



The Chicken & Egg of OOS

Andy Shaw
ESYS plc

Objectives of presentation

- ❑ identify OOS stakeholders & beneficiaries
- ❑ consider OOS demand issues and drivers
 - ❑ examine benefits, risks & uncertainties
- ❑ ask questions about supply and demand of OOS services

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Current status of OOS



- ❑ Primarily an RTD market, technology and engineering focus
- ❑ Limited number of servicing demonstrations
 - Hubble, ETS
- ❑ There are alternatives to OOS that the market is comfortable with
 - insurance
 - launch spare capacity
 - purchase lease capacity
 - retrieved insurance write-off's - ref HGS-1
- ❑ Emerging commercial OOS players
 - Orbital Recovery Corp
 - Vanguard

No explicit, proven demand - this is our chicken & egg scenario



General view on OOS - There are two schools of thought

The 'Yes' Camp

- Reduce cost of space
- Technology is ready
- Achievable economic benefits


All we need to do is change the way we have always worked!

The 'No' Camp

- Too expensive
- Technology obsolescence
- Limited commercial opportunities

If it ain't broken, don't fix it!

**But all agree on one thing -
the business case must make sense!**




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3


Who are the stakeholders?

Where is the market equilibrium?




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4




The beneficiaries?



- ❑ Public mission operators
 - more science for your buck!
 - a use for the ISS?
- ❑ Commercial mission operators
 - extended revenue?
 - reduced asset cost?
- ❑ Insurers
 - benefits to insurers unclear
 - retrieval of insurance write-off's?
- ❑ User communities
 - cheaper services?
- ❑ Everyone
 - better management of a natural resource?

Oh yes, and the guys that could make money out of this!

- OOS service operators
 - Manufacturers
 - Space A&R
 - Launchers



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5



Benefit or threat?

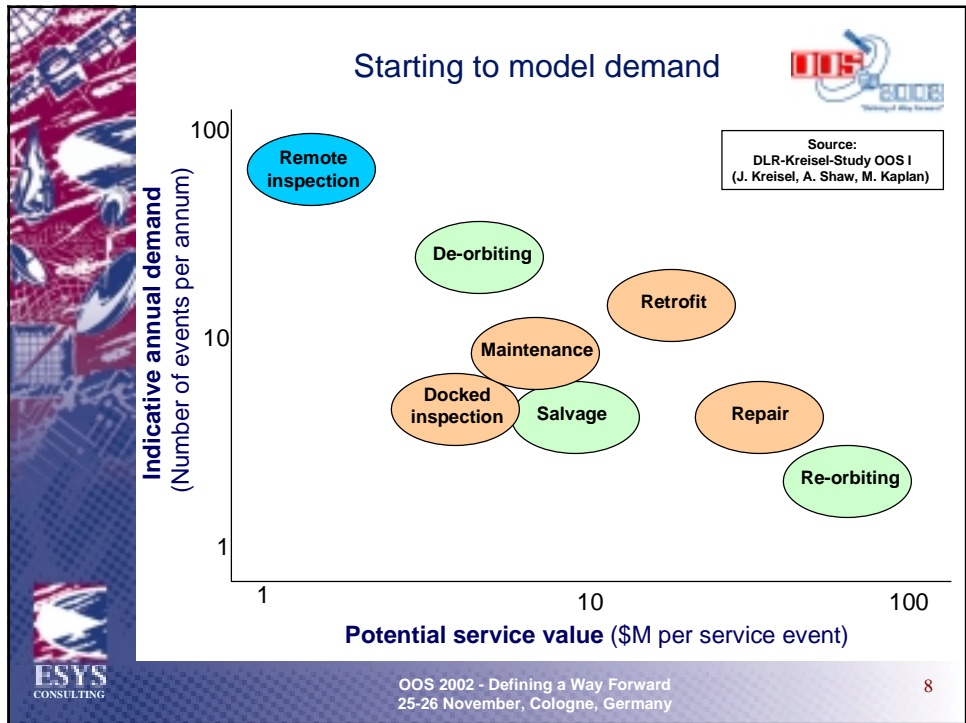
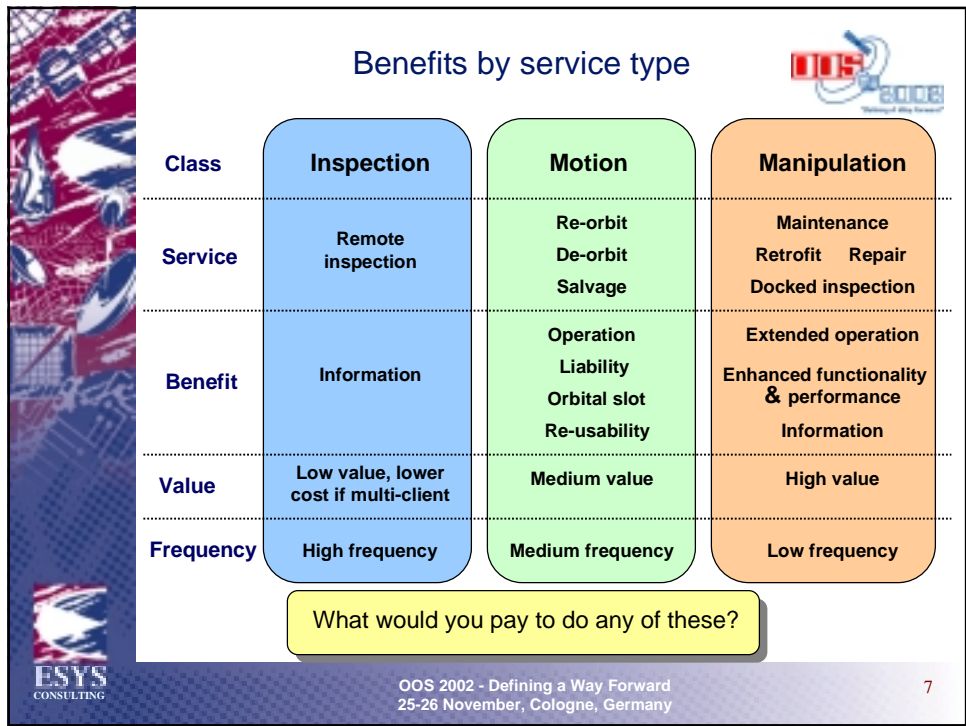




- ❑ Manufacturers
 - is this a threat to existing business?
 - we could build satellites differently, but are people really asking for it?
 - it costs money to develop new technology, who is going to pay?
- ❑ Launchers
 - are we not talking about reducing the number of launches?
 - what about launch costs, is it to efficient to launch servicing vehicles?
- ❑ Space agencies
 - what is this going to cost us?
 - can we justify the risk?
 - who will really benefit?




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6







Demand factors and drivers




- ❑ Assumptions about willingness to pay
 - public versus private assessment of value
 - one-off or wrapped into satellite contract?
- ❑ Failure rates
 - lack of reliable information
 - when do they occur?
- ❑ Scheduled versus emergency servicing
 - implications for servicer launch scheduling
- ❑ Legislation
 - always a good market driver

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9




Demand inhibitors




- ❑ Orbital considerations
 - GEO: long design life, technology obsolescence and cost to orbit
 - LEO: short design life, low value, expendability, future viability?
 - MEO: well there are only Nav sats aren't there?
- ❑ Cost of co-operative satellite design and operation
 - who will pay for the development when prices need to come down?
 - fundamentally changing the lifetime cost profile
- ❑ Limitations on servicer capabilities
 - how capable will any servicer be?
 - can all services be provided efficiently?
- ❑ Launch costs
 - linked to mass of servicer which is in turn linked to what its function will be

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10




In the customer's shoes




- What is the bottom line benefit to me of using an OOS service?
- What are the risks involved?
- Doesn't OOS involve as much risk, if not more, than existing options?
- What about technical complexity - have you shown you can do it?
- Should I be the first?
- Will my shareholders/tax payers be happy??

Customer perceptions can be affected by lack of proof, rumours and negative press!




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11



Issues arising




- Political consensus
 - international discussions on orbital debris
- Role of ISS
 - strong argument for an ISS-centric OOS concept
- Military concerns
 - a strong voice with strong misgivings

Space agencies

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Commercial OOS companies

Both have interests, but who should make it happen?



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12

Something for everyone



- ❑ A divided community with strong views for and against
- ❑ Focus needed on the business case and technical feasibility
 - Demand for OOS still to be defined
- ❑ Need to define an evolutionary strategy that takes manageable, but significant steps towards the ultimate goal
 - Remember! Even the end goal still needs clarification!
- ❑ Likely to remain the domain of significant public investment in the short term
- ❑ Medium to long term - if OOS is to have a future, it must reside in commercial hands

Challenge for 'The Suits' - define a strategy and a business plan that a broad range of stakeholders can buy into

