

Computer Aided Embroidery and Designing: how employable, and how future-proof, is this trade?

India's embroidery sector sits at the intersection of a centuries-old craft tradition and rapidly advancing digitisation tools. The central question for any prospective CTS trainee is whether computer-aided embroidery skills translate into reliable livelihoods -- or whether automated design generation and machine learning will erode the human role faster than the market can absorb new entrants. Our analysis places this trade in the 'Uncertain outcomes' CES band, with strong government and training-quality foundations but thin live-hiring signals and salary data gaps that make the employment picture genuinely unclear.

41.9 /100

COURSE EMPLOYABILITY SCORE (CES V2)

Uncertain outcomes, scored across all four CES pillars (\$02).

6.1%¹

CAGR of the global embroidery market 2024-2033 (Business Research Insights, 2024)

USD 3.89bn²

India handicraft exports FY2024-25, including USD 114.7mn in embroidered and crocheted goods (IBEF, 2025)

4.76 lakh³

Workers skilled under SAMARTH scheme, 88% women, 75% placed in employment (PIB/Ministry of Textiles, 2025)

NSQF Level 4^P

Trade level under the Craftsman Training Scheme, one-year duration, DGT/MSDE (NSTI Panipat, 2024)

Subject: the "Computer Aided Embroidery and Designing" CTS trade · Compiled from NSQF program spec + independent third-party research (see Sources).

Can AI or automation replace this job? The honest answer.

Computer-aided embroidery designing occupies a genuinely hybrid position: the 'computer-aided' prefix means trainees already work with software, making them more resilient than purely manual embroiderers, but AI tools for auto-digitising and auto-generating stitch files are advancing rapidly. The honest answer is that partial automation is real and already underway -- but full displacement of skilled human designers remains limited by dexterity, taste, and the complexity of traditional Indian craft vocabularies.

The risk, stated plainly

The WEF Future of Jobs Report 2025 projects that 22% of all roles globally will be disrupted by 2030, with routine and codifiable tasks facing the steepest risk ⁴. The ILO's sector analysis of apparel and embroidery finds that 'jobs comprised of repetitive codifiable tasks are at greatest risk,' while also noting that 'limited automation penetration' persists in practice due to practical bottlenecks -- particularly for flexible, handcraft-adjacent tasks ⁵. AI-powered embroidery digitising software (such as Wilcom, Hatch, and emerging generative tools) can now auto-convert images to stitch files, raising the risk for entry-level digitisers who perform only that task. However, creative design work, quality oversight, client customisation, and working with Indian regional motifs remain substantially human-mediated ^{4,5}.

What automates vs what stays human

THE TASKS AUTOMATION IS TAKING

- Auto-digitising a scanned or vector image into basic stitch files -- software tools now handle this with growing accuracy ⁵
- Generating repeating fill patterns and standard borders using parameterised templates ⁴
- Colour-way simulation across a design without manual reprogramming ⁵
- Basic monogram and logo embroidery layout from brand assets ^P
- Sorting and optimising stitch order to reduce thread cuts on multi-head machines ⁵
- Inventory and production scheduling for embroidery runs -- increasingly managed by ERP and AI tools ⁴

THE WORK THAT STAYS HUMAN

- Designing original motifs rooted in regional Indian craft traditions (Chikankari, Phulkari, Kantha) that require cultural knowledge and aesthetic judgment ^{P6}
- Quality inspection of embroidered output: identifying misregistration, thread tension faults, and colour inconsistency on physical fabric -- tasks that require tactile and visual acuity machines still struggle with ⁵
- Client consultation and custom brief interpretation for wedding, couture, and export orders where style direction changes rapidly ^P
- Machine setup, troubleshooting, and maintenance of multi-head computerised embroidery machines -- requires hands-on dexterity and mechanical knowledge ^P
- Chemical lace, applique, sequin, and cording work that involves multi-material assembly and cannot be fully automated at commercial cost ^P
- Sampling and proto development for new export collections where buyers require physical sign-off before bulk production ⁶

The resilient anchors

84%⁶

Export growth in Chikankari (Lucknow embroidery) between 2014-indexed baseline and 2024, reflecting sustained premium demand for authentic human craft ⁶

56%²

Share of women in India handicraft artisan workforce -- embroidery is a strong livelihood channel for women in particular ²

6.4% CAGR¹

Projected global embroidery market growth through 2034, signalling sustained end-market demand even as tooling evolves ¹

Partial automation risk, manageable with the right skill mix -- but not a role to enter passively.

Computer-aided embroidery is more resilient than purely manual production because the CTS curriculum already trains graduates on digitising software, CorelDRAW, and multi-head machine operation -- the same tools that are automating simpler tasks ^P. A graduate who masters creative brief interpretation, regional motif design, and machine maintenance occupies a different labour market position than one who only runs pre-loaded stitch files ⁵.

The risk is real at the commodity digitising end: if a graduate's only skill is converting a logo to an embroidery file, emerging AI tools will undercut that value. The protection comes from breadth -- combining software literacy with craft knowledge, client-facing skills, and quality oversight. Graduates who build this combination can move toward design roles (average salary range Rs 3.1-15.2 lakh per year) rather than remaining at machine-operator level (Rs 2-5 lakh) ^{7,8}.

Automation exposure by task

Task in this trade	Automation risk	How this trade / program is positioned
Auto-digitising standard logos and fill patterns	High	AI tools now automate this at scale; graduates should treat this as a baseline entry skill, not a career anchor ⁵
Running and monitoring multi-head embroidery machines	Moderate	Machine monitoring is increasingly sensor-driven, but setup, thread changes, and fault recovery remain manual ^P
Original motif creation using CorelDRAW or equivalent	Moderate	Generative AI can suggest designs but cultural specificity and buyer taste still require human direction ^{4P}
Quality inspection of embroidered output	Lower	Machine vision is being deployed in large factories, but cost-prohibitive in SME units that dominate India's embroidery sector ⁵
Artisan training and ITI instruction	Lowest	Graduates can qualify as craft instructors via CITS -- human instruction of physical skills is not automatable ^P
Custom wedding and couture sampling	Lowest	High-value, low-volume customisation driven by client relationships and physical samples; premium segment is growing ⁶

How to read these numbers. Automation probability estimates (Frey and Osborne style) assign a single number to an entire occupation but cannot capture within-occupation variation ⁹. A computer embroidery operator who runs bulk logo digitising is in a very different risk position from one who designs original export collections. The WEF 2025 figure of 22% role disruption is a global aggregate across all sectors; labour-intensive craft-adjacent roles in developing economies like India face lower near-term displacement pressure because automation capital costs remain high relative to local labour costs, as the ILO notes for the apparel sector broadly ^{4,5}. These numbers should be read as directional, not deterministic.

02 THE COURSE EMPLOYABILITY SCORE (CES)

How this trade scores on Lakshya's employability metric

Lakshya's Composite Employability Score (CES) for this trade is 41.9 out of 100, placing it in the 'Uncertain outcomes' band -- the third of four bands, corresponding to 'Reduced exposure with safeguards' in financing terms. The score reflects genuinely strong government support (70/100) and decent training quality (65/100) on one side, set against a weak market dynamics pillar (22.4/100 with low confidence) and a very thin placement signal -- just 1 live listing and 2 employers in the data window, with no salary-linked postings. Scored on the evidence in this report, this role earns a **CES of 41.9 / 100, "Uncertain outcomes."**

CES Pillar (CES v2)	Weight	What it measures
Training Quality	0.30	Regulatory recognition and licensure of the qualification
Market Dynamics	0.30	Demand, salary band, sector trajectory, automation possibility and displacement risk
Placement Outcome	0.25	Whether the market actually hires this role: live employers, openings, pay and recency
Government Support	0.15	Migration pathways, federal frameworks and policy backing the role

Score bands: ≥80 High employability (full financing exposure) · ≥60 Moderate · ≥40 Uncertain outcomes · below that Weak job linkage. Framework: CES v2.

Market Dynamics, by sub-signal

Sub-signal	Score/100	Sub-weight	Conf
Demand	7	0.40	0.65
Salary (vs country floor)	0	0.30	0.20
Sector trajectory	80	0.15	0.88
Automation possibility	50	0.10	0.30
Displacement risk	50	0.05	0.30
Market Dynamics composite	22	n/a	0.50

The four pillars, scored

CES pillar	Score	Conf	Weight	Evidence
Training Quality	65	0.95	0.300	One-year NSQF Level 4 programme taught at government NSTIs (Panipat, Vadodara, Noida) with DGT-certified curriculum covering hand stitches, CorelDRAW, scanner digitising, chemical lace, and machine maintenance ^P .
Market Dynamics	22	0.50	0.300	Demand sub-score 7.3/100 (low confidence) -- live job postings are sparse; salary sub-score 0 due to absence of salary-linked postings in the data window, though third-party salary surveys suggest designer-level roles can reach Rs 6-15 lakh ⁷⁸ .
Placement Outcome	21	0.04	0.250	Live market hiring of the role: 1 openings · 2 employers · 0 with pay · 7 recent postings
Government Support	70	0.90	0.150	Pillar scores 70/100 -- PLI Scheme for Textiles (Rs 10,683 crore outlay), SAMARTH skilling scheme, NSDC Textile Sector Skill Council, and IndiaHandmade portal all directly support the sector ³¹⁰¹¹ .

Composite (applied weights, renormalised over scored pillars): **65×0.30 + 22×0.30 + 21×0.25 + 70×0.15 = 41.9**. Confidence 0.88 · evidence 7 clean / 0 rejected · 6 sources.

COURSE EMPLOYABILITY SCORE (CES V2)

41.9 / 100, "Uncertain outcomes"

The 41.9 CES reflects a structural mismatch: the government has invested heavily in both the sector (PLI, SAMARTH) and the training pipeline (NSQF-certified NSTIs), but live hiring evidence is thin -- partly because embroidery employment is dominated by MSMEs, self-employment, and export-house contractual work that does not appear on mainstream job boards ³¹⁰. The weak market dynamics pillar (22.4/100) and near-zero placement signal (20.6/100, confidence 0.04) are honest reflections of this data gap rather than proof that jobs do not exist.

The concrete route to a better outcome: graduates should target export clusters (Surat, Lucknow, Delhi-NCR, Kolkata) where verified demand exists; pursue the National Apprenticeship Certificate after the NTC to strengthen the credential; and build self-employment or freelance digitising income via platforms like IndiaHandmade or international embroidery digitising service marketplaces ^{P211}.

Pillar scores map cited evidence to the published CES v2 rubric; the live figure refreshes as cohort outcomes feed Lakshya's engine.

03 EMPLOYABILITY & DEMAND

A growing export sector, but jobs are thin on mainstream portals.

India's embroidery and handicraft sector is genuinely growing -- but most of that growth flows through export houses, artisan clusters, and self-employment channels, not through salaried roles visible on job aggregators.

The global embroidery market was valued at USD 1.54 billion in 2024 and is forecast to reach USD 2.62 billion by 2033 at a 6.1% CAGR ¹. India accounts for a significant share: embroidered and crocheted goods exports reached USD 114.7 million (approximately Rs 955 crore) in the April-June 2025 quarter alone, within total handicraft exports of USD 903 million for that quarter ². The broader India handicrafts market was valued at USD 4.57 billion in 2024 and is projected at USD 8.2 billion by 2033 at 6.4% CAGR ¹². Over 64.66 lakh artisans work in handloom and handicrafts, with women accounting for 56% of the workforce

²¹³. The demand gap is real: India's textile sector employs 45 million people but faces a persistent skilled-worker shortage -- the Indian Texpreneurs Federation has flagged shortages of trained craft workers as a recurring constraint during peak production seasons ¹⁴. Under SAMARTH, only 5.41 lakh workers had been skilled as of 2025, against an estimated need for 10 million trained workers to meet export targets ³¹⁴.

USD 2.62bn¹

Projected global embroidery market size by 2033, up from USD 1.54bn in 2024 at 6.1% CAGR

Rs 4,350 crore¹³

India's embroidered and crocheted goods exports in 2024-25 (EPCH/Ministry of Textiles)

7.5 lakh+¹⁰

Jobs targeted under PLI Scheme for Textiles over the five-year period FY2025-30

04

LIVE HIRING EVIDENCE (2025/26)

What employers are actually posting

Captured from live job boards (Indeed, LinkedIn, Naukri) in the current scrape window: **1** openings across **2** employers, **0** with disclosed pay, **7** recent. These are real postings.

The CES data window captured 1 live listing across 2 employers (Craftroots, Ahmedabad) with 7 recent postings and zero salary-linked ads. This is a very thin signal -- but it reflects the structure of this labour market rather than absence of demand: embroidery employment in India is dominated by MSMEs, export houses, and self-employment, most of which recruit through word-of-mouth, cluster networks, or trade fairs rather than online job boards.

Employer (live posting)	Posts	Disclosed pay	What they want
Craftroots	1	n/a	**Textile Designer** Employment Type: Full Time, Permanent Role Category: Home, Fashion, and Accessories Location: Ahmedabad **Roles and Responsibilit

Employer names and counts are from live job boards in the current window; counts fluctuate daily and are date-stamped in the engine. This sample is smaller than a mature occupation's; the scraper is being scaled to widen coverage.

THE SIGNAL IN THE DATA

- The one captured listing (Craftroots, Ahmedabad) is a Textile Designer role in the Home, Fashion, and Accessories category -- consistent with the design-facing career pathway a CAED graduate could enter.
- Surat, Lucknow, Delhi-NCR, and Kolkata are the live embroidery employment hubs; geographic mobility to these centres materially improves job-finding odds.
- Glassdoor shows embroidery designer salary ranges of Rs 3.1-15.2 lakh in India, with Surat and Delhi at the top end -- but these figures come from small sample bases ⁷⁸.

WHY THIS MATTERS

- Target export cluster cities (Surat for sequin and machine embroidery, Lucknow for Chikankari, Delhi for couture exports) where demand is structural, not cyclical ⁶¹³.
- Build self-employment income via IndiaHandmade (zero-commission government portal) or international digitising service marketplaces to create income while building a client base ¹¹.
- Pursue National Apprenticeship Certificate (NAC) after NTC -- apprenticeships provide stipend income and employer-verified experience that strengthens future hiring prospects ^P.

Bottom line: The thin job-board signal understates real market demand but should not be dismissed -- a CAED graduate who stays in their home district without targeting embroidery-active clusters will face genuine employment difficulty.

05

ROLES, PATHWAYS & EARNING POTENTIAL

What the trade leads to, and what it pays

The CAED trade offers three distinct outcome routes: salaried employment in export houses or garment units, self-employment as a designer or digitising freelancer, and the craft instructor pathway via the CITS programme. Each requires different post-training moves.

Role this prepares for	Indicative pay in India	Automation resilience
Embroidery Machine Operator	Rs 2-5 lakh/year ⁸	Moderate -- routine operation is partially automatable; machine maintenance skills extend resilience
Embroidery Digitiser	Rs 2.1-8.8 lakh/year (median Rs 5 lakh) ⁸	Moderate -- AI tools are encroaching on basic digitising; complex and cultural work remains human
Embroidery / Textile Designer	Rs 3.1-15.2 lakh/year ⁷	Resilient -- creative and client-facing work; grows with portfolio and network
Self-employed Artisan / Freelancer	Variable; premium craft exporters can earn Rs 4-12 lakh/year ⁶	Resilient -- premium and customised segment growing; digital platforms reduce market access barrier
Craft Instructor (ITI/NSTI)	Government pay scale (approx Rs 4-8 lakh/year) ^P	Highly resilient -- public sector role with job security; requires CITS qualification after NTC

PHASE 1 Foundations (Months 1-6) Complete NTC curriculum: hand embroidery stitches, basic CorelDRAW, scanner digitising, machine setup and safety. Focus on building a physical and digital portfolio of 10-15 original designs - these are the primary interview asset ^P.	PHASE 2 Specialisation and Credential (Months 7-18) Sit the NTC examination through DGT; simultaneously register for an apprenticeship under the National Apprenticeship Promotion Scheme (NAPS) at an export house or garment unit to earn stipend income and employer-verified experience. Explore advanced software modules (Wilcom, Hatch EmbroideryStudio) if the apprenticeship host uses them.	PHASE 3 Practical Execution Target design-facing roles in Surat, Lucknow, Delhi-NCR, or Kolkata export clusters. Simultaneously open an IndiaHandmade or Etsy seller account to monetise self-created designs. Graduates who build both salaried and freelance income streams within three years substantially de-risk the uncertain placement signal inherent in this trade ^{11P}.
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06 SKILLS BUILT & WHY THEY'RE AI-RESILIENT

Trained for the floor, not just the test

WHAT CANDIDATES ACTUALLY WORK ON

- Master Wilcom, Hatch EmbroideryStudio, or equivalent professional digitising software beyond the CorelDRAW basics taught in the curriculum ^P
- Develop deep knowledge of at least one Indian regional embroidery tradition (Chikankari, Phulkari, Kantha, Kashmiri, Zardozi) as a differentiating specialisation ⁶
- Learn fabric-specific settings: stitch density, underlay, and pull compensation for silk, chiffon, denim, and technical textiles ^P
- Build client communication skills -- couture and export orders depend on brief interpretation and iterative sampling, not just technical execution ^P
- Understand export documentation basics: HS codes for embroidered goods, GI-tag implications, and EPCH registration -- relevant for self-employment routes ¹³

WHY THESE RESIST AUTOMATION

- Cultural motif design: AI tools lack the contextual knowledge to create regionally accurate Indian embroidery patterns that satisfy domestic and export buyers ⁶
- Physical quality audit: tactile inspection of embroidered fabric for tension, registration, and hand-feel cannot be replicated by machine vision at SME cost levels ⁵
- Creative brief translation: converting a client mood board or garment sketch into a viable embroidery design requires aesthetic judgment and two-way communication ⁴
- Machine fault diagnosis and maintenance: hands-on mechanical troubleshooting of multi-head embroidery machines remains a skilled manual task ^P
- Craft instruction and knowledge transfer: teaching embroidery technique to new trainees is irreducibly human and carries growing demand as the sector expands ^{P3}

The positioning in one line: A CAED graduate who combines software literacy with regional craft knowledge and client skills occupies a defensible niche that AI tools are not close to replacing.

07 THE CREDENTIAL & QUALITY LAYER

NTC at NSQF Level 4 -- a government-recognised credential with stackable pathways.

The National Trade Certificate (NTC) awarded by the Directorate General of Training (DGT) on completion of the CTS programme is a nationally recognised, NSQF Level 4 qualification. It is accepted by central and state government departments, PSUs, and private export houses as proof of formal vocational training. Unlike informal or private craft certificates, the NTC is issued under a statutory framework, creating verifiable, portable evidence of competency ^P.

The credential is stackable: NTC graduates can progress to the National Apprenticeship Certificate (NAC) via apprenticeship, enrol in the Crafts Instructor Training Scheme (CITS) to become ITI instructors, or pursue Advanced Diploma (Vocational) courses under DGT. In a sector where most workers have no formal credential, the NTC is a genuine differentiator for salaried hiring and for accessing government artisan welfare schemes and IndiaHandmade seller registration ^{P11}.

08 THE INDIA TALENT CONTEXT

Abundant graduates, scarce job-readiness

India's overall graduate employability stands at 54.81% as of the India Skills Report 2025 -- meaning nearly half of all formally trained graduates are not directly hireable at the point of completion ¹⁵. Vocational trades like CAED sit in a different segment: their graduates are occupationally trained rather than academically credentialled, and employability depends heavily on geographic proximity to industry clusters and the quality of post-training job-matching. The textile sector's SAMARTH scheme has demonstrated that targeted, sector-specific training with employer linkage achieves 75% placement rates -- significantly above the national graduate average -- suggesting that the pathways framework matters as much as the trade itself ³. India's demographic pipeline is also a structural tailwind: with over 64.66 lakh artisans currently active and the government registering 32 lakh-plus under the Pehchan scheme by 2024, the formal training pipeline is expanding into a sector that was previously informal ¹².

In the textile and handicraft sector, a government-certified artisan with digital design skills commands a market premium that an uncertified peer cannot -- the NTC is the minimum credential to capture that premium ^P.

09 STAYING FUTURE-READY

How a candidate stays on the resilient side

LEAN INTO

- Professional embroidery software (Wilcom, Hatch) -- positions graduates above commodity digitisers who rely on AI auto-conversion tools ⁴
- Regional craft specialisation -- GI-tagged Indian embroidery styles (Chikankari, Phulkari, Zardozi) command global luxury premiums that generic AI design cannot replicate ⁶
- Self-employment via digital platforms -- IndiaHandmade (government, zero commission), Etsy, and direct export channels allow income diversification beyond salaried roles ¹¹
- Export cluster mobility -- relocating to Surat, Lucknow, Delhi-NCR, or Kolkata puts graduates in proximity to the employers who actually hire CAED-skilled workers ¹³
- Apprenticeship and instructor pathways -- NAC and CITS routes provide employer-verified credentials and government-sector options that are structurally insulated from private-sector hiring cycles ^P

AVOID BEING DEFINED BY

- Treating basic logo digitising as a career foundation -
- AI tools are rapidly commoditising this task and entry-level digitising rates are under sustained downward pressure ⁵
- Staying in geographic areas with no embroidery industry presence -- the live-hiring data shows demand is cluster-concentrated and remote-work opportunities for this trade are limited [agg]
- Ignoring the self-employment and freelance route -- the thin job-board signal for salaried roles makes freelance and artisan income a necessary, not optional, component of the career plan ¹¹
- Skipping the NTC examination -- without the formal DGT certificate, graduates cannot access government schemes, EPCH registration, or the CITS instructor pathway ^P

10 SOURCES & CITATIONS

Every figure, traced to a source

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