煤氣 Towngas

香港中華煤氣有限公司
The Hong Kong and China Gas Co. Ltd.

智慧倉庫
Smart Warehouse

團隊名稱 Team Name	智慧倉庫 Smart Warehouse
成立日期 Date of Formation	2017年12月 December 2017
業務單位 Business Unit	企業物料供應及行政部 Corporate Supplies and Administration Department
部門促導員 Team Facilitator	招國來 Chiu Kwok Loi Ricky
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背景 BACKGROUND

目前煤氣公司的倉庫正面臨退休潮、現職員工年紀漸趨老化和招聘困難等難題。公司的業務亦日趨多元化，積極拓展電商市場。為了解決以上難題，支援公司業務發展和保持競爭力，公司倉庫必須透過建立及實踐「智慧倉庫」方案去實行自動化和智能化。利用最新的科技和設備，重新規劃操作流程和減少人力搬運，從而提升整體效率。

Warehouses of HKCG currently experience several difficulties such as wave of retirement, an ageing population and difficulty in recruitment. Meanwhile, business scope of HKCG is also getting diversified and actively expands into e-commerce market. In order to solve the above problems, support company's business development and maintain competitiveness, warehouses are automated and digitized through the establishment and implementation of a "Smart warehouse" solution. Overall efficiency is improved by redefining processes and reducing manual handling with the help of latest technology and equipment.
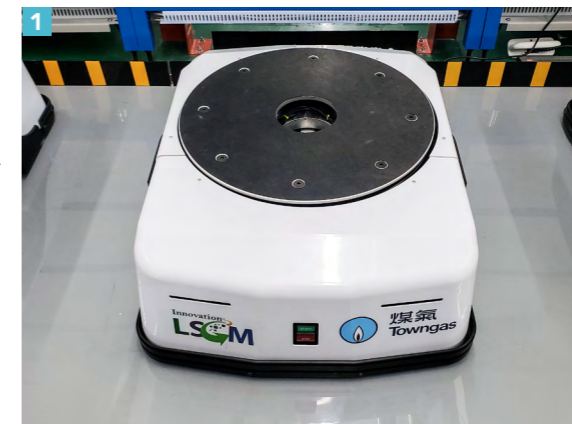
問題成因 CAUSE OF THE PROBLEM

- 沒有流動性設備
- 沒有資訊網絡基礎建設
- 人手核對燃氣爐具

- Lack of Mobile Device
- Lack of Network Infrastructure
- Manual Checking of Gas Appliance

解決方法 SOLUTION

- 配合SAP 建立自動導引運輸車系統(AGV)，利用自動機械搬運貨架至指定工作地點
    - 透過AGV和倉管系統的配合和地面標誌的定位，AGV系統能讀取區域內所有貨物的存貨量和分佈。
    - 按照揀貨單，AGV自動把指定貨架搬運到工作平台。揀貨人員在固定位置作業，消除揀貨程序中的運輸行走時間及減少人力資源。

- 利用SAP Fiori技術，編寫一個適用於爐具揀貨的流動應用程式
    - 把倉管系統連接平板電腦上，加強流動性，簡化文件處理和核對貨物程序。倉庫同事能利用平板電腦處理倉庫工作的日常流程及實時更新庫存資料，查詢爐具數量、儲存位置和歷史動態。
    - 配合著掃描器和爐具包裝上的QR標籤，同事們能於應用程式上完成揀貨和點貨程序。

- Develop an "Automated guided vehicle" system interacting with SAP, using automated machine to deliver racks to designated locations
    - Through cooperation of AGV and warehouse management system and navigation using special markings on the ground, AGV system can identify inventory level and storage location of all goods in the area.
    - According to picking lists imported from SAP, AGV automatically picks up and delivers required racks to designated work stations. Staff works in one location only, eliminating travel time and reducing human resources required in the picking process.

- Develop a mobile application for appliance picking using SAP Fiori technology
    - This application connects warehouse management system with mobile tablets to enhance mobility, simplify documentation and clicking procedure. Warehouse staff can use tablets to handle routine works, update system data in real time and check inventory level and storage location of appliance and its movement record.
    - With scanner and QR label on the package, staff can perform and complete picking and checking processes on the application.

成果及效益 ACHIEVEMENT & BENEFIT

- 自動導引運輸車系統
    - AGV自動把貨物送至揀貨員面前，大大減少員工的行走時間。工作平台上的拍燈系統為員工提供清晰的指示，加快流程並減少出錯機會。
    - 有了這個系統的幫助，每周工作時間減少了52工時。
- 爐具揀貨的應用程式
    - 程式的應用成功於倉庫推行無紙化，提高職安健水平，提升揀貨準確度和效率，並加強貨物追溯性。
    - 由於簡化文件處理流程和減省了核對工序，每天爐具揀貨工序減省了30分鐘。

- Automated Guided Vehicle (AGV) system
    - AGV automatically delivers the goods to warehouse staffs, significantly reducing their walking time among racks. "Pick to Light" system on the work stations provides clear instructions to staff, speeding up picking process and reducing opportunities of making error.
    - With the assistance of this system, weekly working time is reduced by 52 man hours.
- Appliance picking mobile application
    - This application succeeded in the implementation of "paperless" concept in warehouse, strengthening occupational safety and health, enhancing accuracy and efficiency of picking, and enhancing traceability of appliance.
    - Entire daily appliance picking process is reduced by 30 minutes due to streamlined document handling process and eliminated checking procedure.

1　自動導引運輸車
Automated Guided Vehicle

2　Fiori爐具揀貨應用程式
Fiori Appliance Picking Application