



Modernising Upholstery Practices Through Wool & Knitted Textiles

Georgia Brunmayr

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Report by Georgia Brunmayr
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The International Specialised Skills Institute

1/189 Faraday St,
Carlton VIC 3053
info@issinstitute.org.au
+61 03 9347 4583

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01

Acknowledgements

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The Fellow sincerely thanks The George Alexander Foundation for providing funding support for the ISS Institute and for this Fellowship.

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Fellow's Acknowledgements

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Executive Summary

This Fellowship report documents the research and technical exploration undertaken by Georgia Brunmayr, founder of Curio Practice, through an International Specialised Skills Institute Fellowship. The project investigated the integration of advanced knitting technologies — particularly in wool and sustainable fibre blends — into the upholstery sector, with the aim of modernising Australia's approach to furniture textiles.

Drawing on a background in both technical knitting and performance material development, Brunmayr spent her Fellowship engaging directly with Italy's leading textile mills, machinery manufacturers, and upholstery innovators. The research extended to attending two major international trade events: Heimtextil in Frankfurt, Germany, and Pitti Filati in Florence, Italy, providing insights into the latest yarn innovations, knitting structures, and market trends.

The Fellowship had three primary goals:

1. To identify how flat, circular, warp, and 3D knitting can be adapted for upholstery applications.
2. To explore how wool — particularly Australian merino — can be enhanced through fibre blending and advanced finishing techniques to meet upholstery performance standards.
3. To determine how these innovations could be translated into an Australian manufacturing context, despite the absence of high-speed knitting machinery domestically.

The outcomes reveal that while Australia currently lacks the industrial infrastructure to replicate Italian upholstery manufacturing at scale, there is significant opportunity to begin with flat-knitted prototypes, test market appetite, and gradually build a niche for design-led, wool-rich knitted upholstery fabrics. The report recommends targeted collaboration with local furniture makers, strategic investment in sampling capabilities, and further engagement with the international textile technology network to maintain technical currency.

03

Fellowship Background and Introduction

Fellowship Context

The Fellowship addresses a significant gap in Australian upholstery. Woven fabrics — flat weaves, velvets, and printed textiles — dominate local supply, while knitting technologies, well established in apparel and footwear, remain almost entirely absent from interior applications. Knitting can reduce material waste, integrate functional performance directly into the textile structure, and support localised, on-demand production that suits the scale of the Australian market.

Italy was chosen as the primary research destination because it offers a rare ecosystem where centuries of material knowledge coexist with state-of-the-art machinery, enabling comparative study across techniques, scales, and philosophies. The Fellowship aimed to explore all viable technologies — circular, flat, warp, and 3D knitting — and assess their respective benefits, limitations, and scalability for the Australian market.

Fellowship Methodology

The research methodology combined direct observation, hands-on machine trials, structured mill visits, trade fair immersion, and informal interviews with technicians, designers, and sustainability leaders. The approach emphasised comparative analysis across gauges, machine families, yarn blends, and finishing processes. Visual documentation, swatch collection, and structured technical notes were maintained throughout for subsequent translation into Australian prototyping.

Fellowship Period

Research travel and fieldwork were concentrated in January and February 2025, across Italy and Germany. The itinerary covered Brescia and Carpi for machine-focused learning; Lombardy, Biella, Tuscany, and Veneto for mill visits; Florence for Pitti Filati; and Frankfurt for Heimtextil.

Fellow Biography

Georgia Brunmayr is a Melbourne-based material designer and founder of Curio Practice, a studio dedicated to slow-making, innovation, and the considered use of materials. Her design philosophy combines traditional craft with modern textile engineering, often anchored in the use of Australian merino wool — a fibre she has worked with extensively across both artisanal and industrial contexts.

Her career began in high-performance knitwear with five years at Santoni Shanghai — one of the world's most advanced circular knitting technology companies. While there, she worked across apparel, footwear, and technical textiles, and played a central role in establishing the Santoni Material Experience Centre (MEC): a hub for research, prototyping, and the application of knitted structures across diverse industries. This gave her deep technical knowledge of machine capabilities, programming, and yarn selection for performance-driven textiles.

Following her time at Santoni, Brunmayr joined Adidas in footwear development, further refining her skills in engineered knitting, functional yarn blending, and high-precision manufacturing. This role exposed her to the ways in which sportswear innovation — zonal performance knitting, shape engineering, function-mapped material systems — could be adapted beyond apparel and footwear. That insight became a cornerstone of the Fellowship's methodology.

The ISS Institute Fellowship was conceived as a bridge between these two worlds: the high-tech, performance-oriented knitting sector and the traditional, craft-driven upholstery industry. Brunmayr recognised that upholstery in Australia is still largely dominated by woven fabrics and conventional foam-and-fabric construction, while in Europe, knitted upholstery is an established, fast-evolving category integrating 3D shaping, breathable structures, and waste-reducing production techniques.

Rationale for the Fellowship

Australian upholstery manufacturing is highly limited in its capacity to adopt knitted solutions. The country exports some of the finest wool in the world yet imports most of its high-value textiles. By embedding herself within the Italian textile ecosystem — from Brescia's advanced knitting machine facilities to Tuscany's artisanal mills — Brunmayr sought to:

- Understand the technical requirements of knitted upholstery production.
- Identify yarn blends that balance the natural advantages of wool with the durability required by real-world use.
- Explore both high-speed, high-volume production methods and small-batch, design-led approaches.
- Understand the intellectual property, software skills, and trained technical workforce required to operate advanced knitting machinery — a critical gap in Australia.
- Build an actionable plan for introducing these methods into Australia.

The Fellowship journey was as much about technical learning as it was about cultural immersion. Italy's textile industry is underpinned by centuries of craftsmanship, yet it thrives through relentless innovation — a model that offers valuable lessons for Australia's own textile and upholstery sectors.

Abbreviations, Acronyms and Definitions

- **GG: Machine gauge** — the number of needles per inch. A lower gauge (e.g. 14gg) accommodates thicker yarns and produces more textural, robust fabrics. A higher gauge (e.g. 80gg) produces finer, denser fabrics suited to refined surfaces.
- **SJ: Single jersey** — a basic single-layer knit structure, lighter and more drapey.
- **DJ: Double jersey** — a two-layer knit with greater thickness, stability, and abrasion resistance. Suited to upholstery seating.

- **Interlock:** A stable double-knit with balanced appearance on both faces. Dimensionally stable and resistant to curling.
- **Warp knitting:** A knitting method where yarns are fed in parallel along the fabric length, producing highly stable, low-stretch fabrics. Key machines include the Karl Mayer Rascheltronic.
- **Shima Seiki:** A Japanese manufacturer of flat knitting machines. The Fellow operates a 14gg Shima Seiki at Curio Practice's Melbourne studio — a versatile machine suited to prototyping, sampling, and small-run upholstery panel production.
- **Santoni:** An Italian manufacturer of circular knitting machines, considered the global benchmark for seamless and performance knitting. The Fellow spent five years at Santoni Shanghai and conducted key research at Santoni's Brescia headquarters and Carpi production facility.
- **CAD/CAM:** Computer-aided design and manufacturing — used to program knitting machines, map zonal structures, and translate design intent into machine instructions.
- **MEC:** Material Experience Centre at Santoni Shanghai — a research and prototyping hub co-established by the Fellow.
- **Spacer:** A three-dimensional knit using two outer layers connected by monofilament or pile yarns, creating built-in cushioning without foam.
- **Martindale:** A standardised abrasion test for upholstery fabrics. Contract-grade fabrics typically require 30,000–50,000+ rub cycles.
- **RWS / GOTS / GRS:** Responsible Wool Standard, Global Organic Textile Standard, and Global Recycled Standard — certifications relevant to sustainable fibre sourcing and production.

04

Fellowship Context and Itinerary

The purpose of Georgia Brunmayr's ISS Institute Fellowship was to investigate how modern knitting technologies, paired with Australian merino wool, could be applied to the upholstery sector in ways that extend beyond conventional woven fabrics. Italy was chosen for its unique position as both guardian of textile heritage and hub of cutting-edge innovation — offering a rare opportunity to study processes from fibre preparation to final finishing at the highest level.

Brunmayr's research was intentionally broad. While flat knitting was a clear area of interest due to her existing Shima Seiki capabilities in Australia — a computer-controlled flat knitting machine used for prototyping, custom panels, and small-run production — the Fellowship sought to explore all viable technologies: circular knitting, warp knitting, and 3D knitting. This openness allowed for a holistic view rather than a single-technology bias.

Santoni Headquarters — Brescia

The first major stop was Santoni's headquarters in Brescia. Santoni is the world's leading manufacturer of seamless circular knitting technology — their machines are used globally for apparel, technical textiles, and increasingly, interiors. Brunmayr examined an extensive range of machines from 14gg to 80gg, with demonstrations of how stitch density, yarn choice, and patterning software could be tuned for different performance outcomes. Swatch libraries showed upholstery-relevant structures including double-knits for stability, mesh zones for ventilation, and spacer fabrics for cushioning.

The visit reinforced the critical role of advanced software in maximising a machine's potential. Santoni's Loop software demonstrated how knit-to-shape patterning could reduce waste and simplify finishing. One of the most striking observations was the skilled technician workforce that sustains these systems in Italy — dedicated training pathways and apprenticeship systems that simply do not exist in Australia's upholstery sector. See Figure 1 and Figure 2.

Carpi — Santoni Production Facility

In Carpi, Brunmayr conducted hands-on trials on 14gg, 16gg, and 22gg circular knitting machines. The 14gg and 16gg runs produced robust, tactile structures well-suited to thicker yarns, while the 22gg trials delivered smoother, more compact surfaces — comparable to the face fabric of a premium armchair or automotive headrest. See Figure 3.

One key challenge emerged: yarn set-up requirements. Circular knitting for upholstery requires a minimum of 48 cones of yarn to fill the feeders for a single colourway. At approximately AUD \$60 per cone, the yarn commitment for a single set-up approaches AUD \$3,000 before a metre of trial fabric is produced. The trials also revealed the potential for zonal knitting — integrating high-abrasion structures only where needed, with lighter constructions elsewhere.

Italian Mills — Lombardy, Biella, Tuscany, Veneto

Across four major textile regions, Brunmayr visited mills specialising in both woven and knitted upholstery fabrics, gaining insight into the full supply chain from fibre preparation through to finishing.

- Yarn treatments: felting, heat-setting, and finishing to improve abrasion resistance and dimensional stability. At a Biella mill, superfine merino yarn was heat-set at controlled temperatures to lock the fibre structure and reduce pilling — directly applicable to flat-knit upholstery panels. See Figure 4.
- Blending strategies: combining wool with recycled polyester or nylon. In Tuscany, a merino-recycled polyester blend at 70/30 ratio passed 40,000 Martindale rub cycles while retaining the warmth and handle of natural fibre.
- Finishing processes: brushing, calendaring, and coating to alter handle, sheen, or durability. Veneto mills showed how a simple brushing finish could transform a flat-knit surface from industrial to refined.

Heimtextil — Frankfurt, Germany

Heimtextil, the world's largest interior textiles trade fair, provided exposure to hundreds of upholstery innovations. Key observations included knitted upholstery from Northern European manufacturers featuring highly engineered spacer fabrics for office and transport seating; performance yarn developments including bio-based polyesters and solution-dyed fibres; and hybrid constructions combining knit and woven layers for automotive interiors. See Figures 7 and 8. Heimtextil also provided networking opportunities with fibre producers, coating specialists, and machinery manufacturers.

Pitti Filati — Florence, Italy

Pitti Filati, the world's premier yarn exhibition, provided a forward-looking view of fibre and yarn development. Several exhibitors presented upholstery-relevant yarns including high-tenacity wools with improved abrasion resistance, recycled polyester filament yarns blended with wool for dimensional stability, and novelty yarns with bouclé or slub textures for tactile depth in flat-knit surfaces. See Figure 1.

Conversations reinforced a crucial insight: upholstery performance is rarely achieved by fibre choice alone — it is the interplay of yarn engineering, knitting structure, and finishing that creates a commercially viable product. In Australia, this kind of collaboration between spinners and knitters is almost non-existent. The knowledge is held by a small number of large companies and not actively shared with emerging designers or the next generation of practitioners.

05

Key Technical Learnings

The Fellowship offered the rare opportunity to work hands-on with machinery, materials, and processes at the cutting edge of upholstery textile production. Through in-person trials, mill visits, and trade show research, several core technical learnings emerged — each with implications for how wool and knitted textiles can be adapted for the Australian upholstery market.

5.1 Circular Knitting Technologies

Circular knitting on Santoni machines emerged as a cornerstone for upholstery innovation. Key gauge observations:

14gg & 16gg — Heavier, more open structures paired with thicker yarns for upholstery with a tactile, dimensional surface. A 14gg double jersey in a merino-polyester blend produced a swatch with handle and weight comparable to a traditional woven armchair fabric.

22gg — Offers a sweet spot between density and refinement. Trials using merino-polyester blends produced smooth, compact surfaces ideal for high-touch areas such as armrests, seat panels, or automotive headrests.

High Gauge (40–80gg) — Can produce micro-patterned jacquards and subtle textures suited to premium interiors, but require extremely fine yarns and significant programming investment.

A single production set-up requires a minimum of 48 cones of yarn — at approximately AUD \$60 per cone, this represents around AUD \$3,000 in yarn alone. Circular knitting is best suited to scaled production once market demand is proven, rather than as the entry point for Australian makers. See Figures 2 and 3.

5.2 Flat Knitting — The Australian Entry Point

Flat knitting on Shima Seiki machines provides a far more accessible path for prototyping and low-volume upholstery production in Australia. The conclusion from the Italian research is clear: while circular knitting offers superior speed for high-volume production, flat knitting is the practical pathway for Australia right now. See Figures 9 and 10.

- **Lower Yarn Set-Up Requirements:** Uses only the amount of yarn needed for the programmed piece, making it economical for sampling and bespoke production.
- **Design Flexibility:** Stitch patterns can be changed frequently without the long downtime required to reconfigure circular machines.

- Shape Engineering: Panels knitted to exact dimensions, reducing cutting waste and aligning with zero-waste production goals.

5.3 Warp Knitting for Stability and Commercial Settings

Warp knitting on Karl Mayer Rascheltronic machines produces fabrics with dimensional stability comparable to woven textiles while retaining knitting's design flexibility.

- Abrasion Resistance: Warp knits can achieve 50,000+ Martindale rub cycles, meeting and exceeding contract upholstery standards.
- Design Versatility: Capable of both open mesh structures for breathability and densely packed jacquards for high-wear applications.
- Weight Range: Upholstery-relevant constructions typically sit between 330–400g/m², placing them in direct competition with heavy woven fabrics.

Warp knitting is most often associated with synthetics, but mills in Lombardy and Veneto were experimenting with wool-warp knits pairing merino with high-tenacity recycled polyester for contract upholstery.

5.4 3D Knitting — Future Capability

3D knitting produces a complete furniture cover in a single seamless piece, eliminating cutting, sewing, and multiple panels. See Figure 6.

- Rib Zones: Offering compression or shaping at specific structural points, such as the edges of a seat cushion.
- Mesh Zones: Allowing ventilation for seating comfort.
- Spacer Structures: Creating built-in cushioning without foam inserts — with the potential to eliminate synthetic foam from upholstered furniture.

Access to the necessary machinery and programming expertise remains a barrier in Australia. In Italy, this process is supported by specialist technicians who can translate a designer's vision into complex multi-zone programs — a skill base that does not yet exist in the Australian upholstery sector.

5.5 Yarn Science — Wool in Upholstery Applications

A major part of the research focused on how wool performs when re-imagined for upholstery. The Fellowship also crystallised an evolution in the Fellow's position on fibre composition. While the original ambition was 100% natural knitted upholstery, direct engagement with real-world demands — hotel interiors, high-traffic seating, contract environments — made clear that a selective, considered use of recycled synthetic fibres is not a compromise but a design decision grounded in performance reality.

100% Australian Merino Wool — Pros: elastic recovery, natural flame resistance, moisture regulation, softness. Cons: lower abrasion resistance compared to synthetics, requiring structural reinforcement or blend partners for long-term durability.

Wool + Recycled Polyester — Increases abrasion resistance and improves pilling performance while stabilising dimensions without compromising tactile quality. The preferred blend for Curio Practice's prototyping work.

Wool + Monofilament — Adds sculptural rigidity for complex furniture shapes, particularly in spacer constructions.

Wool + Elastane — Offers controlled stretch, useful for tight-fitting covers or organic furniture forms.

From visits to Biella and Tuscany, it became clear that finishing techniques — felting, heat-setting, brushing — are as important as fibre composition in determining performance outcomes. See Figures 4 and 11.

5.6 Insights from Pitti Filati

Pitti Filati reinforced several important signals for the upholstery market: performance-oriented wool blends engineered specifically for contract interiors; traceable, low-impact wool with RWS, GOTS, and GRS certifications; innovations in colouration including space-dyed merinos, bouclé, and slub yarns; and active co-development between spinners and machine manufacturers like Santoni to ensure yarns are optimised for specific gauges.

Australian wool has a genuine brand advantage internationally. But to compete in upholstery markets, it must be paired with technical performance data and design-led storytelling. That combination — natural provenance, measurable performance, design integrity — is precisely what Curio Practice is positioned to deliver.

06

Industry Context, Mills, and Next Steps

One of the most valuable aspects of the Fellowship was the ability to embed directly within the Italian textile and upholstery ecosystem — a network of mills, technicians, and suppliers refined over generations.

6.1 The Italian Upholstery Ecosystem

Italy's textile manufacturing strength lies in its clustering model — entire regions specialising in specific processes, creating short supply chains, rapid prototyping, and an unusually high level of quality control.

- Biella Region: Renowned for fine wool spinning and finishing, with dedicated R&D teams and traceable wool supply chains.
- Lombardy: A hub for knitting technology, with Santoni and Karl Mayer facilities producing machinery for both high-fashion and industrial-scale output.
- Tuscany: Known for artisanal finishing houses where fabrics are brushed, fulled, sheared, or felted.
- Veneto: Home to synthetic specialists and upholstery-focused mills producing for global contract markets.

This ecosystem is supported by a deep and continuously replenished skill base. Cross-disciplinary understanding is the norm — machinists, programmers, textile chemists, and designers carry knowledge of the full textile lifecycle. In Australia, the contrast is stark: no dedicated training pathways for knitting machine programming exist in an upholstery context, and the knowledge that does exist is held by a few large companies and not shared openly with emerging designers or the next generation.

6.2 Key Mills and Facilities Visited

NESATEX, Carpi —

A leader in circular knitting for fashion and upholstery. Brunmayr observed the full production flow from yarn creeling to fabric take-up, noting the speed at which design changes could be implemented once a machine was set up.

Santoni, Brescia —

The global epicentre of seamless circular knitting technology. Time here included hands-on trials at different

gauges, consultations with technicians about structural integrity in upholstery applications, and exploration of double-knit spacer fabrics for built-in cushioning.

Suedwolle Group, Biella —

A global leader in worsted wool spinning. Their R&D team discussed wool's abrasion resistance in upholstery, reinforcing the need for blends or structural enhancements for high-duty applications.

Macpi, Lombardy —

A machinery company whose pressing and bonding technology could play a role in laminating knitted upholstery panels to backing fabrics, enhancing stability without heavy coatings.

Tonello, Veneto —

Famous for eco-finishing processes — ozone washing, low-water brushing — offering a pathway for Australian wool to be finished with both aesthetic richness and genuine sustainability credentials.

6.3 The Role of Finishing in Upholstery Performance

Finishing often determines the success of an upholstery fabric as much as the knitting itself. In Italian mills, finishing is a design stage in its own right — increasing surface density through controlled felting, improving abrasion resistance by locking fibres in place, enhancing handfeel via brushing or shearing, and adding flame retardancy without heavy chemical loading. The near-absence of commercial-scale finishing houses equipped to work with knitted fabrics in Australia is one of the most critical infrastructure gaps to address.

6.4 Bridging the Australian Gap

Short-Term (0–2 years): Use flat knitting on the Curio Practice 14gg Shima Seiki for sampling and boutique production runs. Source yarn directly from Italian suppliers identified during the Fellowship.

Mid-Term (2–5 years): Explore shared investment in finishing equipment. Develop pilot programs with local furniture makers. Build a reference library of stitch structures.

Long-Term (5+ years): Establish circular or warp knitting capacity once market demand is proven. Position Curio Practice as a design-led supplier to Australian and international contract upholstery markets.

6.5 Potential Business Models for Curio Practice

- **Designer–Mill Partnerships:** Signature collections with trusted manufacturing partners — maintaining design leadership while leveraging established production infrastructure.
- **Distributed Production:** Flat knitting across small facilities with centralised finishing offshore until local infrastructure develops.
- **Export-Led Strategy:** Positioning Australian wool knitted upholstery as a high-value export, leveraging the natural fibre narrative and design-led identity.
- **Hospitality and Contract Niche:** Small but highly tailored fabric runs for hotel interiors and architecture firms — a market that suits Curio Practice precisely. Volume is too low for large European mills, specification too high for generic contract suppliers, and demand for Australian provenance and natural fibre content is genuine and growing.

07

Personal, Professional and Sectoral Impact

Personal Impact

The Fellowship was transformative in ways that went beyond technical learning. One of the most significant realisations came from reflecting on the Fellow's background in sportswear and performance footwear engineering. In that context, every material decision was driven by function: zone-specific performance, engineered stretch, breathability mapped to body movement, durability built into the stitch architecture from the outset. Sitting with European upholstery manufacturers, the same logic emerged in a furniture context — the question shifted from 'what does this fabric look like?' to 'what does this fabric need to do, and where?'

This reframing — from surface to system — is the Fellowship's most lasting personal contribution. It also produced an important evolution on natural versus blended fibre. The original ambition was 100% natural knitted upholstery. The reality of high-traffic use — hotel interiors, contract seating, client expectations around longevity — made clear that a considered, minimal use of recycled synthetic fibre, deployed precisely where performance demands it, is not a compromise but a responsible design decision.

Professional Impact — Curio Practice

Since returning from Europe, Curio Practice has entered into early-stage conversations with multiple architecture and interior design firms regarding bespoke knitted textile development for hospitality projects. These conversations are at various stages across several firms and represent a genuinely new market for the studio — one that aligns closely with Curio Practice's capabilities and values.

Yarn research has intensified since the Fellowship, deepening the focus on the relationship between spinning strength, yarn fineness, and consistency — all of which affect machine performance and finished fabric durability. Direct relationships with Italian spinners and yarn suppliers now provide a channel for sourcing merino-appropriate upholstery yarns without relying on domestic supply limitations.

Curio Practice will expand its scope to include a published living library of knit structures for furniture and interiors, and will pursue pilot installations with Australian furniture designers to generate performance data and case studies. A repair and refresh model for knitted covers — enabling seasonal colourway updates and replacement sets — is also in development.

Sectoral Impact

Australia's design sector stands to benefit through new supply options that are local, lower waste, and easier to repair or refresh. The hospitality sector in particular — hotels, workplace interiors, public seating — represents a significant opportunity for limited-run, design-led knitted upholstery that cannot currently be met by existing Australian suppliers. Demonstrating that knitted upholstery can meet contract-grade performance specifications will support a broader shift in how Australian designers specify interior textiles.

08

Immediate Application with Limited Resources

The Fellowship was, in the Fellow's own words, 'just the tip of the iceberg' of what could be learned from European textile manufacturing. What the Fellowship did provide was enough technical grounding and relational foundation to begin meaningful work in Australia immediately — without waiting for infrastructure, investment, or ideal conditions.

Starting with What Exists

The Curio Practice 14-gauge Shima Seiki flat knitting machine is the immediate starting point. Its flexibility — lower yarn cone requirements, ability to knit multiple structures within a single panel, support for fully fashioned shaping — makes it well suited to the prototyping and market testing phase. The key constraint in Australia is yarn access. The Fellowship's relationships with Italian spinners now provide a direct channel for sourcing merino-appropriate upholstery yarns without relying solely on domestic supply.

A Phased Development Approach

- Phase 1 — Flat knit prototyping: Develop a range of merino-blend panels on the Shima Seiki, testing double jersey, interlock, rib, mesh, and spacer structures against upholstery performance criteria. Build a physical sample library for designer engagement.
- Phase 2 — Pilot installations: Partner with two to three Australian furniture makers to trial knitted covers on modular seating. Document abrasion, pilling, fit, and client response. Use findings to build a performance evidence base.
- Phase 3 — Roll goods exploration: Scope opportunities with local knitters and finishers to produce limited yardage in circular or warp knit formats that mirror conventional upholstery supply.
- Phase 4 — Scaled capability: If pilot demand justifies it, prepare a business case for investment in circular or warp knitting capacity — through machinery acquisition, shared facility access, or international production partnerships.

This phased approach ensures each step is funded by the outcomes of the previous one, reducing risk and building market evidence before committing to significant capital expenditure.

09

Importance for Australia and Closing Reflections

9.1 Strategic Value for the Australian Textile and Upholstery Industry

The knowledge gained during this Fellowship represents a rare and direct transfer of technical capability from one of the most advanced upholstery textile ecosystems in the world to the Australian context. The introduction of knitted upholstery in the Australian market offers upholstery fabrics engineered for performance — delivering elasticity, ergonomic fit, breathability, and tactility that woven fabrics cannot always match. It opens the door for locally made, design-led patterns produced on-demand, reducing inventory waste and enabling highly customised production runs. And by combining Australian wool with advanced knitting technologies, Australia could establish a niche in high-value, lower-volume upholstery textiles that compete with leading European brands.

9.2 Potential Pathways to Market

The existing 14-gauge Shima Seiki at Curio Practice offers an immediate testing ground. By carefully selecting yarns — blends of Australian wool with recycled polyester or nylon for abrasion resistance — it is possible to create upholstery prototypes approaching the performance standards seen in Italy. A secondary pathway involves contract production through Italian mills for high-profile Australian design projects. Longer term, there is an opportunity to position Australian knit upholstery as a design export — following the Kvadrat model of design leadership, trusted quality, and global reach.

9.3 Industry Collaboration and Knowledge Sharing

One of the most striking differences between the Italian and Australian contexts is the degree of open collaboration between suppliers, manufacturers, and designers. This Fellowship has already opened conversations with Italian mills and technology providers willing to advise and, in some cases, partner on development. There is also scope for collaboration beyond the textile industry — upholstery knitting requires input from industrial designers, furniture makers, and architects to ensure fabrics meet the demands of both aesthetics and function.

9.4 Personal Reflections

Standing in the Santoni facility in Brescia, surrounded by machines capable of creating complex, seamless, three-dimensional forms, the potential applications for upholstery felt both immediate and limitless.

Yet translating this potential into an Australian context will require patience, persistence, and a phased approach. What the Fellowship provided is clarity — a deep understanding of what is technically possible, what is commercially viable, and where the most strategic entry points lie.

This experience also underscored the role of narrative in material innovation. Knitted upholstery is not simply a technical achievement; it is a story of heritage wool, contemporary design, and responsible manufacturing. The most successful Italian mills understand the balance between performance and poetry, between engineering and emotion. Bringing this sensibility to Australia will be as important as the fabrics themselves.

10

Recommendations and Considerations

Industry Recommendations

- Establish a collaborative pilot between a local knitter and two or three furniture makers to produce a short run of flat-knitted merino blend covers. Measure abrasion, pilling, ease of fit, and customer response.
- Create an open reference library of knit structures for interiors, tagged by gauge, yarn, and performance metrics. Invite designers to borrow, test, and iterate.
- Engage a university textiles program to co-develop knit programming skills relevant to upholstery, including CAD mapping of zones and integration of spacer structures.
- Scope the business case for warp knitting with an international partner, focusing on contract-grade fabrics for hospitality and workplace projects.
- Develop a repair and refresh model for knitted covers, enabling replacement sets and seasonal colourways to extend furniture life.

Policy Recommendations

Italy's textile industry strength is the product of sustained policy support for small and medium manufacturers, regional industry clusters, and cross-sector collaboration. Australia has comparable craft knowledge and world-class raw material. What it lacks is the infrastructure, yarn access, trained workforce, and policy framework to allow small textile practitioners to bring technical innovations to market.

- Targeted R&D grants for small textile manufacturers: Dedicated funding for technical textile research — material trials, machine access, prototyping — would enable studios like Curio Practice to move from concept to commercially viable product without requiring private investment at early stages.
- Investment in knitting and textile programming skills: Dedicated training pathways for knitting machine programming, yarn specification, and textile finishing — equivalent to the apprenticeship systems sustaining Italy's workforce — beginning through university partnerships with design and engineering schools.

- Shared knitting infrastructure: A shared-access model for technical knitting machinery — similar to fabrication labs or ceramics studios — would allow independent designers and small studios to access circular and warp knitting equipment without the capital outlay of ownership.
- Cross-industry yarn and materials access programs: A shared materials research initiative connecting textile practitioners across apparel, interiors, and industrial applications to accelerate innovation and open knowledge currently held by a few large companies.
- Procurement guidelines recognising knit-to-shape and local content: Government and institutional procurement specifications could explicitly recognise knit-to-shape construction and Australian-made natural or recycled fibre content as measurable sustainability criteria.
- Wool value-chain investment: Policy support for domestic wool processing — particularly at the fine and technical end — would create the upstream supply chain conditions necessary for a viable knitted upholstery industry.

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Dissemination and Stakeholder Engagement

Sharing the Fellowship's learnings is as important as the research itself. Dissemination will proceed through several streams.

Workshops and Education

Hands-on workshops will introduce participants to knit structures, machine capabilities, stitch performance, and finishing — supported by physical swatches and sample panels. These sessions will target furniture designers, interior designers, upholsterers, and textile students, expanding the design community's understanding of what knitted upholstery can do and identifying collaborators for pilot projects.

In February 2025, the Fellow participated in a Knitting Technology workshop at RMIT University as part of the Fashion and Textiles School Alumni Event at Melbourne Fashion Festival. This engagement marked an important step in connecting the Fellowship's technical learnings with Australia's design education community, and in positioning Curio Practice as a resource for emerging textile practitioners seeking to develop skills in knitted structure and performance.

Designer Collaborations

Beyond education and industry engagement, the Fellow has begun translating the Fellowship's research into tangible creative outcomes through direct designer collaboration. In May 2025, Curio Practice partnered with Melbourne-based furniture designer Dowel Jones for Melbourne Design Week. The collaboration resulted in a lamp featuring a knitted seamless woolen shade, produced using the flat knitting techniques and wool knowledge developed during the Fellowship. The lamp was displayed at multiple events throughout Melbourne Design Week, generating interest from designers, architects, and the broader creative community. This project exemplifies the kind of cross-disciplinary application — textile craft meeting furniture design — that the Fellowship envisioned, and provides a visible, publicly exhibited proof of concept for the potential of knitted wool in interior applications.

Case Studies and Open Documentation

Each pilot installation will be documented from brief to installation, including performance data, client feedback, and maintenance practices. These case studies will be made available openly through Curio Practice's channels and relevant industry bodies to build a shared evidence base for knitted upholstery in Australian contexts.

Industry Body and Procurement Network Engagement

The Fellow will engage with industry bodies, design institutions, and procurement networks to advocate for knitted upholstery within standards, specifications, and tender processes — including presenting Fellowship findings at industry events, contributing to publications on sustainable interiors and local manufacturing, and working with educational institutions to integrate knit-for-interiors into textile and industrial design curricula.

Next Steps

Immediate actions for Curio Practice focus on translation to local prototypes. The 14-gauge Shima Seiki will be used to develop panels and covers in merino-rich blends, with recycled polyester or nylon used only where required for abrasion resistance or stability. Yarn and structure tests will include double jersey, interlock, rib, mesh, and spacer combinations. The outputs will seed a sample library for designers and a set of small pilot installations.

Parallel to this, opportunities with local knitters and finishers will be scoped for limited yardage roll goods. Conversations with architecture and hospitality design firms already underway will be developed into formal briefs where readiness exists. Italian yarn supplier relationships established during the Fellowship will be activated for the first round of prototyping.

If market demand from pilots is demonstrated, a staged business case will be prepared for investment in circular or warp knitting capacity. The Kvadrat model — design leadership and trusted quality — provides a useful analogue for a knit-forward Australian brand that exports value-added merino textiles.

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Conclusion

The Fellowship confirms that knitted textiles can modernise Australian upholstery. The technologies exist, the design vocabulary is rich, and the alignment with sustainability goals is strong. The gap between Italy's world-leading upholstery industry and Australia's emerging potential is not insurmountable. With the right combination of technical skill, creative vision, and strategic partnerships, Australia can carve out a unique place in the global upholstery market — one that honours its raw material heritage while embracing the future of textile engineering.

By starting with achievable local prototypes and building collaborative momentum, Curio Practice will lead the translation of international knowledge into practical, testable outcomes that benefit Australian designers, manufacturers, and users.

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References

- Industry conversations and factory observations, Italy and Germany, January–February 2025.
- Santoni machine documentation and in-house technical notes consulted during site visits.
- Trade fair observations: Heimtextil, Frankfurt, 2025; Pitti Filati, Florence, 2025.
- Technical literature on knit programming and CAD/CAM for 3D knitting, various sources.

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Appendix A: Image Plates

The following photographs were taken during the Fellowship research period in Italy and Germany, January–February 2025.



Figure 1. Yarn cone library — the breadth of colourways and fibre types available to Italian knitters, illustrating the material access that Australian practitioners currently lack. Photographed during the Fellowship research period, Italy, 2025.



Figure 2. Circular knitting machine close-up showing yarn creel feed system — each of the 48+ cones feeds a separate yarn carrier, illustrating the scale of yarn commitment required for a single circular production run.



Figure 3. Merino-blend yarn cones prepared for upholstery sampling trials — natural tones typical of undyed or low-impact processed wool, used in hands-on machine trials at the Carpi facility.



Figure 4. Production facility floor showing circular knitting machines and yarn creel systems — Nesatex, Carpi. This facility was the primary site for hands-on sampling during the Fellowship.



Figure 5. Large-format circular knitting machines in operation at the Carpi production facility — illustrating the industrial scale of upholstery knitting and the density of machinery required for commercial output.



Figure 6. 3D engineered knit panel laid flat — illustrating zoned stitch architecture with distinct structural, mesh, and patterned areas mapped to functional zones of a garment or furniture cover.



Figure 7. Upholstered seating knitted on Top2 machine balancing structures and yarn. Knitting in house at Santoni — botanical jacquard textile illustrating the complexity of surface patterning achievable through advanced knit and weave construction.



Figure 8. Upholstered seating knitted on Top2 machine balancing structures and yarn. Knitting in house at Santoni — botanical jacquard textile illustrating the complexity of surface patterning achievable through advanced knit and weave construction.



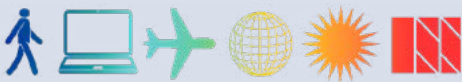
Figure 9. Flat knitting machine needle bed with yarn cones — the individually controllable needles visible across the full width of the bed, enabling zoned stitch structures within a single panel.



Figure 10. Heritage Coppo flat knitting machine alongside a modern Santoni circular machine — the coexistence of traditional and advanced technology in Italian facilities illustrates the depth of accumulated knowledge that informs contemporary practice.



Figure 11. Santoni circular knitting machine with fabric samples laid on the worktable — illustrating the translation from complex machine capability to finished textile outcome.



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