

# Special Award for Small Enterprises and Start-ups – Shing Hing Plastic Manufacturing Limited 小型企業及初創企業特別獎 – 成興塑膠製品有限公司



Shing Hing Plastic Manufacturing Ltd.  
成興塑膠製品有限公司

## Report Summary

Provided by Shing Hing Plastic Manufacturing Limited

### Company Background

Shing Hing Plastic Manufacturing Limited (hereafter called Shing Hing), established in 1995, is a plastic animal toys manufacturer. In the early years, the cost of raw materials, domestic operations, and labor continuously rose. The company must upgrade and transform to maintain competitiveness, so the company's products were transformed into eco-friendly educational toys. At the same time, the concept of Industry 4.0 is actively introduced, and it is hoped that the factory will enter the era of data management and achieve production efficiency.

### Leadership

In 2015, Shing Hing cooperated with an external consultant to conduct Industry 4.0 assessment for formulating an Industry 4.0 migration roadmap and identifying its pilot rollout projects, enabling technologies, and methodology. In 2016, Shing Hing started the implementation and was the first in the toys OBM industry to carry out Industry 4.0 migration, covering the full spectrum of Industry 4.0 applications.

### Strategy

An integrated production line from manufacturing plastic compounds to finishing final products was built based on Industry 4.0. The three main aspects of the rollout include:

1. Vertical Integration – Digitalization and Connectivity within Shing Hing
2. Horizontal Integration – Digitalization and Connectivity with supplier
3. Reasonable Automation – Reduction of labor cost and tackling the labor shortage problem in the PRC

## 報告摘要

本報告摘要由成興塑膠製品有限公司提供

### 公司背景

成興塑膠製品有限公司(下稱成興)成立於1995年,主要業務包括設計及製造塑膠動物玩具。早年有感原材料,國內運作和人工成本不斷上漲,公司必須升級轉型以保持競爭力,於是便把公司產品轉型為生態友善教育玩具。同時亦積極引入工業4.0的概念,希望令工廠進入數據化管理時代,達至節流的效果。

### 領導才能

成興管理層一直鼓勵不同的項目和計劃,推動業務發展和提升生產力。2016年自行制定及提出「2020+ 成興智能工廠」,成為行業內OBM企業實施工業4.0的先鋒。

### 策略

在工業4.0的概念和基礎下,成興建立起由塑膠化合物至成品的綜合生產線,並從三方面實現其智能工廠計劃,包括:

1. 垂直整合:引入Data management system及無紙化運作,將日常營運及生產數據全面數碼化
2. 橫向集成:材料生產水平數據化,與供應商連接,更準確地控制及預測材料用量及庫存數據
3. 合適的生產自動化:引入六軸自動化設備、優化及整合模具的設計及生產程序,降低勞動力成本

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## Customers

In the early 90s, Shing Hing mainly focused on the OEM business. Since 2000, Shing Hing has transformed into an ODM business and an OBM business by developing our brand – “Wenno.” Shing Hing also collaborated with the world-renowned brand National Geographic and Animal Planet, its global licensee, to manufacture PVC animal figurines, covering the whole business chain from design, manufacturing, distribution, and retailing.

Since 2015, Shing Hing has complied with the ISO 14006:2011 Eco Design and Manufacturing Standard for incorporating eco-design elements into the product realization. Shing Hing implemented mass standardization on parts for those brands. Thus, Shing Hing enjoyed an economy of scale in production.

## Measurement, Analysis, and Knowledge Management

After the implementation of Industry 4.0, most of the data are digitalized and collected automatically. Management is using data to perform daily operations. Different reports can easily be generated, and immediate corrective actions are taken place with the support of real-time data. Risk mitigation and reduction of raw materials inventory are significantly achieved.



Shing Hing Factory Plants in Dongguan.  
成興東莞廠房。

## 客戶

自 2015 年起，成興通過發展自主品牌“維亮 (Wenno)”，成功向 ODM 及 OBM 業務轉型。透過與世界知名品牌「國家地理」及「動物星球」合作，成興成為 PVC 仿真動物玩具的全球授權商，由設計、製造、分銷至零售，涵蓋整個業務鏈。同時，成興利用自身的設計及生產能力，對這些品牌產品組件實施了標準化，從實現規模效益。

## 評估、分析和知識管理

整個生產流程，會利用車間追蹤系統監控半成品的流向。在每個生產工序部門交接站都設有已 IOT 的磅，貨物放上磅便會利用淨重和單重的關係，自動計算出流通件數，透過工廠內聯網傳送到數據中心。透過計劃目標及實時實際產出對比，便可達至持續改善的效果。

自家研發的品質管理系統，幫助提高品管同事日常工作效率。操作員只需手持平板電腦，到所需崗位進行如常的品檢工作，在現場利用平板電腦制作品檢報告，所收集的所有數據，透過工廠內聯網實時上傳數據中心提交報告，而系統更會實時作出分析報告顯示給管理層。

項目讓成興日常營運更為數碼化，包括可實行數碼化績效管理，對生產狀況進行即時的糾正及預防措施，同時能更有效地進行原材料庫存管理，減低風險。

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## Workforce

With the adoption of a digital human resource management system, the efficiency and effectiveness of Shing Hing's workforce management have increased significantly by dropping 40% of the workforce while maintaining quality operations. Structured HR policies and procedures that benefitted from applying Industry 4.0 have helped remove the repetitive work and added new skill sets in middle management.

Shing Hing also provides clear guidelines to employees in Social Responsibility and Care Behavior Manual. And also offer diversified training courses for the workforce to enhance skills to which the needs of the ever-changing environment are catered.

The occupational health and safety system ensure a safe working environment. It focuses on compliance with the law, safety education and training, safe and environmentally friendly raw materials use, and employee occupational health checks.

Shing Hing has nurtured a strong family culture within the company and demonstrates a commitment to staff engagement and communication. We have a labor union, suggestion boxes in different departments, informal meetings, and other means of communication between employees and the top management, including the director, to support open communication among the workforce in different channels. We also offer competitive salaries, benefits, and recreational activities to improve the workforce's working and living environment.

## Operations

By introducing digitalized operation, the data from customer orders to commercial invoices is a single truth source. Factory can manage all manufacturing orders using all these systems, from production planning to finished goods inspection. MES system with sensors application showing injection machine real-time parameters to control the production quantity and schedule. A production planning system can help plan and organize all the manufacturing orders by combining production to enjoy economies of scale. Also, it can help provide recommendations for inserting urgent customer orders. Paperless application to internal QC daily operation is successful as all data collected by handheld tablet. The operator only needs to present their report at the production station.

## 工作團隊

隨著數字化人力資源管理系統的採用，成興勞動力管理效率和效益顯著提高，在保持優質運營的同時減少了40%勞動力。受益於應用工業4.0結構化人力資源政策和程序，有助於消除重複性工作並增加中層管理人員新技能。

除了高效和有效外，成興還為員工提供明確的社會責任和關愛行為手冊指引。為員工提供多元化的培訓課程提高技能，以適應不斷變化的環境需求。為了確保安全工作環境，更推行了職業安全及健康系統。重點關注遵守法律、安全教育培訓、使用安全環保原材料以及定期對員工進行職業健康檢查。

成興在公司內培養了一種強大的家庭文化，表現出對員工參與和溝通承諾。我們有工會、不同部門的意見箱、非正式會議等員工與包括董事在內的高層管理人員之間的溝通方式，支持員工通過不同渠道進行公開溝通。我們還提供有競爭力的薪酬福利和娛樂活動，以改善員工的工作和生活環境。

## 營運

通過引入數字化操作平台，成興利用科技一步步邁向工業4.0的方向，目標以達至更大的生產效益以及建立持續改善的柔性生產線。從輸入客戶訂單開始數字化，一直到開啟商務發票收取貨款，端對端的操作都以同一作業系統，以實現工業4.0其中一個重要原則「單一數據來源」。整個工廠從生產計劃到成品檢驗，都是以不同輔助系統來管理所有生產訂單及數據，數據從工作站透過工廠內聯網路傳送到數據中心加以分析及可視化顯示，務求透明化管理，達至可持續性發展。

帶有傳感器應用的MES系統，可以顯示注塑機實時參數和狀態。MES系統會按照從ERP取得的數據，在系統內進行資源分配，利用內聯網注塑機會收到生產指令而按照訂單需求生產。系統會實時顯示已生產數量，以便管控生產數量和進度。生產計劃管理系統幫助組合不同生產訂單，綜合各種需要而建議出最合理的生產計劃，減少資源浪費，享受規模經濟。

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## Results

Upon the project's completion, a stable net profit increase was recorded in the past few years. The value of finished goods has increased by more than 150% since 2013, while the gross profit ratio has increased yearly. Wenno was granted the Hong Kong Q-Mark in 2015. Shing Hing had been awarded various prestigious certifications such as BSCI, ICTI, ISO 9001, and ISO 14006. And all the products comply with EN71 and ASTM standards or relevant country-specific safety standards where the products are shipped.

## 業績

雖然歐美市場在過去數年表現不穩，但在有效的品牌管理下，項目的淨利潤、成品價值以及毛利率均有穩定增長，“維亮 (Wenno)”更於 2015 年獲得香港 Q 嘜優質產品認證。成興同時取得了 BSCI、ICTI、ISO 9001 和 ISO 14006 等多項認證，所有產品均符合 EN71 和 ASTM 標準或相關分銷國家特定安全標準。



Digitalised Management System.  
數碼化管理系統。