

Session 3 Notes – Value

Table 1

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Flipchart Notes Only

Question 1 why funding proposals are rejected?

- Setting the context (Balancing funder vs expectations)
- Weighted values of different criterias are 'unknown' to the applicant
- Communicating the requirements (evaluation value measurements) clearly between the funding evaluators and the applicants.
- Unconscious bias from the evaluators can contribute to the problem.
- Affordability of the proposal + when can the outputs be realised.
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Question 2 Where do you think financiers see true value?

- Context of the problem that you are trying to solve/ motivation behind the problem and the motivation of the finder
- Where the skills are (location) and the availability – levelling up agenda and the social context.

Question 3 Where does industry see value and where do you think industry should move?

- Safety, money, quality
- Regulatory compliance
- Social value as part of current procurement policies
- Risk assessment -> value of life/asset

Future Drivers

- Digitalisation/ digital era to be embraced
- ML/AI opportunities for the industry
- Embracing the process of changes that priorities might change frequently.

Table 2 (including flipchart)

Daniele Fornelli- Geo Obs, Haris Alexakis- Aston, "Jason Sun CSIC, Paul Fidler CSIC, Mark Enzer-Motts, Peter Hewitt-LOR, Adam Box-Topcon, Manar Alsaif, UoC, Paul Fidler-CSIC, Brian Sheil-CSIC

1. Why have your requests for funding, or proposals, been rejected? What reasons have been given for rejecting your requests for funding, or proposals?

- The contractor may be convinced, but the clients may not see the value. Researchers must present value cases to the clients/funding body.
- Internally, company managers may fail to appreciate the case, do not understand it, consider it difficult to adopt, or may be focused on saving money.
- It may be challenging to scale up the proposal for large companies, especially those with a significant number of projects. Even the proposed new technology is the same price as the traditional one, industrial adaptation is still very challenging, ie. changing the mindset / project system / additional risk for new technology.
- Communication issues may arise between scientists and industrial personnel.
- Research questions may be too narrow or specific, and it may be necessary to refocus on the company's vision and understanding of its needs.
- Companies such as Laing O'Rourke may need to understand the direct benefit of the proposal and how it can be resold to clients and produce profit.
- Targeting the wrong stakeholders for research projects may be problematic.
- Communication issues may arise due to differences in language, background, and writing style. Even people in a slightly different field of industrial, they may use different terminologies, which can cause confusion.
- Making a value case for collecting data and monitoring infrastructure may be difficult. Many proposals may only talk about "monitoring more" without explaining the industrial use case, short-term, and long-term benefits of "monitoring more". For instance, it can be challenging to determine the short-term and long-term benefits of monitoring fibre optic sensing on HS2. Many HS2 contractors would prefer the traditional sensors, like vibrating wire strain gauge as they cannot understand the FOS data and how it is useful.

2. Where do you think financiers (private investors & public entities) see true value?

- Private investors tend to be profit-oriented.
- Contractors tend to focus on reducing defects and generating profits.
e.g. Laing O'Rourke like automation related projects, which often leading to increased profitability. They are also interested in related R&D projects.
- Large companies such as Laing O'Rourke often focus on both the public benefit and commercial benefit of a project. Moreover, the public influence and tender requirements that may include social value are also their considerations

Additionally

- The role of universities is to learn how to better communicate with funders, particularly in terms of demonstrating the **value** of the project.

3. Where do you as a member in industry see value, and what direction do you want to see the industry move in?

- The industry's value is mainly cost-oriented, driven by different factors.

- Companies often focus on reducing costs from a health and safety standpoint, including minimizing the number of people on-site, and increasing the use of pre-fabrication.
- Many companies are risk-averse and prefer to follow others' investment directions.
- Construction companies operate with a low-profit margin, making it difficult to view long-term benefits. Thus, the industry is typically focused on projects with a quick impact.
- Despite being a conservative industry, construction companies are willing to adopt new technology with low risk, such as the use of tablets to check the as-built and as-design rebars.
- Laser scanners, such as bridge scanners, are becoming more popular. However, it may be unclear whether a bridge requires further inspection after scanning. Different from research perspective, the industry focuses more on the solution and profit generation using this new technology.

Table 3 (including flipchart)

Table 3 – Fraser Perceval (Jacobs), Fiorella Dell'Olio (CSIC), Carmen Muriana Cobo-TfL, Chrysoula Litina-(NH), Zaid Rawi (BP), Paul Campion (TRL), Chiho Jeon (CSIC/CAU), Felipe Rojas Parra (CSIC)

The value case/'incentive conundrum' for smarter infrastructure – making the financial argument for doing things differently.

- The need to differentiate between competitive and non-competitive. Competitive public procurement bids are subject to rules that generate high level proposals but do not allow some to play.
- The very structure of the supply chain squeezes out innovation because it sets up certain criteria.
- Innovation, by definition, means doing something different, which means that even if that innovation could be delivered at the same cost, there's a higher risk associated with it.
- In the public procurement context, clients use/interpret the process by giving a solution/answer instead of questioning by saying: this is my problem, can you solve my problem?
- Excessive regulation in the public sectors not only makes the process of innovation very slow (if not impossible) but also dramatically slows down the rate at which the industry can work.
- Public competitive thing is potentially one of the key issues that we face when seeking to respond to the climate crisis because of time constraints. Excessive regulation the public sectors makes things much harder to achieve.
- There is a clear divide between the public and private sector in terms of understanding the needs of the client. Both kinds of organization can talk about best practice where they have a collaborative approach.
- There is also the issue of differentiating not only between the public and private sector when we talk about innovation but also between internal and external approval. Internal approval for innovation and change is much harder to achieve in the public sector. That's why the success rate of the outcome might be different between the two sectors.
- Private sector might lose because sponsorship is not really clear.
- The public sector tends to formalise the decision-making process, which in some way masks what really is going on. We know that the decision will be taken by a set of people who can

use the system to the advantage of a particular bidder, so it may look like the decision is taken in a certain way that is inconsistent with actual practice.

- There is the need of more transparency to in the system to address its flaws.
- The private sector is driven more by money, which means that the tangible benefits of the proposal are often lost, while the public sector focuses on other kind of benefits.
- In the public sector, to prove the value of the innovation that you are going to implement in a project or in an asset, you need to have data or information about previous experience where you can that show you can do it.
- The public sector often lacks the resources or capacity to do more.
- There are often different types of interests and different types of drivers and therefore a mismatch of views/objectives across different stakeholders.
- There is often a mismatch between the bidder and the sponsor not only in terms of value but also on what can be achieved and the way to achieve it.
- What squeezes out innovation in the public sector is that it keeps hold of the responsibility 'how' the jobs get done, while the private sector doesn't care.
- In the public sector a lot of procurement becomes your skills; the public sector tries to measure innovation progress with the green book, which includes business cases that are not necessarily geared towards innovation, while the private sector follows a different metric to measure innovation progress.
- There is always the divide between academia and industry on how to articulate value. For example, the 'values' of UK research innovation are not necessarily how the public sector would articulate value.
- There is also a problem of relationship and communication: the public sector is not often open to dialogue with clients to understand their needs and/or redirect them or help them to redefine their request and find the best solutions.
- The public sector should be open to learn more from the private sector to allow change.
- Best practice is found where the public sector is not driven by 'public procurement rules' but uses public procurement rules to get the right answer, for example by subcontracting experts to achieve better knowledge and understanding.
- It is important to reflect about 'the process': does your process allow for negotiation? The funding proposal should be the summary of negotiation.
- The public sector tends to base the outcome of bid proposals on facts/data while the private sector gives more importance to negotiations.
- The public sector tries to play safe and reduce risks and challenges, which has great consequences on the pace of the progress it makes towards innovation.
- The winner is always the company that tenders the lowest plausible bid, which is why every contract overruns. Every major project overruns because the bidder lied about it to win it, almost always, and this means that the public sector will end up paying more anyway.
- Innovation is not just about new technology but doing things differently and better.
- Our society and the public sector needs to change the attitude towards risks when investing in innovation, but unfortunately, there is a lot of fear that taking risks will not pay-off.
- We need to keep our mind always open to change even if we have been in the same job for many years.
- It is about systemic change, standards and leadership-skills training for the next engineering challenges, to look ahead and do things differently.
- Even though people understand the need for change, they often don't know how, they don't know what to do.

Table 4 (including flipchart)

Carlos Laguna Sanchez-Motts, Dee Dee Frawley CSIC, Olly Wright-Aviva, Sharon Duffy-Thames Water, Tim Embley-Costain, David Pocock-Jacobs, Fergus Harradence-BEIS, Monika Kreitmar-CSIC, Xiaomin Xu-CSIC, Robert Mair, CSIC

The value case/'incentive conundrum' for smarter infrastructure – making the financial argument for doing things differently.

Why have your requests for funding been rejected or proposals, been rejected? What reasons have been given for rejecting your requests for funding, or proposals?

RM – review process for academics is quite random in UKRI. The Panel do not always have the right experience.

Do the panel have the right expertise?

Are they interested in the end result?

DP – In industry there is a competitive tender and an internal tender

DP -UK Tender – technical and financial proposals with ratio split of quality of capability to finances. Best economic value – quality v price. Weightings can be wrong.

Subjectivity is a real issue if you have to do a presentation as part of your UK submission.

DP -Internal investment – Research, internal process, affected by challenging economic situation. There is now beginning to be an internal process to bring in objectivity to it.

OW – dependant on 'what's in' at the moment. Buzz words. Diluting the technical to layman's terms to make it appealing/understandable to the review panel.

SD – for internal investment projects- prioritisation is a huge limit of the amount of money they can spend. Sometimes not having the right level of benefit for the level of investment certainly hinders the success of innovative projects.

JP – clarity defining benefit. Who is benefitting from the investment? Who is benefitting and when do they benefit. There needs to be a level of evidence to identify the return of investment.

FH – getting the business case at the right scale. We don't always pitch the level of the case right. We try to be too granular. Business case needs to be at the right scale – 1. Asset scale, 2 System scale. E.g., the value of an asset - bond street vs entire line.

SD – There is an element of sustainability with the investment. It can't be done in pockets. How do you bring it back into pockets? It needs connecting up. Maintenance systems become obsolete.

Where do think financiers (private investors and public entities) see true value?

OW – profitability – return investment to shareholders and brand and reputation. Aviva – not insuring any mining of coal.

Brand, reputation and impact. Social media holding brands to account. In Aviva, the use of coal is not supported. There is now a balance between profitability and being green.

RM – increasing shareholder pressure on ESG from investors?

OW – shareholder dividends is a big driver

Government – influence – flooding – regulation – brand + reputation.

CLS – branding and marketing good to attract talent.

Where do you as a member of industry see value and what direction do you want to see the industry move in?

SD – looking at whole value chain from source to toilet to natural environment. We look at the public value framework, regulatory, environmental, providing life service to public. Direction - would like it to be moving to be more optimised, efficient, more productive, standardised. Useful to look beyond institutional boundaries. Driving towards more efficiency, reducing waste. Not reinventing the wheel, decreasing carbon, planning for the next AMP cycle.

DP – benefit to ourselves, standardising designs, how can we bring benefits to our customers. For customers - less breakdowns, for end users – keeping supplies running.

OW- early collaboration, early engagement with insurers. Understand risk early in the process. Early risk management.

SD – looking at new funding streams. E.g., Control reservoir. More involvement with funding low risk innovation. Trialling Innovation using seed funding.

Need to address risk appetite.

OW- higher return for a higher risk. Finding the best way to talk openly without compromising competition ‘anti competition’ legislation - Tread lightly in conversations with industries/clients.

Funding can be released – adopt pay back – innovation bank.

CLS – productivity in construction. Supply chain difficult to invest in innovation because it is very cyclical.

OFWAT – normalise(?) across water companies

Productivity in construction –

- Challenge to invest in capital
- Public sector crises
- Technology vs hire people
- Barrier to investment

Construction – lag – time frame – construction industry 6 months behind economic change

SD – digital delivery is more efficient overall for all parties involved in industry.

SD – Digital delivery - internally more collaboration

SD – legacy infrastructure is a big challenge for public infrastructure. Costs money

SD – redundant assets are a huge problem. Costs money

- Services
- Green infrastructure
- NUAR (?)

Table 5 (including flipchart)

David Simavorian-Accenture, Shelley Arora-Tailby CSIC, Chris Campbell-Skanska, Nicky De Battista-Epsimon/CSIC, Alejandra Masia-BP, Chris Barker-Arup, Jill Campion-UC Land Economy, Nikolas Makasis-CSIC, Kwadwo Oti-Sarpong, Dongfang Liang-CSIC

Rejection of funding requests

- Often you don't get a reason.
- Monitoring systems get rejected as often there's a mismatch between the clients expectation in terms of costs, what the system will cost and reality.
- The same can be translated into a research proposal – and in industry a problem of seeing the benefits of instrumentation to a client. It's hard to get them to see the value, even if they know at the back of their heads that it's valuable, they struggle to justify the cost.
- This is particularly true with smart whole life monitoring, e.g monitoring for a bridge to make sure that doesn't collapse in 50 or 60 years. Hard to justify investing so much money now for something that will happen in the future.
- Is to me. But it's still hard to accept that case, even though it's it could be obvious even if you make it plain black and white.
- Part of the barrier is changing mindsets. There's also friction when it comes to new technologies. Incorporating something new, a new technology, into kind of established process results in lots of friction to implement that due to perceived risk. This then translates to overpricing aspects, and then that kind of comes down to cost being infeasible and then you get a reduction in instrumentation and less innovation.
- If you are pitching a proposal to a client organisation and you don't actually understand the internal mechanisms within that client organization or whether you're talking to the right person or not. You end up searching in the dark with this great idea but no place to land it. There's a higher hierarchy of decision making, and you might be talking to someone who is very excited about what you're talking to them about, the next person up is reasonably excited, the next person up starts getting lost, and then the one who's actually making the decision is thinking 'What the hell is this?'
- How can we improve that? Establishing a relationship and a long term understanding with the organisation. This can happen when you're lucky enough to find a champion within an organization who's got some real leverage in that organization and speaks the same language as you. But in these huge organisations with thousands of people, finding the right person with the right kind of leverage to make things happen is very difficult. Also, even when you find them, they often move on.
- The key is to make everything as simple as possible, especially with new technologies, even with the proposals that the reviewers are reading, not all reviewers have the same background. Some of them might but not all will understand well and will grade low because they don't get it. They are not doing it on purpose. It's unconscious bias. They don't understand the overall purpose or the value – make it simple and visual so that it can be easily understood.
- Speak in common language.

- Proposals that are multi disciplinary are harder to get through the review process because the reviewers may not understand the whole piece just their own are of specialism. The review process is not necessarily prepared for the types of projects that are really different multidisciplinary multisector. – Difficult to get funding for solutions to systemic problems. The review process is set up for a really nice easy technical problem.

- Sometimes you have to fit the proposal to the to the call that's being made, and there may be keywords you have to get in.

- There's also an issue with some clients about the fear of being the 1st and taking the risk because of the risk of failure is too high. They want to wait and see if it's successful other places, and if it is, then they'll do it. Of course the problem is if everybody does that, you won't go anywhere.

Risk averse profile of the investor is actually like what? But that's. Can be assessed like through the body - Do you think you when you don't win a contract, how often is it cost as opposed to innovation? It's meeting the overall criteria, not just cost, it's cost and quality. Sometimes it's expertise and experience. If you are up against an organisation who has more experience than you in a specific area, they may win even at a higher cost. But, cost is still the biggest weight.

- There is a contradiction or a catch 22 here, in that an organisation takes a risk moving into a new area, a new technology, but then if they don't they may be left behind and not get contracts due to lack of experience in that area.

- Picture a matrix where you're offering existing products to existing customers in existing sectors, then you can offer the same products where you got the expertise into new sectors, or new products in existing sectors, or new products in new sectors, and there's spectrum of what the risk is like.

The tech industry innovate much faster because the risk of failure is less and it's more easy to quantify the result of that innovation.

Where do you think financiers or private investors and public entities see the true value?

- Private investors - how much money am I going to get for the for the spend. But then it really depends on the company and how they're going to deploy the results of the service and that's very often where it where it falls, where it falls down because they can't see the value of it.

- Usually they use the TRL scale and are more keen to go for TRL 5 and up.

- The value is in having something that can be implemented and achieve the financiers outcomes.

And where where do you see the sustainability pursuit towards net zero fitting within these?

- There are funds to fund those new investments (BP re renewal and low carbon innovation), but there are crazy deadlines to meet. and we are all trying to submit the bids to meet the deadline. It's almost impossible to find the time to properly think about an innovative proposal.

- Often the implementation of a zero carbon proposal ends up on the contractor to figure out how to make it work as everyone keeps pushing it down the chain.

- You need policy and legislation to make net zero happen and be more than a tick box exercise. Like in the automotive industry where petrol cars are being phased out due to legislation which has unblocked that and led to the industry manufacturing different cars. There's a commercial reality.

- But it's got to be incremental with the technology. E.g. you could have mandated no cement tomorrow, but there are incremental steps to reducing it until it can be replaced.

- How will we hit a net zero target without widespread and affordable replacements for steel and cement.

So just thinking so just going to the last question, which is what direction do you see the industry moving on?

- In five years time things will be different. Proving that you are going to deliver a more sustainable project will increase compared to just fuel costs and value. Resources will likely be more scarce. Whether cost or sustainability will carry a bigger weight will depend on legislation
- For infrastructure moving forward, because it the need is so high right now to improve infrastructure, lots of need and not enough money to pay for updating and improving, this will require both public and private financing. If the public sector cannot fund all this, the private sector is going to have to come in.

Table 6

Lizzy Moyce-Arup, Cara Bootman CSIC, Matthew Foote-WTW, Joanna Bonnett-Cowi, John Pelton-Costain, Anne-Marie Friel-Pinsent Masons, Mike Spencer-IMIA, Nevena Vajdic, DRF, Farhad Huseynov-CSIC, Jennifer Schooling CSIC

The value case/'incentive conundrum' for smarter infrastructure - making the financial argument for doing things differently

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JP – rationalizing difference sense of value that people have. Is it affordability, resources or value? Look at long term benefit. Understanding the value that should be being targeted when presenting a case for funding.

JMS – Academia has the opposite problem, multi interdisciplinary things, funders want the next amazing science project and are not so keen on looking at systems views.

MF – The problem of review of the process leads specialists to micro focusing – no one is looking at the bigger issues, is this a consequence of the review process or is it cultural?

JMS – It depends on the Research council's current direction they never fund the same thing twice, there can be bias on the part of funders. Disconnect.

JP – There can be a temporal aspect - phase 1 gets funding, but this does not continue to phase 2 where real benefit comes (but is often not funded).

JB – Applicants have to articulate value to stitch enough of these parties together. JMS this is a reality for funding she is applying for at present.

JMS - CSIC puts research into practice and provides feedback to clients who are part of the supply chain, CSIC has lots of 'real' projects but how take the next step to systemic change to get orgs think systems upfront is a challenge.

AMF – Influencing how funding is organized, regulated funding cycles, influencing them to ring fence funding for digital solutions.

JMS – Funders think they are doing this already but in a difference space.

LM – framing stage at start of project

MF – are priorities wrong at the start?

MS – Insurance perspective

JMS - Skanska instrumented foundations and monitored as taken down. Carbon reduction argument if can avoid knocking down buildings.

MS – why should contractor be incentivized to not knock building down as will affect his income and order book.

AMF – Network rail how to get more for less, plan of activity to meet statutory regulations within a defined cost, business case why should put aside money to do this. Start with bid stage.

JP – Have to approach Orgs to say if I can save you the cost of bridge repairs 20% you fund us.

JB – works on a smaller scale.

AMF - regulatory risk adverse, worried about reputation reluctant to do, who sits behind DfT/ORR.

JP – Comes back to government policy. Back to CSIC funding issue.

AMF – No win no fee type situation in an industry situation?

JP/MS – Suggestion that CSIC becomes a consultancy. JMS – not allowed to as a charity.

AMF – How about looking to commercial models?

JMS – Manu lots of success recently with grants.

AMF – climate risk management targets, strategy for management of risks, investors all over TCFD regulations (Task force for . . .)

MS – if can demonstrate lower risk

MF – TCFD similar to greenwashing. Solvency 2 – seeing more people recruiting sustainability roles on LinkedIn

CCRI – Coalition for Climate Resilience investment

MF – Flood re-debt?

AMF – have to know audience what care about, how funded, what they care about, target offer around specific client. Climate risk at absolute top. TCFD way moving at present

AMF – anything climate and decarbonisation, net zero, compare resilience is popular

JP – Health, civil engineers sewage fitted in 19th C. Two biggest health issues obesity and respiratory disease.

MF – healthcare insurance, threshold of risk in the US very different, number of clients challenged to do de-carbonization strategy, changes risk profile overnight. TCFD, opens a door to whole risk.

JP – Moving waste, JMS a lot of carbon waste at present, designing carbon in structures

JMS – Research councils, collaborating with others, shiny glossy content. Impact not as important, no pathways to impact section.

CSIC Strategy Day Session 3 Notes

JP – CDBB – DT hub trying to fill the gap left by closure of CDBB.

JB – demonstrating baselines, a lot of data silo's. No data architecture structure, lots of different spreadsheets recording same info.

JP - Innovation, only 2.5 years to cover Crossrail innovation programme. Need find value capture.

JMS – ask partners for case studies, but don't cover wider benefits to the project. Unless externally visible problematic.

LM – wider value to biodiversity etc

JMS – Programme of weighting of bid costs – software. Gave monetary value to carbon reduction.

JB – projects via Catapults – value added.

JP - All Built Environment catapults gone.

MF - AIRMIC – industry body and educative body CSIC should look at – suggested by MF, discuss with

JMS – look at risk training