



Engineering Design & Simulation

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central
innovation

CAPABILITY DOCUMENT - SIMULATION

Engineering Design & Simulation

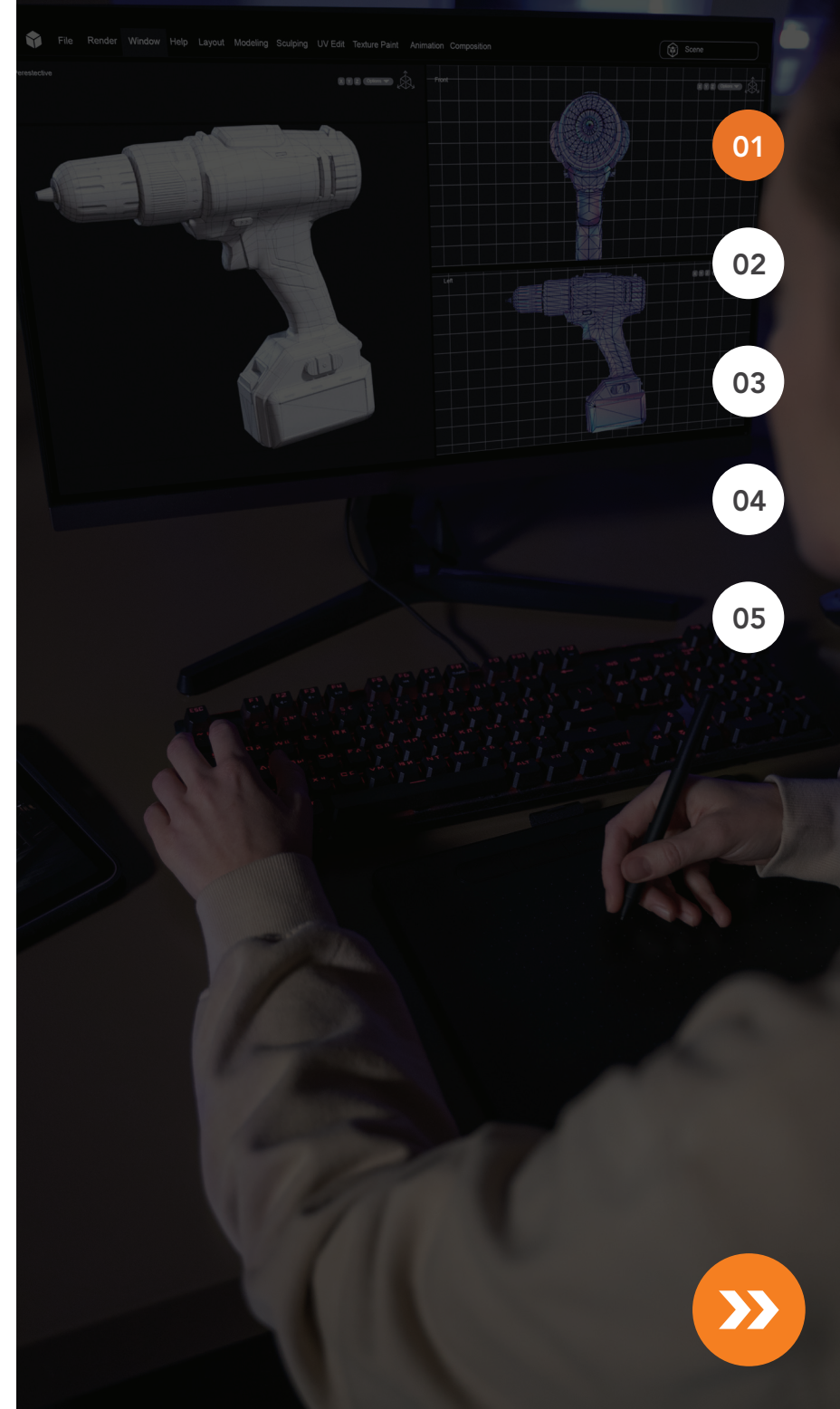
Central Innovation has been a valued strategic partner to the Australian and New Zealand manufacturing and AEC sectors for more than three decades.

We work closely with leading and emerging companies, supporting them in their growth journey through the provision of integrated solutions which deliver a measurable difference to their bottom lines.

Engineering design and simulation is a core component of Central Innovation's consulting services. This embraces everything from design review, utilising simulation and analysis to evaluate integrity, performance and safety, to standards compliance, improvement and optimisation, and design validation through documentation and reporting.

These services are delivered utilising the latest technological advances by our multidisciplinary team of in-house experts, which includes top-in-class certified mechanical/ mechatronic engineers and other specialists with many years of experience in 2D/3D design modelling, proficiency in programming languages and in-depth knowledge of multidisciplinary simulations.

Effective communication and collaboration are crucial in design validation, and to this end we engage in regular discussions with your engineering and design staff to ensure we understand your project requirements, are able to identify and address concerns, and provide you with regular updates throughout the process.

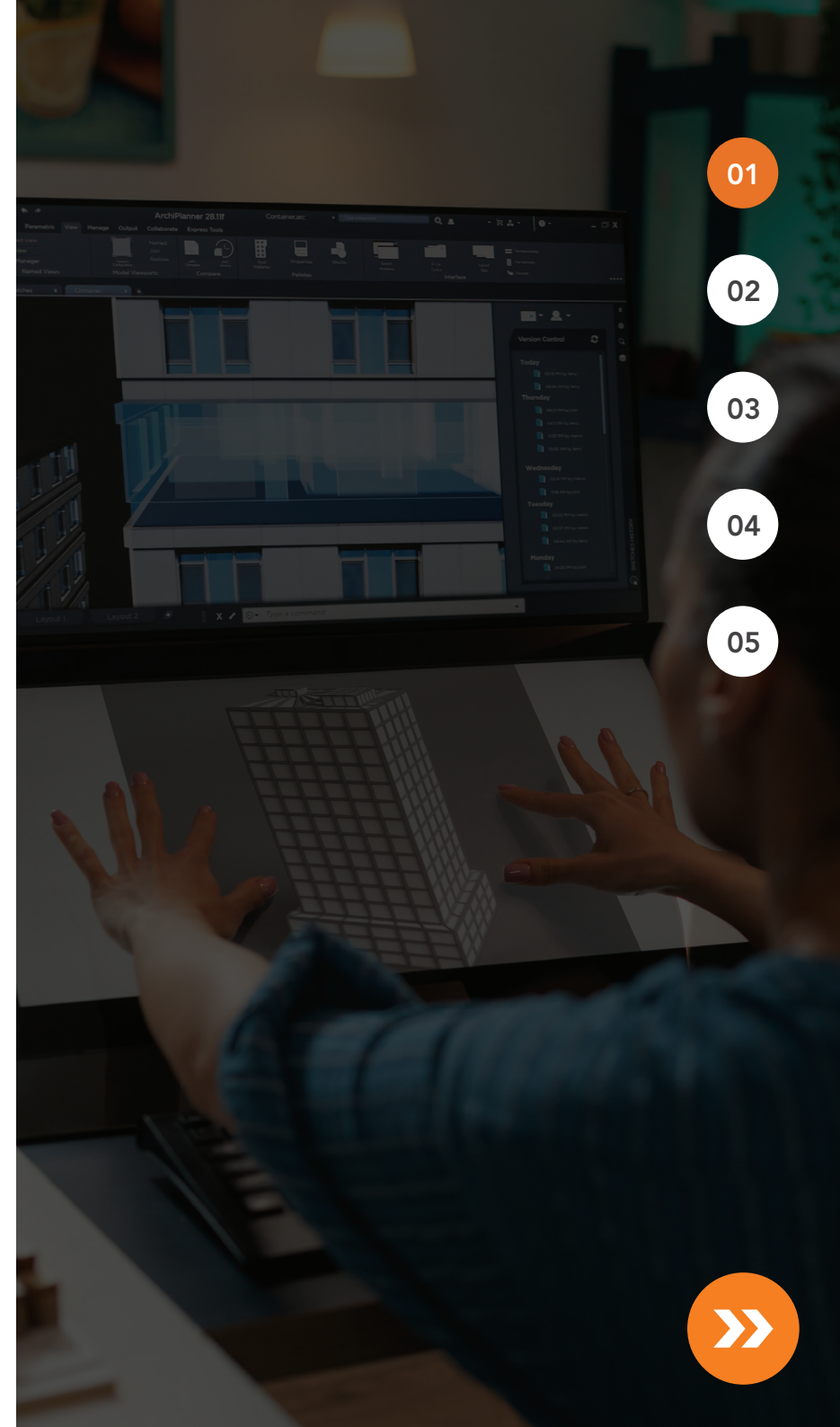


But it doesn't end there. Our market leading customised, on-the-job training in simulation and analysis is unmatched by our competitors, and can help to speed up the product life cycle, cut down on costs and upskill your people all at the same time.

Central Innovation can also assist you with process automation, including workflow automation design and customised configurations; and data management and collaboration streamlining and optimisation.

Complementing our consulting services is our extensive range of manufacturing and AEC software solutions, including our own suite of in-house developed tools designed to help you use the power of automation to design faster, optimise workflows and improve time to market.

Our aim is always to partner strategically with our customers and deliver solutions which meet their needs.



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How Our People Can Make The Difference To Your Business

When you partner with Central Innovation's engineering design and simulation services, you gain access to a dedicated team of in-house experts across Australia and New Zealand, including top-in-class certified mechanical/mechatronic engineers.

Our team works closely with you to review and assess your design specifications, identify any potential issues or weaknesses, and find solutions in the form of improvements and optimisations.

We lead the market in the provision of customised, on-the-job training to help you undertake simulation projects, typically bringing in our own team member/s on site to work with your staff as required. This service is tailored to your specific needs – we work closely with your people to implement the simulation and obtain results for analysis, we provide the expertise and support to interpret those results, and we counsel on the next steps needed to ensure you achieve your design/production goals.

Our aim is always to validate design integrity and functionality prior to implementation and/or manufacture. This approach means you can go to market secure in the knowledge that your product ticks all the boxes and there will be no unwelcome surprises in store.

To that end, we work closely with your people across each relevant step of the product life cycle, ensuring each of our services are delivered to meet your timelines.

Thanks to the skillset of our expert team, you can be assured our simulation and design validation results will reflect the highest possible accuracy. And through us working closely with your own people, they have the opportunity to upskill their own design and validation credentials.

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Team Credentials

Central Innovation's engineering design and simulation team embraces experts with:



Extensive experience across the three core disciplines of EMAG (electromagnetic), CFD (computational fluid dynamics) and FEA (finite element analysis) simulation



Proficiency in scientific programming languages including C/C++, FORTRAN, Python and MATLAB



Standard-based mechanical and material testing skills as per ISO/ASME



In-depth knowledge of structural and materials analysis (mechanical/thermal, fluid dynamics, static/dynamic, linear/nonlinear, vibration, fracture/fatigue, etc)



Strong background in developing next-gen battery technologies, aerospace structures and mechanical/thermal management systems



Experienced multidisciplinary research team leadership and R&D collaboration skills



Ph.D. in Mechanical Engineering with focus on computational mechanics/materials; M.Eng in Mechanical Engineering; B.Eng in Mechanical Engineering specialising in engineering mechanics; Certified Chartered Mechanical Engineer

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What We Offer

Central Innovation's engineering design and simulation services encompass an unmatched range of solutions to meet the needs of our manufacturing and AEC sector clients.

These include our advanced simulation and analysis expertise, consulting and strategic counsel, customised on-the-job training, software bundles and support, and further in-person and virtual education as required.

We work with you across each relevant step of the product life cycle to ensure the integrity and functionality of your design prior to its implementation/manufacture. If you need assistance and support with any of the following, you can count on us to help.

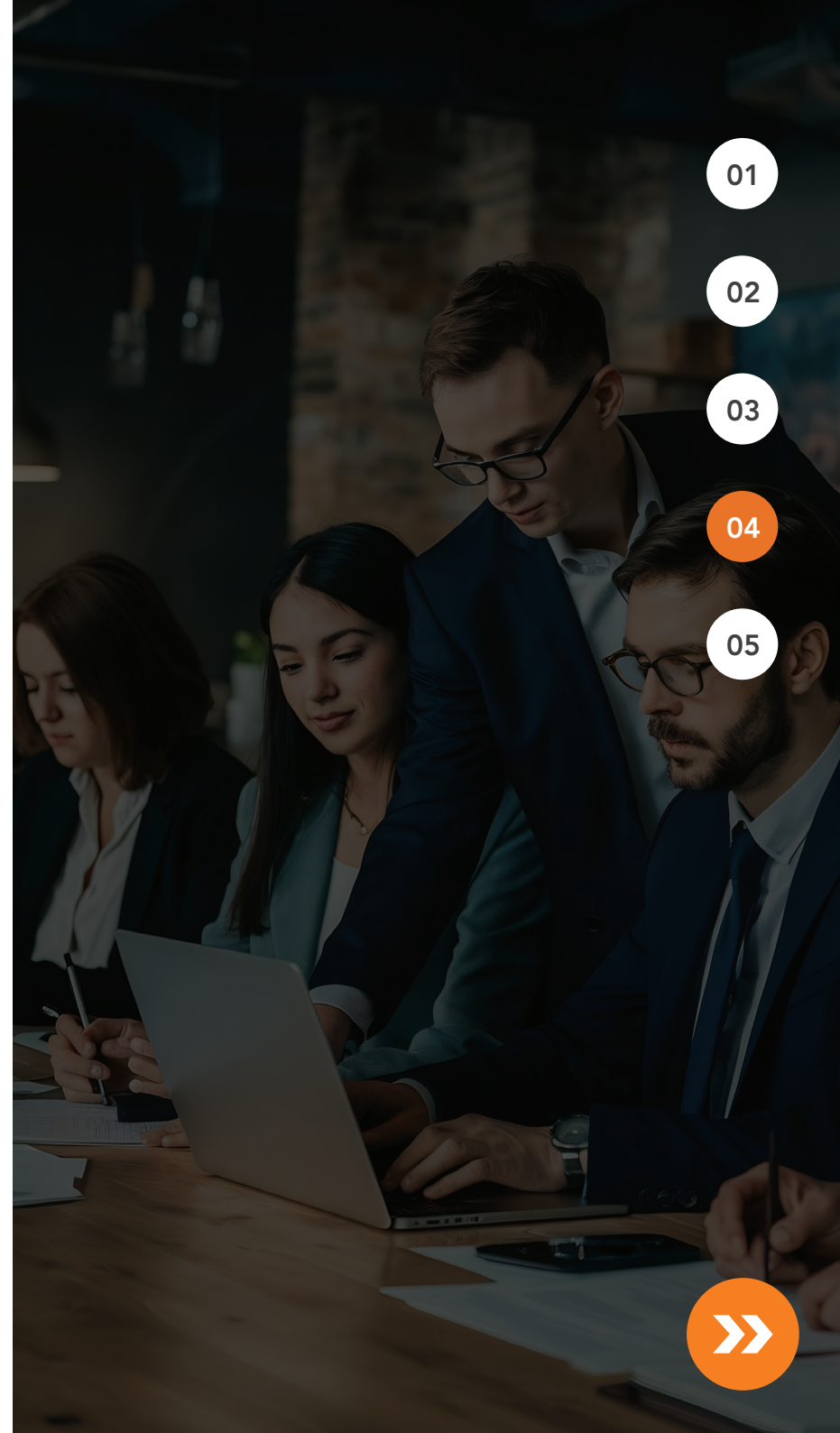
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Simulation and Analysis

Our team specialises in solving complex engineering and design questions through advanced simulation techniques, providing you with accurate and reliable insights into the behaviour of your parts and products under various conditions.

We conduct simulation and analysis across the three core disciplines of



ELECTROMAGNETIC (EMAG)

We utilise computational techniques and extensive in-house expertise to model and analyse the behaviour of electromagnetic fields in devices, structures or systems. This typically involves complex mathematical equations which describe the interactions of electric and magnetic fields. Applications include antenna design/optimisation, radio frequency and microwave circuit analysis, electromagnetic compatibility (EMC) assessments, thermal analysis in electromagnetic systems and wave propagation studies.



COMPUTATIONAL FLUID DYNAMICS (CFD)

This discipline, which utilises algorithms and numerical methodology to simulate and analyse fluid flow behaviour, enables us to predict complex interactions of fluids (liquids and gases) with structures, surfaces and each other across engineering applications. It encompasses thermal analysis, aerodynamic analysis, environmental flows and multiphysics simulations.



FINITE ELEMENT ANALYSIS (FEA)

FEA is used to simulate and analyse the behaviour of a component or assembly under given conditions, typically to identify any issues with structural integrity and thereby ensure safety and reliability. Using this discipline allows us to better understand how the component or product will perform in the real world, without need for a physical prototype.

We can work with both linear and nonlinear models as well as composite material models.

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Design Review

We undertake comprehensive design and specification reviews, analysing designs for

- Industry standards compliance
- Functionality
- Manufacturability
- Performance

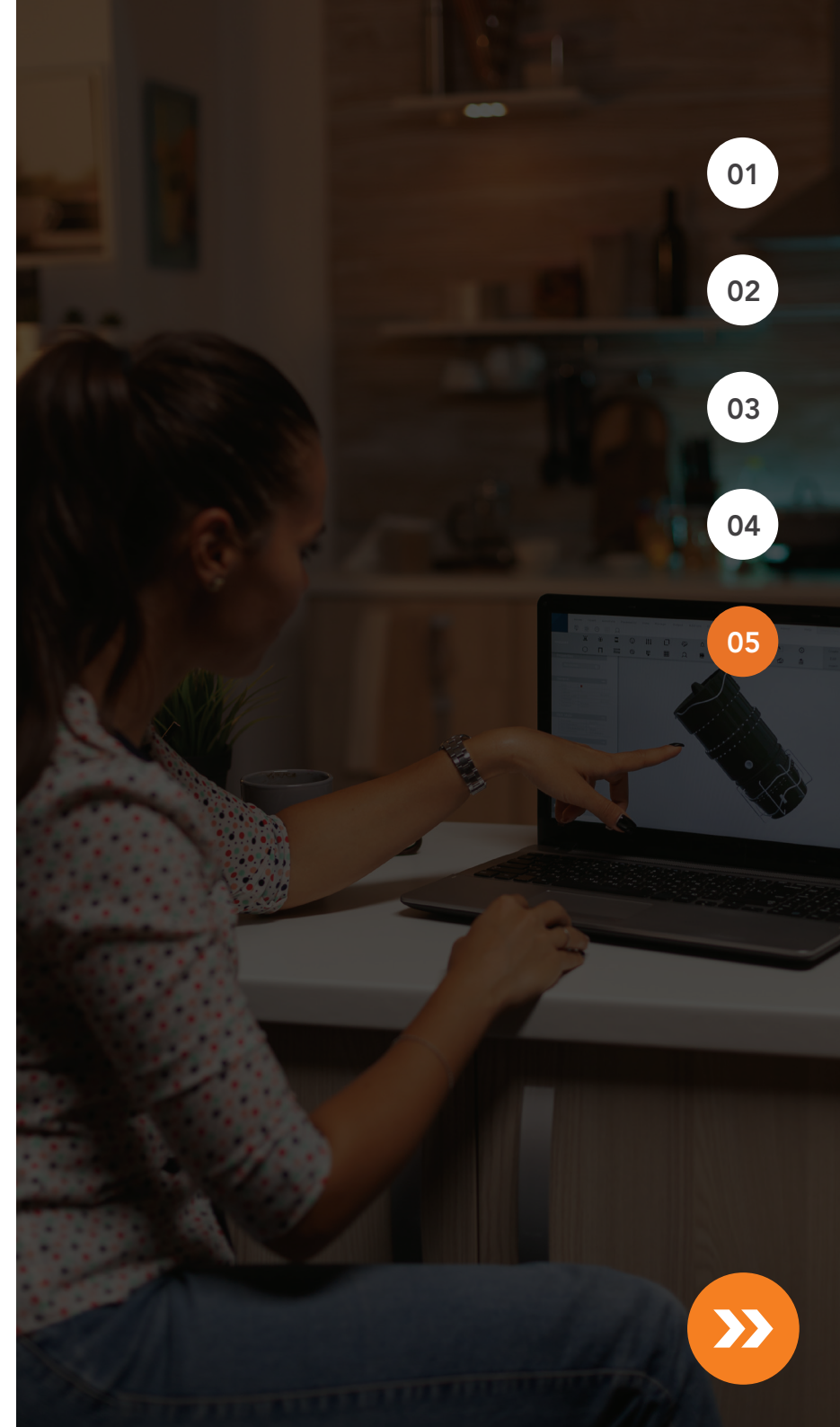
Failure Analysis

In the event of design failures or malfunctions, Central Innovation's team can perform failure analysis to identify root causes, such as design flaws, and advise on corrective actions.

Compliance and Standards

We ensure designs comply with relevant industry standards, codes and regulations (such as DNV, AS, ISO and NORSOK).

Our in-depth knowledge of applicable standards can guide you through the compliance process to avoid costly legal or safety issues down the road.



Optimisation and Improvement

Central Innovation's team works closely with you to optimise and improve designs, drawing on tools including

- Topology optimisation
- Functional generative design technology

This process can enhance performance, reduce costs, streamline manufacturing workflows and identify solutions for any shortcomings.

We can provide recommendations and alternative approaches to help you achieve better design outcomes.

Documentation and Reporting

Our findings, recommendations and test results are documented in detailed graphical, tabular reports.

These serve as valuable references to help you make informed decisions about design modifications/improvements.

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At Central Innovation, design and data technology meets innovation, as we help our customers get the most out of their technology and people. Since 1990, we have been helping customers in the architecture, engineering, construction, and manufacturing industries maximise their design capabilities. We do this by helping them bridge the gap between technology and what they get out of it.

Parent to the leading companies, Intercad & Graphisoft Australia, we don't just provide industry-leading software, but also training, consultations, technical support and many other tools and resources to help you transform the way you work.





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