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How to foster innovation – the past
and the future

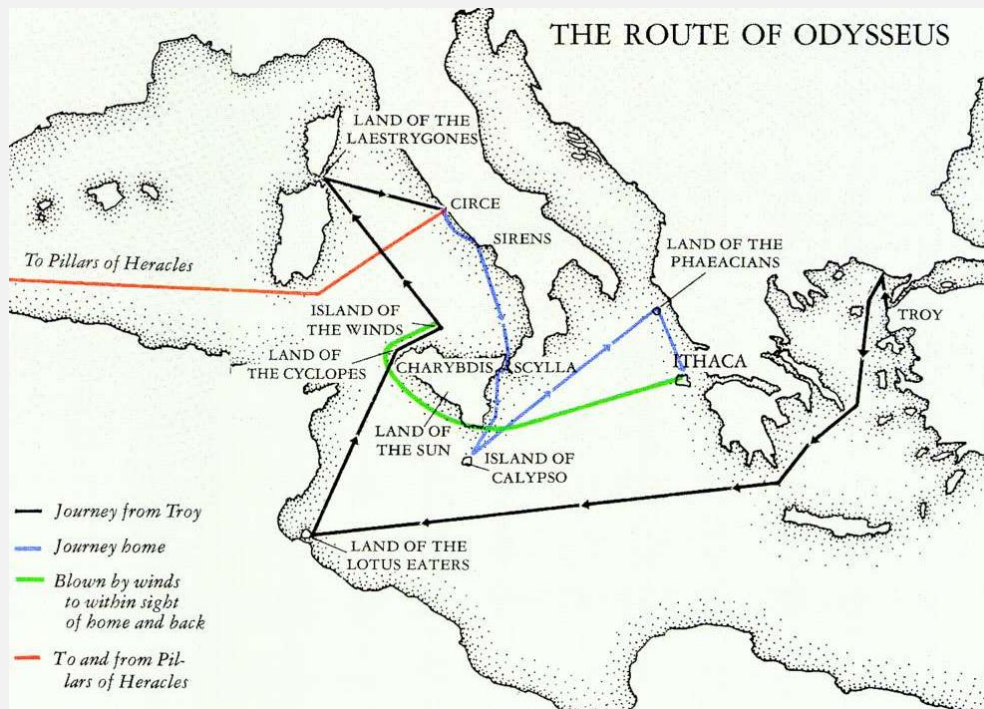
**Innovation in the past – ideas for the
future ?**

INNOVATION IN THE PAST – IDEAS FOR THE FUTURE ?

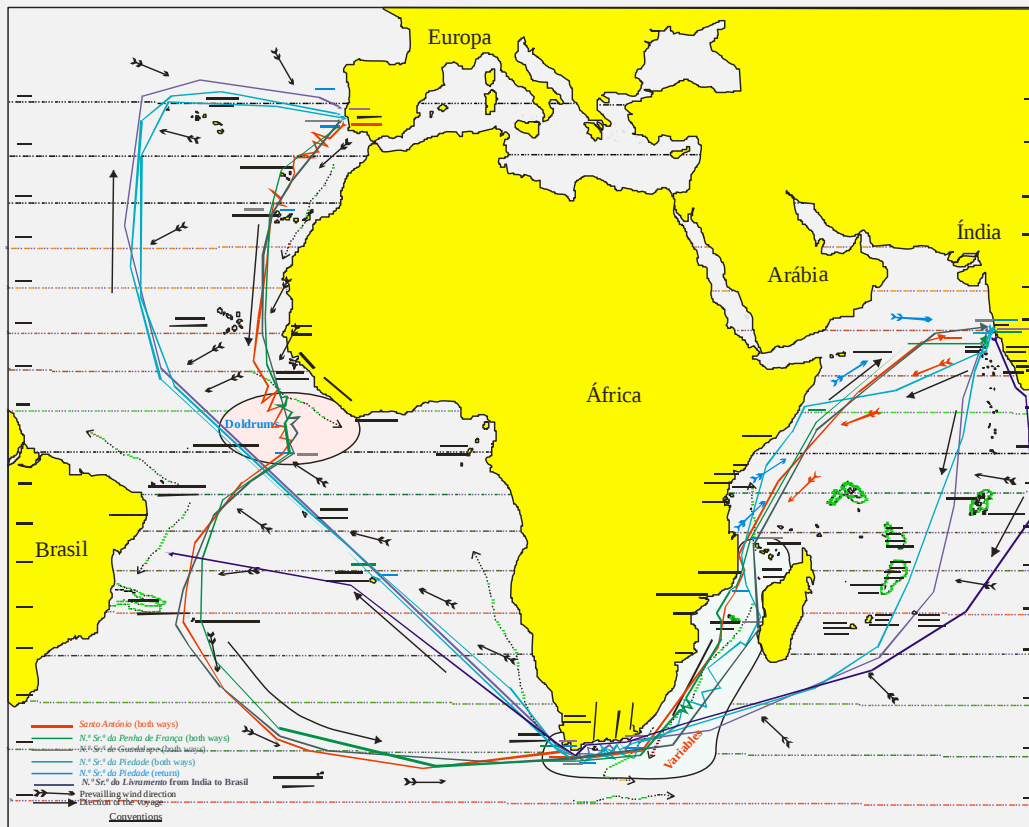
Session subtitle



Some 2000 years of European navigation took place here



Short-range
Point-to-point navigation



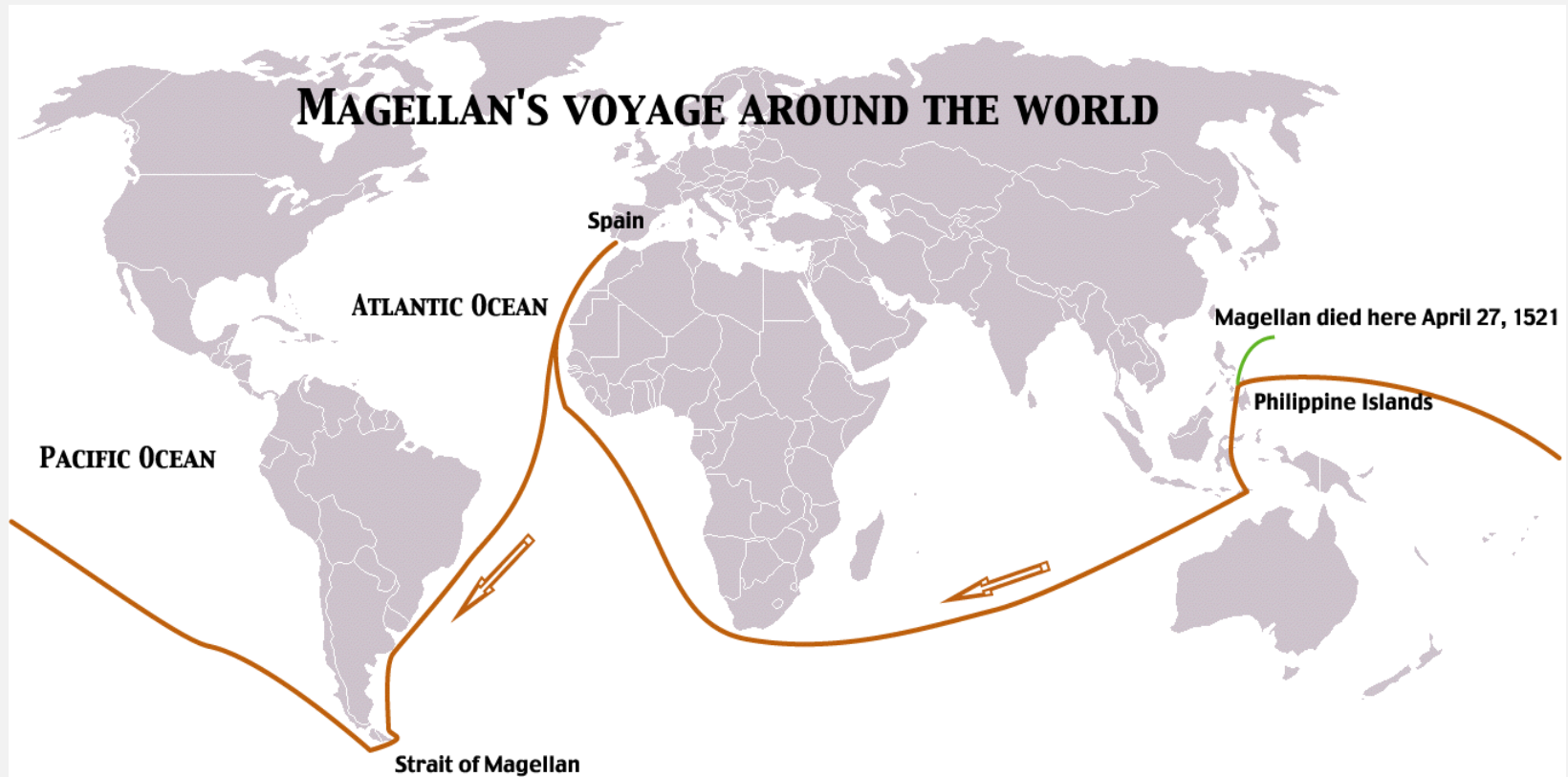
Typical mediterranean scales:

Distance: ~ 100 km;
Time of travel: days

Typical Oceanic scales:

Distance: ~ 1000 km;
Time of travel: weeks/months

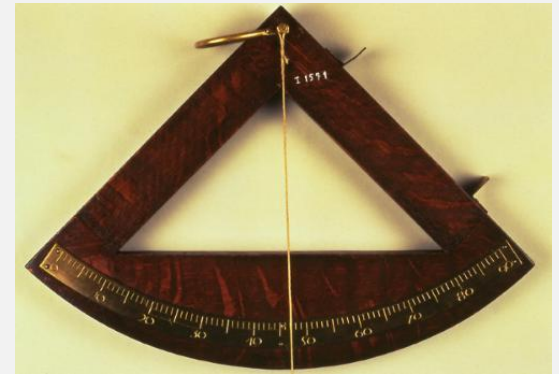
1519-1522



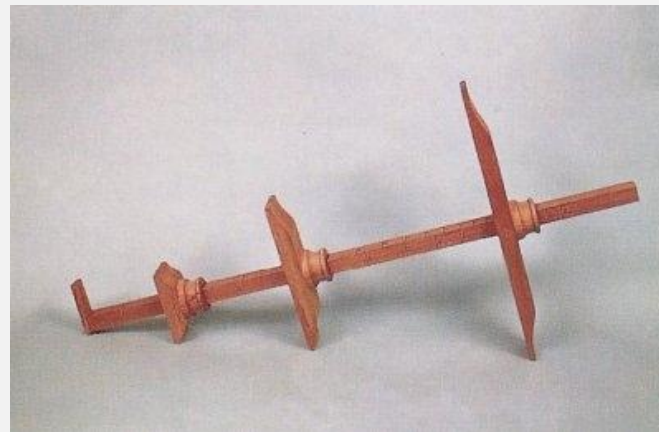
Innovation and TECHNOLOGY



Nautical astrolabe



Quadrant



Cross-staff

Innovation can mean SIMPLIFICATION



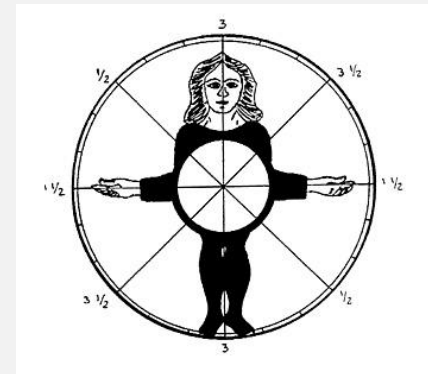
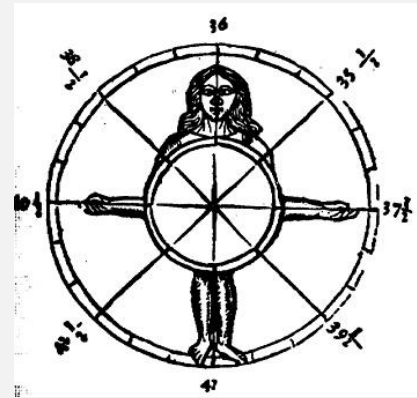
From the medieval
planispheric astrolabe



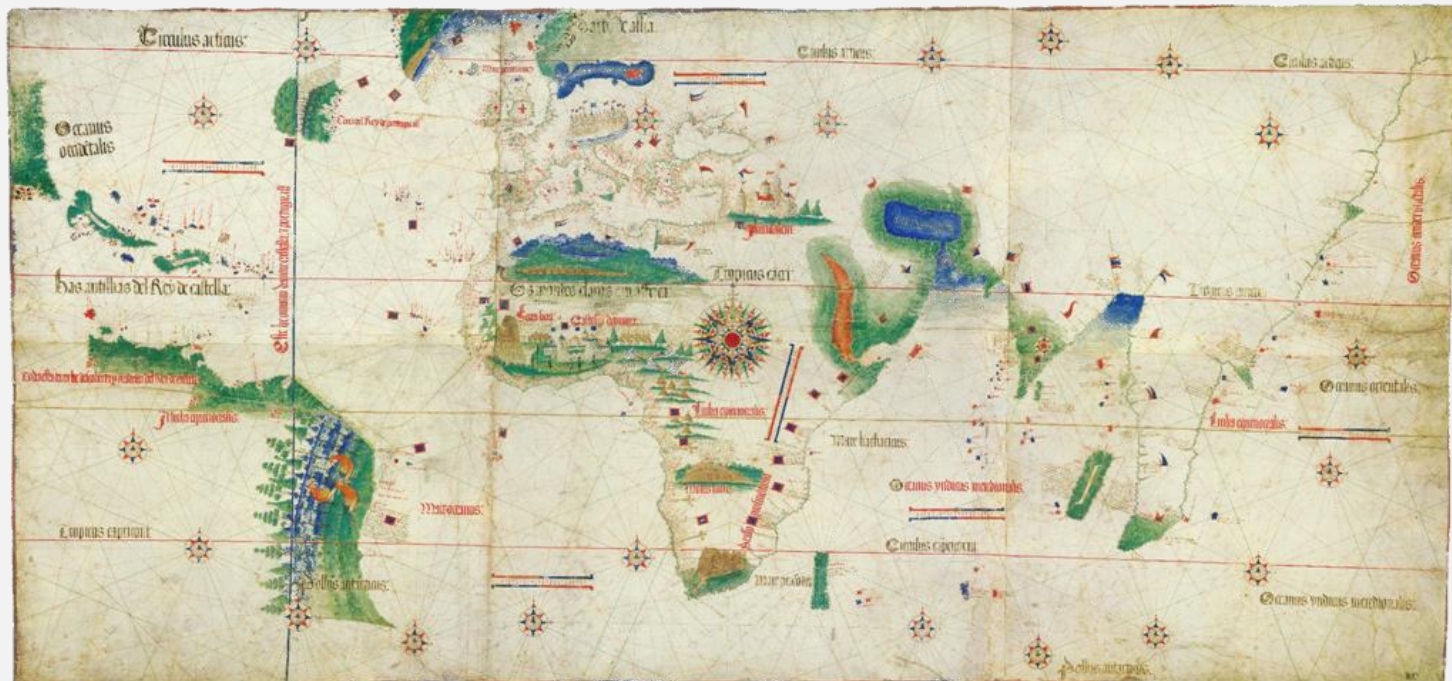
To the nautical
astrolabe

Diagrams and the visual display of information

- Organizing algorithmic procedures
- Solving mathematical equations
- Replacing the use of tables
- Modelled on real instruments



Visual display of information : nautical charts



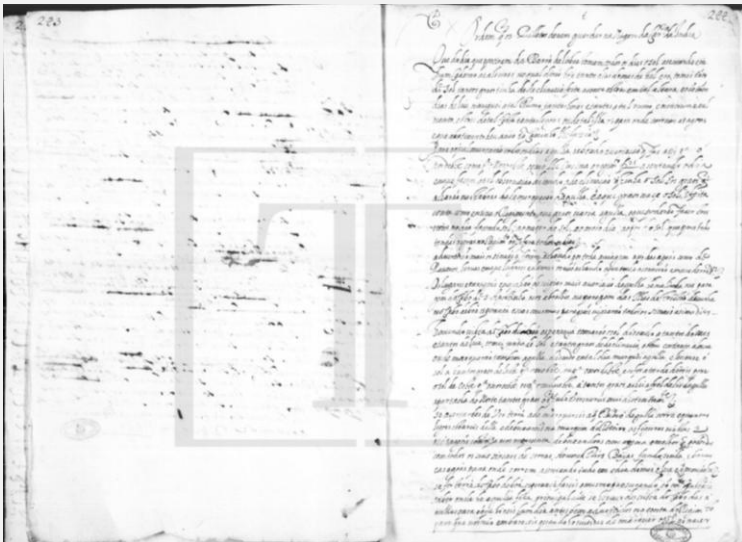
Innovation and INFORMATION

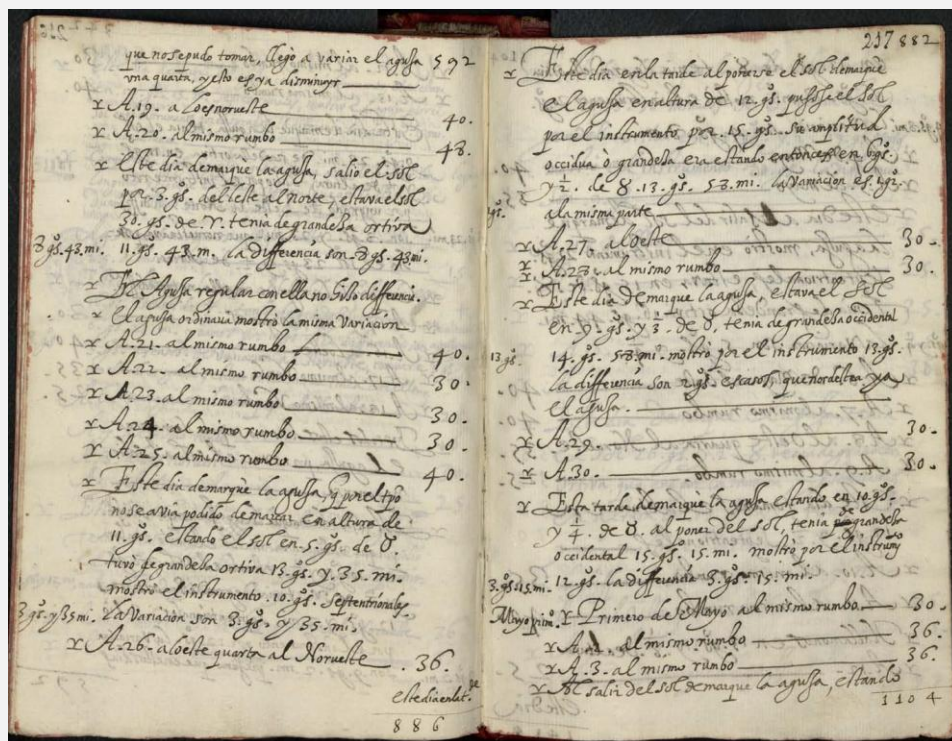
Instructions for pilots

Every day at sea:

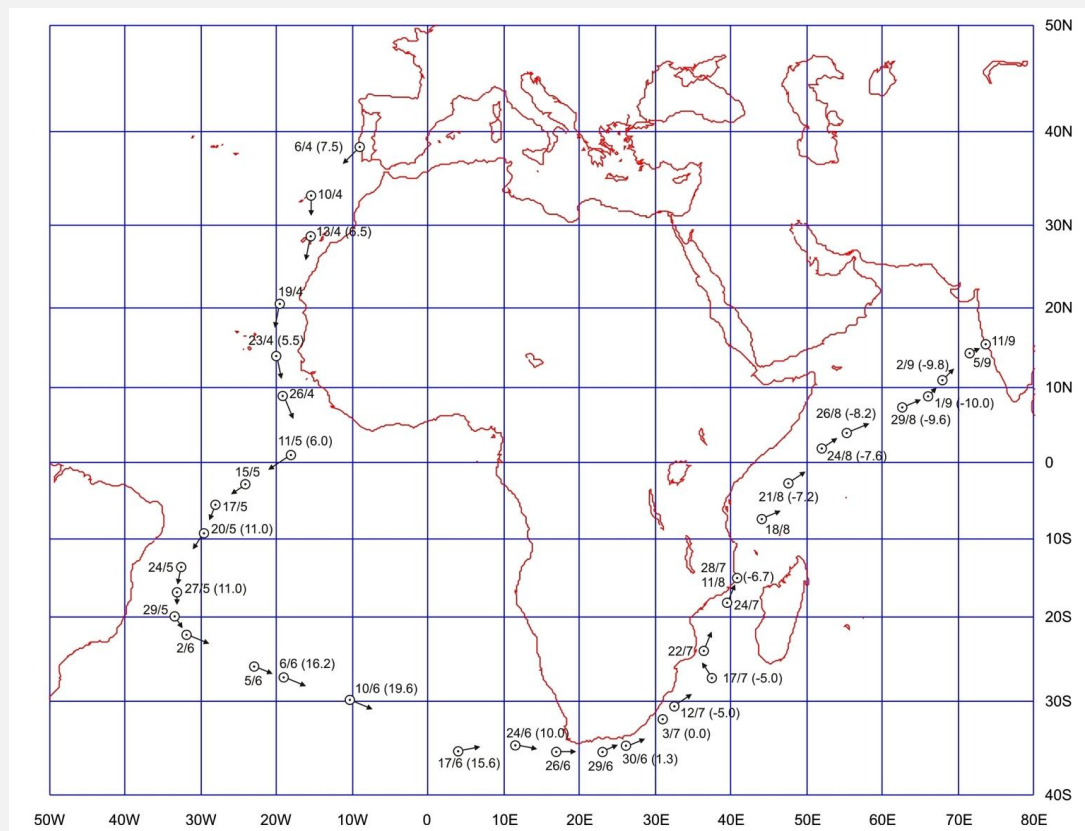
- Measure latitude
- Record ship's position
- Record wind direction
- Estimate currents
- Record magnetic variation

- Record animals, plants, etc
- Record meteorology
- Correct maps



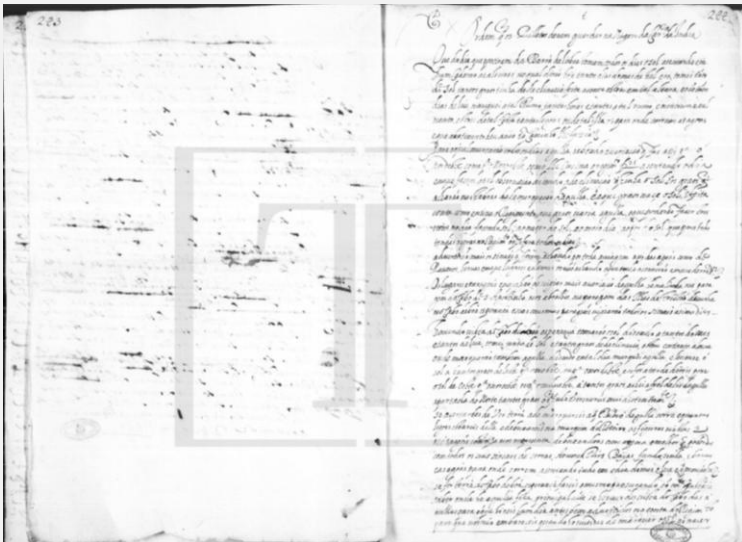


Control and management of INFORMATION



Instructions for pilots

Upon return, ship's logs must be handed to Cosmographers and Mathematicians for analysis



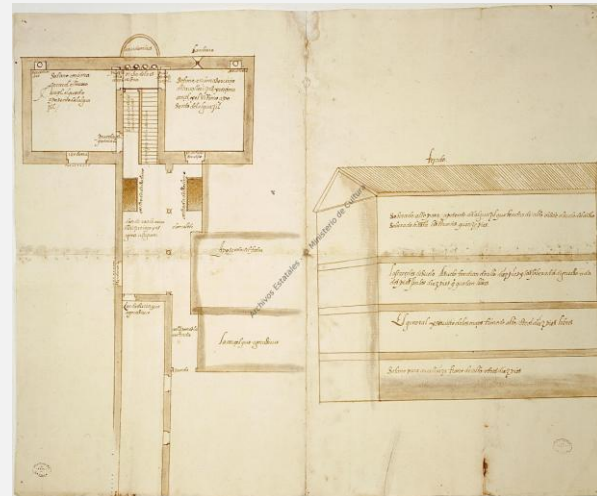
Institutions

Lisbon



Armazéns da Índia e da Guiné
Warehouse of India and Guinea

Seville



Casa de la Contratación
House of Trade

INNOVATION IN THE PAST – IDEAS FOR THE FUTURE ?

Session subtitle

Can we learn something from History ?

INNOVATION

Facing Challenges

Technological advances

Modernising processes

Management of information

People

Institutions