



# **Logistics, Procurement and Supply Chain Management MSc**

## **Thesis Projects – Outline & Examples**

[www.cranfield.ac.uk/som](http://www.cranfield.ac.uk/som)



# Benefits

- Provides **external expertise** to investigate a challenge or business issue you are faced with
- The student (supported by University faculty) will undertake an analysis based on **your problem and objectives**
- The student will present an intermediate progress report and a **final report with targeted recommendations**
- **Additional deliverables** can be part of the project, e.g. an executive summary or analysis files
- You will have the opportunity to **work with the student** for a longer evaluation period (e.g. for future employment)

# Timeline & Milestones

October – March

Taught component of the MSc

## Deliverables:

1. Interim presentation (progress report)
2. Final presentation (results and recommendations)
3. Bound copy of their thesis (detailed report)

January/  
February

- Scoping the project focus and overall aim
- **January/February:** Project submissions to Cranfield University

March/April

- **Early March:** students apply for projects
- **Mid March:** Allocation of projects to students
- **End April:** Start of thesis project
- Initial meeting between student, company and supervisor

May

- Student engagement with company
- Agreed project plan and milestones

June/July

- Data collection and analysis
- Interim presentation

August/  
September

- Thesis write up
- **Early September:** Thesis hand-in
- Final presentation

Project Duration – 4 Months

# Examples of Project Sponsors

- FMCG companies (e.g. food, fashion, tobacco, beverages, toys, home and personal care) including national and multinational organisations
- Retailers across various specialisations e.g. grocery, apparel, furniture, office products, etc.
- 3<sup>rd</sup> Party Logistics Providers (3PL)
- Ports and port service providers
- Telecommunications companies
- Automobile and engine manufacturers
- Supply chain and general consultancies
- Specialist research organisations
- Oil, gas and energy companies
- County councils
- NHS trusts, charity organisations,

... and many more ...



# Examples of Previous Project Topics

- Investigating the stores of a manufacturing company with the objectives of improving material flows, layout and control procedures.
- Analysing the operations of an oil distribution network with the objective of evaluating a demand focused strategy.
- Application of supply chain management principles to assist a social enterprise to become a financially self-sustaining producer.
- Investigate an pharmaceutical supply chain in order to reduce lead times and improve customer service.
- Evaluation of alternative stock strategies in spare parts distribution.
- Factory gate pricing opportunities for a lubricants manufacturer.
- Making cost, performance and efficiency comparisons between the finished goods warehouses of a major alcoholic spirits producer
- The application of time compression techniques to reduce inventory in a European distribution centre for consumer electronics.



# Detailed Project Examples

1. Client care engineer spare part inventory management: Matching supply and demand
2. How can global standards support the integration of multiple retail channels (omni-channel)?
3. Analysing and defining capacity requirements for a warehouse at an industrial bakery
4. Procure-to-Pay process improvement in the UK metal packaging industry - Lean Six Sigma initiative
5. Supplier selection criteria optimisation for a Chinese automotive manufacturer

# Client care engineer spare part inventory management: Matching supply and demand

## Background & Issues

- A global company providing shipping and mailing products found that its inventory management on spare parts which should be immediately available (in stock) to service engineers is ineffective due to a mismatch between customer demand and inventory profiles.
- On one side certain spare parts are stocked by the service engineer but are rarely used.
- On the other side some spare parts are used frequently but are often unavailable when needed.

## Approach

- Analyse how the company controls and manages the spare parts that are immediately available in a service engineer's stock.
- Firstly, available theory from literature and benchmark studies are reviewed.
- Secondly, qualitative and quantitative data was collected and analysed in order to understand the current spare parts inventory management policies the company applies.
- Analyse the qualitative/quantitative data (e.g. how to achieve a First-Time-Fix, that is when the service engineer can fix the problem on a single visit).
- Identify the causes of any mismatches.

## Outputs & Benefits

- The company now applies several combined approaches to manage its spare parts inventory.
- Rather than using one criterion, spare parts are now classified by many criteria using both financial and non-financial aspects.
- The planning system used to determine the planning parameters on spare parts relevant to First-Time-Fix failures was studied and optimised.
- Recommendations on future improvements of the spare parts inventory management are proposed.

# How can global standards support the integration of multiple retail channels (omni-channel)?

## Background & Issues

- Omni-channel retail depends on a high degree of communication with the various suppliers and customers as well as superior visibility of inventory across the retail channels.
- Common issues in omni-channel include: organisational silos and ownership challenges, integration and technology barriers, execution and operational barriers, as well as cost allocations and product variety.
- Data standards are crucial for inventory visibility and order fulfilment.

## Approach

- This research aimed to understand how data standards can support the integration of multiple retail channels and how effectively these standards are currently employed.
- The research project relied on a variety of data sources:
  - Trade publications and reports from consulting companies
  - Academic journals and books
  - Primary data collected through interviews with industry stakeholders
  - Secondary data obtained through multiple case studies of omni-channel retailers.

## Outputs & Benefits

- Data standards support inventory accuracy and supply chain visibility.
- Data standards ensure an industry-wide, scalable and repeatable solution, connecting the channels.
- EPC-enabled RFID, enable more visibility in the supply chain, increase inventory accuracy, and speed up order fulfilment.
- Enablers of omni-channel include top management support, the integration of system, platforms, and data standards.
- Barriers include the difficulty in integrating back-office technology across channels.
- Omni channel forces retailer to offer greater flexibility and convenience in terms of delivery and pick-up options.
- Especially 'Click and collect' options add convenience and flexibility for the customers and offering an integrated shopping experience.



# Analysing and defining capacity requirements for a warehouse at an industrial bakery

## Background & Issues

- The production of bakery products at the industrial bakery is characterised by a small average inventory, short stock holding time, and low safety stocks.
- Inventory levels across days, weeks, and different seasons are highly stochastic, following changing customer demand patterns.
- At current the activities which impact customer demand patterns and resulting production capacity and storage issues are not well understood.
- Storage capacity is severely overstretched during peak times.

## Approach

- Create profiles of current operational processes in the product storage and despatch area.
- Develop a detailed model of required storage capacity for a variety of time horizons.
- Investigate the 5-year business plan in order to understand future space requirements.
- Build a targeted simulation that investigates future storage capacity requirements.
- Identify and illustrate “what-if-scenarios” based on a range of possible future business developments.
- Suggest feasible solutions to solve capacity shortage problems in current and future operations.

## Outputs & Benefits

- One practical outcome is a realistic model of inventory flows based on historical data extracted from the warehouse management system.
- The model output can be utilised to calculate the space requirements for production periods and the degree of potential space shortages.
- The model offers a high degree of flexibility, allowing e.g. for changes to sales targets and product compositions.
- This flexibility enables the use of “What-if-scenarios” in order to analyse alternative conditions and potential solutions.

# Procure-to-Pay process improvement in the UK metal packaging industry - Lean Six Sigma initiative

## Background & Issues

- The procure-to-pay (P2P) process is an integral part of a manufacturing company's supply chain, providing the required raw material for its core operations.
- The world's largest can manufacturing company is experiencing discrepancies in its P2P process when reconciling deliveries at the end of the month.
- The lack of standardisation in the P2P processes increases the:
  - a) Complexity of the process
  - b) Probability of variance and error

## Approach

- Build a theoretical foundation upon which the current P2P process may be measured, analysed improved and controlled.
- Implement DMAIC –Lean Six Sigma Methodology to identify the process output variations using statistical process control charts
- Design an optimized and standardised Information System for the company's metal P2P process
- Reduce or eliminate discrepancies in the three-way-match and the end of month quantity reconciliation.

## Outputs & Benefits

- The process maps for central planning, procurement and finance were combined with the process map of the production plants to highlight the areas of potential improvement.
- A detailed standardised map of P2P process was developed that enabled the company to potentially reduce their inventory levels from 21 days to 7 days.
- Variance Tracking Dashboard was developed to provide live information on the Process Control including: a) quantity ordered against quantity received; b) material over/under-delivered; c) Cpk Index.

# Supplier selection criteria optimisation for a Chinese automotive manufacturer

## Background & Issues

- Competition in the Chinese automotive industry is increasingly fierce as both global and local automotive manufacturers (OEMs) are challenged to meet the ever-increasing consumer demands.
- To sustain their competitive advantage, optimizing their supply chain has become vital for the project sponsor.
- Selecting appropriate suppliers meeting OEMs' requirements is one of the most important steps to achieve an optimized supply chain.
- The project sponsor needs to substitute old and unqualified suppliers with new and capable ones.
- Its old supplier selection checklist is out of date and cannot meet its current requirements.

## Approach

- The research explored new supplier selection criteria mainly from the aspects of:
  - Quality
  - Cost
  - Flexibility
  - Sustainability
  - Customization.
- Primary data collection was based on 20 interviews and 50 questionnaires.
- Secondary data was collected from a variety of sources including company reports and data bases; case studies and trade journals and reports.
- Analytical Hierarchy Process (AHP) method was employed to create a transparent and repeatable sequence of the supplier selection criteria.

## Outputs & Benefits

- Current supplier selection and evaluation criteria was evaluated to unearth fundamental flaws in how the criteria were sequenced in terms of their comparative importance.
- A detailed supplier selection criteria was developed that enabled the procurement department to assign a weighted score to each category.
- Based on the assigned weighted score, the project sponsor was able to potentially compare and contrast different suppliers in a transparent and repeatable manner.