EXPLORING THE IMPACT OF CROWDSOURCING ON HOTEL ROOM MAINTENANCE:
A CASE STUDY

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ABSTRACT: It is well known that guests are able to make an initial impression within seconds. Additionally, surveys have frequently ranked cleanliness and appearance among the most important factors in selecting a hotel. In this environment what is the impact of guest identification of room maintenance issues? Product defects such as a frayed carpet, or a non-functioning remote negatively affect guest's perceptions of the hotel. Whereas properties typically schedule routine maintenance checks, and respond to guest-initiated requests, could a crowdsourced approach to issue identification be valuable? The objective of this study was to explore the phenomenon of guest initiated maintenance service calls in order to determine if there exists a solution in which product defects are optimally identified prior to a guest's stay. The proposed solution: expanding the maintenance process to include internal partners (housekeeping, etc.) and external partners (guests). A case study approach was employed. A luxury class resort in the Central Florida region was selected in order to study the phenomenon. Conversations were held with employees to better understand current practices, and follow-up interviews were conducted with key stakeholders in the maintenance process (operations, housekeeping). The results of the study provide an overview of the current processes and procedures in relation to product defects and maintenance service. The study provides an assessment of the applicability of implementing a crowdsourced solution (employing partners in the product defect process). The input of key stakeholders has been distilled into opportunities for implementation, and challenges that would be faced.
Keywords: Lodging, Hotels, Crowdsourcing, Open Innovation, Maintenance, Product Defects

INTRODUCTION

One day you might have the pleasure of staying at a four diamond rated hotel in Orlando, Florida. The hotel, a grand affair, will most

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likely be a luxury-class resort with ample grounds, a golf course and a convention centre. Lavish by hotel standards, but not terribly uncommon here in the theme-park capital of the world, which is a focal point for attractions, entertainment and excitement. Driving down the tree-lined boulevard a guest first sees the hotel from afar, rising up out of its lush green surroundings. The entrance, predictably, is dominated by a large water fountain, and is populated by an army of attendants ready to assist the guest. The lobby, expansive and themed reminiscent of an Italian villa is imposing, tidy and polished. The accommodations, stocked with amenities, and possessing expansive views of the surrounding scenery, are a welcome respite from the frenzied nature of business travel. Given the luxuriousness of the surroundings, the care and attention to detail, and the culture of service one would find it difficult to lodge a complaint against such an establishment.

Our story begins here, inside of a pleasant hotel room, at a luxury-class resort, in the heart of one of the world's entertainment capitals. A smile, some kind words and a small gratuity, and you might find yourself in a corner suite high in the hotel's main tower. While perusing the room, you begin an almost ritual process of relaxation that accompanies finding one's hotel room after a long journey. You begin to familiarize yourself with the surroundings. Running through a mental checklist, one: finds the remote, looks for the fridge, ensures that toiletries are stocked, observes the room temperature; undertaking a casual inspection of the room. It is at this point that you might notice an almost inconsequential product defect, something that draws little emotion, or causes negligible concern, but non-the-less represents a deviation from the high standards of the property.

A small section of carpet has lifted off from the floor. Small, simple, inconsequential. Given the extensive usage of the room by the guests, and the vigorous regiment of cleaning, upturned carpet can be a common occurrence. Along the same vain are tens of other small, simple, inconsequential problems. Have you ever entered a hotel room to find that bulb in the desk lamp is broken? Have you ever attempted to turn on the television, only to find that the batteries in the remote control have died? Perhaps you have encountered some small product defect yourself over the course of your travels. More often than not it is a forgettable defect, a problem that if deemed serious enough by the guest results in a relatively quick fix by the property's maintenance or engineering staff.

Why care about such a trivial affair? An occurrence of this nature is easily fixed and can be easily forgotten. Because they occur quite frequently. But certainly the hotel maintenance staff isn't oblivious to these small product defects? Certainly they must take some form of pro-active action to limit the extent to which guests experience product defects? The answer to that question is yes. Most properties do have

in place processes and procedures that seek to limit the exposure of product defects to the guest. Even so, every maintenance issue that occurs that is unaccounted for prior to a guest's arrival represents a potential loss due to a perceived failure of the service and / or brand. Operating in this reality of a constant stream of minor product defects, how can a hotel best act in order to minimize their potential impact to guest satisfaction and loyalty?

Hotels cannot be faulted for a lack of effort, or a lack of a determination to minimize the incidence rate of product defects. Preventative maintenance programs are designed to limit the potential exposure of product defects to guests, in so much as the effort doesn't unduly burden the profitability of the hotel. Challenges in the lodging industry stemming from the limitations of traditional processes and procedures are candidates for non-traditional, innovative solutions. The researchers propose that crowdsourcing, the process of opening up the problem solving process to a large group of individuals, can assist maintenance teams in product defect identification. By incorporating stakeholders in the issue identification process, both internal and external to the hotel, issues can be identified faster at a lower cost.

In this study the researchers seek to better understand the relationship that exists between hotel product defects, and efforts to combat them. Existing research supporting the proposed negative impact of product defects on guest impressions and behaviours is utilized as a justification for this study. The research questions motivating this effort are: how often do product defects occur, what is being done to minimize product defects, what are the limitations of the current method, and can crowdsourcing play a role in further reducing defect incidence rates? In order to better understand the answer to these questions a case study analysis of a luxury resort located in Orlando, Florida is undertaken. Document analysis, observations, and interviews are employed to better understand the existing processes, the challenges being faced, and the potential for crowdsourced solutions. The study concludes that while crowdsourcing can play a role in reducing the exposure of maintenance issues to the guest, and can do so in a cost-effective manner, the primary obstacle to implementing crowdsourced solutions will be overcoming organizational culture barriers.

LITERATURE REVIEW

Guest Perceptions

Previous research has shown that: first impressions are important; hotel guests correlate service quality with cleanliness and appearance; and

guests experience distinct emotions related to hotel services, including maintenance issues. We propose that when a guest enters a property for the first time, a quick assessment is conducted of the quality, cleanliness, and appearance of the hotel and its facilities. The same process is proposed to hold true for the hotel room and its amenities. These assessments can affect the perceived service quality of the hotel, which in turn can impact key hotel metrics such as guest satisfaction and loyalty.

First impressions are important. First impressions can also be almost instantaneous. Only a brief exposure to the item of interest is required in order to make broad generalizations (Allport, 1937). Willis and Todorov (2006) tested the confidence levels of participant's assessments of traits inferred from brief exposure to images of facial features. The results speak for themselves, "judgments made after a 100-ms exposure correlated highly with judgments made in the absence of time constraints, suggesting that this exposure time was sufficient for participants to form an impression" (p. 592). Past research in the field of social perception has studied the ability of brief impressions to lead to perceptions of personality, competence and ability (Gosling, Ko, Mannarelli, & Morris, 2002). The authors propose that this same process, responsible for near-instantaneous collection and analysis of external observations is relevant and applicable to hotel guest's first impressions of the hotel and their room.

Not only can guests quickly assess their surroundings and form initial impressions, these impressions help form the overall perception of the service quality of the hotel. Research has shown that guests consistently rank cleanliness and appearance highly in factors associated with staying at a property (Barber & Scarcelli, 2010; Chubb, 2011). Getty and Getty (2003), who developed a lodging quality index, which assessed customers' perceptions of quality delivery, identified one of the dimensions within the quality construct to be *Tangibility*, which represents the physical characteristic of the service encounter. The final 26 item index included the tangibility items of "the hotel's interior and exterior were well maintained" and "the hotel was clean." Lockyer (2003) supporting the importance of physical environment, concludes that the customer's perceptions of service quality are affected by the cleanliness of the hotel.

Beyond initial impressions and assumptions of service quality, the cleanliness and appearance of the hotel share a connection with the emotional experience of the guests. An empirical study conducted by Desmet, Caicedo and Hout (2009) concluded that unpleasant emotions were just as common as pleasant emotions experienced during a hotel stay. Unpleasant emotions included: Dissatisfaction, aversion, boredom, sadness and fear (amongst others). The coded data, analysed by the researchers, resulted in a category entitled "Maintenance" with examples provided by respondents including "Noisy elevator [and] jammed door lock" (p. 3). Overall when the eliciting conditions were mapped against the emotional responses, the

category of maintenance was shown to be closely related to the emotions of dissatisfaction and fear. Why are hotel guests emotions related to maintenance issues important? Studies have shown that emotions have an impact on levels of post-purchase satisfaction (Oliver, 1993) and repurchase decisions (Allen, Machleit & Kleine, 1992). Within the lodging industry, it has been shown that the key metrics of satisfaction and loyalty are strongly influenced by emotional experiences (Barsky & Nash, 2002).

The body of research that studies the impact of the physical surroundings on a service process, so called *servicescapes*, has sought to better understand its effect on customer's emotions and behaviours (Bitner, 1992; Mari & Poggesi, 2013). Supported by the environmental psychology literature, servicescapes utilizes Mehrabian and Russell's (1974) stimulus-organism-response (S-O-R) paradigm to justify the process by which external stimuli is evaluated and ultimately influences behavioural responses. Bitner (1992), who is credited with the term servicescapes, identified three dimensions of the physical surroundings: ambient conditions (e.g. temperature, odor), spatial layout and functionality (e.g. furnishings and amenities), and signs, symbols and artefacts (e.g. décor). Clearly the hotel maintenance staff will have a strong influence on how the guest perceives and experiences these dimensions. Regulating the temperature, maintaining the décor, and repairing furnishings are some examples of how hotel maintenance operates within all three dimensions. Lin and Mattila (2010) studying the impact of physical surroundings on customer's emotions and satisfaction concluded that servicescapes influence a guest's levels of pleasure and satisfaction with the service experience. At the same time, research findings have shown that the psychical surroundings can positively affect future behavioural intentions, a relationship mediated by emotion (Jang & Namkung, 2009).

In light of a guest's ability to make rapid assessments of their physical surroundings, coupled with that assessments' ability to result in an emotional response, which in turn can influence behavioural intentions, hotels must aggressively guard against product defects and maintenance issues that threaten to damage perceptions of the physical surroundings. Taking a page from the six sigma literature, the goal of hotels should always be to minimize deviations from the intended service quality, ultimately reaching zero product defects exposed to guests. Whether or not it is practical and / or achievable to reach zero product defects is irrelevant, as long as it is the long-term goal, the desired end state.

Hotel Maintenance

Given that guest's impressions of, and emotional reactions to the cleanliness and appearance of the hotel can have a significant impact upon key lodging metrics such as satisfaction and loyalty, what is the

current state of hotel maintenance and its efforts to minimize product defects and their exposure to the guest? According to the British Standards Institution (1993), maintenance is defined as "the effort in connection with different technical and administrative actions to keep a physical asset in, or to restore it to, a condition where it can perform a required function." Here we can see the primary differentiator in the tasks for which maintenance is responsible; to maintain or restore. In hotels it is the difference between replacing a remote's batteries prior to a complete loss of power, thus ensuring continuous operation of the remote, versus replacing a remote's batteries after a complete loss of power, which carries with it the potential to negatively affect the guest.

The challenge presented to hotel management is how to prevent and repair product defects in a 24/7/365 operating environment, while at the same time adapting to increasing levels of external competition, and guest awareness and social media utilization. All hotels to varying extents possess a Planned (or Preventative) Maintenance (PM) plan. Ritz-Carlton, a brand synonymous with luxury and service quality excellence, utilizes a preventative maintenance program named "Clean and Repair Everything" (C.A.R.E.). This program provides Ritz-Carlton employees with its vision and mission for maintenance, in addition to the scope of the work, job descriptions, team work flow and procedures and standards. At Ritz-Carlton this C.A.R.E. team typically consists of a general engineer, a painter, a deep cleaner and a prompt response mechanic (P.R.M.). Accountable to the Director of Engineering and the General Manager, C.A.R.E. teams are accountable for improving the consistency of the product, as well as internal, and ultimately, external customer satisfaction. Typical of many other hotel chains with upper-upscale and luxury properties, Ritz-Carlton seeks to visit rooms once they have been occupied for a minimum of 90 nights (Ritz-Carlton, 2003).

Given the attention to detail and the effort expended in order to carefully craft the standards and operating procedures for guestroom maintenance one wouldn't be remiss in asking why this study is necessary. Surely Ritz-Carlton, and similar hotel chains, with their wealth of knowledge and access to resources, have determined how best to minimalize the incidence rate of product defects? Based on our analysis of one such hotel property, detailed below, the researchers would agree that while guestroom maintenance has been optimized based on traditional approaches to maintenance, through the use of non-traditional methods such as crowdsourcing the maintenance process can become more inclusive, co-producing the identification of issues by incorporating its stakeholders into its processes.

Crowdsourcing

Innovation is the life-blood of a firm's ability to maintain a competitive advantage and ensuring long-term survivability (Cefis & Marsili, 2004;

Danneels, 2002; Helmers & Rogers, 2010). Adapting to an ever-changing environment requires operational repositioning (Porter, 1996) that could require new innovative products, processes, organizational practices or marketing efforts (OECD, 2005). A concept distinct from inventions, innovations represent small, pragmatic adaptations of existing products and services (Hjalager, 2002) that can be put to practical use (Hjalager, 1997). In the fields of hospitality and tourism most innovations are incremental in nature, representing marginal changes to existing processes (Peters & Pikkemaat, 2005). While innovations within tourism has been organized into five main categories: product innovations, classical process innovations, management ones and institutional innovations, it is well-understood that innovations can transcend individual categories (Hjalager 1997; 2010). For example an innovative approach to reducing guest exposure to product defects would more than likely involve improvements in both processes and managerial practices.

Innovation, a vital component of firm survivability, need not be attempted alone. While traditionally research and development (R&D) was conducted in-house, more recently firms have realized the benefits of opening the innovation process to external partners. Chesbrough (2003) observes that, "Companies are increasingly rethinking the fundamental ways in which they generate ideas and bring them to market — harnessing external ideas while leveraging their in-house R&D outside their current operations" (p. 1). The benefits of open innovation? An increased number of innovative ideas, a decrease in innovation cost and process time, and a decrease in the time it takes to bring the product to market (Sloane, 2011). Within the field of open innovation, crowdsourcing represents the act of a firm taking an internal function and outsourcing it to a large group or community. This group can collaboratively peer-produce solutions, or work independently. Relative to more traditional methods of outsourcing, crowdsourcing has the potential to provide higher quality solutions cheaper and faster (Dawson & Bynghall, 2011, Lakhani, 2010). In order to obtain the advantages of crowdsourced solutions though firms must overcome the limitations of firm-centric value creation. Tapscott and Williams (2006) advocate: reducing the reliance on internal employees, removing hierarchical structures, and allowing the crowd access to the firm's intellectual property.

METHODOLOGY

Endeavouring to better understand not only the preventative maintenance plan itself, but the underlying motivations and expectations as well as the intended and actual outcomes, the researchers sought out a luxury hotel property to evaluate. The researchers located a hotel within the Or-

lando, Florida area, a large property (500+ Rooms), managed by an international hotel management firm, and located in the South-West quadrant of the city (nearest the theme parks and attractions). Permissions were obtained to have conversations with employees and to interview key employees within the operations and housekeeping teams. The results of these discussions and observations are presented along with select quotes in order to achieve two objectives. First, to confirm that a preventative maintenance plan is in place at this property, and that despite the current operating procedures, maintenance issues are occurring with regular frequency. Second, to query the maintenance process participants on the current state of stakeholder support, and to challenge them to envision how stakeholders could play a greater role in the maintenance process.

Data Collection

The data were collected by the researchers via conversations and interviews that took place over the course of two months in late 2013 and early 2014. The selection of participants was determined by a combination of insights from the literature in addition to the extensive industry experience (12+ years in lodging) of one of the members of the research team. Specific participants weren't targeted, rather the researchers noted their preference for employees from specific functions (operations and housekeeping) within the hotel, and selection was made based on the availability and approval of the individual participants.

In order to gain a better understanding of the hotel, how it functioned, and how various functions interfaced with the maintenance team, the researchers held conversations (prior to interviews) with two employees within the hotel: a manager with operations, and a housekeeping supervisor. These conversations were informal, took place over coffee, and each were completed within one hour. These initial conversations helped confirm the researcher's understanding of the phenomenon and assumptions based upon previous research. Conversation participants were queried on the interview questions, providing feedback on the appropriateness of the questions, relative to the unique characteristics of the lodging industry. Interviews were then conducted with three individuals within the hotel, one from operations (Asst. Director) and two from housekeeping (Manager and Supervisor) (Table 1). The interviews took approximately 30 minutes each, and were centered around the set of questions developed by the researchers to gain insight into: existing preventative maintenance, frequency of issues, the role of peripheral stakeholders, and ways in which the hotel could completely prevent guest issue exposure.

Table 1. Participant Overview

Participant	Type	Function	Title	Exp. (Years)
1	Conversation	Housekeeping	Supervisor	5
2	Conversation	Operations	Manager	5
3	Interview	Housekeeping	Manager	4.5
4	Interview	Operations	Asst. Director	6
5	Interview	Housekeeping	Supervisor	3

Data Analysis

Collected data, in the form of recorded interviews, were transcribed by the research team, and placed into electronic document files for analysis. An initial review of the data consisted of assessing each interview individually to better understand the responses provided. At this point a second review of the data was conducted assessing the interviews collectively in order to determine how the contributions were related and transcended the individual business functions of the hotel. Finally the researchers came together, and collectively agreed to the key findings, and how best to structure the results of the study (Bruan & Clarke, 2006).

RESULTS

The Current State of Affairs

Based on the observations gleaned from the conversations as well as the formal transcribed interviews an assessment of current practices and standard operating procedures was undertaken. According to participant #4 (Asst. Director – Operations), the hotel possessed a dedicated staff for preventative maintenance, but did note that they can get redirected to other tasks to handle emergencies as they occur. When asked about the hotel's current preventative maintenance schedule, participant #4 responded by confirming that "all rooms must be PM'd quarterly," but with the caveat that "sometimes we visit rooms more often due to VIPs or multiple complaints." This early indication of complaints portends the discussion that would take place later on during the interview on issue identification by guests.

When asked which preventative maintenance system the hotel was currently using, participant #4 indicated that "Synergy MMS" (Maintenance Management System) was being utilized. He went on to explain its functionality noting that "the issue can be entered using the guestroom phones and putting it codes or calling our hotel operation department. Once they put the code in or request, it gets dispatched to the working team member at that time." This is substantial, as the use of guestroom phones implies

(and was confirmed) that housekeepers are in fact utilized as part of the preventative maintenance process. Most importantly though, while house-keepers have the ability to assist the maintenance team, the statement in itself doesn't indicate the extent to which they actually do.

When participant #3 (Manager – Housekeeping) was asked "How many room maintenance/engineering issues would you say your house-keeping team identifies every day/week/month, etc.?" his response was approximately 800 per month (given a 500 room hotel). He did note that this was a highly variable number, but that 30 calls per day was a rea-sonable average value based on his experience in his role over the past two years. This is certainly an accomplishment for the hotel, as it rep-resents 800 issues per month that being identified by the housekeeping staff, weren't identified at a later point in time by guests. Participant #5 (Supervisor – Housekeeping) corroborated the remarks of the Manager, noting that she "identif[ies] 5 to 10 [defects] a day that are directly related to an Engineering issue that needs immediate attention that will affect a guest's stay such as leaking shower or a light out" going on to say that she is "expected to report at least 100 issues" every month. The super-visor also noted the importance of her role in this defect identification process noting, "I am the last person to check the quality of a room be-fore releasing it for check-in for a guest. If I do not report it, it will not get fixed unless the guest calls to report the issues." At this point we can surmise that if an issue isn't identified by the quarterly review, and isn't subsequently identified (or reported) by the housekeeper or supervisor, it then has the potential to be identified by the guest.

If we take a step back to assess the entire spectrum of issue identifica-tions (Equation 1), we can see that there exists an actual number of issues, from which some are identified by housekeeping (HK), some by guests (G), some purposely not reported (N - neglected), and some not at all (H- hidden).

$$\text{Total Product Defects} = HK + G + N + H \tag{1}$$

While the researchers weren't able to quantify the neglected and hid-den populations of issues, the researchers did inquire as to the num-ber of issues reported by guests. Participant #4 (Operations – Asst. Director) responded by indicating that over the course of one month (recent) they "had 880 guest calls. Divide that by [15,000] (rounded for anonymity) possible room nights and under 6% of our guests had prob-lems in their rooms that they experienced." In light of this additional information it is clear that while the housekeeping staff is assisting in the preventative maintenance program, they are only responsible for approximately 50% of identified and reported issues. This percentage becomes smaller (by an unknown amount) when neglected and hidden issues are included. It should also be noted that all of these issues are

occurring in addition to the traditional preventative maintenance program, and its recurring 90 day guestroom inspection process.

Per the review of the literature maintenance issues discovered by the guest will potentially negatively affect their emotional state, their satisfaction with the hotel and their intentions to visit in the future. Given these findings, it is important for the hotel to ask itself what actions it can take to best minimize the number of issues identified by the guest. In order to assist in conceptualizing the various hotel functions and their potential roles relative to the identification of product defects a diagram has been provided (Figure 1). The potential contributing groups are represented as concentric circles, with bolded lines distinguishing the products from internal and external stakeholders. The diagram has been adapted from the crowdopolis model proposed by Kazman & Chen (2009) which seeks to organize the contributions of the crowd.
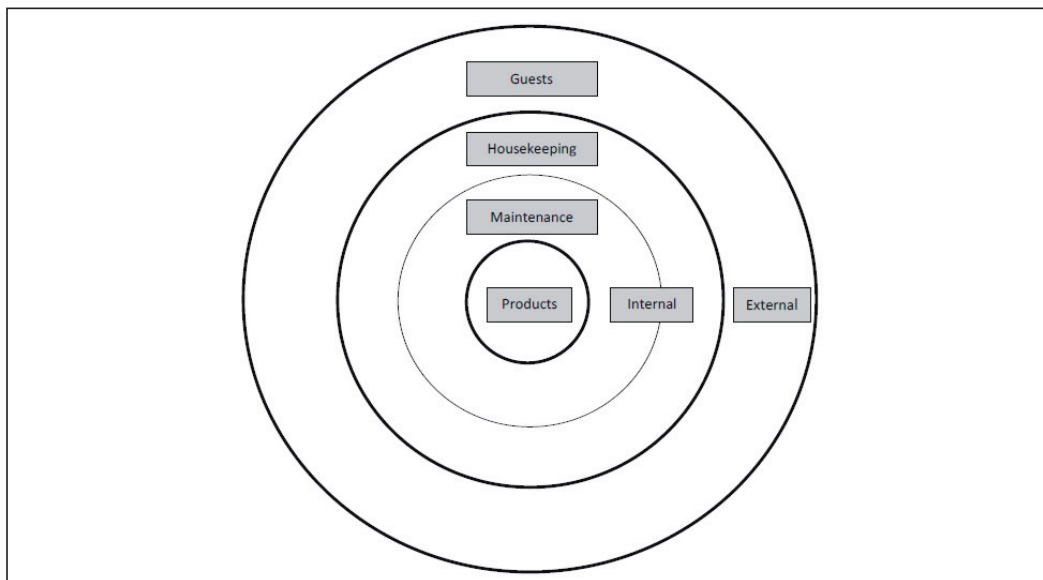
Figure 1. Preventative Maintenance Process Stakeholders

Resolving the Gap

If product defects are occurring outside of the control of the preventative maintenance program, and its inspection processes, what are the current actions being undertaken by the hotel, and what future actions could it take to resolve these issues? Participant #4 (Asst. Director – Operations) when asked about the formal role of internal partners in the inspection process, replied "Yes, housekeeping is our eyes and ears in rooms. They enter work requests in the system so we can fix them even before our guests experience the problem." This partnership, implying open lines of communication and a dotted line organizational structure between the two departments is on the surface encouraging. When then

asked as a follow-up question, if housekeeping receives any compensation or recognition for identifying and reporting issues, the answer was a powerful and definitive "no." This lack of encouragement represents a potential missed opportunity by the hotel. When participant #3 (Manager – Housekeeping) was asked a similar question regarding recognizing housekeeping contributions, his response was,

> *"I do. It's clear when a housekeeper takes pride on their job and will report every single detail in order to maintain her section and guests happy. I've seen cases where the housekeepers would carry batteries, new remotes and even tools to fix maintenance issues so they wouldn't have to wait for engineers to come over. I would always congratulate them for those kind of actions."*

From participant #3's statement it can be deduced that while no overarching reward or recognition system is in place, there are ad hoc instances where good practices at the managerial level result in employee recognition at the team level.

Participant #5 (Supervisor – Housekeeping) is by far the interviewed participant closest to the actual process. She is as she calls it on the ground in the trenches everyday fighting to ensure that the rooms are turned around quickly, defect-free, ready for the next guest. Still when asked about her experiences in regard to "Synergy MMS" (the Maintenance Management System), she expressed the following concern:

> *"My experience with the system to report issues is that it is easy to use. However, I have a very busy schedule and it is very time consuming to put each task code in due to the speed of the automated system. There are many pauses and when I am short on time, which is most of the time, I end up not putting it in and postponing to a later date. In addition, I have to look up the number of the task code to enter the information."*

Here we can see the difficulties that a supervisor and by extension the housekeepers themselves have in their ability to report issues. Participation in a crowdsourced platform (the Maintenance Management System) will be challenging when it is seen as burdensome to use, and lacking incentives.

From the researchers industry knowledge and the initial conversations with housekeeping supervisor at the hotel (participant #1), it was apparent though that ad hoc efforts to motivate housekeeping staff not tied to formal review processes could be difficult. Housekeeping staff can be contract hire, or temporary staff, get paid very close to the state minimum wage, and have a high level of turnover. Supporting this assessment, Tembi (1991) in an empirical study of 17 hotels in the Rochester, NY area, concluded that a majority of housekeeping staff had left a past job due to low wages, and that a high level of dissatisfaction was caused by lack of upward mobility, job insecurity and working weekends. Participant #5 provided her assessment of the challenges and possibilities in regard to motivating housekeepers to take part in the defect identification and reporting process:

"Most housekeepers are rushing to finish their work in a timely manner and will avoid entering the issues in the phone in order to save time. There is no incentive or motivation for the team member. As a Supervisor, it would be more efficient to add an incentive each room attendant for issues reported. I think that the rooms would be much better maintained and in better quality. Instead of one person reporting most of the issues, it would be a team of many which would yield more positive and effective results."

Here again we see the reinforcement of previous assessments of the situation. Employees rushing to meet the ambitious cleaning schedule, primarily focused on turning over rooms, have little time to allocate to reporting issues, especially when no formal system for recognition is in place.

Given the potentially encouraging, but mixed results of attempts to entice housekeepers into becoming a stakeholder in the preventative maintenance process, identifying whether or not any external stakeholders, namely the hotel guests, can play a role in identifying issues remains an important consideration. When asked what the guest's role was in the preventative maintenance process, participant #4 responded with, "I don't believe the guest should have a role. The guest should experience a flawless room every time." Not surprising, although it did contrast somewhat with participant #3's response that "issues such as light out, remote control not working are hard to prevent since the room may have been closed for a day or a week. I think the guest should have a minimal responsibility in that role." Still both participants agreed that the guest's role should be minimal to non-existent. Confirming this assessment, when asked if the guest could or should play a role in issue identification, participant #4 noted that "we appreciate any comments we receive and work to resolve them, but again they should have a flawless visit."

Given the mixed effectiveness of the utilization of housekeeping in the current system, and the hesitancy of key stakeholders to involve the guest in the issue identification process, it is imperative to determine how best improvement can be achieved. When both participants were asked, "How would you like to get to 0 issues identified by the guest?" participant #4 (Asst. Director – Operations) replied with a confirmatory statement of his prior analysis, that "94% of our guests in December didn't experience any problems. We love to receive this feedback on our [metrics]." Participant #3 confirmed the status quo by noting, "I doubt that will ever happen, a light bulb can goes out at any time. The TV signal can go away at any time." Still housekeeping did express the potential for improvement, but at a cost, "I don't think it's possible as stated above. It would also be very expensive to maintain proper staff to walk every room every day, especially when dealing with larger properties."

Thus it would seem that in addition to the maintenance team and their 90 day inspection cycle, the opportunity exists for a potentially increased role of the housekeeping staff, and a longer-term discussion on the role

of the guest in co-producing the identification of product defects. While a stigma exists on incorporating the guest into the defect identification process, clearly the guest already plays a role as noted by the study participants. While the question of whether or not guest participation is appropriate is best left to the hotels and management firms, if a hotel wishes to do so, the emphasis progresses from why to how. How can the firm best incorporate the guests, and housekeeping, into the defect identification process?

DISCUSSION

At present, this hotel property is in fact actively utilizing a crowd-sourced approach to defect identification with the housekeeping staff. This is accomplished through the preventative maintenance software, and its ability to accept defect notifications from the guestroom telephones. While the hotel has successfully deployed a platform to capture the contributions of the crowd (housekeeping), it is perhaps less successful in its ability to motivate the crowd to help accomplish its goals. Thus we must look beyond the capabilities of the platform, and instead focus on the hotel's efforts to motivate the crowd, which at present are relatively non-existent, at least on a property-wide level. Richard (2012) provides an outline for those factors that will enable effective crowdsourced solutions including: understanding the nature of the crowd, properly motivating the crowd participants, and ensuring organizational factors such as the platform and incentivizing mechanisms are in place. Of all the motivators that spur crowds to contribute, perhaps recognition and financial incentives will be the most effective for the housekeeping staff. As Tembi (1991) concluded wages and lack of advancement are of serious concern to housekeeping staff. Recognition and / or financial incentives would help alleviate both of these sources of dissatisfaction.

The incorporation of the guest into the preventative maintenance process, currently occurring haphazardly and against the best intentions of the hotel, represents a challenge for hotels. If the guests are included in the process it must be done with hesitancy, in a slow rollout process, testing and evaluating at every stage. The rationale for caution is that one of the hotel's primary missions is to provide a relaxing, stress-free environment for the guest. Incorporating guests into the defect identification process could damage the perception that the hotel is solely responsible for delivering a quality product and service. In addition offering financial incentives to guests allows for the possibility of guest deviant behaviour. Still as guest's are currently involved in the process, by identifying product failures as they experience them, it is logical to ask how this process can be improved. The issue again becomes one of understanding the crowd, and how best to motivate it. While there are guests who won't wish to be

included in any activity that detracts from their business or leisure activities, other guests will potentially be motivated by recognition and financial incentives. If some token incentivizing mechanisms were put in place, such as a website recognizing guest's efforts to improve the hotel, and / or hotel reward points being distributed as a result of defect identification, a subset of guests, likely either die-hard fans of the brand, or those strongly motivated by financial incentives might be willing to become part of the defect identification process. The benefit of this strategy is that those guests who are more than willing to contribute would do so, reducing the likelihood that all guests (including those that don't wish to participate) would be exposed to product defects.

CONCLUSIONS

Relative to the initial goals of this study, this paper was successful in: providing a better understanding of current preventative maintenance practices relative to their inclusion of stakeholders (both internal and external), detailing the opportunities for reducing product defect exposure to guests, and providing recommendations for the utilization of crowdsourcing methods in order to help achieve this goal. Hoteliers should take note that in attempting to apply the lessons learned from this study, results will vary based on the unique conditions inherent in each property. Motivating staff at lower tier hotels may be even more challenging than proposed in this study if wages are lower, turnover is higher, and training is less rigorous. On the other hand, hotels located in countries where minimum wage is higher and social support structures are more developed and substantial would conceivably face less issues in motivating staff and implementing crowdsourced solutions.

Limitations

While this study helps to better understand the phenomenon of product defect identification, and the potential place of crowdsourcing, some limitations do exist. As all case studies do, this paper seeks to expose current practices, in an in-depth and informative manner, at the expense of generalizability. The conclusions from this study obtained from a luxury resort hotel within the South-eastern United States can only be generalized to other similar hotels with the additional of follow-up quantitative research.

Another limitation of the study: only two fact finding conversations and three interviews with representatives of housekeeping and operations were conducted. While these participants collectively represented over 24 years of direct experience in their roles, including employees at the supervisor, manager and director level, the participants only repre-

sent one viewpoint of the process, that of the hotel. Understanding of current preventative maintenance practices relative to stakeholder's inclusion could be better understood when more entities and different types of stakeholders are interviewed. Since guests are (at least to some extent) involved in the process of identifying product defects it could be beneficial to conduct interviews also with them. Additional interviews would lead to a more comprehensive understanding of guest motivations, specifically their willingness to engage in crowdsourcing activities and the types of incentives that would be most effective. Finally, the research is exploratory rather than conclusive. It is only a starting point to future research which can help solidify and expand upon the findings of this study.

Future Research

The researchers call for additional empirical research in this area, in order to better assess the likelihood of staff and guest participation in crowdsourced solutions to preventative maintenance challenges. It is recommended that researchers study the links between the level of crowdsourcing in product defect identification in hotels and the level of employees' wages, their work satisfaction, or guest's satisfaction. Research seeking to better understand stakeholder's motivations to identification of product defects would be beneficial. Comparing the guests' and employees' perceptions of crowdsourcing in product defect identification in the hotel industry would also be a useful study. Sometimes one party can attribute different motivations and attitudes to the other (e.g. in the area of taking part in crowdsourcing as a source of product defect identification). Separately, identifying the group of failures that are purposely not reported (N – neglected in Total Product Defects) in hotels would also be valuable – answering questions such as: Why they are not reported, how do they influence Total Product Defects, and what can be done to make this "N" lower? Finally studies seeking to develop comparisons between different types of hotels and the same hotel types but in different countries could be interesting. From these studies the effects of differences in organizational culture or market features and how they influence crowdsourcing could be identified. The researchers welcome future research in these areas in order to better understand the issues addressed in this article.

REFERENCES

Allport, G. W. (1937). *Personality: A psychological interpretation*. New York: Holt.
Allen, C.T., Machleit, K.A., Kleine, S.S. (1992). A comparison of attitudes and emotions as predictors of behavior at diverse levels of behavioural experience. *Journal of Consumer Research*, 18, 493-504.

Barber, N., & Scarcelli, J. M. (2010). Enhancing the assessment of tangible service quality through the creation of a cleanliness measurement scale. *Managing Service Quality*, 20(1), 70-88. doi:http://dx.doi.org/10.1108/09604521011011630.

Barsky, J. D., & Nash, L. (2002). Evoking emotion: Affective keys to hotel loyalty. *Cornell Hotel and Restaurant Administration Quarterly*, 43(1), 39-46.

Bitner, M. (1992). Servicescapes: The Impact of Physical Surroundings on Customers and Employees. *Journal of Marketing*, 56(2), 57-71.

British Standards Institution. (1993). BS 3811: *Glossary of terms used in Terotechnology*, British Standards Institution, London, UK.

Bruan, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative research in psychology, 3(2), 77-101.

Cefis, E., & Marsili, O. (2005). A matter of life and death: innovation and firm survival. *Industrial and Corporate Change*, 14(6), 1167-1192.

Chesbrough, H.W. (2003). The era of open innovation, MIT Sloan Management Review, 44(3), 35-41.

Chubb Group of Insurance Companies. (2011). *Americans Pick Cleanliness Over Hotel Security, According to Survey*. Retrieved on 02/01/2014 from http://www.chubb.com/corporate/chubb14110.html.

Danneels, E. (2002). The dynamics of product innovation and firm competences. *Strategic management journal*, 23(12), 1095-1121.

Dawson, R., & Bynghall, S. (2011). *Getting Results from Crowds: The definitive guide to using Crowdsourcing to grow your business*. Advanced Human Technologies Inc.

Desmet, P.M.A., Guiza Caicedo, D., & van Hout, M. (2009). Differentiating emotional hotel experiences. Proceedings of the *International Hospitality & Tourism Educators EuroCHRIE Conference*, Helinski, Finland.

Getty J, Getty R. (2003). Lodging quality index (LQI): assessing customers' perceptions of quality delivery. *International Journal of Contemporary Hospitality Management* [serial online], 15(2):94. Available from: Business Source Premier, Ipswich, MA.

Gosling, S. D., Ko, S. J., Mannarelli, T., & Morris, M. E. (2002). A room with a cue: personality judgments based on offices and bedrooms. *Journal of Personality and Social Psychology*, 82, 379–398.

Helmers, C., & Rogers, M. (2010). Innovation and the Survival of New Firms in the UK. *Review of Industrial Organization*, 36(3), 227-248.

Hjalager, A.M. (1997). Innovation patterns in sustainable tourism. An analytical typology, *Tourism Management*, 18(1), 15-41.

Hjalager, A. M. (2002). Repairing innovation defectiveness in tourism, *Tourism Management*, 23, 465-474.

Hjalager, A.M. (2010). A review of innovation research in tourism, *Tourism Management*, 31, 1-12.

Jang, S., & Namkung, Y. (2009). Perceived quality, emotions, and behavioral intentions: Application of an extended Mehrabian–Russell model to restaurants. Journal of Business Research, 62(4), 451–460.

Kazman, R. & Chen, H. (2009). The metropolis model: A new logic for development of crowdsourced systems. *Communications of the ACM*, 52(7), 76-84.

Lakhani, K., Garvin, D., & Lonstein, E. (2010). Topcoder (a): Developing software through crowdsourcing. *Harvard Business School General Management Unit case*, 610-032.

Lin, I. Y., & Mattila, A. S. (2010). Restaurant Servicescape, Service Encounter, and Perceived Congruency on Customers' Emotions and Satisfaction. *Journal Of Hospitality Marketing & Management*, 19(8), 819-841. doi: 10.1080/19368623.2010.514547

Lockyer, T. (2003), Hotel cleanliness: how do guests view it? Let us get specific: a New Zealand study, *Hospitality Management*, 22, 297-305.

Mari, M., & Poggesi, S. (n.d). Servicescape cues and customer behavior: a systematic literature review and research agenda. *Service Industries Journal*, 33(2), 171-199.

Mehrabian, A., & Russell, J.A. (Eds.). (1974). An approach to environmental psychology. Cambridge, MA: MIT Free Press.

OECD. (2005). Oslo manual: The measurement of scientific and technological activities. *Proposed guidelines for collecting and interpreting technological innovation data* (3rd ed.). European Commission, Eurostat, OECD.

Peters, M, & Pikkemaat, B. (2005). Innovation in tourism, *Journal of Quality Assurance in Hospitality & Tourism*, 6(34), 1-6.

Porter, M.E. (1996). What is strategy? *Harvard Business Review*, 74(6), 61-78.

Oliver, R.L. (1993) Cognitive affective and attribute bases of the satisfaction response. *Journal of Consumer Research*, 20, 418-430.

Riadh Ladhari. (2012). The lodging quality index: an independent assessment of validity and dimensions, *International Journal of Contemporary Hospitality Management*, 24(4), 628-652.

Richard, B. (2012). Cheap Solutions: Managing a co-producing crowd of strangers to solve your problems In B. Ran (Ed.), *Contemporary Perspectives on Technical Innovation, Management and Policy* (pp. 261-287). Information Age Publishing: Charlotte, NC.

Ritz-Carlton. (2003). C.A.R.E. Clean And Repair Everything: Geustroom Preventative Maintenance, Standards & Operating Procedures. The Ritz-Carlton Hotel Company, L.L.C.

Sloane, P. (2011) The brave new world of open innovation, *Strategic Direction*, 27(5), 3-4.

Tapscott, D., & Williams, A. (2006). *Wikinomics: How mass collaboration changes everything*. New York, NY: Penguin Group.

Tembi, M. N. (1991). Employee turnover: housekeeping department of Rochester hotels (Doctoral dissertation, Rochester Institute of Technology).