Smoothing production planning

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Fair Dynamics consulting

the companies

- Fair Dynamics
  - Milan based Management Consultancy

- DSE Consulting
  - Leicester based Decision Support Consultancy
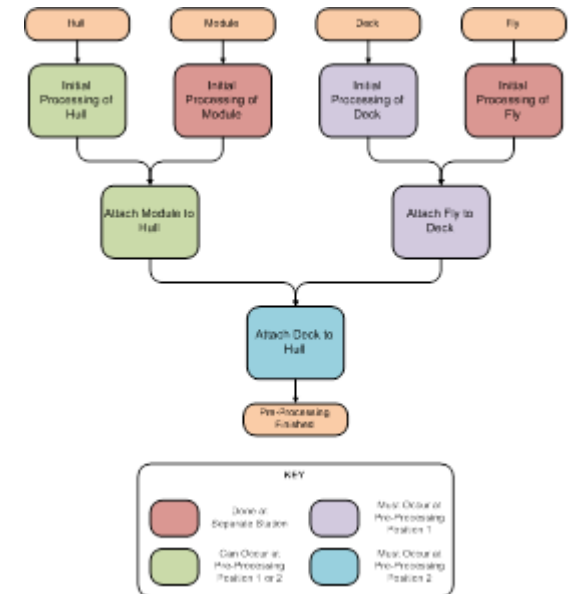
- Collaboration agreement since 2011

The dream…

…and the
nightmare

Production uniqueness

- Complex process flow
- Logistic over 60 foot
- Limitation in space (both for yachts and people)
- Inflexible highly skilled workforce
- High quality & 'hand made' finish, but delivered cost effectively
- Huge quantity of man hours of work - circa 6000hrs
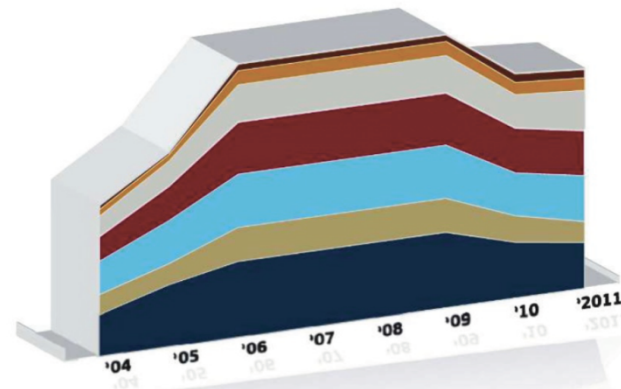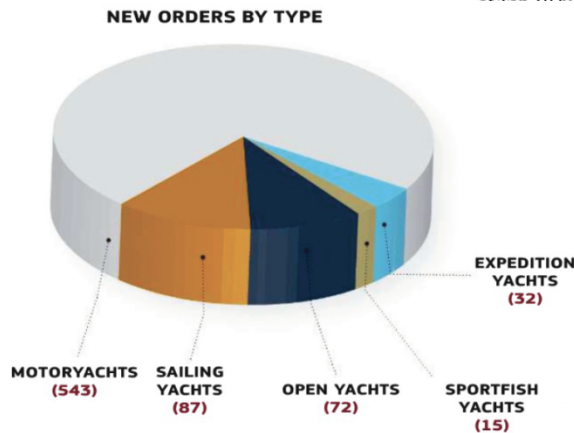- Different *specialist* trades

The case: the market

ITALY* (1) 37,400ft (11,399m)

THE NETHERLANDS (2) 11,063ft (3,372m)

TURKEY (3) 9,334ft (2,845m)

UNITED STATES (4) 8,424ft (2,568m)

UNITED KINGDOM (5) 5,512ft (1,680m)

FRANCE (9) 1,932ft (589m)

GERMANY (6) 4,826ft (1,471m)

CHINA (8) 2,732ft (839m)

TAIWAN (7) 3,438ft (1,048m)

NEW ZEALAND (10) 1,532ft (467m)

TOP 10 BUILDER NATIONS

- Italy is the top nation in yacht industry of luxury yachts and super yachts.
- Market downturn from 2008
- Mature and competitive market

NEW ORDERS BY TYPE

- 250'+
- 200'-249'
- 150'-199'
- 120'-149'
- 100'-119'
- 90'-99'
- 80'-89'

MOTORYACHTS (543)
SAILING YACHTS (87)
OPEN YACHTS (72)
SPORTFISH YACHTS (15)
EXPEDITION YACHTS (32)

'04 '05 '06 '07 '08 '09 '10 '2011

* (data super yacht intelligence 2011)

The case: the customer

- New Entrant to the market
  - With New designs
    - Immediate winner of international prizes
  - New manufacturing ideas
    - lean manufacturing influenced
    - And a new production site
  - And an attractive price

- Equals **immediate success :-)**

- But...with a complex manufacturing process and a company still '*learning*' how could production keep pace with sales without compromising quality? :-(
  - 1 model currently, with aggressive growth strategy needing a *fast* production ramp up period

- The management felt that the solution lay in production scheduling, but current tools were not fit for purchase

- **The company needed a new approach to the production scheduling problem**

The case: the requiments

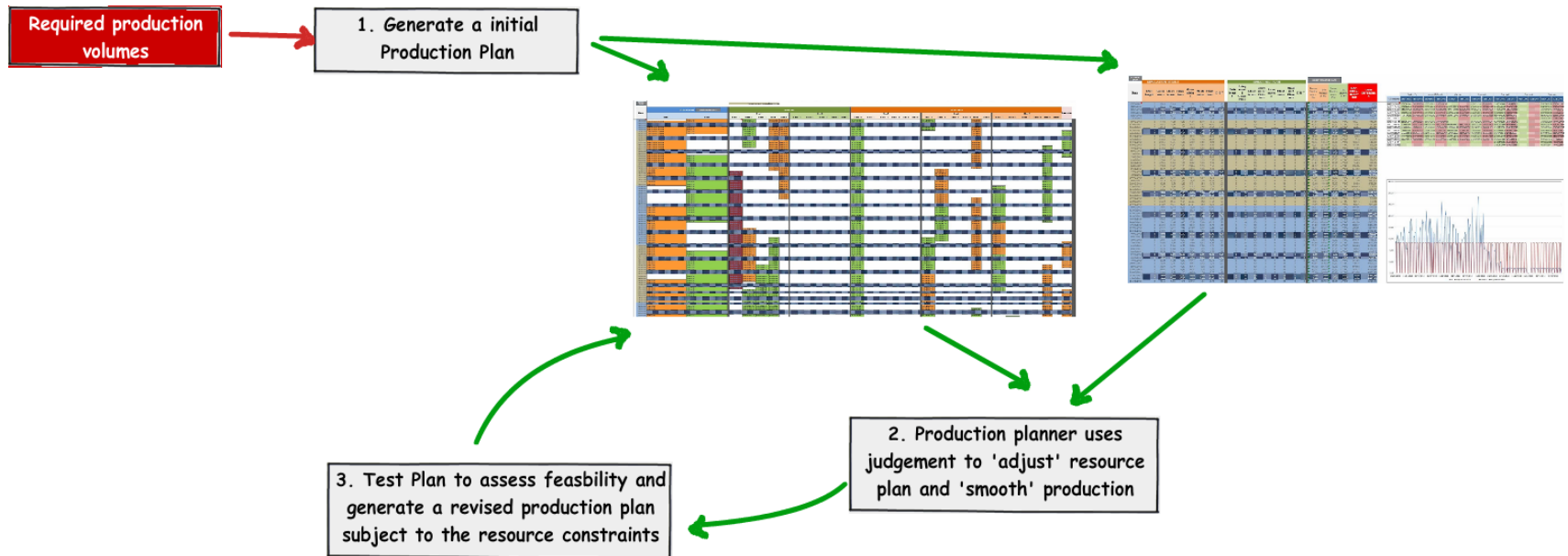The managers needed a new intelligent approach that would make the planning process simpler.

- How to balance the delivery dates required by final customers with the need of workforce over the production season
- Aggregate production plan to be used for scenario's analysis
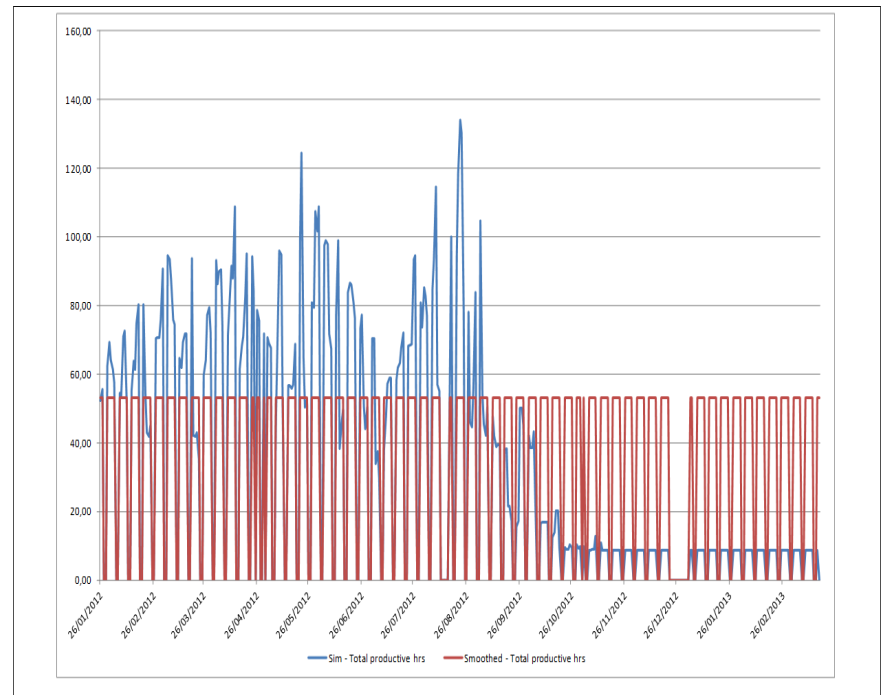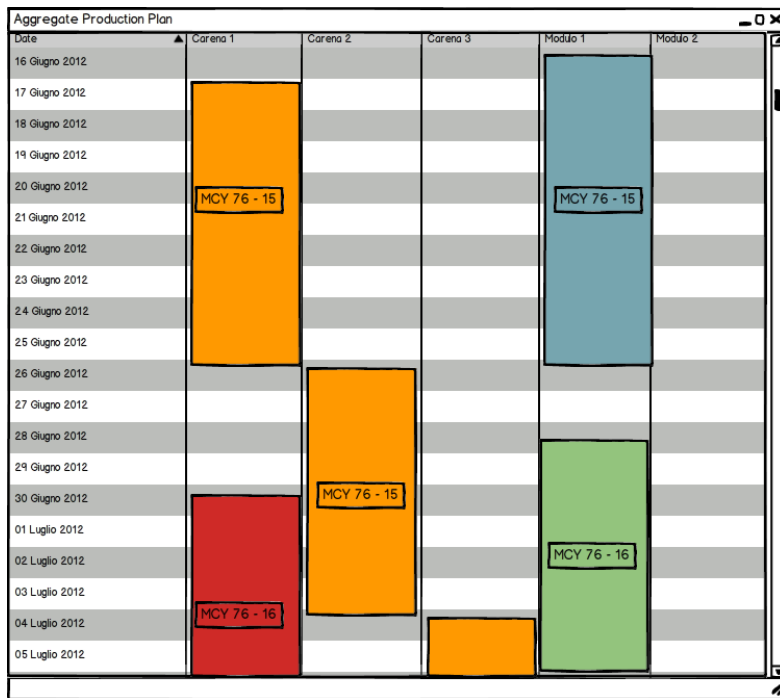
the Solution

- A test & learn decision support system power by AnyLogic simulation

Required production volumes

1. Generate a initial Production Plan

2. Production planner uses judgement to 'adjust' resource plan and 'smooth' production

3. Test Plan to assess feasbility and generate a revised production plan subject to the resource constraints

AnyLogic® 6

Mixed modelling methodology using discrete Event & Agent-Based approaches

the innovative features (1)

- ## Agent Based approach for the production planner

  - complex rules in daily scheduling tasks

    - What is the best daily schedule to meet delivery dates?

    - What should *bob* do next?

    - I'm getting behind - what should I prioritise to minimise the impact
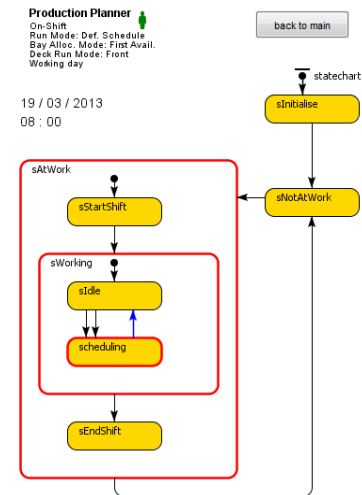
- ## Built by working very closely SMEs & the *real* production planner

  - to ensure we understood how day to day decisions were being made

  - that we had a good 1-to-1 fit between reality and the simulation

the innovative features (2)

- a new enterprise library object
  - dealing with concurrent process
    - on the same yacht
    - but which might take different times
    - and use shared resources
    - but of different types
    - that might also be needed elsewhere
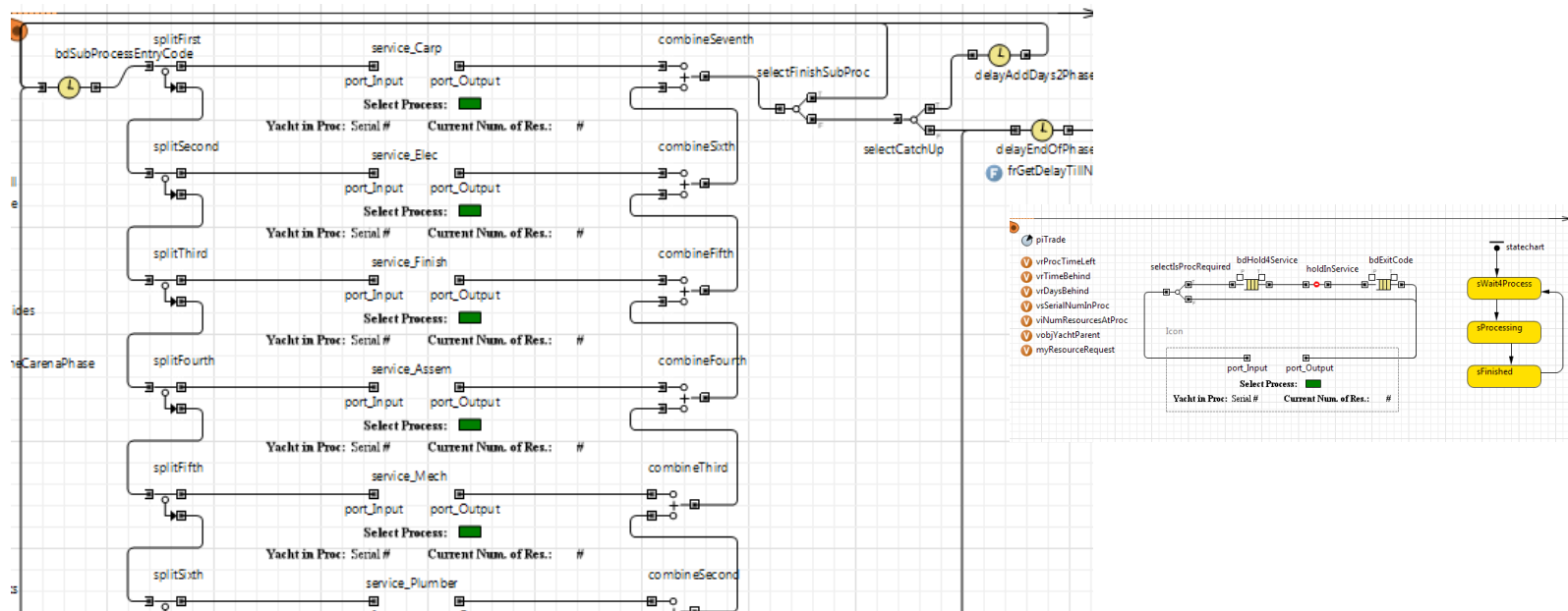
the innovative features (3)

- Test & Learn

the demo...

concluding remarks

- A happy *learning* customer
  - Easier planning during the budgeting process
  - Operational improvement - an improvement in resource utilisation

- The project also provided a basis for the follow on project -
  - Extend the planning tool to other aspects of the supply chain
    - furniture manufacture
    - fiberglass shop

- Commercially - A innovative planning tool with broad applications

- Evidence that the use of agents does deliver robust solutions for complex system modelling - beyond the limits of DE

Questions

Thank you for your time...

Luigi and Dave

Further information available from

● www.fairdynamics.com
● www.dseconsulting.co.uk

Or grab us for a coffee or glass of champagne later ;-)