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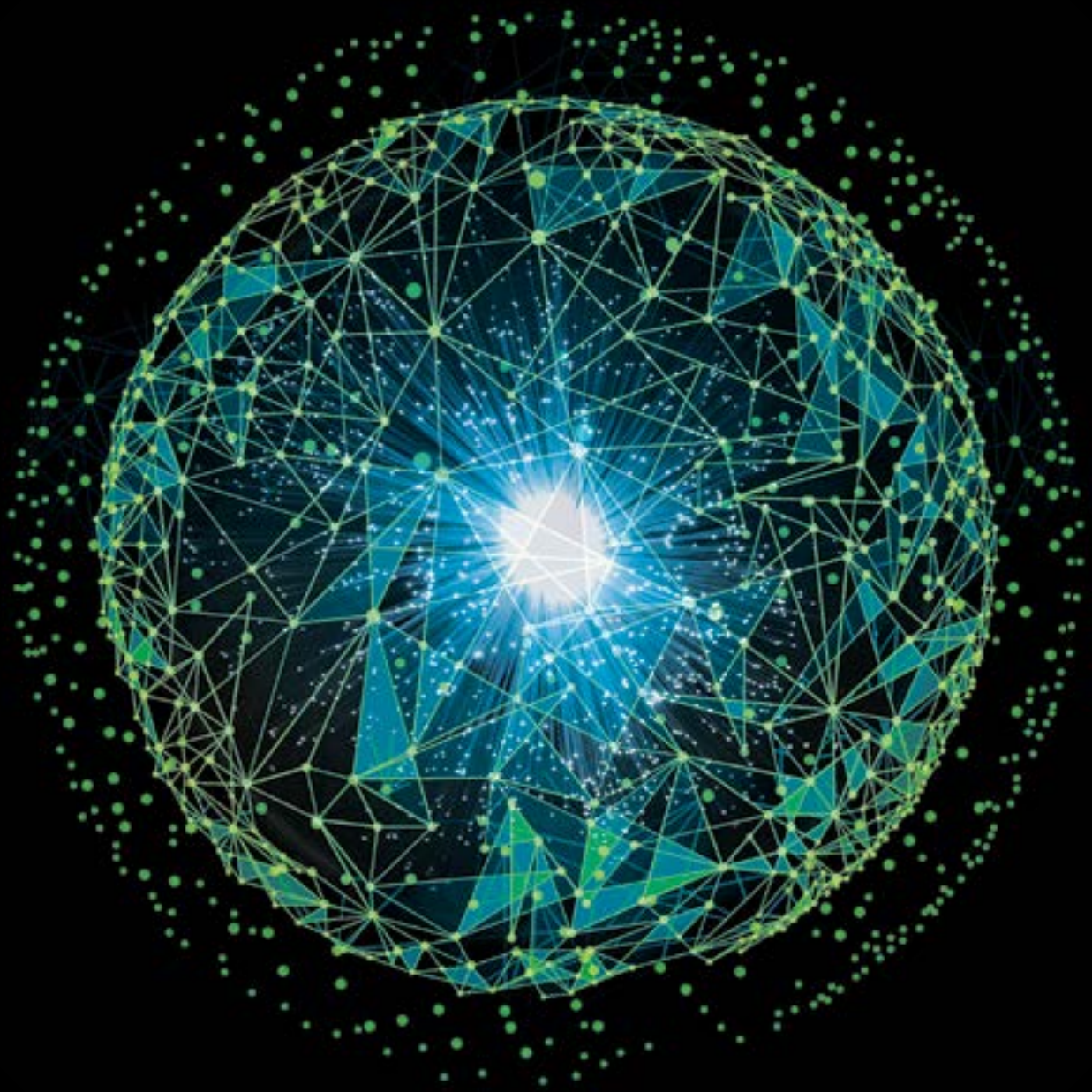

Architecting Giga Projects

February 2023

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1. Giga Projects: Delivering the future

The purpose of this article is to provoke conversations about Giga Projects: their characteristics, complexities, opportunities and challenges. We provide some thoughts and guiding frameworks, and a chance to join those conversations about delivering the future.

So what are Giga Projects?

Giga Projects are Infrastructure or Capital Project investments of such scale and ambition that they can be considered 'once in a generation' in terms of what they deliver to the world, and the way that they deliver it. They have a guiding vision which, if successfully delivered, will have a fundamental and transformative impact on entire societies and the ways we live and work.

What opportunities do Giga Projects present?

Giga Projects have the potential to be immensely impactful in both delivery and legacy. In delivery, they can be places of inspiration and discovery, as new solutions are made possible to respond to the sheer scale of the challenges they face. Following delivery, their legacy can create step changes for countries, economies, government institutions, social systems and markets. They can focus and accelerate the response to global challenges and pioneer innovations at all levels of the delivery ecosystem.

What are the requirements for leaders of Giga Projects?

Achieving the potential of Giga Projects relies heavily on the leadership provided at multiple levels in the project, and over an extended period of time. Giga Projects will comprise multiple Mega Projects, for instance, and leaders will need to handle the complexity of integrating these. This calls for a new mindset that is holistic, entrepreneurial and proactive in its approach to identify and leverage new digital capabilities to provide solutions. This mindset will enable them to integrate all components of the project effectively and dynamically, and will ensure that the lasting legacy of the project is realised. In addition, leaders will need to:

- Work productively under extensive public scrutiny as they manage the complexities of politics, economics and cultural shifts. They cannot passively give way to legal and societal pressures; they need to influence their external environment to realise the legacy.
- Focus continually on evolving the delivery strategy and design a Delivery Ecosystem that is able to respond to changing conditions. Static delivery models may work at component levels but not at the Giga Project level.
- Monitor continuously the societal value and impact that the Giga Project will deliver, adopting new criteria for performance measurement. New criteria will ensure that delivery performance is acceptable, recognising that adopting only traditional criteria focused on compliance with estimates for cost, time and benefits is insufficient at the Giga Project level due to the uncertainty and complexity involved.
- Have a mindset that is future focused on how capabilities will need to evolve over time. Giga Projects require enduring but evolving organisational structures, which need to continuously re-evaluate capability requirements now and in the future; underpinned by an ability to harness the value of new technology and digital solutions.

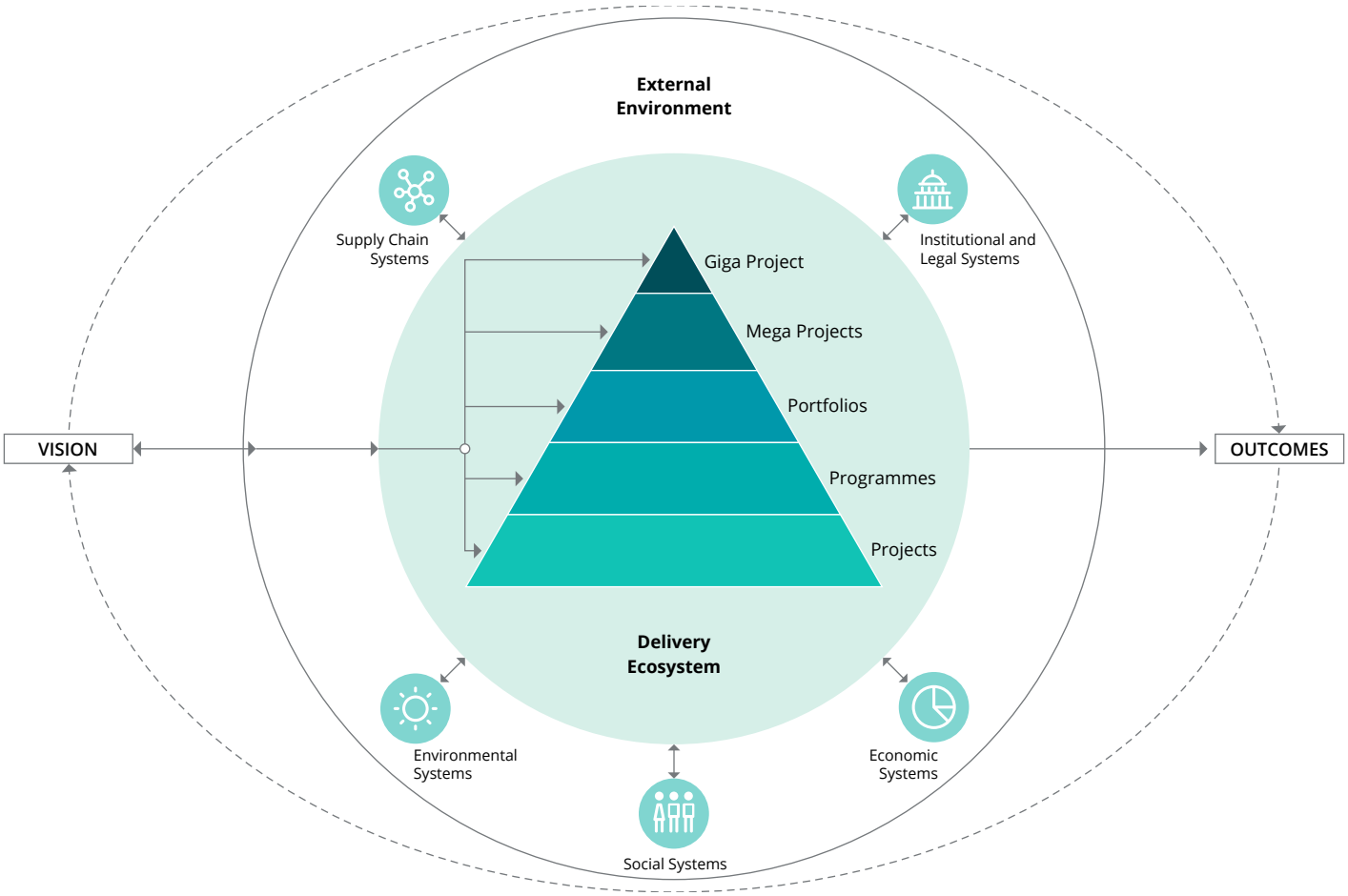
References

Previous definitions (e.g. Galloway et al, 2013) propose that a Giga Project's valuation, by definition, is a project in excess of $10Bn. This article does not consider the economic measurement for a Giga Project as an accurate definition. Instead, this article considers Giga Projects as projects of such scale and ambition that they can be considered 'once in a generation' in terms of what they deliver to the world and the way that they deliver it.

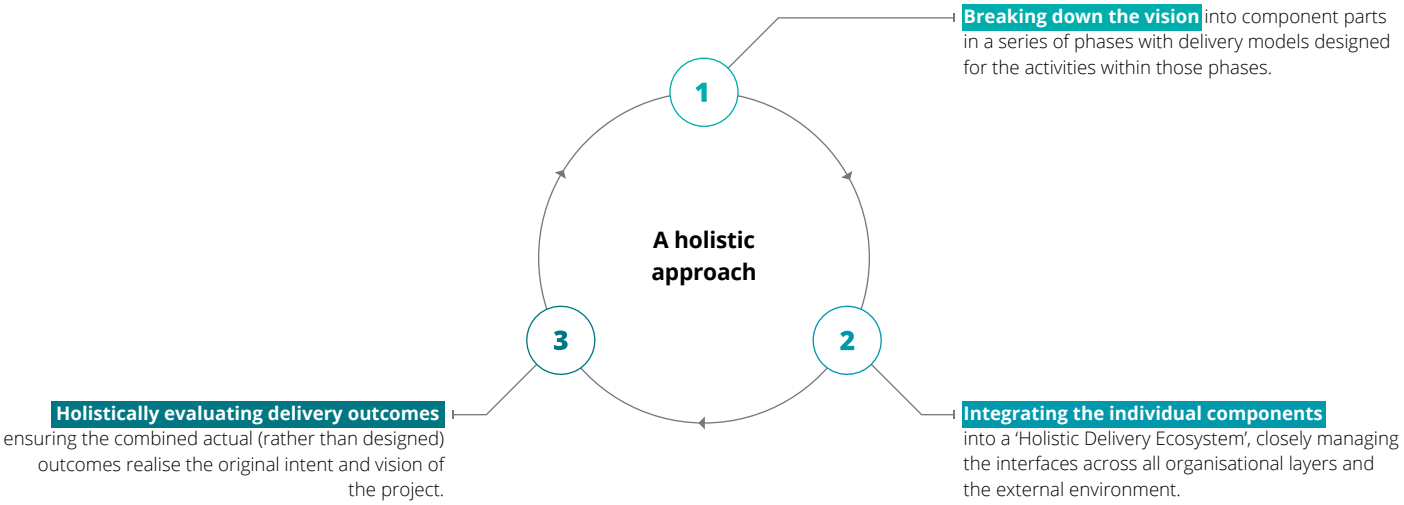
2. A holistic approach

Giga Projects comprise multiple Mega Projects which, in themselves, comprise Portfolios, Programmes and Projects.

For Giga Projects, there is a step change in scale and a much greater complexity due to the number of interfaces that need to be managed and integrated. This presents significant challenges for leaders in the way they architect their **Delivery Ecosystems**. They need to interface and align continuously with systems in the **External Environment** within which they operate. They also need to remain focused on and aligned with the **Vision** to ensure the delivered **Outcomes** realise the original intent of the project.



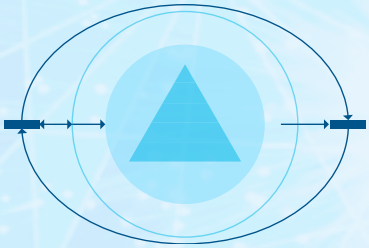
Fundamental to achieving the transformation vision of a Giga Project is an ongoing and iterative process comprising three elements:



This iterative holistic approach provides the foundation architecture for Giga Projects, and leaders should consider the following three key enablers as critical for successful delivery:

1. **The right benefits** – ensuring outcomes maximise the long-term legacy
2. **The right external environment** – influencing external systems to enable successful delivery
3. **The right capabilities** – building organisational capability to fulfil accountabilities and meet obligations

3.1 The right benefits



Giga Projects represent once-in-a-lifetime investments, and opportunities to add social value to communities and regions where they are delivered. Investments should deliver whole-life benefits that go beyond financial outcomes and include wellbeing and environmental sustainability.

If Giga Projects are to provide maximum benefits to society, they need to be guided by a clear vision focused on the long-term legacy rather than short-term project outputs or outcome performance measures. While non-financial benefits are often harder to measure, they give decision-makers a broader set of goals as well as a deeper understanding of the long-term risks and benefits of projects.

Moving on from a profit mindset

Giga Projects need to move on from a mindset focused solely on profit. Success and motivation is often driven by the desire to desire to deliver the best ROI almost regardless of cost, legacy, or the interests of key stakeholders. While some benefits may be difficult to measure or forecast, Giga Projects need to focus on implementing the Triple Bottom Line – "Doing Well by Doing Good". To deliver long term legacy and benefits for all stakeholders, leaders need to consider not only profitability, but also the economic prosperity of the communities the project serves, environmental issues impacting the stakeholders' ecosystem, social justice, and other equality and diversity targets.

The Triple Bottom Line

People
Giga Projects must focus on the well-being of society and demonstrate a positive impact on associated communities.

Planet
Projects need to ensure that outcomes and operations have a neutral environmental impact and cause minimal disruption to ecosystems.

Profit
Projects have to demonstrate a contribution to economic development and have a viable, resilient and sustainable commercial pathway model.

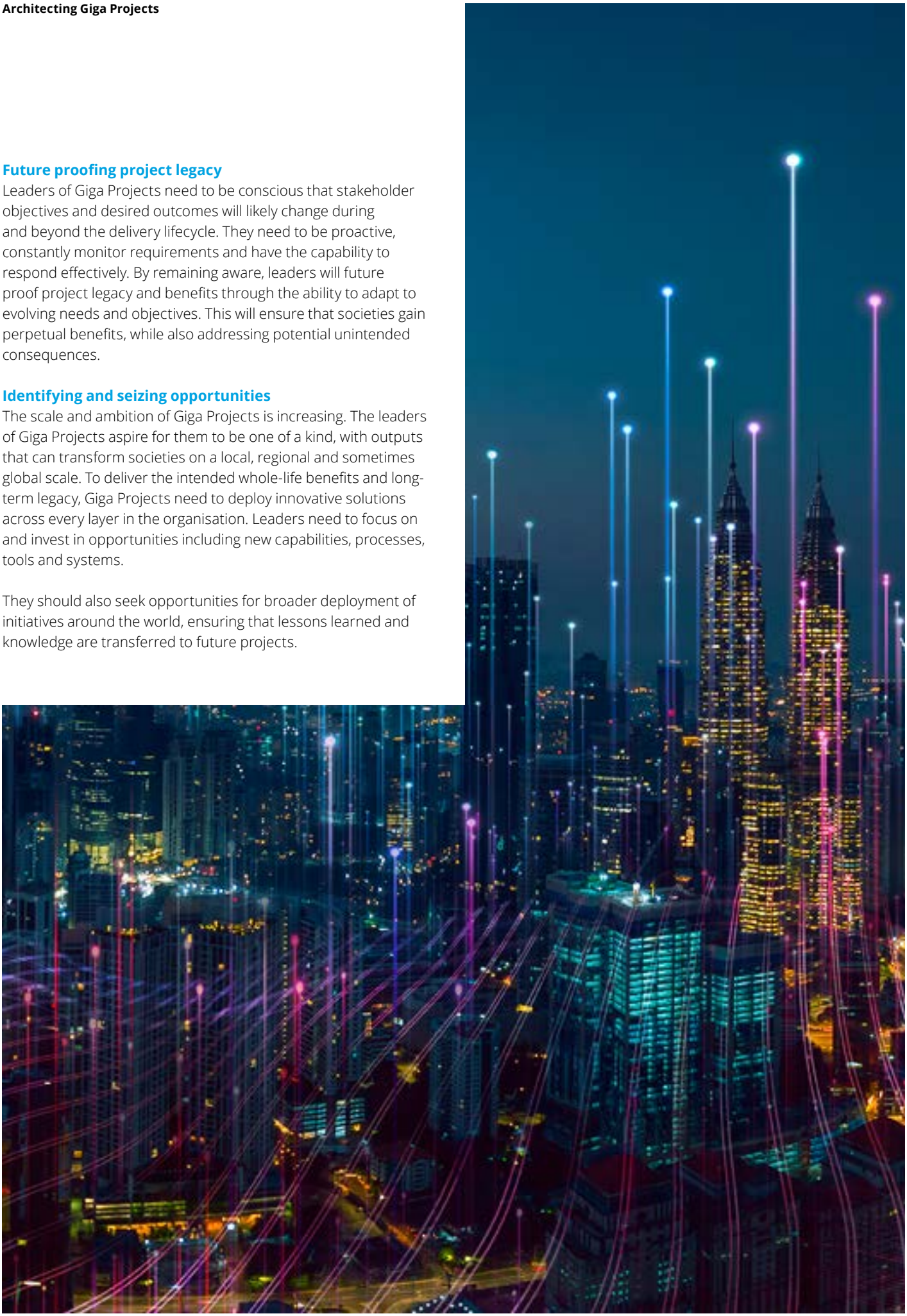
Future proofing project legacy

Leaders of Giga Projects need to be conscious that stakeholder objectives and desired outcomes will likely change during and beyond the delivery lifecycle. They need to be proactive, constantly monitor requirements and have the capability to respond effectively. By remaining aware, leaders will future proof project legacy and benefits through the ability to adapt to evolving needs and objectives. This will ensure that societies gain perpetual benefits, while also addressing potential unintended consequences.

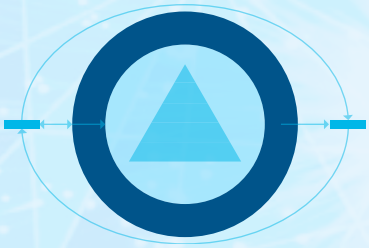
Identifying and seizing opportunities

The scale and ambition of Giga Projects is increasing. The leaders of Giga Projects aspire for them to be one of a kind, with outputs that can transform societies on a local, regional and sometimes global scale. To deliver the intended whole-life benefits and long-term legacy, Giga Projects need to deploy innovative solutions across every layer in the organisation. Leaders need to focus on and invest in opportunities including new capabilities, processes, tools and systems.

They should also seek opportunities for broader deployment of initiatives around the world, ensuring that lessons learned and knowledge are transferred to future projects.



3.2 The right external environment



The right external environment needs to be created to enable Giga Projects to implement the Triple Bottom Line successfully and deliver the desired long-term legacy and whole-life benefits.

The external environment is made up of five key systems all of which can impact the project in a different way. With Giga Projects, organisations should not be passive recipients of environmental pressures. They should be set up with the required capability to challenge and influence external systems to deliver change. Leaders need to be forward thinking, proactive, resilient and willing to interact and co-develop solutions with the external systems to deliver long-term benefits.

Leaders of Giga Projects need to interact with the following systems to create an environment which is mutually beneficial in what it constrains and enables:

01 Institutional and Legal Systems

Government policy, public and private investment and funding can all be key barriers to successful delivery. Leaders need to interface directly with institutions to influence and enable necessary change.

02 Economic Systems

Leaders need to influence local and global economies, demonstrating that the project will be economically sustainable and generate returns for investors.

03 Social Systems

Giga Projects need to adopt a human systems approach, co-creating solutions and bringing communities with them on the journey, to enhance social value and cultivate relationships.

04 Environmental Systems

Giga Project leaders need to assess their long-term impact on the environment. Their vision should be aligned with the United Nations Sustainable Development Goals (UNSDGs) after Unite Nations Sustainable Development Goals demonstrate commitment to peace and prosperity for people and the planet, now and in the future.

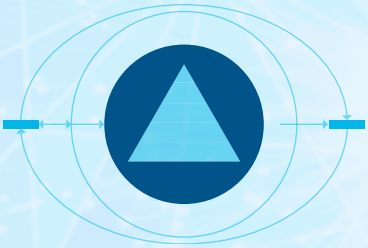
05 Supply Chain Systems

Giga Projects place significant demands on global supply chains including resources, materials and information. There needs to be reliable supply and demand forecasting and the creation of markets to ensure sufficient and effective supply.

References

Dualism – Mutually Constraining and Enabling systems. For example: Government Institutions can be 'constraining' by setting safety standards and requirements for construction projects while also 'enabling' delivery through legislative change.

3.3 The right capabilities



Industry-leading organisational capability

The future of Giga Project delivery is uncertain. Leaders will need to architect their Delivery Ecosystems with dynamic capabilities that can evolve and respond effectively to challenges.

Industry leading organisational capabilities take years to build and can be destroyed quickly, in many cases due to a lack of ongoing development, employee attrition and lack of appropriate training. Capabilities need to be protected, matured, evolved and adapted during and beyond the delivery lifecycle to realise the long-term legacy. It is also critical, due to the long programme lifecycles of Giga Projects, that delivery strategies consider succession planning, knowledge transfer, and when to demonstrate organisational readiness through capability assessments ahead of key milestones.

Entrepreneurial leadership

To deliver Giga Projects successfully, risks need to be taken and failures will likely occur. Leaders need to be comfortable with this and have the capability and mindset to respond effectively. Giga Projects need to be guided by individuals with an entrepreneurial mindset who are positive change agents responsible for promoting and enabling transformation in the midst of complex environments.Entrepreneurial leaders have a greater tolerance of uncertainty and ambiguity and are able to re-strategise and re-assemble continuously enabling them to build, sustain and lead resilient organisations.

Success Factors

Leaders of Giga Projects need to focus on building mission-led, integrated and collaborative project teams that are driven by the vision, long-term legacy and benefits across the entire Delivery Ecosystem.

Leaders need to consider their Delivery Ecosystem requirements holistically. They should consider the vision, desired outcomes and external environment and set up their organisations up with the following:

The right people,

Entrepreneurial leaders need to identify and attract talent and provide the necessary training and support to be able to quickly and effectively stand-up teams with the required capabilities for the project. Depending on requirements, leaders may choose to build or buy capabilities through partnerships and alliances. Leaders must create a high performing, outcome-focused and collaborative culture.

at the right time,

Leaders need to evolve their Delivery Ecosystems in line with changing conditions and requirements, building new and scaling up (or down) existing capabilities ahead of key milestones. Leaders will need to recruit, develop and flexibly deploy the right talent as needs change to ensure the right capabilities take prominence at the right time.

set up in the right way

Organisational and governance structures need to be clearly defined, with roles and responsibilities assigned appropriately. Teams also need access to processes, systems, data, analytics and reporting mechanisms to facilitate more efficient and effective decision making.

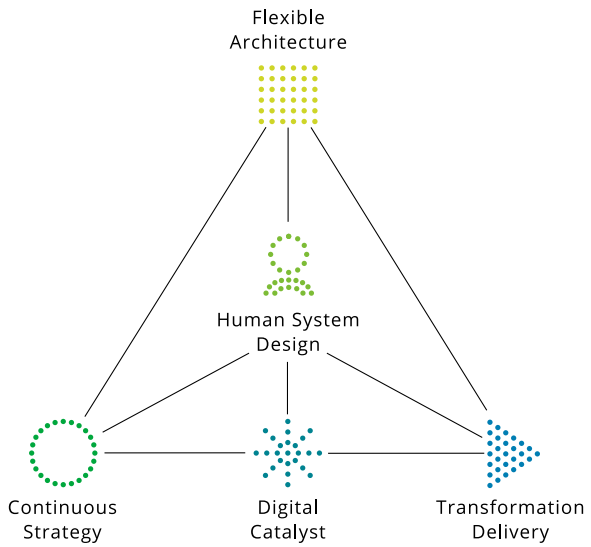
4. Key outcomes when we get it right

Giga Projects that adopt a holistic systems approach, and prioritise the implementation of the right benefits, external environment and capabilities in their programme architecture, have the opportunity to:

1. **Provide a foundation for the future**, pioneering new ways to deliver projects
2. **Realise a long-term legacy** that is aligned with the original vision and generate a body of knowledge and expertise that can be applied to future global projects
3. **Stimulate the economy and society** through benefits that go significantly beyond the real estate and infrastructure sectors to diversify the broader economy
4. **Accelerate the response to global challenges** through the prioritisation of UNSDGs and the implementation of ESG performance indicators
5. **Support global transformation efforts and promote investment** in multiple sectors, achieving high returns over the medium and long term
6. **Create unrivalled procurement, supply chain and logistics ecosystems**
7. **Champion new technologies and methodologies** to accelerate project delivery
8. **Attract the best talent** from around the world, building diversified and inclusive economies
9. **Accelerate job creation, upskill the workforce and stimulate social development**
10. **Deliver future-proofed assets** which are sustainable, resilient, and multi-use, and deliver diverse revenue streams to global economies

5. How Deloitte can help

A fundamentally new approach, Deloitte's Programme Aerodynamics® is a next generation delivery framework designed to create the conditions for success for the world's largest complex programmes.



It brings together mindsets, expertise, methodologies and solutions from Strategy, Digital, Programme Leadership and Human Centred Transformation to better anticipate, shape and manage change in Major Programmes.

Continuous Strategy

Our approach, centred on simulation technology, provides leaders with the ability to anticipate future needs, develop choices, assess options and evaluate outcomes.

Flexible Architecture

We define the key components of your project, developing a framework to manage the relationships between these components. Our framework helps manage evolving designs, improves resource and capability reallocation, and ensures greater alignment across the programme and external environment.

Human System Design

Our approach ensures that across the lifecycle, the right roles, skills, capabilities and leadership styles are in place. We focus on building a collaborative approach within organisations to ensure that teams are aligned and committed to making the best programme decisions.

Digital Catalyst

Using digital as a catalyst enables the achievement of business outcomes and benefits. We deliver digital capabilities to shape the design of solutions, manage delivery and support decision-making. We leverage technologies including digital twins to design more precise, impactful solutions.

Transformation Delivery

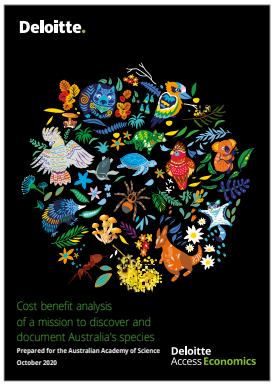
We define a delivery process which creates a forward-looking, problem-solving and aligned mindset. Focusing on building a delivery rhythm and transparency accelerates delivery and momentum.

Our Major Programmes website can be found here with links to further points of view below.

Setting up for Success
Deloitte's point of view on how Major Programmes should set up and transition their organisations over time in line with programme requirements.

Delivering with confidence
This insight shares Deloitte's experience of the challenges of setting up and transforming project controls, why controls are valuable, and how Deloitte supports clients to achieve transformation.

Delivering Sustainable Capital Projects
Deloitte's Path to Net Zero team set out their vision for a sustainable capital project that embraces ESG principles to pursue goals for reduced GHG emissions and consumption of finite resources.



Cost Benefit Analysis
Measuring the economic benefits of taxonomy has inherent uncertainty. This report accounts for this by identifying a range of outcomes, including total financial benefits of the taxonomy mission.

Digital Capital Projects
Deloitte's three phase digital transformation process is set out in this piece to support clients to gain safety, efficiency, and significant financial benefits through the project lifecycle.

Mining Capital Projects
This paper outlines five levers for mining companies to improve project success and scalability throughout the next upcycle, and beyond.

6. Get in touch

We would be delighted to discuss what our thought leadership and Programme Aerodynamics framework could mean for your Giga Project.

Our key contacts are below, who you can reach out to via email or LinkedIn. We can also offer an you immersive 'Deloitte Greenhouse lab' to discuss your key challenges in more detail and provide you with a tangible action plan.

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