3%	19%	26%	42%
Question 3: Do you feel using services such as mobile apps and similar technologies detract from what is experienced at the Grand Canyon?		13%	26%	32%	16%	13%
Question 4: You go to the Grand Canyon with certain expectations and perceptions. Does or would having digital technology in the palm of your hand enhance those expectations and perceptions?		10%	0%	32%	32%	26%
Question 5: There are many ways to disseminate information about an area like the Grand Canyon. Assuming you are able to, are you more inclined to access that information though personal technology rather than traditional service offerings?		13%	3%	6%	39%	39%

Figure 8 Percentages of Survey Answers

Qualitative feedback was also obtained as the surveys left room for participants to write in comments and verbal discussions were had as the app was displayed to or simply talk about with individuals. All were intrigued and while most were enthusiastic some remained only fascinated. An interesting comment about the app possibly detracting from GCNP experience was:

"I think there is some aspect of it, but it doesn't really have that much of an effect because it's not changing GCNP itself."

Reflecting information gathered through technology or traditional service offerings it was stated that:

"Personally I'm not for the technology boom where everything is going to be replaced by computers. I like doing things the old way, like looking at a piece of paper rather than looking at an electronic computer/cell phone screen."

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Lastly a participant pointed out while the app is a good tool there are some practical questions to go along with it:

"How will you get around the obstacles of cell [and internet] service?"

Results Analysis

Canyon customers range from potential first timers to those who have logged a few miles in GCNP. The assumption that the sample group is diverse also leads to the estimate that it can moderately represent the experience diversity of GCNP customer population and thus be analyzed as such and on the whole. The most notable difference in the sample group was those who were emailed the survey were also given a chance to try out the app. Since there was little statistical variation from those who were emailed and those who filled out the in-store surveys the indication is having access to a Flash Player version of the prototype app made little impact on participant answers. Another analysis factor that can be drawn from the results is while the answers to the majority of the questions were in the affirmative; question number three hovered around neutrality and therefore could have influenced the overall examination.

Considering most answers to the questions were in favor of a mobile app customer service tool that teaches you about what you are seeing from the rim, addresses expectations and perceptions, and people like the idea of having the location based information available in the palm of their hands it can be concluded that if this tool was available to them most survey participants would use it. On the whole people like the idea of at least having the technology available to them but may not want to abandon the adventure of experiencing GCNP without it. Overall from the survey answers and comments people gave the technology is "not changing GCNP itself" but offering another facet of customer service.

Analysis of the answers given on the survey can also be done in relation to the research questions. Question one and two which relate to digitizing location based data show for the purpose of customer service most people leaned toward having not just a personal service tool but one that provides some depth of area information that they can individually attach themselves to. That being the case it can be concluded Canyon customers are looking for more than just a

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brochure or static kiosk. They desire customer service instruments where an information experience is provided and can be accessed in a personal way. Results from questions three and four regarding expectations and perceptions show most people while slightly approving of the app enhancing their experience they are somewhat indifferent in their feelings regarding technology and its influence on what they want out of their Canyon adventure. Even the 17% that remarked either "Not really" or "Definitely" did not seem to have this influencing their answers to the other survey questions. So while in favor of a personal handheld customer service device it seems neither expectations nor perceptions will be greatly affected by such a tool. As for question five is about personal preferences of service and a large majority favoring access of information through personal devices rather than traditional sources it can be concluded people like the idea of having a location based app right at their fingertips. The question does imply that service providers offer several ways to get area information and multiple service options are available. From the survey results it appears Canyon customers like the idea of have a choice and being able to pick what suits their needs for the particular visit.

Analysis of qualitative responses to the survey and app seems to fairly parallel that of the quantitative answers thus somewhat confirming each other. The general feel from the comments and verbal discussions was people were in favor of the app and somewhat excited about it but they could still experience GCNP without it. Like the responses to the survey questions, the app was thought to be a choice customer service tool but really did not interfere with GCNP adventure. It could be a satisfaction enhancement device but not necessarily. People really like having this option of customer service and area education, especially as is can come in a personal access form, and would use it if available but would not feel anything was taken way if it was not to be found.

Limitations and Parameters

The primary goal of this research was to address the hypothesis and research questions of whether or not mobile technology enhances Canyon customers' satisfaction when visiting the Grand Canyon. To that end the study was exploratory in nature and carried out with certain

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limitations and parameters. This investigative approach allowed for some flexibility but in order to get to the point without over interrogation of the subject the design was meant to be kept as straightforward and basic as possible. The project was intended to simply establish that location based mobile technology used in outdoor settings and similar destination areas was and is an effective customer service tool for guest satisfaction and area education. This included demonstrating that the creation of a mobile app for the purpose of disseminating rich location information was possible and significantly beneficial.

The project was also intended to be a pilot project for further projects of its nature. The prototype app created only deals with one trail, the South Kaibab, found in the Grand Canyon. Actually during the data gathering and digitizing phases of this project the Bright Angel trail, Phantom Ranch region, and some of the developed rim areas were also included. While time, processing, learning curve, resource, and other limitations disallowed for this other data to be included in the developed prototype, the app of the South Kaibab trail set the stage for this other data to be added to the prototype or fashioned as their own apps. This pilot project established a venue for other Canyon trails, such as the Hermit and Grand View, who likewise have historic collections held by Cline Library, the NPS, and other entities, to be circulated to Canyon customers. This also holds for other historic holding by the Special Collections department such as collections of Route 66.

In synchronization with the rest of the project the survey itself was narrowed to a basic focus of the hypothesis and research questions. As explained in the methodology and models section of this paper, five specific questions were chosen to understand Canyon customer's feelings and understandings regarding using mobile technology to enhance their visit. This simplification meant the questions had to be direct in nature and unambiguous as possible. It was felt that answers to these questions could give a basic understand of peoples' feelings without going past the purpose of the research and people would be more inclined to answer a short survey.

As this research was exploratory and intended for a basic understanding of mobile technology and Canyon customers, more inquisitive and scrutinizing questions such as ones about demographics or situational particulars have been reserved for further research. However based on past research, understanding, and experience reasonable assumptions can be made. For instance, it makes sense that technology savvy youth or gadget loving males would answer

differently than older females or traditional nature purists.   The nature of the knowledge investigation is that it establishes certain baseline answers while opening pathways for further exploration.

Other limitations include the season being off peak when the survey was conducted. Like Pan and Ryan's study sample size and survey location were factors in determining true results (2007). The survey location would have been ideal right at the Grand Canyon Visitor Center on the edge of the rim. Unfortunately the NPS requirement process for any research, even one such as this, takes a significant amount of time and goes through several interior departments. As with most research time was a determinant. Although with this being a pilot project and a jumping off point for further research and development of the app produced from this project and the circulations of the Special Collections Department's archives, the time for this project could be said to extend beyond this report. Lastly, while not a limitation so to speak, it is important to note the relevancy of this project, as with all projects, is dependent on who benefits from it.

> "The success of the site ultimately depends upon the number of tourists who visit
> it. Many sites provide counters to determine how many users actually access the
> site but we really need to know not only whether it is accessed but whether it was
> useful" (Bertazzon et al.1997: 56).

Conclusions

Based on the results from the analyzed surveys and the literature review Canyon customers can find their visit to the Grand Canyon satisfactorily enhanced if the rich information of NAU's Cline library's Special Collections, supplemented by contemporary and historic NPS data, can be accessed through personal mobile devices while at the geographic location. For many guests the customer service provided in mobile electronic form can help meet their expectations and positively affect their perceptions. This form of service will not have a negative impact on their outdoor experience. A large percentage will find this a beneficiary tool for discovering area information along with traditional methods and amenities provided.

Some results from the survey showed there were people who felt having this form of mobile technology at their disposal was disenchanting or negligible to their above the rim

Canyon experience. It can be concluded while there are those who find customer service through person digital tools inviting there are some who would rather experience other forms of service in their visit to GCNP. The researched literature also shows this element. Interaction quality, as pointed out by Kyle et al, is important for visitors' satisfaction so if the interaction is with the mobile device rather than GCNP the experience diminishes (2010). It has also been found overuse of technology can result in a loss of imagination and adventure and the reality becomes fictional (Joliveau 2009). The nature of the place is replace by crafted visualization and magic (Hultman 2007). Others may feel the modern tools of tourism simply take away from the natural experience (Cipollari 2010, Eslami et al.2011).

General conclusions may also be derived from this project. As the literature review and survey discovered, the use of handheld electronics and other modern tools are increasingly being used and desired for accessing and educating guests about the depths of adventure and enjoyment a scenic area or tourist venue has to offer. The tourist gaze is an important aspect of the experience and is thus affected by technology as much as the natural landscape of a destination scene. Additionally customer service in various capacities and even in a wilderness location plays an impactful role for many who are seeking satisfaction.

Recommendations and Further Research

As this project has verified mobile technology is an efficient and effective medium for disseminating information about a place such as a scenic area it is recommended that development of the app created and the use of cultural and historic collections be extended beyond this project. Indeed the Special Collections department at Cline Library can use this prototype app as a template for further circulation of their materials. They will of course need to enlist more advanced technical skills to evolve this into a full app but this project proves the potential is there. Not only would it be an effective tool for disseminating cultural collections but if the NPS were to work with Special Collections and deploy the developed apps to guests gazing off the rim of GCNP they both would find more enlightened and enriched Canyon customers

Furthermore the scope of the entities and people involved in this venture would wisely be increased as was a thought waiting in the wings since the beginning. This project has to do with

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the Grand Canyon, initiated from historical collections held by Northern Arizona University for the purpose of enriching current or potential Canyon customer experience. Naturally other groups such as the Grand Canyon Association, Grand Canyon Historical Society, Xanterra, NPS, and other Grand Canyon service providers might want to participate. Other units at NAU, such as the Communications and Geography, Planning, and Recreation departments might also want to get involved as it is an opportunity for their students to get experience with a real world product. This could also work as a service template for other outdoor destinations and tourist venues.

From an academic stand point this project establishes by quantitative measure found in the survey results that cultural data can be digitized, georefrenced, and the subsequent information formed into contemporary tools used by society. The survey itself along with the literature review of academic articles shows that such an app as the prototype created from this project is a customer service tool usable for bringing about customer satisfaction. In addition, as this study has found and researched, the propagating of cultural resources such as historical collections through modern technology provides enriching and qualitative education for people such as Canyon customers.

Closing Statement

The Grand Canyon National Park hosts over a million people annually. A large majority of these Canyon customers are only able to enjoy this natural wonder for a few hours from select observation points along the rim. This may be due to reasons ranging from time to physical restrictions but they all know GCNP has much more to offer. By using customer service tools such as location based mobile technology to set the experience stage and tourist gaze the NPS and other Grand Canyon service providers can better distribute, exhibit, and promote cultural and other area information used to enhance Canyon customer satisfaction.

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NAU graduate research survey

The purpose of this survey is to understand what people think about using mobile technology to enrich their above the rim Grand Canyon experience. Please indicate where on the scale (1 to 5) you most agree. Thank you for your time.

Would having a mobile app that tells you about the trails you are looking at from the rim, while at the rim, add to your Canyon visit?

Not really   Neutral   Definitely
    1   2   3   4   5

When at the rim do you think it is more beneficial to have a location based app that teaches you about GCNP than a standard travel guide?

Not really   Neutral   Definitely
    1   2   3   4   5

Do you feel using services such as mobile apps and similar technologies detract from what is experienced at the Grand Canyon?

Not really   Neutral   Definitely
   1   2   3   4   5

You go to the Grand Canyon with certain expectations and perceptions. Does or would having digital technology in the palm of your hand enhance those expectations and perceptions?

Not really   Neutral   Definitely
    1   2   3   4   5

There are many ways to disseminate information about an area like the Grand Canyon. Assuming you are able to, are you more inclined to access that information though personal technology rather than traditional service offerings?

Not really   Neutral   Definitely
    1   2   3   4   5
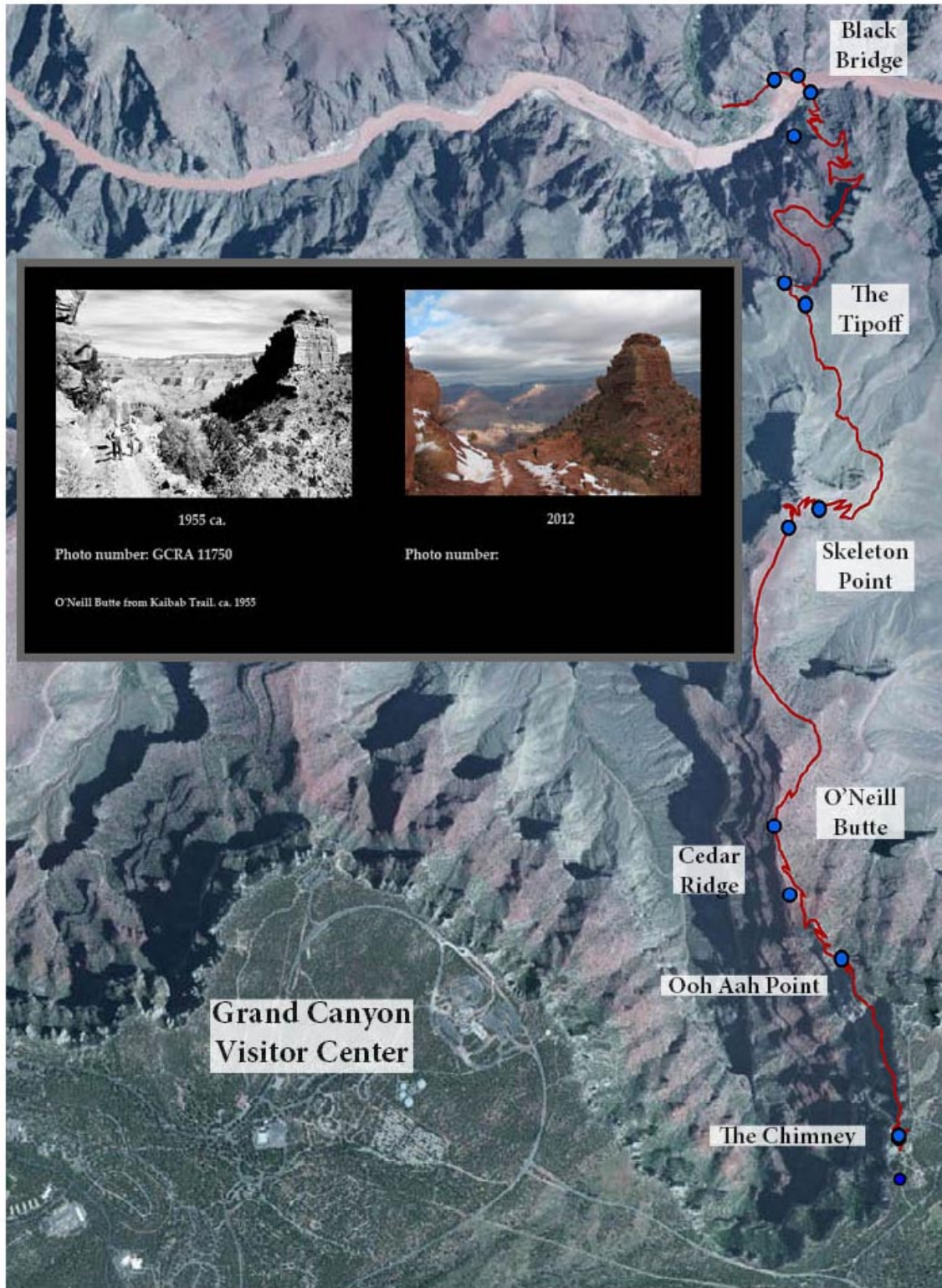
On the iPad or with the Flash Player version the app works by touching or clicking each blue point along the trail to reveal a photo of that location