



School of Engineering and Mathematical Sciences

Uma Patel, John Carlton, Michael Tscholl





**CITY UNIVERSITY
LONDON**

The University for business
and the professions

Content

- **Setting:** MSc in Maritime Operations and Management (MOaM)
- **Research:** Technology enhanced learning (Ensemble)
- **Module:** Conceptual ship design module
- **Fieldwork:** Ethnography in the classroom
- **Orchestration:** Resources and interventions
- **Conclusions:** Summary and future

Education for Future Maritime Managers and Leaders

Strategic
relationships

**Taught by
Maritime Leaders**

**In consultation with
Maritime organisations**

Broad based
curriculum
including
technology,
management,
operations,
law and
accounts

REGULATORS

- Classification Societies
 - IMO
 - Flag States
- Baltic Exchange
 - Lloyds
 - UK Government

SHIPPING

- Ship Owners
- Ship Managers
 - Shipper or Charterer
- Ship Broker
- Liner Agency Services

SUPPORT SERVICES

- Media & Publishing
- Maritime Education
- Manning Agencies
 - Research Consultants
- ICT Services

INTERMEDIATE SERVICES

- Marine Insurers
- Lloyd's Brokers
- Legal Advisers
- Bankers & Accountants
- Technical Consultants and Surveyors

INDUSTRY ASSOCIATIONS national / international

MSc in Maritime Operations and Management (MOaM)

First cohort 2003

London UK
Base /



**CITY UNIVERSITY
LONDON**

The University for business
and the professions

Vision

To give students the necessary skills to become effective leaders and managers in the marine industry and to be technically literate.





CITY UNIVERSITY
LONDON

The University for business
and the professions

Programme Structure

- Professional Studies and Research Methods

Core Modules :

ALL

- Maritime Technology
- Maritime Management
- Maritime Operations
- Maritime Law and Insurance
- Maritime Economics and Accounting

Elective **CHOOSE 3**

- Ship Design
- Security Studies
- Environmental Issues
- Marketing and Maritime Services
- Port Strategy and Development
- Offshore Engineering and Operations

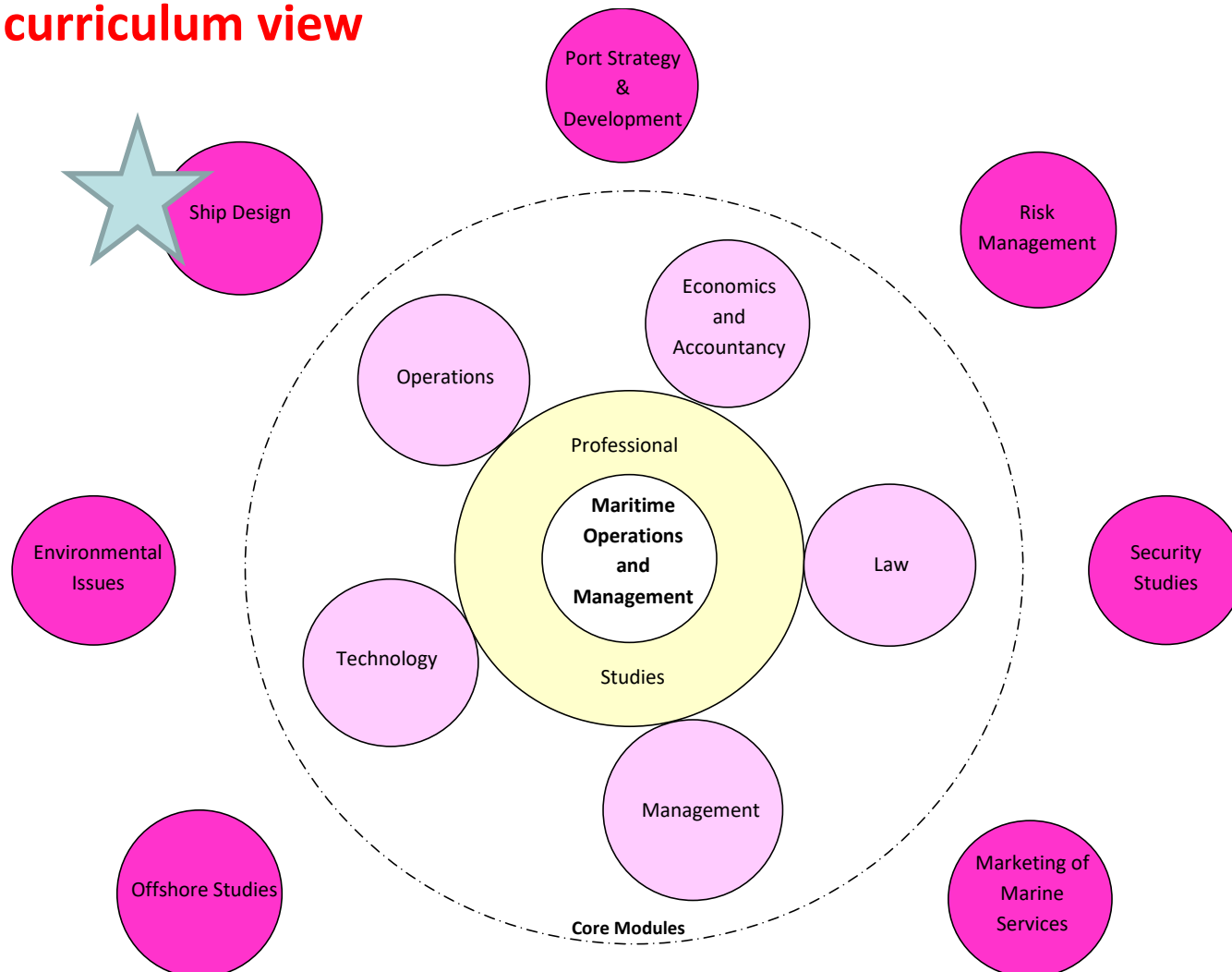
- Dissertation



**CITY UNIVERSITY
LONDON**

The University for business
and the professions

MOAM curriculum view





CITY UNIVERSITY
LONDON



www.ensemble.ac.uk

The Ensemble Project

- Part of National TEL UK £12m [ESRC](#)/[EPSRC](#) funded
- Ensemble one of 8 projects
- Ensemble research settings UG and PG courses at Cambridge and City
- Collaborators - UK Universities (Cambridge, City, UEA, Stirling, LJMU),
 - Economic and Social Data Service UK,
 - 2 international partners (MIT and UT Sydney)
- Team includes education researchers, cognitive scientists, computer scientists and disciplinary specialists



CITY UNIVERSITY
LONDON



www.ensemble.ac.uk

Ensemble research

- N**ature, scope and role of learning with cases and their relationship to learning outcomes and expertise?
- P**edagogical affordances of using semantic web technologies to support learning where outcomes are complex?
- T**heoretical framings for researching the dynamics of learning in practice, and the design of learning technology to enhance this?

Ensemble project settings

- Maritime Operations and Management
- Journalism
- Archaeology and Anthropology
- Plan sciences
- Contemporary Dance
- Field work and outdoor education

Commonalities

- Complexity from many variable
- Multiple, heterogeneous information sources
- Information incomplete or missing
- Judgement / decisions around trade-offs
- Collaboration in international teams
- Time pressures, presentations, reporting



The Brief



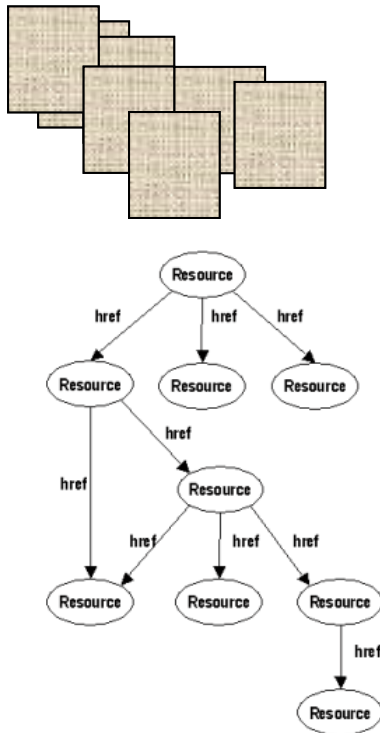


CITY UNIVERSITY
LONDON



www.ensemble.ac.uk

Web 1.0



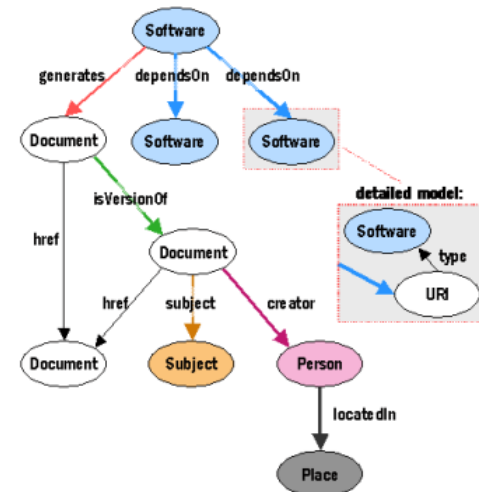
Docs. access/store

Web 2.0

Power of social
Networks
Collaborative
Authoring
Friends
Colleagues
Family
Face book
Wikipedia
Flicker
Twitter

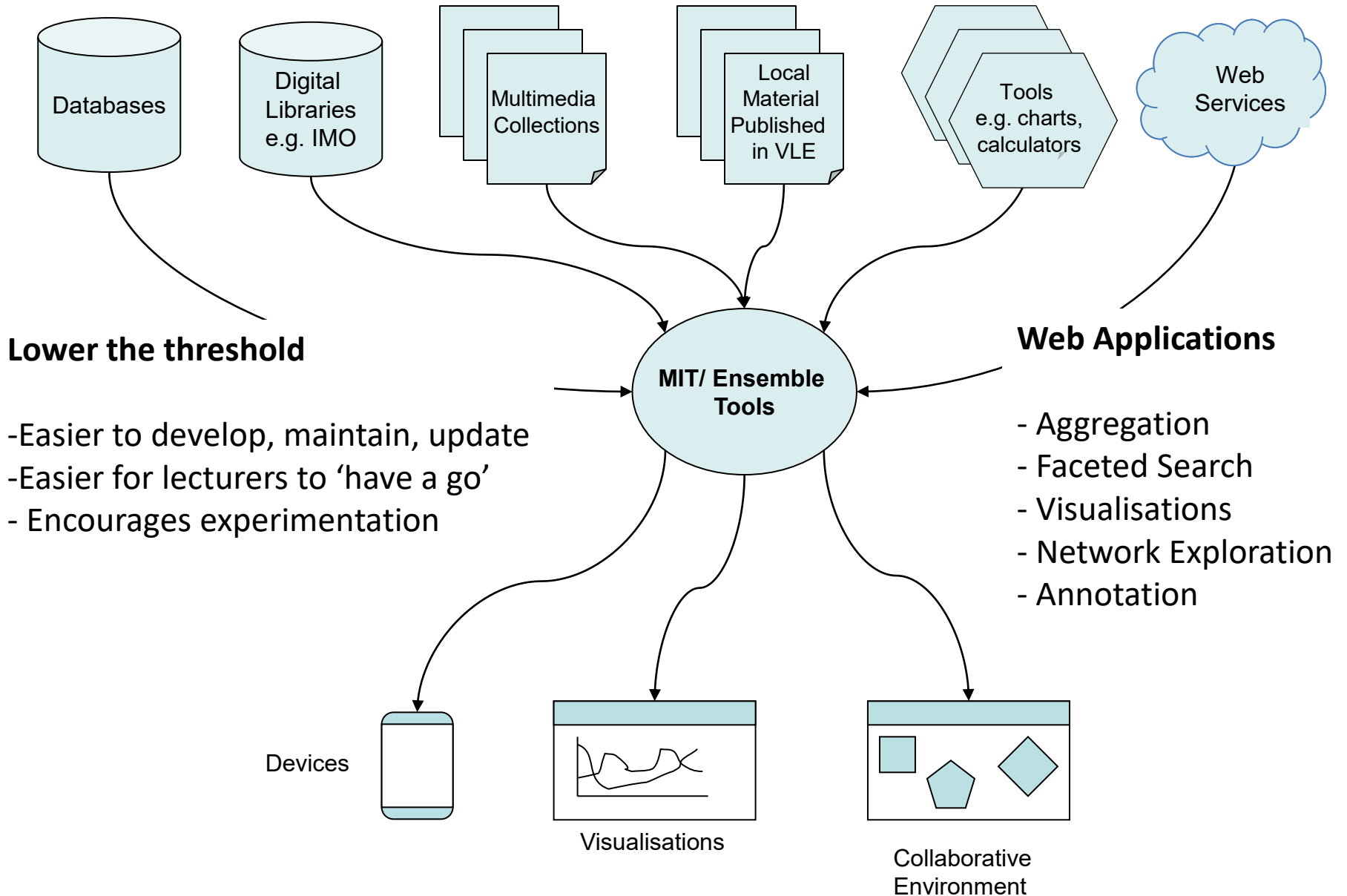
The collective

Web 3.0 semantic web



Databases/ structured
data aggregation
reasoning

Ensemble semantic technologies





CITY UNIVERSITY
LONDON

The University for business
and the professions

Conceptual Ship Design - The Case

- A suitable case - **The Scillonian III**
Hypothetical replacement
- Passenger ferry, day excursions, cargo
- Commercial case
- Reliability case
- Safety case
- Passenger experience
- Competitor analysis
- Technical design decisions e.g. Hull form and type , propulsion/resistance , shafting, engine type, docking considerations, sea keeping, safety, environmental friendliness.





Conceptual Ship Design Module

- 1 day of lectures compliment previous lectures in ship technology and operations
- Students allocated to group
- Mixture of experience
- International mix
- Group elect chief designer
- Other roles are allocated
- Resources made available
- Lecturer provides help and guidance
- Student present in teams
- Assessed on individual presentation and report

Extract from the brief

“Board of directors invite conceptual design options to be presented to them on the possible replacement of the ship within the next few years.”

- The basic ship type, form and layout.
- The machinery and propulsion type, auxiliaries and layout.
- The outline of the electrical system and communications.
- The personnel safety arrangements.
- An environmental plan for the ship's operation.
- A supporting economic case, including operational costs, marketing and analysis of the competing transport options



Findings from ethnographical observations

- Fieldwork – nonparticipant observations, rich descriptions, photos, informal conversations, notes, follow up interviews
- Two types of dynamics:

Interventions?

A - productive

- Task is structured and planned
- Justification directed discussion
- Directed search and browsing
- Argumentation is task focused
- Example based reasoning
- Sharing of artefacts for grounded talk

B - confused

- Being overwhelmed
 - Don't know what to do next
 - Aimless browsing
- “At its most extreme this sense of being lost is when students don't know where they are, where they have been and where they are going”



CITY UNIVERSITY
LONDON

The University for business
and the professions

Interventions

- What events/factors turn B to A
- What reduced periods of B type activity
- Teacher's interventions
- Early group discussion of problem and stages
- Understanding design as iterative
- Right questions at the right time
- Right resources at the right time
- **Can technology help?**





CITY UNIVERSITY
LONDON

The University for business
and the professions

Orchestrating Interventions

- **How can technology help?**
- Knowledge engineering techniques
- Visual representation of the design process
- Questions at each phase of design
- Appropriate resources linked to each phase
- Still allow groups to learn from mistakes



Orchestrating Interventions with learning technology

Ship Design Maritime Operations and Management

A resource using semantic web approaches developed by the Ensemble Project. [EPM793] [v1.2 04-04-2012]

[Introduction](#) [Preparation](#) [Ship Design Exercise](#)

Conceptual Ship Design Online

Welcome to this experimental web resource. Knowledge of the current trends in application of research to ship design, marine equipment and systems is desirable for managers and leaders in the sector. Think of this web resource as an App to help you to negotiate the complex process and resources associated with learning about ship design. You will work as a team on this module and will rely on each other's skills and knowledge. This module will draw on work covered in the core modules especially Maritime Technology, Operations, Business and Economics.

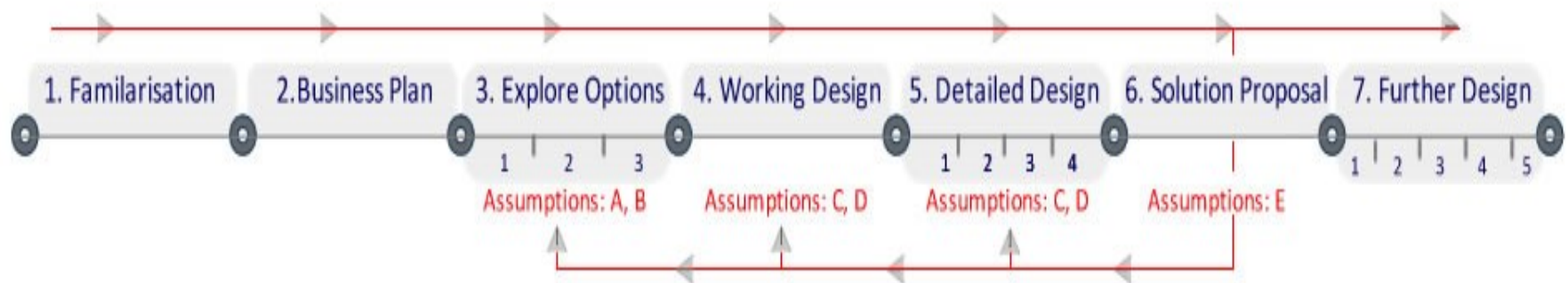


About this Web Resource

This resource uses a new kind of web architecture (the 'Semantic Web') which enables you to explore information and display the results in different ways - you'll find lists of guidance questions, picture galleries, articles and spreadsheet programs linked in ways that model the ship design process. It will also link to other relevant sources of information - like IMO website, Google Books and the City library. But it does this 'live' - it might not find anything when it gets there. If it hits a dead end - it's making the best use of what it can find.



Orchestrating Interventions with learning technology



Questions

Resources

Move back and forward in the process

Orchestrating Interventions with learning technology

Design Phases		1 <input checked="" type="checkbox"/>
1	1. Familiarisation Ship Design Case and Exercise	<input type="checkbox"/>
1	2. Business Plan for Ship Design Case	<input type="checkbox"/>
3	3. Exploring Ship Design Assumptions and Constraints	<input checked="" type="checkbox"/>
1	4. Working Assumptions Decisions and Revised Business Plan	<input type="checkbox"/>
4	5. Detailed Ship Design	<input type="checkbox"/>
1	6. Ship Design Solution Proposal	<input type="checkbox"/>
5	7. Further Detailed Design	<input type="checkbox"/>

Ship type options

This phase is about undertaking research and working as a team to understand the preliminary decisions that will restrict and shape the design possibilities.

What improvement to the ship design is envisaged at this stage.

What would be the advantage, if any, for a different ship types: monohull, catamaran , trimaran , other

What are the sea conditions likely to be encountered?

Is ship to be cargo only, passenger only, or cargo and passenger?

What are the priorities in terms of considering the competition from helicopter and aeroplane services?

Consider current passenger and crew comfort and whether and how to improve it?

Consider the reliability of hull structures for service conditions?



Paper on
multi-hull
comparison



Paper on
mono-hull
behaviour: Van



Admiralty charts
of Hugh Town



MARSDEN
SQUARE
calculator



Video
advantages of
catamaran 1



Video
advantages of
catamaran 2



Video on
Trimaran



Seakeeping
analysis



Human Comfort
Data



**CITY UNIVERSITY
LONDON**

The University for business
and the professions

Conclusions

- General heuristics for ‘how to do design learning’ useful but lack specifics
- Ethnographical observations suggest new findings
- Students find it difficult to manage time and structure the process
- Students can become overloaded
- Expert lecturer intervention is key
- This is difficult to deliver consistently and with large cohorts
- Capturing expert pedagogy and knowledge is an alternative
- Affordances of semantic technology can help
- Lowering the threshold for development of TEL is important
- Our application is promising
- More studies and developments are planned