

RFID Technology in Theme Parks: A Case of Hong Kong Disneyland



Source: Unsplash (2025)

Background

Radio frequency identification (RFID) is a form of wireless communication technology. An RFID system consists of two components: a reader (transceiver) and a tag (transponder), where the reader uses radio waves to transmit signals to activate the tag, and then the tag sends a wave back to the reader to complete data transfer (Amsler, 2021). As a leading theme park, Hong Kong Disneyland (HKDL) has integrated RFID technology into its facilities to improve operational efficiency and enrich the overall experience for both guests and cast members.

One of the key applications of RFID at HKDL is in the costuming department. Prior to this implementation, costumes and utility equipment were tagged with barcodes that required manual scanning—a process that caused long queues during peak hours (GS1 Hong Kong, 2015). With over 7,000 cast members as of 2024 (HKDL, 2024), HKDL collaborated with vendors to develop the RFID system in 2009. The initiative included the installation of four self-service kiosks with RFID sensors and the replacement of old barcodes with durable RFID tags (GS1 Hong Kong, 2015). Cast members can now scan all necessary costumes and gear simultaneously by holding them near the kiosk's sensor after tapping their staff ID, significantly reducing processing time and wait time (GS1 Hong Kong, 2015).

Apart from the new costuming system, HKDL also adopted RFID technology in designing one of its original attractions, Mystic Manor. It is the first Disney ride in the world to operate trackless with the help of RFID technology (Cripps, 2018). Disney Imagineers explained, with over 200 RFID tags buried under the concrete floor, the ride vehicles are signaled to move according to their assigned route (Niles, 2013). Without a physical track in sight, together with the ability to start, stop, speed up, slow down, and turn the ride vehicles around by 360 degrees through the controls of RFID, Disney Imagineers were able to amplify the attraction's storytelling effect and offer a more immersive ride experience to the guests (Niles, 2013).

Challenges

Despite the advantages, several challenges accompany the use of RFID systems at HKDL. In the costuming department, cast members are required to understand how to operate the self-service kiosks. For those unfamiliar with technology, training and demonstrations are essential to ensure smooth adoption. Heavy reliance on RFID without a contingency plan could disrupt operations in the event of system failure or damage to the RFID tags. Retaining barcodes on costumes as a backup could offer operational resilience.

From a guest experience standpoint, although RFID enhances the freedom and immersion of rides like Mystic Manor, it also introduces risks. The ability to make sharp turns and sudden stops—enabled by the trackless design—may cause discomfort or dizziness, especially among younger children or elderly guests (HKDL, n.d.).

Discussion Questions

1. What are the pros and cons of HKDL's new RFID-based costuming system?
2. What contingency measures can HKDL implement when the RFID costuming system fails?
3. How can HKDL ensure the safety and comfort of guests, especially elders and younger ones, on RFID-powered attractions?
4. How might RFID technology evolve in the future to further enhance theme park operations and guest experiences?

References

- Amsler, S. (2021). RFID (radio frequency identification). TechTarget. Retrieved from <https://www.techtarget.com/iotagenda/definition/RFID-radio-frequency-identification>
- Cripps, K. (2018). What do Hong Kong Disneyland's expansion plans mean for travelers? CNN Travel. Retrieved from <https://edition.cnn.com/travel/article/expansion-hong-kong-disneyland/index.html>
- GS1 Hong Kong. (2015). Hong Kong RFID Awards 2009. Retrieved from <https://issuu.com/gsl1editor/docs/gslhk-casebook-rfid-award-2009>
- Hong Kong Disneyland. (2024). Annual Business Review for the fiscal year 2023. Retrieved from <https://hkcorporate.hongkongdisneyland.com/pdf/AnnualBusinessReview23.pdf>
- Hong Kong Disneyland. (n.d.). Mystic Manor. Retrieved from <https://www.hongkongdisneyland.com/attractions/mystic-manor/>

Niles, R. (2018). The Imagineers behind Hong Kong Disneyland's Mystic Manor talk about their award-winning attraction, at Disney's D23. Retrieved from <https://www.themeparkinsider.com/flume/201308/3599/>

Park Journey. (2016). Hong Kong Disneyland – Mystic Point. Retrieved from <https://www.parkjourney.com/disney-parks/hong-kong-disneyland-mystic-point>

Unsplash. (2025). A group of people walking around a town square. Retrieved from https://unsplash.com/photos/a-group-of-people-walking-around-a-town-square-FYL1_WV5TK8

Keywords

- Theme Park
- Attraction
- Operation
- Guest Experience
- Innovation
- RFID

Acknowledgement

This case study is based on and adapted from the work of undergraduate students CHOI Tung Ting, Michael; LAM Ka Yan, Alice; LUI Kin Hung, Hero; LUI Shu Lam, Locki; PUI Hong Ching, Alex; TSE Ka Wai, Peter from the School of Hotel and Tourism Management at The Hong Kong Polytechnic University.