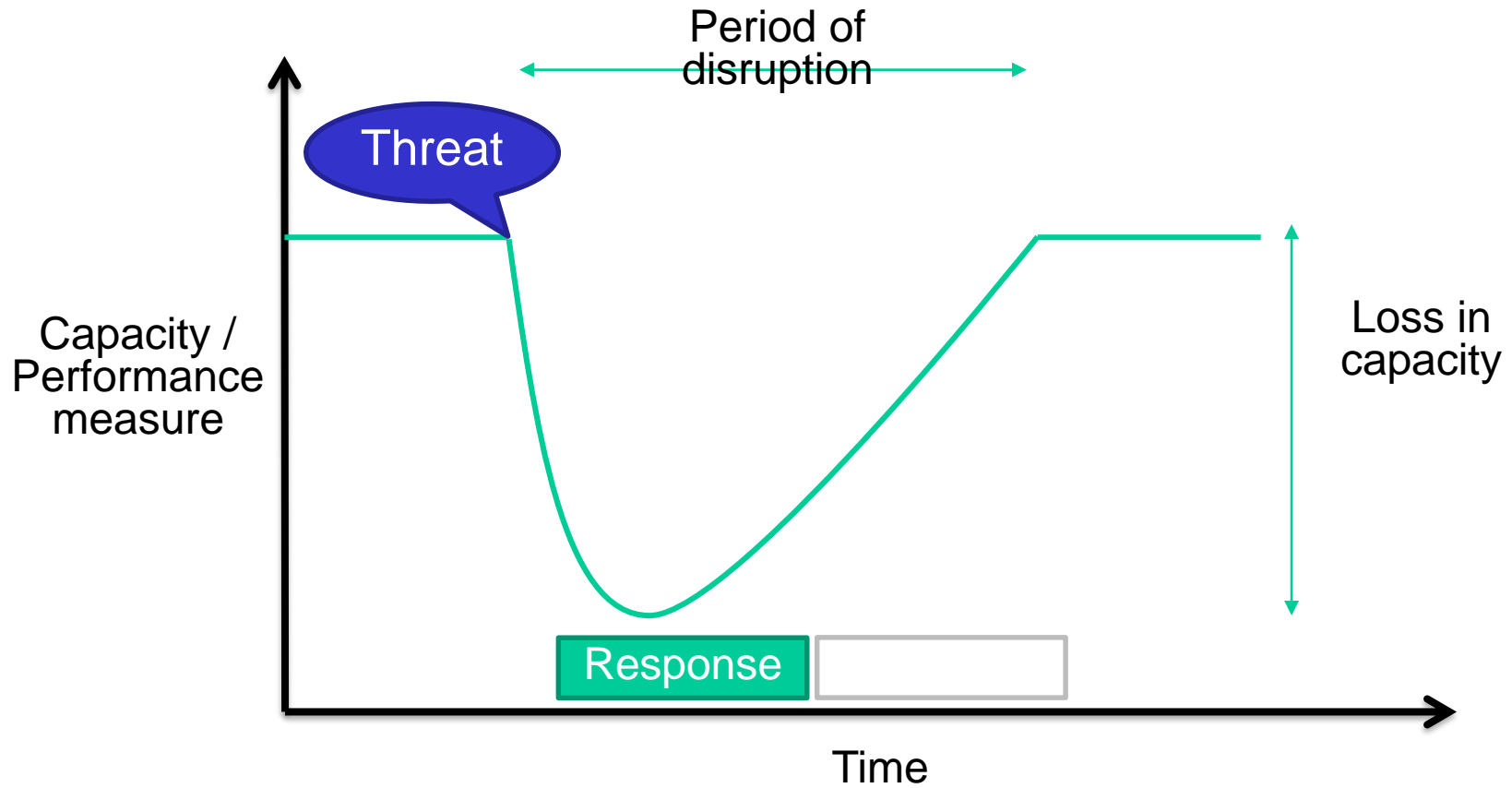


How the right information can better enable effective & efficient port management - Especially: Port Resilience

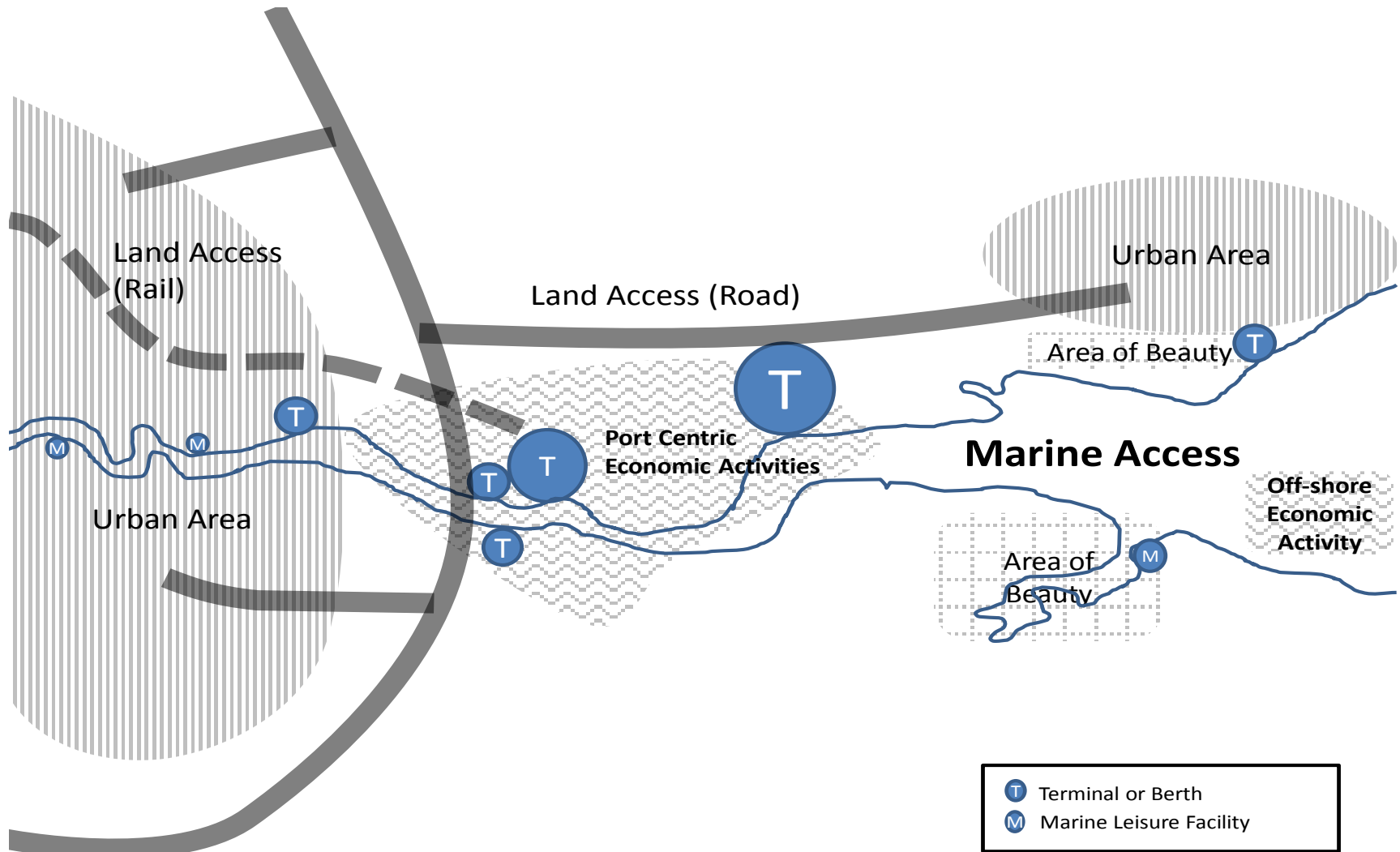
Andrew Grainger, Duncan R Shaw, Kamal Achuthan

Andrew.Grainger@nottingham.ac.uk; Duncan.Shaw@nottingham.ac.uk; k.achuthan@ucl.ac.uk

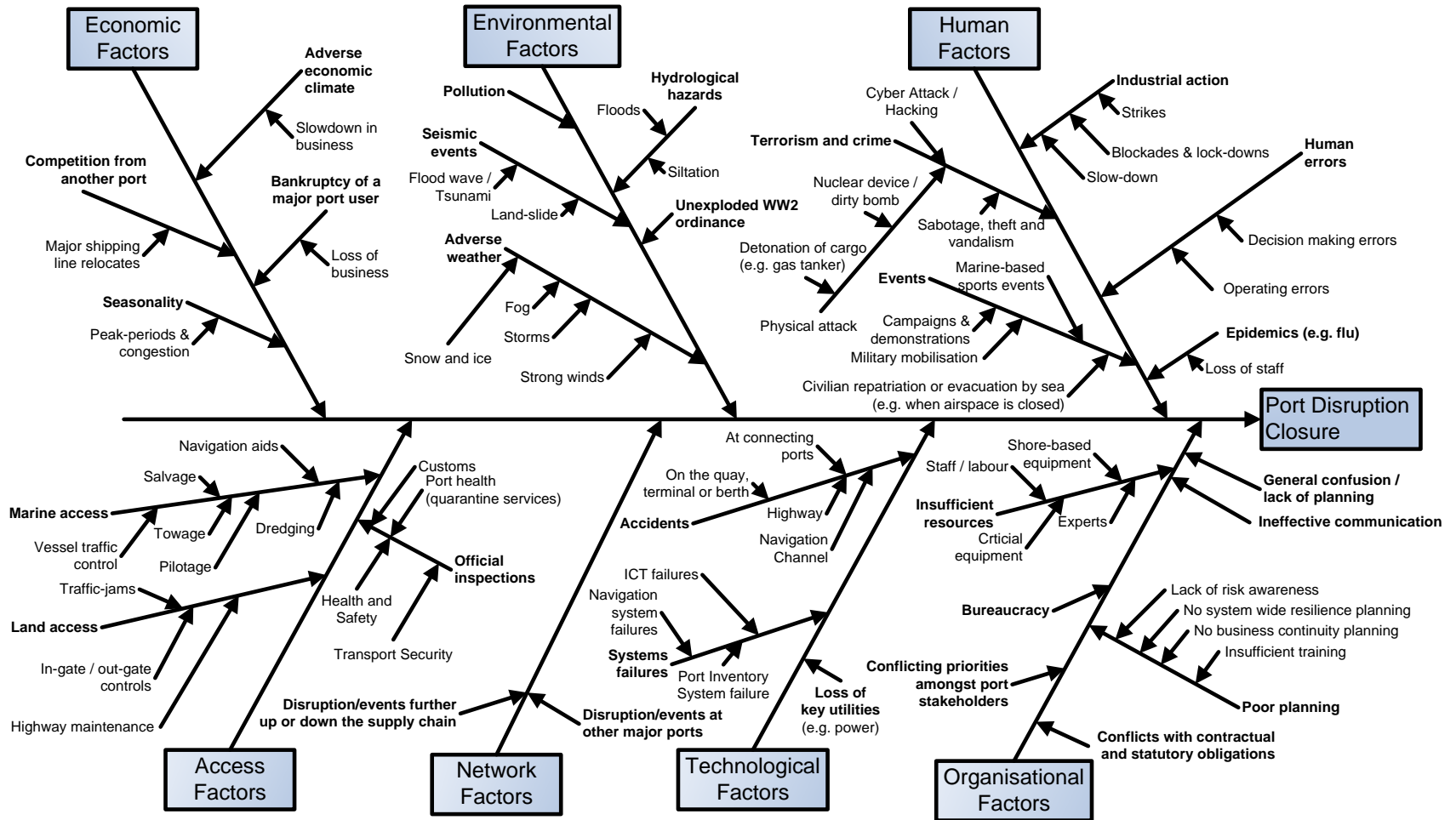
The Idea: Port Resilience



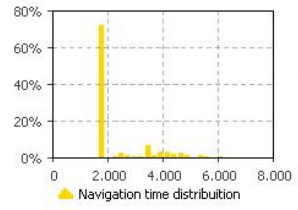
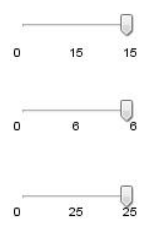
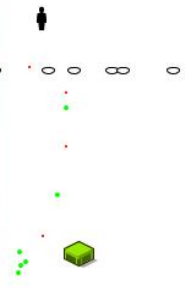
First things first: What is a port?



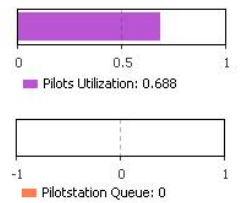
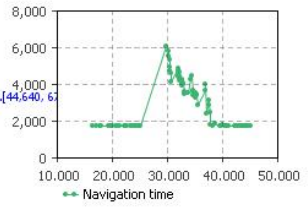
What can go wrong?



MARS: Simulation Tool



dataset
32 samples ...[44,640, 6

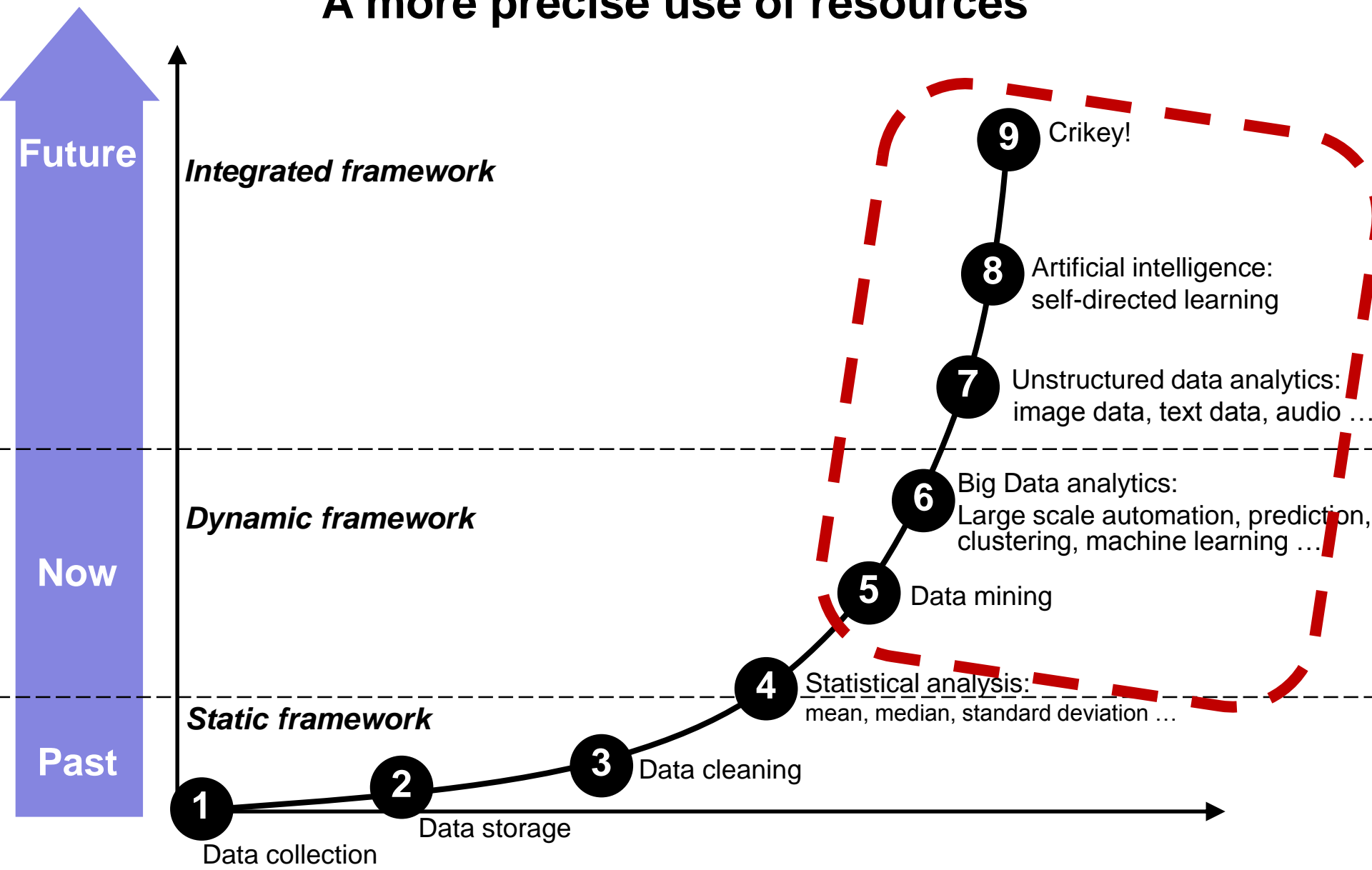




A Directory of Port Related Information Sources and Uses

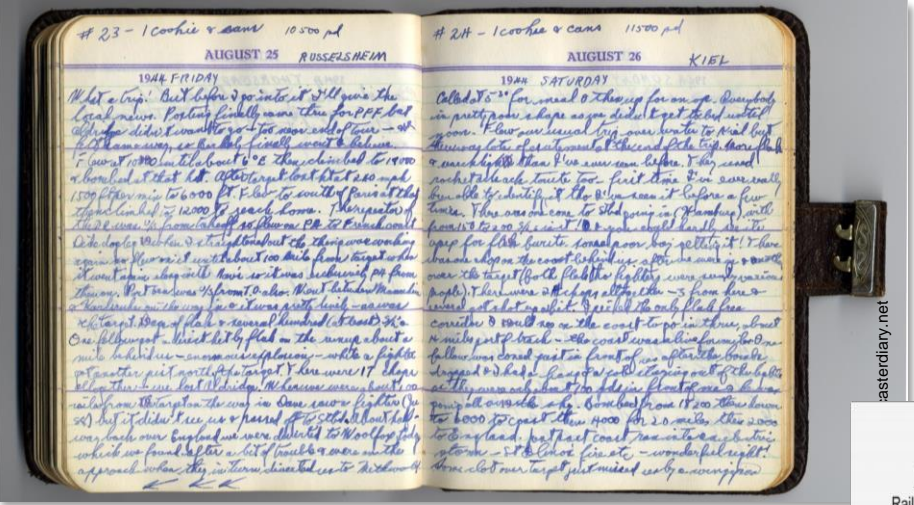
Growth curve of how companies use information

A more precise use of resources



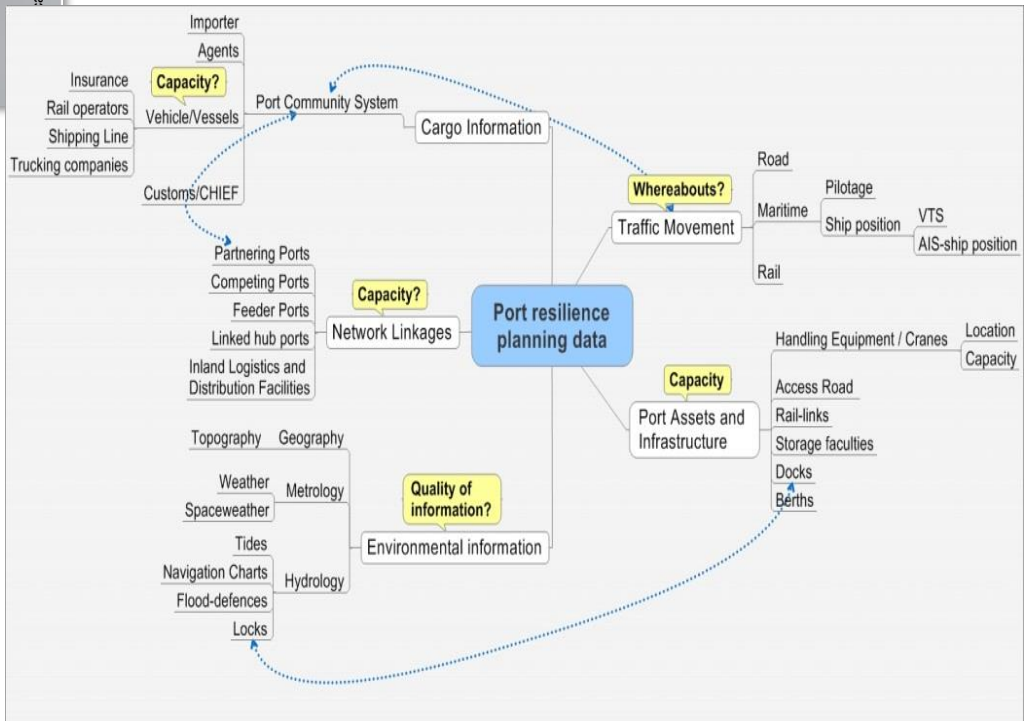
What is Big Data?

Big data is the personal minute to minute diary of everyone and everything – B2C, B2B and your machines.



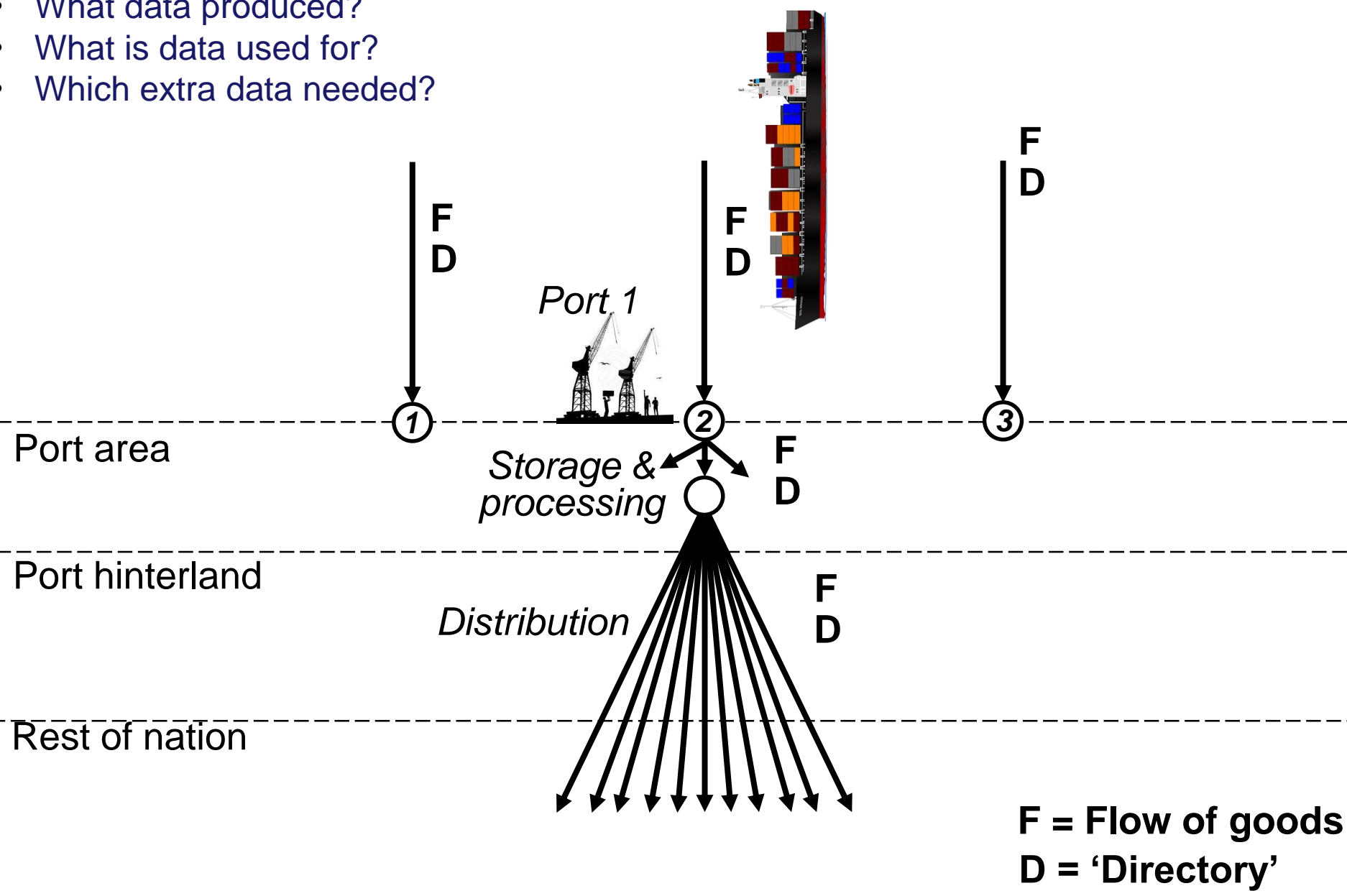
- A more precise use of resources, a more personalised service.
- Always a missing piece of the puzzle...what data do you need?

- Considerable scope for application in **Port Resilience Planning**
- Access to **information** needed, but **currently not known** where to locate or access it



What data is produced as cargo flows through a port?

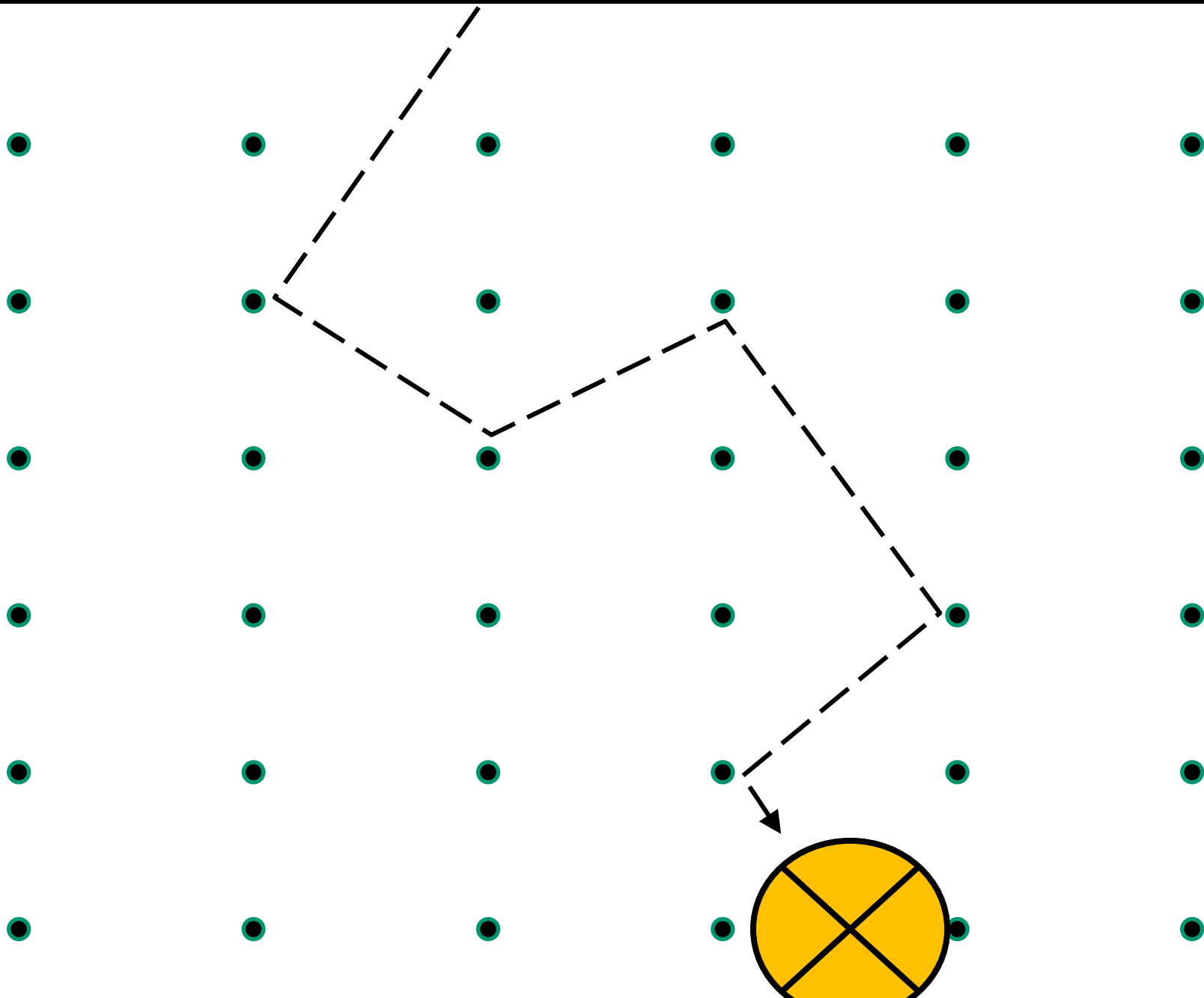
- What data produced?
- What is data used for?
- Which extra data needed?



'Bagatelle': pennies or steel balls drop between nails



Imagine pennies bouncing on different flow routes



MARVIN: gives better quality alternatives

- A crisis occurs and a node in a flow of cargo is blocked, flooded, destroyed ... or something else.
- Information is needed to choose an alternative routing of the flow – just like the penny.
- MARVIN will be a **directory** of where to get that information.
- And would contain some of it to suggest **alternative options** & help in choosing... and look like Google Maps.
- Son of MARVIN would be an **access point** to that information.
- Grandson of MARVIN – identifies strategies to **fill** information gaps & **use** latest analytics technology.

Eye in the Sky...



- Position, Location and Movement:
 - AIS, GPS
- Advance Notice:
 - Climate and weather; Tides; “Space Weather”
- Images:
 - Port facilities; Infrastructure; “eye in the sky” verification
- Communications
 - Satellite Phones
- Mapping
 - Topography; Infrastructure; Transport Systems