

# Technology Strategy to Change the Service Offered on a Refit

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Established 1983

# Summary

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- Introduction
- Industry Trends
- Problems with Traditional Approaches
- Technology Strategy
- Development Strategy
- Conclusion

# Introduction

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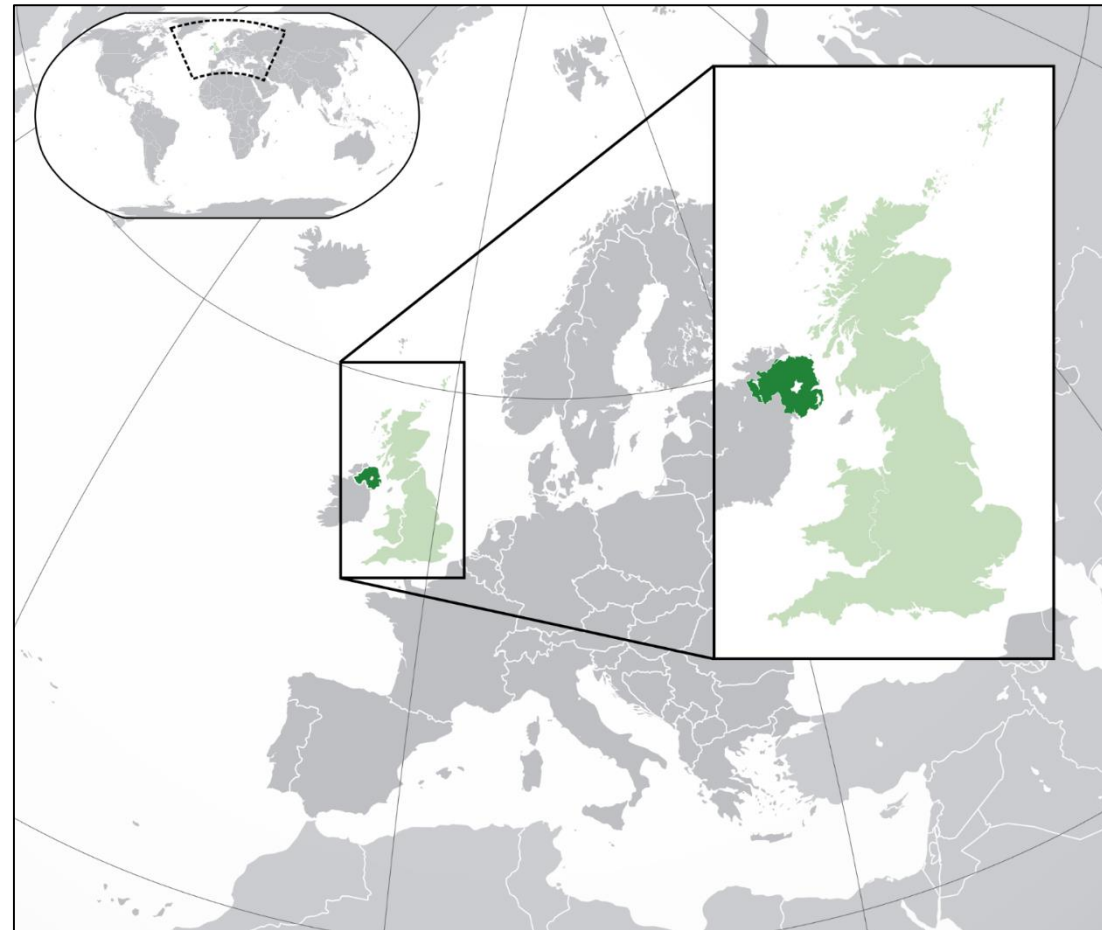
## Edward Fitzpatrick

- BEng, Materials Science and Engineering, Imperial College London
- MSc, Polymers and Composite, Ulster University
- KTP Associate partnered with MJM Marine Ltd. and Ulster University, winning Business Leader of the Future
- Member of IMarEST and IOM3
- Research & Development Manager, MJM Marine Ltd.

# Introduction

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## Northern Ireland in Context



# Introduction

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## Northern Ireland in Context



Harland & Wolff 1995



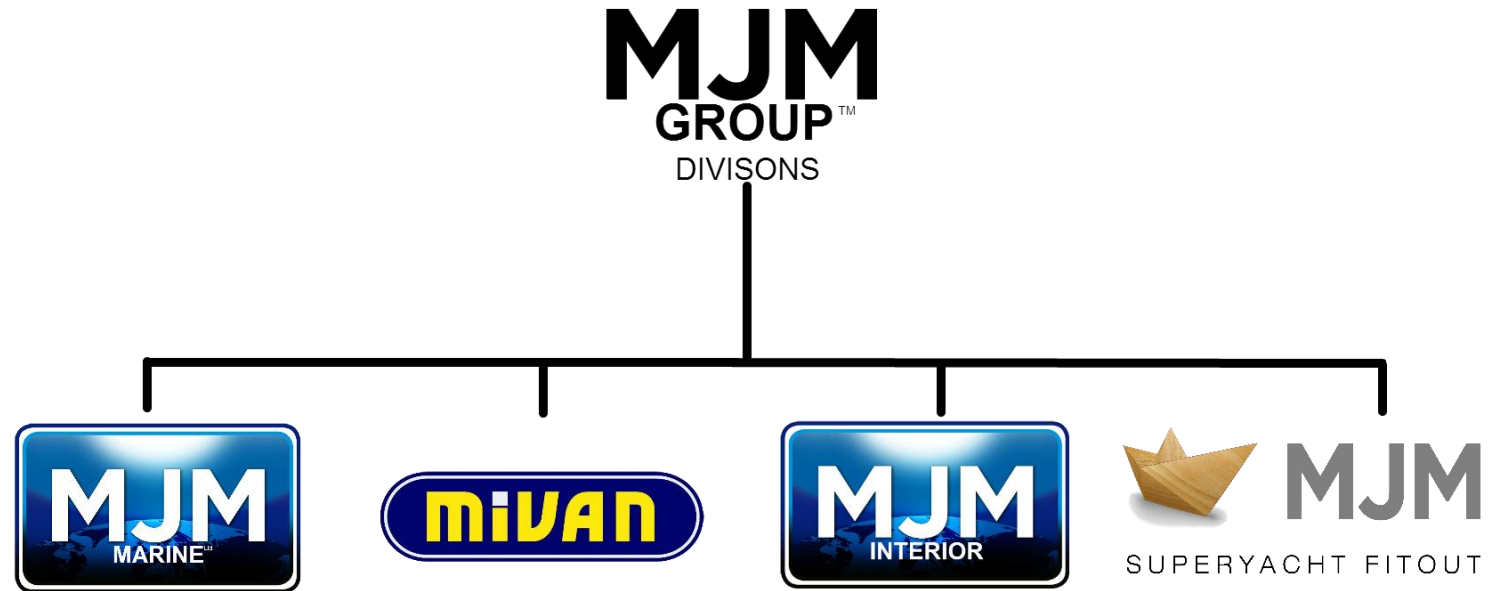
E-LASS Gorinchem 2015 Harland & Wolff 2015

# Introduction

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## MJM Marine

- Company Structure

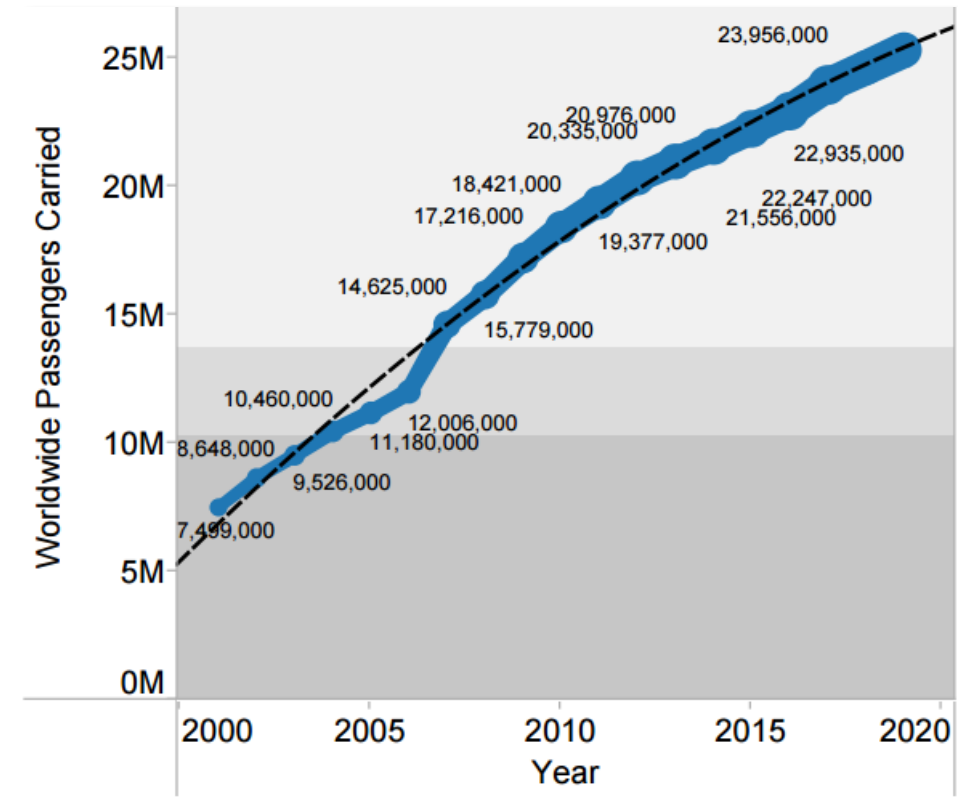




# Industry Trends

## Cruise Ship Market Growth

Year	World Wide Passengers Carried
2015	22,227,000
2019	25,316,000



# Industry Trends

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## Linear Strategies to Manage Growth

- Offer shorter cruises
- Deploy fleet throughout the year
- Increase capacity
  - Additional fleet with greater capacity
  - Additional cabins to existing fleet





# Problems with Traditional Approaches

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## An Ageing Fleet

- Lost reputation with customer dissatisfaction



Continuous battles with corrosion



Flexural Fatigue and subsequent lifting

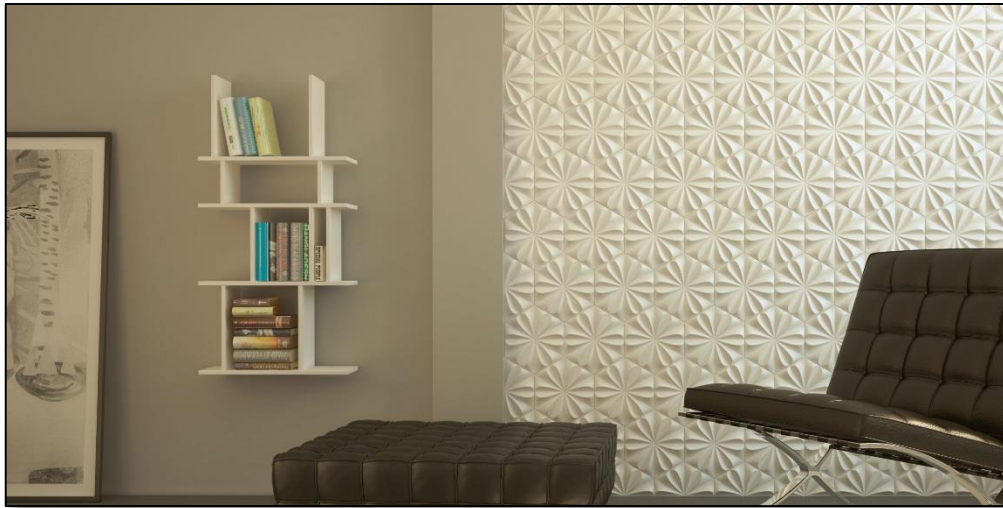


Haphazard Patchwork Fixes

# Technology Strategy

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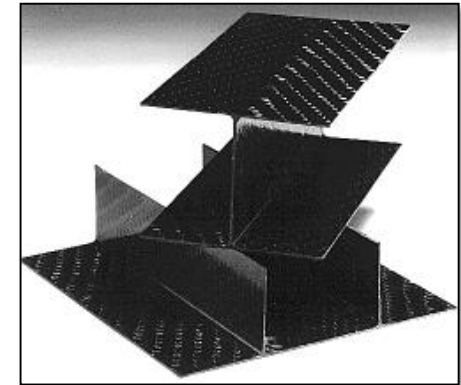
## Advanced Composites Integration



Decorative GRP for Walls & Ceilings



Superyacht Modifications



Structural Components (Regulation 17)

# Technology Strategy

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## Northern Ireland – From Flax to Fibre



Double Demask Power Loom, Warrington, County Down



Northern Ireland Advanced Composites & Engineering,  
Belfast, County Antrim

# Development Strategy

## Attain access to knowledgeable, intellectual support & physical resources



Northern Ireland Advanced Composites & Engineering,  
Belfast, County Antrim

- 40,000 sq ft facilities housing ~£3m of equipment
  - 20 full time operators and technicians
  - Workshops (**Advanced Fabrication & Processing**)
  - **World Class Laboratories** (Mechanical & Environmental Testing, Polymer Processing, 3D Weaving, Microscopy, Thermal Analysis)
  - Design & Visualisation Facility
  - World Class Conference Facility
  - Quicker product/process development
  - **Business 2 Business** opportunities
  - Share knowledge & **best practice** from **aerospace, automotive & defence**
  - Access to University Expertise
  - Quickly become **Global Leaders** in Marine Composites



# Development Strategy

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## Attain access to knowledgeable, intellectual support & physical resources



### ■ Current Participants:

- ADS
  - Axis Composites
  - Base
  - B/E Aerospace
  - Bombardier
  - CCP Gransden
  - CPI Technologies
  - Datum
  - Denroy
  - Enbio
  - LPE
  - McFarland Associates
  - Salamander
  - Thales
  - WiS
  - Wrightbus
- Trade Organisation
  - Composite Consultancy
  - Stress Analysis
  - Aircraft Interior
  - Aircraft Manuf. (3<sup>rd</sup> largest)
  - Composite Manufactures
  - Process Equipment
  - Tool Design
  - Engineered Plastic Services
  - Surface Technologies
  - Rapid Prototype Development
  - Concrete Consultancy
  - Amphibious Vehicles
  - Aerospace Equipment
  - Automated Machinery
  - Composite Bus Manufacturer

# Development Strategy

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Attain access to knowledgeable, intellectual support & physical resources



**BOMBARDIER**

denroy®

**THALES**





# Development Strategy

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## Funding

 The logo for Innovate UK consists of the text "Innovate UK" in a white, bold, sans-serif font, centered within a solid purple rectangular background. The logo for HORIZON 2020 features the text "HORIZON 2020" in a white, bold, sans-serif font. The word "HORIZON" is positioned on the left, and "2020" is on the right. A bright sun or starburst is centered behind the letter "O" in "HORIZON", creating a lens flare effect. The background is a dark blue gradient with a thin, glowing blue arc at the bottom, resembling a horizon line.

# Development Strategy

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## Other Projects for R&D

- *“Purpose built factory purely for production of high performance engineered laminated structures for the refit and cruise industry.”* (BMcC, CS&F, 2015)
- Joint Industry Projects@ NIACE taking on global challenges w/ Bombardier BE, Wrightbus, Denroy etc.
- Products & Processes to minimise non-value added time at site, revolutionising the dry dock service
- Products and systems designed for a circular economy in marine interiors
- Smart Hybrid products with integrated technology (eg fibre optics, magnetics & sensors)
- 3 Dimensional Additive Manufacturing

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WRIGHT



# Conclusion

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- MJM Group Operations
- Position within the Industry
- Technology & Development Strategy
- What can be achieved on a refit?

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