

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?

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Keywords

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

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主题公园中的 RFID 技术：香港迪士尼乐园案例研究



Source: Unsplash (2025)

背景

射频识别技术是一种无线通信技术。一套 RFID 系统由两个组件构成：读写器（收发器）和标签（应答器），读写器利用无线电波发射信号以激活标签，随后标签向读写器返回一个电波以完成数据传输(Amsler, 2021)。作为领先的主题公园，香港迪士尼乐园已将 RFID 技术融入其设施中，旨在提高运营效率并丰富宾客和演职人员的整体体验。

RFID 在港迪的一个关键应用是在服装部门。在此系统实施之前，戏服和公用设备上贴有需要人工扫描的条形码——这一过程在高峰时段会导致长时间排队(GS1 Hong Kong, 2015)。截至 2024 年，港迪拥有超过 7000 名演职人员(HKDL, 2024)，其于 2009 年与供应商合作开发了 RFID 系统。该举措包括安装了四台配备 RFID 传感器的自助服务终端，并用耐用的 RFID 标签替换了旧的条形码(GS1 Hong Kong, 2015)。演职人员现在可以在刷员工证后，将所需的所有戏服和装备靠近服务终端的传感器，即可同时扫描所有物品，显著减少了处理时间和等待时间(GS1 Hong Kong, 2015)。

除了新的服装管理系统，港迪还在其原创游乐设施“迷离庄园”的设计中采用了 RFID 技术。这是全球首个借助 RFID 技术实现无轨道运行的迪士尼游乐设施(Cripps, 2018)。迪士尼幻想工程师解释道，通过在混凝土地板下埋设超过 200 个 RFID 标签，系统可以向游乐车辆发送信号，使其按照指定路线移动(Niles, 2013)。由于没有可见的实体轨道，加上通过 RFID 控制能够启动、停止、加速、减速以及让游乐车辆 360 度旋转的能力，迪士尼幻想工程师得以增强景点的叙事效果，为宾客提供更具沉浸感的游乐体验(Niles, 2013)。

挑战

尽管有诸多优势，港迪在 RFID 系统的使用中也伴随着一些挑战。在服装部门，演职人员需要了解如何操作自助服务终端。对于那些不熟悉技术的人员，培训和演示对于确保顺利采用至关重要。过度依赖 RFID 而缺乏应急预案，可能在系统故障或 RFID 标签损坏时扰乱运营。在戏服上保留条形码作为备用方案，可以提供运营弹性。

从宾客体验的角度来看，虽然 RFID 技术增强了如“迷离庄园”等游乐设施的自由度和沉浸感，但也带来了风险。无轨道设计所实现的急转弯和急停能力，可能会引起不适或眩晕，特别是对于年幼儿童或年长宾客而言(HKDL, n.d.)。

讨论问题

1. 香港迪士尼乐园基于 RFID 的新服装管理系统的优缺点是什么？
2. 当 RFID 服装管理系统出现故障时，港迪可以实施哪些应急措施？
3. 港迪应如何确保宾客，尤其是年长者和年幼儿童，在基于 RFID 技术的游乐设施上的安全与舒适？
4. RFID 技术未来可能如何演变，以进一步提升主题公园的运营和宾客体验？

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关键词

- 主题公园
- 游乐设施
- 运营
- 宾客体验
- 创新
- RFID

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主題公園中的 RFID 技術：香港迪士尼樂園案例研究



Source: Unsplash (2025)

背景

射頻識別技術是一種無線通訊技術。一套 RFID 系統由兩個組件構成：讀寫器（收發器）和標籤（應答器），讀寫器利用無線電波發射信號以激活標籤，隨後標籤向讀寫器返回一個電波以完成數據傳輸(Amsler, 2021)。作為領先的主題公園，香港迪士尼樂園已將 RFID 技術融入其設施中，旨在提高運營效率並豐富賓客和演職人員的整體體驗。

RFID 在港迪的一個關鍵應用是在服裝部門。在此系統實施之前，戲服和公用設備上貼有需要人手掃描的條碼——這一過程在高峰時段會導致長時間排隊(GS1 Hong Kong, 2015)。截至 2024 年，港迪擁有超過 7000 名演職人員(HKDL, 2024)，其於 2009 年與供應商合作開發了 RFID 系統。該舉措包括安裝了四台配備 RFID 傳感器的自助服務終端，並用耐用的 RFID 標籤替換了舊的條碼(GS1 Hong Kong, 2015)。演職人員現在可以在拍員工證後，將所需的所有戲服和裝備靠近服務終端的傳感器，即可同時掃描所有物品，顯著減少了處理時間和等候時間(GS1 Hong Kong, 2015)。

除了新的服裝管理系統，港迪還在其原創遊樂設施「迷離莊園」的設計中採用了 RFID 技術。這是全球首個借助 RFID 技術實現無軌道運行的迪士尼遊樂設施(Cripps, 2018)。迪士尼幻想工程師解釋道，透過在混泥土地板下埋設超過 200 個 RFID 標籤，系統可以向遊樂車輛發送信號，使其按照指定路線移動(Niles, 2013)。由於沒有可見的實體軌道，加上透過 RFID 控制能夠啟動、停止、加速、減速以及讓遊樂車輛 360 度旋

轉的能力，迪士尼幻想工程師得以增強景點的敘事效果，為賓客提供更具沉浸感的遊樂體驗 (Niles, 2013)。

挑戰

儘管有諸多優勢，港迪在 RFID 系統的使用中也伴隨著一些挑戰。在服裝部門，演職人員需要了解如何操作自助服務終端。對於那些不熟悉技術的人員，培訓和演示對於確保順利採用至關重要。過度依賴 RFID 而缺乏應急預案，可能在系統故障或 RFID 標籤損壞時擾亂運營。在戲服上保留條碼作為備用方案，可以提供運營彈性。

從賓客體驗的角度來看，雖然 RFID 技術增強了如「迷離莊園」等遊樂設施的自由度和沉浸感，但也帶來了風險。無軌道設計所實現的急轉彎和急停能力，可能會引起不適或眩暈，特別是對於年幼兒童或年長賓客而言(HKDL, n.d.)。

討論問題

1. 香港迪士尼樂園基於 RFID 的新服裝管理系統的優缺點是什麼？
2. 當 RFID 服裝管理系統出現故障時，港迪可以實施哪些應急措施？
3. 港迪應如何確保賓客，尤其是年長者和年幼兒童，在基於 RFID 技術的遊樂設施上的安全與舒適？
4. RFID 技術未來可能如何演變，以進一步提升主題公園的運營和賓客體驗？

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關鍵詞

- 主題公園
- 遊樂設施
- 運營
- 賓客體驗
- 創新
- RFID

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