PART VI

POM Domains of Application
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OPERATIONS MANAGEMENT IN HOSPITALITY
Rohit Verma, Lu Kong, and Zhen Lin

1 Introduction
According to the World Travel and Tourism Council, the Travel, Tourism, and Hospitality industries collectively generate 9.8% of the world’s GDP while supporting 284 million jobs. Within the United States, the direct contribution of travel and tourism to GDP was US$488 billion (2.7% of total GDP) in 2015 and is forecasted to rise by 2.8% in 2016, and to rise by 3.7% per annum (pa), from 2016–2026, to US$722.3 billion (3.2% of total GDP) in 2026. Considering both direct and indirect impact, the total contribution of travel and tourism to GDP was US$1.5 trillion (8.2% of GDP) in 2015, a total that is forecast to rise by 3.0% in 2016, and to rise by 3.4% pa to US$2.2 trillion (9.3% of GDP) by 2026. During 2015, the total contribution of travel and tourism to employment, including indirect jobs, was 9.6% of total employment (14,248,000 jobs). This is expected to rise by 2.0% in 2016 to 14,527,000 jobs and rise by 2.4% pa to 18,493,000 jobs in 2026 (11.4% of total). The lodging sector of travel, tourism, and hospitality alone accounts for over 53,000 hotel properties, 4.9 million guest rooms, and US$176 billion in sales just within the United States. These statistics from the World Travel and Tourism Council demonstrate the size and value of the travel, tourism, and hospitality operations within the context of the global economy.

While the travel sector, especially within airline operations, has received attention within the operations management research, relatively few articles have been published in the mainstream operations management journals that focus on hospitality operations. We reviewed Management Science, Production and Operations Management, Journal of Operations Management, Manufacturing & Service Operations Management, and Operations Research for published articles that used keywords such as “hospitality,” “hotel,” or “restaurant.” We were able to find only twenty-four articles that met the above criteria (See Table 22.1 and Table 22.2 at the end of the chapter).

Given the size of the hospitality sector in terms of revenue and employment, more research needs to be conducted within the operations management discipline in order to explore unique aspects of this industry. Therefore, the purpose of this chapter is to present an overview of different topics and concepts from hospitality that provide opportunities for research to the operations management community.

The rest of this chapter is organized in several sub-sections that explore different aspects of hospitality operations.
2 The Essence of Hospitality

To study hospitality operations, first one must understand the meaning of hospitality. While many people may define hospitality as providing service to customers, in fact, there are subtle differences between the two concepts. Hospitality is a word derived from *hospes* in Latin, which means “host” or “guest.” Therefore, hospitality means taking care of customers’ feelings and emotions, going above and beyond just meeting their stated needs. In fact, although the words “hospitality” and “hospital” invoke very different emotions, they stem from the same root word in Latin described earlier. The two industries have evolved quite differently over the centuries, but they continue to share many common characteristics. For example, both industries need to take care of the unique needs of their guests by proving comfortable lodging, food-service, privacy/security, and many other similar amenities and supplementary services. Each industry can provide unique opportunities for companies operating in the other industry because of evolving customer preferences/business dynamics and changing regulations and policies. Many new industry segments are emerging at the interface of hospitality and healthcare, including senior housing and care, wellness and medical tourism, and concierge medicine.

The hospitality industry consists of a variety of service operations (Ottenbacher et al. 2009), including lodging, hotel, restaurant, tourism, convention and entertainment industries, etc. With the fast growth of the global economy and new communications technology, customers from all around the world are traveling not merely for business reasons but also for leisure and experience purposes. Therefore, managing their operations to create a memorable guest experience has become extremely important for hospitality firms during the recent years. Multiple dimensions, such as the service environment, customers’ expectations, actual service quality, and even guests’ personalities, influence the customer experience in hospitality. Consequently, managing guest experience within hospitality is a very complex task. Therefore, effective hospitality operations management must include improving guest awareness of positive emotions and distracting their attentions from negative aspects in order to minimize passive influences on overall experience (Pizam and Shani 2009).

3 Product and Service Innovation in Hospitality

Unlike in the manufacturing industry, innovation in the hospitality industry is more difficult to define, measure, and even facilitate. However, to keep up with the rapidly changing market and competition, it is necessary for hospitality firms and the hospitality industry to develop a new product, innovate services to adapt to new customer demands, and therefore remain competitive (Hassanien and Dale 2012). Current research on this topic within hospitality generally falls into two categories. The first set of papers studies the measurement of service innovation in the hospitality industry. These papers suggest that innovation can take place at multiple levels in hospitality including service concepts, primary processes, service environment, technology and service interaction, and in supporting processes (Hertog et al. 2011). Taking a step further, some new studies have identified the characteristics that contribute to the success of service development (Kitsios et al. 2011). The other group of studies puts emphasis on how to facilitate product and service innovation in the hospitality industry. For example, encouraging knowledge sharing and establishing a learning oriented strategy are demonstrated to be useful (Hua et al. 2009). From the individual perspective, both front-line employees and managers play important roles in new service development. Managers should always hold a positive attitude and grant extrinsic reward plus creativity training to motivate innovative ideas or behaviors.
4 Integrating Service Quality in Operational Processes

As demonstrated by past research studies, service quality is closely related to customer satisfaction and is the key to attract and retain guests. Therefore, it is essential for every service company to provide consistent, standard, and excellent quality that can meet guests’ expectations by launching effective quality assurance programs (e.g., “transaction-focused” and “relationship-focused”). If customer expectations cannot be met due to various reasons, errors will appear. Therefore, both programs are designed with the purpose of eliminating errors and recovering from service failures. Relationship-focused systems are more advanced since they not only provide solutions to fix mistakes, but they also find out why the errors happen in order to then prevent them from happening again.

In the process of quality assurance, both employees and customers play vital roles. Therefore, it is important to train our employees, especially those front-line workers who deal with customers face to face, to understand the complaining cues in guests’ gestures, languages, and behaviors. With efficient complaint management, we can always eliminate errors in time and restore customers’ satisfaction.

Current studies have paid significant attention to service quality from various perspectives. For example, since the SERVQUAL (service quality) measurement is proved to be inadequate in fully assessing quality, one recent research study found out the dimensions of customer perception and built a new quality model based on it for travel agencies (Caro and Garcia 2008). One other research paper came up with additional useful measurements for destination quality management (Narayan et al. 2008). Another study (Ha and Jang 2010) focuses on the relationship between service quality and satisfaction. Higher service quality can improve satisfaction and then loyalty, as shown by the research centered on traditional restaurants in Korea, and guest perception of the environment influences that relationship (Ha and Jang 2010). As with the inevitable service failure, successful and unsuccessful recovery have different impacts on customer repurchase behavior and satisfaction (Swanson and Hsu 2011). As demonstrated in the new research, higher commitment and empowering employees are more helpful in motivating them to provide excellent service with high quality (Clark et al. 2009).

5 The Role of Employees

From the topics discussed earlier, it should not be difficult to recognize the importance of service employees, especially front-line workers in the hospitality and tourism industries. Service employees generally serve several roles in daily operations. First, since they interact with customers face to face, their behavior and service quality greatly influence customers’ experiences. Studies have shown that the satisfaction and loyalty of employees directly relate to the satisfaction of customers, while indirectly relating to financial performance (Chi and Gursoy 2009). In other words, satisfied and loyal employees can improve guest satisfaction and bring additional and loyal customers that would then improve performance. Clearly, employees are the source of guest information (Huang et al. 2014). Second, from the business perspective, employees also play important roles in the development of companies. For example, current research has shown that engaged employees can not only improve customer satisfaction but can also improve innovation and develop brands (Slatten and Mehmetoglu 2011).

In addition to studying the roles of service employees, many studies also focus on how to motivate employees to perform their roles and go above and beyond what is required of them. Although some studies point out that intrinsic incentives are more important in motivating employees (Chiang and Jang 2008), it is still critical to combine extrinsic and intrinsic rewards
together in order to create a culture in which employees can get meaningful training, be fully motivated to engage, and have enough autonomy to excel (Alonso and O’Neill 2011).

6 Demand and Capacity Management

The goal of demand and capacity management is to maximize revenue, so both of them are closely related to yield and revenue management (see Section 7). Even though demand and capacity management always come up together in business and academic research, they are essentially different concepts. Companies require different strategies to manage both well.

Demand management requires the cooperation of different departments within a company since it involves pricing, promotion, distribution, and customer relationships. As shown in previous studies in the hotel industry, the setting of prices, occupancy, and the consequent revenue are greatly influenced by all the hotels within the same competitive sets (Kimes and Anderson 2011). In other words, if one hotel sets a higher price, the demand will drop significantly since customers can always find a substitute but with a lower price, so the revenue will also drop. However, if all hotels within the competitive set raise their prices, the revenue is more likely to decrease slightly.

With the development of the Internet, electronic demands have become an important source of demand and it has changed the distribution channels greatly. As a result, the hospitality industry went through several periods: the Global Distribution System, Internet era, the SoLoMo (Social, Location, and Mobile), before finally entering the hybrid stage (Thakran and Verma 2013).

There are many different approaches to analyzing capacity management within hospitality by focusing on short- or long-term strategies (Pullman and Rodgers 2010). Related research materials published during the past five years focuses mostly on studying the capacity of different types of restaurants and providing applicable decision-support models. Hwang et al. (2010) have shown that by combining marketing and operations in analyzing capacity organizations, researchers achieve better results than just focusing on one discipline (Hwang et al. 2010). Another study identified the thresholds of resources, such as a table, server, and cook, and different stages of services that affect customers’ expectations on waiting (Hwang and Lambert 2009). From those research studies, it is clear that, although each approach has its own advantages and disadvantages, it is important to select the most proper analytical technique to develop strategies and even combine them to take every aspect into consideration based on different situations.

7 Yield and Revenue Management

Yield or revenue management was popularized by American Airlines about two decades ago. In the hotel industry, revenue management is all about selling the right rooms to the right customers, at the right time. To achieve this goal, hotels should have the ability to segment their consumers and prices, then allocate room inventory accordingly across those segments. To be more specific, the task requires the revenue manager to forecast the demand using existing reservations on hand (ROH). A booking curve (used to estimate demand) can be drawn using ROH as a function of days before arrival (DBA).

Typical ways to segment the customers include by their booking channels, by the number of days they are staying, and by the day of week they are staying. For example, a special “early booking” price can be set to target those who would like to book long before their arriving date. In addition, instead of a fixed price for all rooms, variable prices can be set. For example, a hotel can sell 30 rooms at $150, 50 rooms at $100, and 80 rooms at $80 to target...
different customer segments simultaneously. In addition to variable pricing, hotels also widely use dynamic pricing. That is, instead of setting unchanged prices, a hotel can change its price over time in response to demand. Usually, hotels decrease price to stimulate demand and increase price when demand is strong. However, this strategy must be used carefully, since with decreased prices, hotels need higher occupancy to break even. If the revenue gain by increasing occupancy cannot offset the revenue lost by decreasing the price, the hotel should think twice before decreasing price.

Easy access to the Internet and the simplicity of its use greatly influence revenue management in hospitality. Since most hotel rates can be found online, consumers are able to compare room rates between different hotels from different channels. Under these circumstances, opaque pricing (i.e., when the brand name of the specific hotel, airline, etc. remains hidden until after the purchase has been completed for a discounted price) can allow hotels to keep higher rates on regular channels as well as target price-sensitive customers using competitive and private rates. For example, a channel using opaque pricing will hide the property names, only posting some segmentation attributes (e.g., location, facilities, and star levels). Only after the room is sold, will the customer find out what property they are staying at. Hotels can also use search engines to manage their exposure on the Internet.

Using online travel agents (OTAs) helps hotels targeting price-sensitive customers, thus increasing the number of reservations. Some OTAs allow hotels to pay and get specific exposure such as taking up top slots in search engine results. A recent study by Anderson (2009) shows that using OTAs can also increase reservation volume at non-OTA channels. Revenue per available room (RevPAR) is widely used to measure hotel revenue performance. In addition, a hotel should look into the performance of hotels in its competitive set.

A study based on a survey of 487 professionals shows that RM in hospitality will become more strategic and more strongly driven by technology. In addition, survey respondents think that the organization of the RM function is going to become more centralized and that the skills required for a successful revenue manager are going to be a combination of analytical and communication abilities. As a consequence of RM, performance measurement will move to total revenue or gross operating profit rather than using RevPAR (Kimes 2011). Noone et al. (2011) try to identify the influence and opportunity that social media brought to RM. They argue that social media provides the ideal platform and data source to support RM’s efforts to build a business strategy, expand RM into other revenue-generating assets, and become more customer-centric. Wang (2012) argues that in practice, companies may find it difficult to accommodate both customer relationship management and revenue management due to potential management conflicts.

8 Ownership Structure, Franchising, and Cost of Operations

Owners often do not operate hotel properties themselves. Conversely, restaurant owners are more likely to operate their own properties. Being familiar with hospitality ownership structure helps participants view the managerial issues from the point of view of owners. There are several forms of ownership. Each has its own advantages and disadvantages: proprietorship, partnership, limited liability companies, and corporations. Typically, there are four types of entities: owner, lender, operator or manager, and franchisor. Typical ownership and operating structures of the U.S. hospitality industry are:

- The owner is also the manager under the affiliation of a franchise company. This structure allows the most flexibility for the owners. However, the associated costs of affiliation can be very high, and it might not be the most effective way for the owner to manage the property.
• The owner contracts with a management firm that has its own brand, such as Marriott, Hilton, Hyatt, etc. to run operations on their properties.

• The owner is the manager and has their own affiliation. The costs of management and affiliation are the lowest under this structure. However, the brand and the managers may not be the best fit for the property and its marketing target.

• The owner is independent and manages the property. Under this structure, the cost is low and motivation is high, since the manager is the owner. However, without a well-established brand name, the marketing power may be low.

• The owner hires a management company to operate the hotel and contracts separately with a franchise company for the affiliation. The cost is highest under this structure, but the owner can choose the location, management team, and affiliation to optimize the brand fit.

Today, it is rare to see publicly listed firms that are owners of the property, have their own brand, and operate their business. This is where franchise comes in. In the relationship between franchisor and franchisee, the franchisee purchases the right to use the concept created by the franchisor as well as the right to sell goods under the franchisor’s brand image. Franchising is expected to and normally offers better results, efficiency, and cost savings for both parties.

Franchise fees in the hotel industry are different than in other industries. The franchisor collects an initial fee at the signing of the franchise agreement that is normally based on the number of rooms. Then franchisors charge a royalty fee based on a percentage of gross revenue. Other fees include training program fee, software and hardware, and so on, also calculated by a certain percentage of gross revenue. When signing their contract, both franchisors and franchisees want the other side to bear higher financial risk. Also, as the owner of the property, franchisees may want to preserve some operational control. Both sides need to decide their proper rights and responsibilities during negotiation.

Corporate social responsibility (CSR) remains a hot topic in recent years. How does the relationship between CSR and managerial ownership look in the hospitality industry? In their study, Paek et al. (2013) found that managerial ownership has a significant impact on the community, environment, and product dimensions, while it has a negative impact on employee relations and diversity dimensions. Roh and Yoon (2009) investigated franchisee’s satisfaction based on franchisor’s pre-opening support and ongoing business support. They found that franchisees were generally not satisfied with franchisors’ ongoing support but that they were satisfied with central purchasing support from their franchisors. As many franchisors are increasing the diversity of their brands, Roh and Choi (2010) explored the efficiency of brands under the same franchisor in the restaurant industry. They concluded that the efficiency of each establishment and brand differed significantly from each other. Going “green” may help hotels build a positive brand image as well as save operation costs. Rahman et al. (2012) found that at the time of the study, chain hotels were stronger adopters of green practices than independent hotels were, and hotels in the Midwest were found to be the most environmentally friendly in terms of their use of no-cost or low-cost green practices.

9 Start-Up of New Locations and Managing Hospitality Projects

For any hospitality projects or start-ups, a relationship between two categories needs to be formed: those who provide financial capital and those who provide services, materials, and labor. Then the development process shall begin: first coming up with a renovation idea, then accessing the site, considering the feasibility, reviewing current and future contracts,
making the improvements, and then finally finishing the project. During this process, many issues need to be considered. First, the demand driver needs to be identified. Which customer segments have yet to be served by the existing businesses? Do significant seasonal demand differences exist? Which hotels are part of your true competitor set? Additionally, local government should be contacted for all the support they can provide, given the benefits a hotel can provide for the local community. Then, occupancy should be estimated, and brands should be properly positioned. As an owner, one should carefully choose from a major chain brand, a small chain brand, or an independent operation to suit the local market. The chain brand’s website usually provides a massive amount of information such as franchisee benefits and requirements in order to help potential franchisors to determine whether the brand is a good fit.

Once the market investigation is clear, a consultant (company) should conduct a feasibility study. This study should examine the project itself, the market and competitors, the demand generators, and the occupancy. The study should also forecast the financial performance within a certain number of years and estimate the value of the hotel. After the feasibility study, a financial review must be conducted. This study’s results would allow for an estimate of the loans and profit. When all the paperwork and preparation are done, the next thing is construction. An experienced construction team is needed to build the hotel according to the franchisor brand and local market. Before the property opening, staff should be retained, certain approvals should be obtained from local authorities such as building department and fire department, and some properties will conduct preopening sales.

Hotel innovation projects are of great importance for managements. As a result, it remains to be a hot topic in academia. Lopez et al. (2011) explored the factors that encourage innovation in hospitality firms. They found that external factors (such as government assistance programs) had little effect on hospitality innovation, whereas internal factors (such as large firm size, membership in a business group, willingness to change, and a sufficiently bureaucratic framework to manage and institutionalize any innovations) have a significant positive relationship with innovation. When planning a start-up hotel, location is another big issue. Yang et al. (2012) investigated how existing hotels in Beijing choose their locations, finding that star rating, years after opening, service diversification, ownership, agglomeration effect, public service infrastructure, road accessibility, subway accessibility, and accessibility to tourism sites are important factors of location choice. In addition, they argued that downscale hotels do not usually seek the benefits of agglomeration effects and upscale ones are more sensitive to accessibility.

As they realize the importance of the environment, more hospitality firms are making an effort to become “green.” Sozer (2010) argued that the efficiency of the resource use starting from the building design to the end-users in hotel facilities is typically low, and the resulting environmental impacts are greater than those caused by other types of buildings of similar size. Thus, decisions taken during the architectural building design play as important a role in reducing these environmental impacts as does the management of the building.

10 Managing Risk and Disruption

Hotel investors face not only risks associated with commercial real estate investments, but they also face risks associated with the hospitality industry. The first major difference is that instead of the long-term tenant, hotels have short-term guests. The rate charged can be higher or lower than the owners initially projected. Lacking tenant commitment brings substantial risks for hotel
investors. The risks then increase the costs of investment. Hotel mortgages and loans are higher when the risks are considered higher—which is known as a risk premium. As a result, investors will look for extra returns to cover the higher rates.

11 Role of Lean Thinking and Sustainable Operations in Hospitality

Lean production is a sociotechnical production system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability. This concept was originated from the automobile industry but can be applied to other industries. Lean thinking refers to more than techniques and approaches. It is a mindset for all employees and managers to eliminate waste in all process operations. In *The Machine That Changed the World*, Womack et al. (1991) made the following points about the principles of lean production: The entire production mechanism should be customer driven. That is, the whole process should create value for customers. From the micro perspective, each step in production should be implemented and evaluated based on its role in value creation. And they should be seamlessly and efficiently integrated to deliver value to customers. This principle is not only applicable to the on-site production; it is also of vital importance to the whole flow from designing to product delivery. And the flow should be continuously improved towards perfection. Efforts have been made to implement Lean and Six Sigma into hospitality organizations. In Lancaster’s work (2011), he seeks to explore the types of operations in hospitality that have used Lean or Six Sigma and provides a plan and framework to successfully implement those systems. Working with a sample of small and medium-sized hotels in Europe, Vlachos and Bogdanovic (2013) found that hotels do apply value mapping techniques, and similarities were found in hotel operations regardless of location. They argued that many value stream mapping techniques (such as process activity mapping, supply chain response matrix, production variety funnel, and so on) could help in detecting and eliminating waste (both upstream and downstream) in the value chain. As mentioned before, buildings in the hospitality industry are not energy efficient. Does the implementation of sustainable techniques influence traveler’s choices? Prud’homme and Raymond (2013) found that the hotel’s adoption of sustainable development positively influences customer’s satisfaction. Additionally, the level of customer satisfaction varies according to the hotel’s size and type of ownership. Sirakaya-Turk et al. (2014) argued that the effect of the value of sustainable approaches is mediated by the travelers’ environment behaviors. They suggested that management should segment customers into “strong-sustainers” and “centrists-sustainers” groups and only send sustainable messages to “strong-sustainer” group.

12 The Role of New Media in Managing Hospitality Operations

During the past few years, new media has become a great marketing tool that no industry can afford to ignore. New media has significantly changed customer behavior and marketing communications. Old or new, the measurements of successful media marketing remain the same: whether or not the new media 1) boosts sales, 2) increases market share, 3) improves effectiveness for complementary media, and 4) helps build long-term customer relationship and loyalty. Usually, hotels and restaurants use an online travel agency (OTA) as one of their distribution channels. The position of display on those OTA websites can significantly affect the booking numbers. Sometimes, using OTA can even increase direct booking from the official websites of
the hotels or restaurants. As mentioned in the “revenue management” section, position of display in search engines can be a form of effective advertising which boosts sales. Firms can manage their display by contracting with search engine companies.

In a way, OTAs and search engines are already “old” technologies. Social media (online communities) and mobile media (including mobile apps) play an important role in hospitality marketing and are already seen as “new technologies.” One big difference is that, on social media, customers not only communicate with companies, they also communicate with each other in a public way, which is known as “peer-to-peer” reviews. Companies can use social media to engage customers and manage this channel by monitoring and responding to their reviews.

Mobile applications provide “space” for marketers to communicate with customers whenever and wherever they want. As we can see in real life, many hotels have launched their own apps in which customers can find relevant hotel information, booking information, comments on experience from other customers, and so on. With the help of these apps, customers can gather information easily and have better experiences during their stays. All media channels provide opportunities for companies to 1) encourage loyal customers to refer new customers and 2) find new customers directly through their interests.

Given the ever-growing importance of social media and search engines, discovering their interrelationships can provide much important information for new media marketing. Xiang and Gretzel (2010) found that social media constitutes a substantial part of the search results, indicating that search engines direct travelers to social media sites. Evidence generated from this study shows that traditional travel information providers are facing incredible challenges. As for customer preference of information gathering sources, Verma et al. (2012) found out in their study that business travelers mostly rely on their companies’ recommendations, search engines, and OTAs to gather information, whereas leisure travelers rely on recommendations of friends and colleagues, travel-related websites, and search engines. However, the researchers also found that, after the information is gathered, both business and leisure travelers tend to use company websites and OTAs to book their rooms.

It seems all evident that hospitality firms need to build and retain customer relationships via social media, but the question remains—as far should companies go? In his article, Withiam (2011) talked about what activities are appropriate and what will offend consumers. In terms of performance, how exactly does social media influence sales? Anderson (2012) pointed out that transactional data from Travelocity illustrate that, if a hotel increases its review scores by 1 point (out of 5), the hotel can increase its price by 11.2% and still achieve the same occupancy and market share.

13 Directions for Future Research

The purpose of this chapter was to provide a broad overview of operations management and related concepts specific to the hospitality industry. We reviewed published research on hospitality from major operations management journals and found that, despite the size and importance of this industry, these topics are generally under-researched. Therefore, we believe that many opportunities exist for additional research and scholarship in the rapidly evolving hospitality, travel, and tourism industry. In this chapter, we identify and describe eleven different multi-disciplinary research themes related to the hospitality sector. Operations and supply chain management scholars can provide many unique insights to addressing these important research topics which also have significant influence in enhancing the practice of hospitality around the world.

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### Table 22.1 Empirical Study on Operations in Hospitality in JOM, POM, MS, and MSOM Journals

<table>
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### Table 22.2 Non-Empirical Study on Operations in Hospitality in JOM, POM, MS, and MSOM Journals

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<td>Lin, Grace; Yingdong Lu; Yao, David</td>
<td>2008</td>
<td>OR</td>
<td>Hospitality</td>
<td>Pricing</td>
<td>Modeling</td>
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## References and Bibliography


Rohit Verma, Lu Kong, and Zhen Lin


