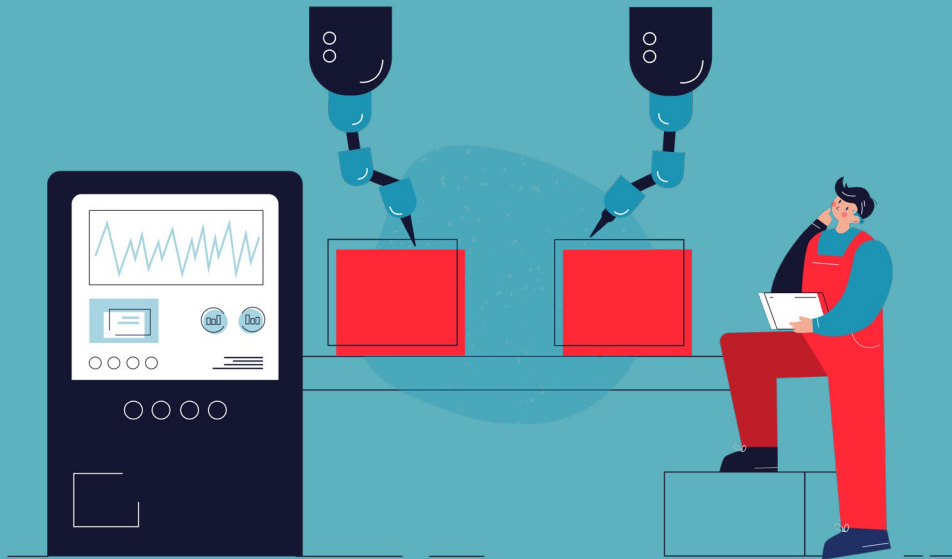# CLOUD UPSKILLING FOR MANUFACTURING

A TOOLKIT FOR ENABLING A DIGITAL FUTURE

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Table of Contents

READ THIS FIRST

AGILITY AND CUSTOMER CENTRICITY. SPEED AND PRODUCTIVITY. ECO-EFFICIENCY. SUPPLY CHAIN RESILIENCE. RESEARCH FROM THE WORLD ECONOMIC FORUM AND MCKINSEY IDENTIFIED THESE 4 SHIFTS DRIVING POST-PANDEMIC DIGITAL TRANSFORMATION IN MANUFACTURING. AND FROM SMART FACTORIES TO DATA-DRIVEN SUSTAINABILITY THE CLOUD IS PLAYING A KEY ROLE. THEREFORE, PROGRESSIVE CLOUD ADOPTION ISN'T A QUESTION OF "IF", IT'S A QUESTION OF "HOW" AND "WHEN".

Cloud skills are key to answering "what", "how" and "when" – because you need the right skills to realise digitalisation ambitions. However, there are massive skills shortages in the market, which have major financial consequences. According to IDC research, IT skills gaps equate to $91 billion of lost revenue annually.

The biggest gaps are around migrating to cloud, leveraging data and analytics, and using a cloud-native approach to developing smart products and services. As a result, it's hard to build momentum around digitalisation,

4 shifts driving post-pandemic digital transformation in manufacturing

- **AGILITY AND CUSTOMER CENTRICITY**
- **SPEED AND PRODUCTIVITY**
- **ECO-EFFICIENCY**
- **SUPPLY CHAIN RESILIENCE**

meaning many manufacturers are taking a piecemeal approach and finding it difficult to overcome internal hurdles. This inertia comes with an opportunity cost. Businesses are held back from capitalising on the cloud's potential to deliver value internally (boosting agility, speed and productivity, and eco-efficiency) and externally (delivering customer-centric products and services to increase customer penetration and expand into new markets).

Even with the best intentions, manufacturers are struggling to fill their cloud skills gaps. There are 4 umbrella reasons for this:

1. IT'S A RAPIDLY EVOLVING SPACE, AND THE SKILLS SUPPLY ISN'T KEEPING UP

On the one hand, years of outsourcing can mean the business doesn't have the skills in-house. On the other hand, education systems can't cope with the accelerating demand for innovation. Cloud is growing 50% year on year. It's calculated that 7

JAN KRITZ

Chief Operating Officer, Nordcloud

million people will be needed to support that change, No education system in the world can deliver graduates at that pace.

2. PEOPLE HAVE TO UNLEARN AS WELL AS LEARN, AND YOU'RE CHALLENGING HOW THEY'VE ALWAYS VALUED THEMSELVES

Your traditional infrastructure manager gets an adrenalin rush from fixing issues, is proud of their infra accreditations, and sees their value in being a problem solver. With cloud, you're upending that identity and saying that traditional measures of value no longer apply.

You therefore need a positive, empowering way to evolve perceptions. And it needs a process of unfreezing, changing and refreezing to bring people on this journey (more on that later).

3. TO GET MAXIMUM VALUE FROM CLOUD, YOU NEED NEW WAYS OF WORKING

Cloud isn't just new technology, it's the foundation for a new way of working – and you therefore need to consider this change alongside the infrastructure and applications.

Implementing new ways of working – involving agile working and DevOps – are harder to execute but gets less attention from people within the wider organisation. Often, it's because they don't perceive the direct link with business outcomes. This puts additional hurdles in the way of digitalisation, because people don't perceive cloud benefits as quickly or powerfully.

4. CLOUD SKILLS ARE PERCEIVED AS A COST

And an expensive one. Because there's a shortage of qualified cloud specialists, recruitment is difficult and expensive. You don't have them internally because of a legacy focus and/or years of outsourcing.

Too often, upskilling challenges are linked with perception of IT as a cost centre instead of a value driver. You're in a chicken-and-egg situation, because this is hard to change without the right training. As a result, people end up doing ad-hoc training that doesn't generate enough momentum and isn't structured enough to deliver sufficient value.

3.8X

TRAINED ORGANISATIONS ARE 3.8 TIMES MORE LIKELY TO MEET CLOUD ROI REQUIREMENTS

We all know that cloud has a role to play in helping manufacturers boost agility and customer centricity, speed and productivity, eco-efficiency and even supply chain resilience. After all, adapting to those trends requires flexibility, scalability, security and cost control that comes from cloud.

But we need to overcome these 4 issues. We must ensure we have the skills to support technologies, so the organisation can sustainably digitalise in a way that drives business value.

THIS PLAYBOOK HELPS YOU DO THAT. IT GIVES YOU A 4-STEP FRAMEWORK FOR DRIVING UPSKILLING, COMPLETE WITH PRACTICAL STEPS FOR IMPLEMENTING IT.

It's based on senior leaders' experiences, and as someone who's done this myself, I wish I'd had hindsight advice like this back when I started. Whatever your stage of cloud adoption, there are nuggets you can implement in the coming days, weeks and months.

Enjoy, and let us know which elements resonate with you.

90% of European organisations are affected by IT skills gaps, equating to $91 billion of lost revenue annually.

ENVISAGE
ENABLE
EMBED
EXPAND

A BEST-PRACTICE FRAMEWORK FOR ADDRESSING CLOUD SKILLS GAPS

The rest of this guide takes you through Nordcloud's Upskilling Four Es Framework for addressing cloud skills gaps, so you're in a stronger position to maximise value from cloud. It answers the critical "how?" and "when?" questions. And it gives you practical steps for developing the skills necessary for cloud success.

Nordcloud's Upskilling Four Es Framework

STEP 1
Envisage the future

Link Business Strategy to Skills through Technology Strategy

STEP 2
Enable people to work with new skills in the new way

Create Multidisciplinary Teams

STEP 3
Embed new skills and ways of working

Get Executives Sponsorship and Partner Support

STEP 4
Expand the reach of cloud skills within the organisation

Replicate and Scale Out
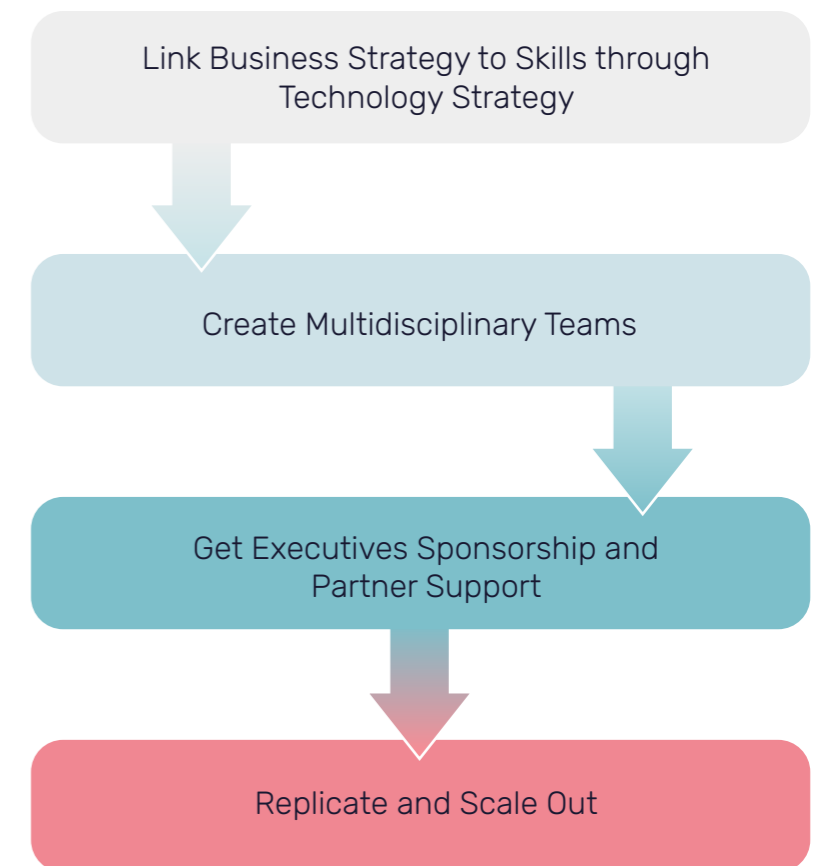
STEP 1
ENVISAGE THE SKILLS YOU NEED FOR THE CLOUD-ENABLED FUTURE

START THE JOURNEY BY ALIGNING SKILLS TO AMBITIONS

Let's say that, because you were facing a contractual change or end-of-life cliff edge, you did a quick lift and shift to public cloud. You're in the cloud, but it's essentially a "migration in name only", because you're still operating the same way you did before. There's visible progress, but you're not getting the cost or scalability benefits that come with cloud.

How do you start realising those benefits? How do you go about modernising and refactoring? You need new:

WAYS OF WORKING – through iterative/agile/DevOps methods

SKILLS AND DIVISIONS OF LABOUR – because roles and the associated requirements are different in a serverless environment

WAYS OF MEASURING VALUE – it's about outcomes (e.g. how quickly users are benefiting from the product) not inputs (how quickly you move tickets in the queue or go through the backlog)

Upskilling is about empowerment

Lots of issues with cloud thought leadership stem from an assumption that a "department" or "company" is homogenous. Some new tech here, a training course there and you've initiated a "transformation initiative" that will "future-proof the business."

This ignores the fact that (even with automation), individuals are at the front line of what you're doing. That "transformation initiative" requires hundreds of small changes from dozens of people. The new approach can conflict with a career's worth of traditional infrastructure and data centre experience. And those changes have to be embraced, coordinated and well executed.

Technical training plays a vital role in driving this, but it's only part of the picture.

After training, if people come back to a working environment embedded in previous ways of working and resistant to new ones, they won't be able to apply what they learned.

That "transformation initiative" requires hundreds of small changes from dozens of people.
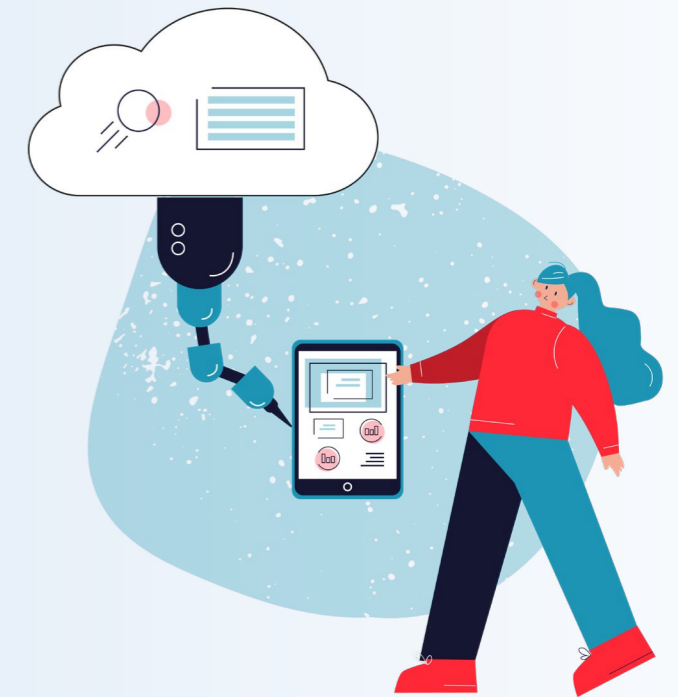
It's like sending someone on a language immersion course so they can speak like today's native English speaker, complete with slang and idiom – but everyone in the office only speaks Shakespearian English. There are going to be communication difficulties.

And that introduces unnecessary friction into the upskilling process. In a recent survey of people who attended Nordcloud training (our courses are open to anyone), **27.27% said they had challenges in applying the cloud skills they learned** – because colleagues didn't have the skills or mindset to support them, or because management wasn't driving enough change to ways of working.

That's why successful cloud adoption requires strategic upskilling and coaching. Each person needs to understand their specific role in the new normal – and be able to execute it.

A cloud-enabled future requires a process of unfreezing, changing and then refreezing skillsets
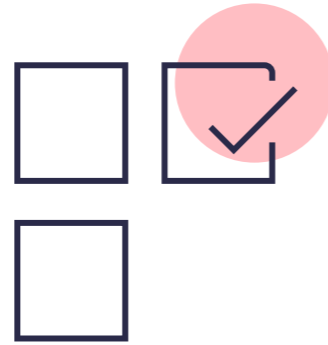
Kurt Lewin's famous change management model provides a useful way of envisioning your upskilling roadmap, so you eliminate digital skills mismatch. Lewin broke change into 3 phases:

Unfreeze

Convincing people that change is necessary

Change

The journey individuals, teams and the wider business go on to embed new tech and working processes

Refreeze

Making the new approach the new normal

Upskilling is an ongoing process of unfreezing, changing and refreezing as the tech stack expands and new services are delivered. It's an organic process – each unfreezing introduces different challenges for different people, and everyone learns as you go along. The key is to provide the support and training required to make each "change" period as simple as possible.

Link your skills strategy to the business strategy through the technical strategy

A common mistake business unit leaders make is failing to make a strong link between their initiative and the overall business strategy and company mission.

This can happen for various reasons, including excessive focus on short-term planning, siloed business unit set-ups or lack of strong company leadership. These "peripheral" initiatives then struggle to get funding, are short-lived or are quickly abandoned in favour of ones more aligned with the business strategy.

It's therefore important that, when formulating your upskilling approach, you start by linking your company's business strategy to the right technical strategy – and then determine what skills are needed to deliver it.

You can think of **the business strategy as the "what" your company will do to be successful** (e.g., generate $1 million revenue from a new smart product) and **the technical strategy as the "how" it plans to get there** (e.g., through a hyperscaler hosted environment).

CLOUD ENVISIONING WORKSHOP

This process is easier said than done. The actual execution of how to design a successful business strategy and how to select the most appropriate technical strategy are beyond the scope of this playbook on upskilling.

Nordcloud regularly conducts Cloud Envisioning Workshops with clients, so get in touch with one of our advisors if you would like to discuss your specific situation and needs.

Once you've determined the **"what"** and the **"how"**, it's time to map how your workforce's current skills compare with what's needed to realise your goals. This mapping will vary greatly based on factors like your company's strategy, industry, geography and technical maturity. To help structure this process, start with these main topics on cloud skills and ways of working.

Topics on Cloud Skills

CLOUD AND PLATFORM BASICS

What is cloud and how it works, core services, etc.

TECHNICAL ESSENTIALS (FOR THE PLATFORM)

Infrastructure services, security measures, data strategies, etc.

SECURITY IN THE CLOUD

Protecting data at rest and in transit, threat identification and mitigation, etc.

DATA UTILISATION

Best-practice data science processes, managing deep learning workloads, in-memory analytics and data storage, etc.

ARCHITECTING FOR CLOUD (BASIC)

Architectural principles; frameworks and best practices; making infrastructure scalable, reliable, and highly available, etc.

ARCHITECTING FOR CLOUD (ADVANCED)

Connecting on-premises data centres to the cloud, enhancing performance, understanding different architectural designs, etc.

DEVOPS ENGINEERING

Continuous integration, automation within the CI/CD pipeline, etc.

DEVELOPMENT IN THE CLOUD (BASIC)

Using containers, developing for scalability, utilising platform tools to streamline development, etc.

DEVELOPMENT IN THE CLOUD (ADVANCED)

Analysing monolithic architecture to determine logical break points, migrating from a monolithic architecture using best practice principles, etc.

KUBERNETES

Containerisation, microservices best practices, installing and configuring, deploying applications, etc.

SYSTEM OPERATIONS IN THE CLOUD

Virtual networking, access management, automation, etc.

PRACTICAL STEPS FOR ENVISAGING THE SKILLS REQUIRED FOR A CLOUD-ENABLED FUTURE

1. Use the Deductive Strategy to Skills Process to identify the cloud skills that support the technical strategy and enable the business strategy

As mentioned earlier, the specific cloud skills needed to support your technical strategy depend on your company's specific situation.

This means you first need to define the business strategy driving the outcome you're aiming for.

Then, you can link the most appropriate technical strategy (which is how you're going to realise the strategy). The third step is to determine the skills needed to execute the strategy.

The Deductive Strategy to Skills Process helps you make this link between skills and strategy.

Here are 2 example scenarios of how this works, using the business strategy to drive the upskilling approach.

Deductive Strategy to Skills Process

	BUSINESS STRATEGY	TECHNOLOGY STRATEGY	SKILLS
Example 1	Organisation is looking to generate revenue from launching new software-based services	Build a SaaS platform model with an end-to-end agile delivery style	Deep cloud architecture skills (including DevOps, etc.) for platform
Example 2	Organisation is looking to speed up the time it takes to bring products to market	Agile delivery style with CI/CD pipelines and frequent releases with product owner owning minor configurations	Cloud and platform basics skills for product owners and automation within the CI/CD pipeline for DevOps team

2. Conduct an "as-is" analysis of your organisation's cloud skills level

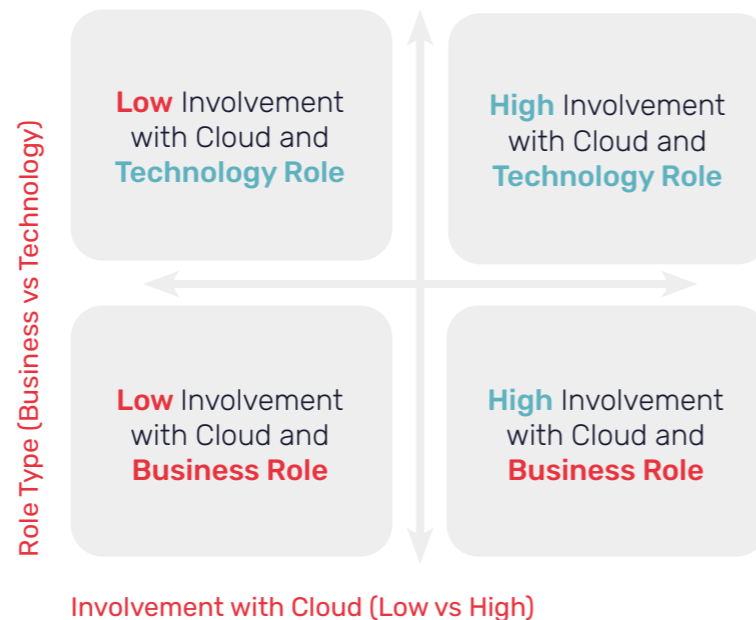To determine the "as-is" state of your organisation's cloud skills, have your employees take the self-assessment survey in Appendix 2.

It gives you a way to score knowledge and experience around the key topics on cloud skills (e.g., cloud and platform basics, data, security) on a scale of 0 to 2. You then have a systematic basis for identifying gaps, which we discuss in Steps 3 and 4.

3. Map your organisation's roles according to the Involvement with Cloud vs Role Type

Not all roles require the same level of cloud skills. One way to align roles to the most suitable upskilling journey is to classify them into 4 groups according to their Role Type (Tech vs Business) and Cloud Involvement (high vs low). This then becomes the framework for conducting a skills gap analysis. (See an example analysis in step 4.)

Role Type (Business vs Technology)

Low Involvement with Cloud and **Technology Role**	**High** Involvement with Cloud and **Technology Role**
Low Involvement with Cloud and **Business Role**	**High** Involvement with Cloud and **Business Role**

Involvement with Cloud (Low vs High)

Self-study isn't the answer!

Self-study can seem easier and more flexible, but it doesn't work at a team level when it comes to driving change and strategically addressing digital skills mismatch.

You need the common experience to unfreeze and embed change. And you need the interactive element that comes from in-person training, where people can ask questions and truly understand how everything will work with their everyday working practices. One of the most common pieces of feedback we get on introductory courses is: "Great training that we should have done 6 months ago."

ROLE TYPE	DESCRIPTION	EXAMPLE ROLES
Technology	Roles that are part of the IT organisation and are skilled in legacy processes but are also able to think of infrastructure as applications, using agile/DevOps	CIO, CTO, System Architect, System Operator, Software Developer, Cloud Engineer, SysOps Administrator, Data Analyst, Database/Infrastructure Administrator, etc.
Business	Business roles with minimal technical knowledge outside of consumer IT	CEO, CMO, CFO, Product Owner, Account Manager, Project Manager, Manager/ Director, Sales, Finance, Marketing, Legal, Risk, etc.

INVOLVEMENT WITH CLOUD	DESCRIPTION	EXAMPLE ROLES
High	High level of cloud familiarity required to deliver value to the project	Software Developer, Cloud Engineer, Product Owner
Low	Low level of cloud familiarity required to deliver value to the project	Systems Operations Administrator, Project Manager, Risk/Legal

Illustrative Project Team Setup

This chart gives you an example of how various roles can be organised according to their involvement with cloud and role type. Typically, core project team members have higher cloud involvement than the rest of the organisation, while the core team and wider organisation have a mix of technical and business roles.

Team Upskilling Planning and Gap Analysis
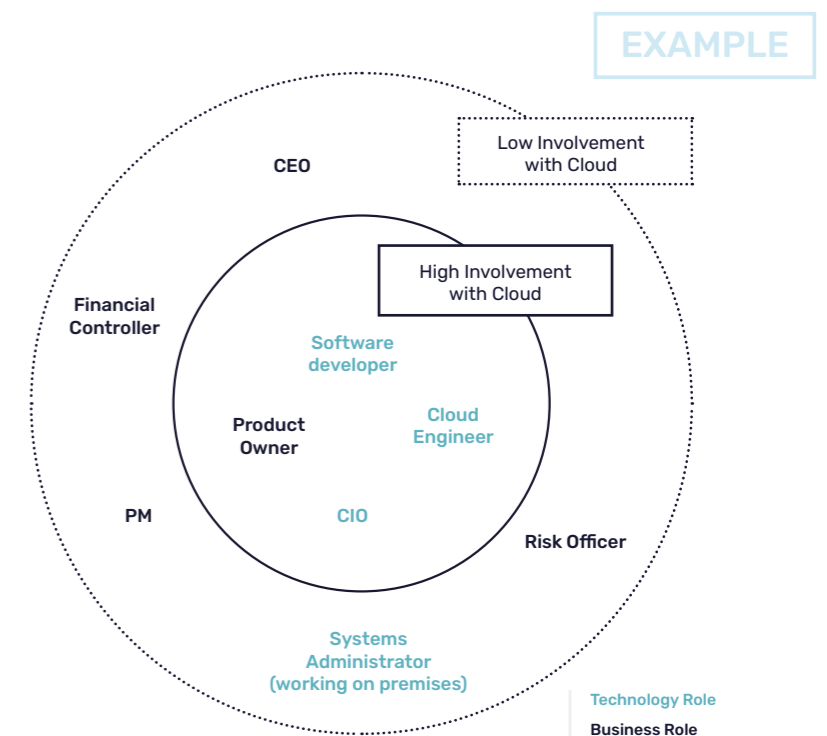
[ENVISAGE - PRACTICAL STEPS]

4. Conduct a skills gap analysis for each role group

Now you have the "as-is" cloud skills assessment according to the Involvement with Cloud vs Role Type Matrix, it's time to bring it all together and conduct a gap analysis.

Each quadrant or role group will require a different knowledge level for the various topics for cloud skills (which will, in turn, be rooted on your company's strategy, industry, use of cloud, etc).

3 key elements to look for in technical training

INTERACTIVITY – This is an area where people learn by asking questions related to their situations and having opportunities for practical application.
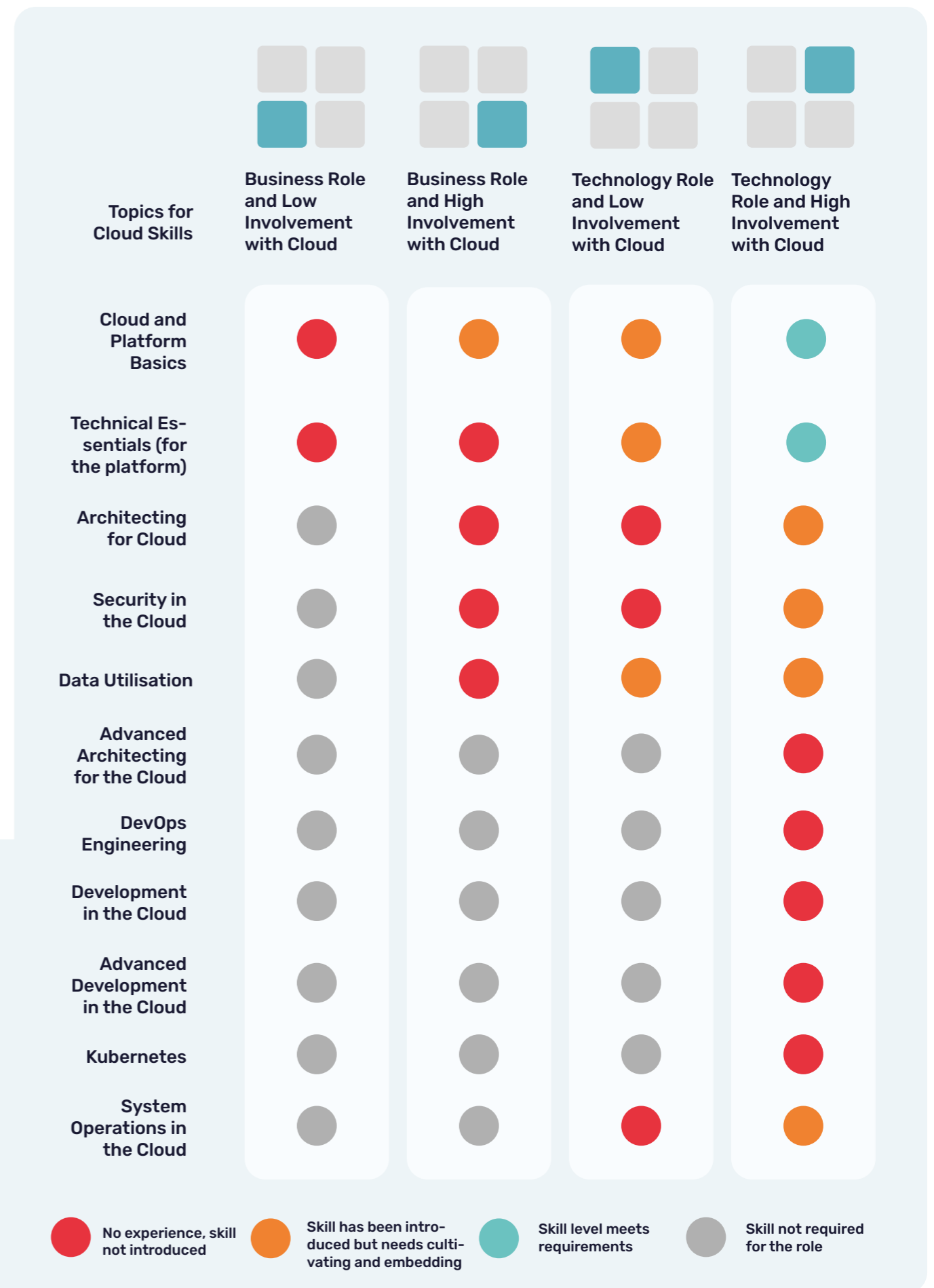
PEOPLE WHO PRACTISE WHAT THEY TEACH – cloud is complex and fast-moving, so you need training from people who live and breathe cloud (and can teach it), not from professional trainers who don't interface with the tech.

CUSTOMER UNDERSTANDING – being able to understand the customer's need and tailor a standard topic towards that, rather than blindly following a one-size-fits-all curriculum.

5. Plan your training pathways

The next step is to plan the most appropriate training for each role group based on the skills gap analysis.

Use Appendix 3 to help with this – it gives you a step-by-step process for rolling out a cloud upskilling programme. If you have any questions or would like to discuss the best way to plan training based on your specific strategy and skills gaps, get in touch with our expert cloud training advisors.

Team Upskilling Planning and Gap Analysis – example

→

This chart shows a worked-up example of a skills gap analysis. Typically, less technical roles with lower cloud involvement require fewer skills – but also have the lowest "as-is" knowledge level. On the other hand, technical roles with high cloud involvement generally require more extensive upskilling but start from a higher knowledge level.

Topics for Cloud Skills	Business Role and Low Involvement with Cloud	Business Role and High Involvement with Cloud	Technology Role and Low Involvement with Cloud	Technology Role and High Involvement with Cloud
Cloud and Platform Basics	Red	Orange	Orange	Teal
Technical Essentials (for the platform)	Red	Red	Orange	Teal
Architecting for Cloud	Gray	Red	Red	Orange
Security in the Cloud	Gray	Red	Red	Orange
Data Utilisation	Gray	Red	Orange	Orange
Advanced Architecting for the Cloud	Gray	Gray	Gray	Red
DevOps Engineering	Gray	Gray	Gray	Red
Development in the Cloud	Gray	Gray	Gray	Red
Advanced Development in the Cloud	Gray	Gray	Gray	Red
Kubernetes	Gray	Gray	Gray	Red
System Operations in the Cloud	Gray	Gray	Red	Orange

Legend:
- **Red** – No experience, skill not introduced
- **Orange** – Skill has been introduced but needs cultivating and embedding
- **Teal** – Skill level meets requirements
- **Gray** – Skill not required for the role

STEP 2
ENABLE PEOPLE TO WORK IN THE NEW WAY

MULTIDISCIPLINARY TEAMS ARE YOUR KEY TO OVERCOMING DIGITAL SKILLS MISMATCH

This guide isn't about promoting massive change management or organisation-wide transformation initiatives. If you think: "Reorganisation is required to become an agile business," you'll fail in a frustrating, slow and expensive way.

Likewise, sending individuals on ad-hoc training courses to get public cloud certifications isn't sufficient. People who do technical training often aren't senior enough to drive changes to ways of working.

Organisation-/division-wide is too big a scope, and individuals are too narrow. You need a Goldilocks approach – and teams are just right.

TEAMS ARE A MANAGEABLE, MEASURABLE UNIT FOR GAINING MOMENTUM AND DELIVERING VALUE

- You only need a few champions to begin with

- You have a simple starting place for planning upskilling, because you can identify skills gaps in a strategic way

- You have a low-friction way to eliminate siloes and join up thinking, so people experience how the outcome is greater than the sum of the parts

- A team can own a manageable project to deliver early results

The multidisciplinary team is your unit for closing costly skills gaps and incubating cloud-enabled ways of working.

"Bring in the gatekeepers in early"

COO

One of the smartest decisions I made was getting the gatekeepers involved early.

In our case, this was Risk & Compliance. I knew they would challenge us about the new product and have perfectly reasonable questions about the way it worked in the cloud.

I got Risk & Compliance to lend us someone to be part of the team and participate fully in the sprints. The rationale was that it would help avoid risk down the line, plus it would save time and money because we were pre-empting bottlenecks that could delay/scupper deployment.

I made the business case in their language; they saw the benefit and we got them on board. This meant they were invested in the project's success – and having gatekeepers on our side made a huge difference to the value we delivered.

"

I made the business case in their language, they saw the benefit and we got them on board.

PRACTICAL STEPS FOR SETTING UP MULTIDISCIPLINARY TEAMS

"Teach us to fish, and leave the fishing rod"

CIO

That's the brief I gave the agile consultant.

In the team, I had several forceful personalities with different perspectives on how cloud should work. Bringing in an external, objective coach was one of the best decisions I made. Having someone independent and authoritative helped take emotion out of the process.

That external viewpoint doesn't care whether you're used to using scrum or Kanban or Monte Carlo. They're focused on delivering the outcome.

In terms of curating how the teams run stand-ups, what tools they use, how to track, what KPIs to report on – they worked with the teams to embed best practice, which gave us a shortcut to delivering results while avoiding vendor lock-in.

"

Bringing in an external, objective coach was one of the best decisions I made.

1. | Choose a pilot project

The pilot project should slice vertically across functions, so a group of people needs to be involved. You don't want a horizontal approach where you're only working with DBAs or testers, for example. It should be a pilot for breaking down siloes, giving a contained and manageable way to unfreeze and experiment with changes to skillsets.

The project should also:

• Take approximately 8 weeks to deliver using automation and agile/DevOps

• Be a kernel of the new tech that can be scaled out as part of building momentum

• Have a controlled blast radius, so there's room for failure and experimentation

• Be important enough that success has demonstrable value for the team and wider stakeholders

2. Structure rewards to incentivise cloud-enabled ways of working

As we've mentioned, working with cloud also entails a change in the company's culture and ways of working. This should be reflected in what success measures are tracked, how rewards are handed out and what gets celebrated.

The focus should not be just about marking a ticket as "solved" or ticking something off the backlog. It needs to be about about the myriad ways each person is contributing to a business outcome. And that initiates a vital perception change.

People need to see that their value actually increases, and that the new approach can make a positive difference to their careers.

Tips for making rewards work:

- Reward based on outcomes (value and velocity) rather than inputs (e.g., time-to-market improvements)

- Make rewards small and continuous

- Make rewards visible to the organisation to promote correct ways of working

3. Identify 3-8 'friendlies' with different roles

Team members should be drawn from tech and business functions, so the team has a holistic view of value. You're looking for people who will be responsive to the new ways of working – and who can be cloud champions moving forward.

4. Give teams agile coaching

We did a small survey of C-level leaders to assess their views on upskilling effectiveness.

They were unanimous on this issue – **teams need agile coaching to:**

- Deliver business value faster with the new operating model

- Embed the new ways of working, so the added value is sustained medium and long term

- Take the emotion out of the change process – because you have a neutral expert steering them

Bring the coaching in early. This helps you build a mini, cloud-enabled incubator for experimenting with applying skills and adapting ways of working based on the business' unique personality.

STEP 3
EMBED NEW SKILLS & WAYS OF WORKING

EXECUTIVE SPONSORSHIP AND PARTNER SUPPORT CEMENT THE NEW SKILLS AND WAYS OF WORKING

This is the refreezing stage – ensuring the cloud-enabled way becomes the new normal for the team. Having executive sponsorship and partner support are key to achieving this.

CHANGE MUST BE VISIBLY DRIVEN FROM THE TOP

People have to see new cloud skills and ways of working as an enabler. And that means company leadership have to be visibly on board. That way, people feel like there's impetus to see change through – that it's a new reality, not a fad that will fizzle once the CEO launches a new initiative.

Executive sponsorship reinforces that the cloud is an essential tool to realising a bigger vision – of growth for individuals and the organisation. You lay the groundwork for the new, cloud-driven way of measuring self-value, de-risking change and creating a desire to step away from business as usual.

PARTNER SUPPORT GIVES YOU MORE SUSTAINABLE RESULTS

Coaching is part of this – teams need access to the agile coaches for 6 to 18 months, so their hands are held to get the operating model embedded.

Another part is co-staffing, which is invaluable when it comes to embedding. Co-staffing ensures people can truly flex their new muscles in a way that offers support while keeping them accountable. You have a partner integrated with the teams, supplementing in-house skills and enforcing a cloud-native approach to structuring sprints, prioritising work packages and managing backlogs. Then, when the team is skilled enough, the partner leaves and the teams fly on their own.

In a Nordcloud survey, 1/3 of training attendees who faced challenges in applying new cloud skills said a key reason was management's failure to drive enough cultural change to support cloud-based ways of working.

PRACTICAL STEPS FOR EMBEDDING NEW SKILLS AND WAYS OF WORKING

1. Involve leaders in the pilot project

This should extend throughout the project lifecycle. For example, one Nordcloud client launched their agile coaching initiative with a team away day, bringing together on-site and remote staff. Senior leaders kicked off proceedings, affirming executive commitment and reinforcing the important work the team was spearheading.

Leaders should then attend stand-ups and demos on a regular basis, and be involved in promoting project success across the organisation.

Best practice leadership involvement for a cloud-enabled future

- ☑ Project kick-off – emphasising executive commitment to cloud enablement and associated upskilling
- ☑ Stand-up attendance at end of the first sprint
- ☑ Demo attendance at end of the third sprint
- ☑ Project launch presentation from team
- ☑ Publicising project success across internal communication channels, e.g. Slack, team meetings, intranet

2. Provide co-staffing and mentorship programmes with experienced cloud architects and engineers

This helps build people from zero cloud nativeness to hero cloud nativeness, quickly. For a frame of reference, the **Nordcloud Launchpad talent acceleration programme** achieves this in 6 weeks. The Talent Acceleration Programme is an intensive approach built around doing actual work, putting theory into action, working as a team and understanding how to use individual skills to solve problems. Trainees get mentored through a series of tasks, building microservices in a controlled environment so they can then deliver on business projects with greater velocity.

All respondents in Nordcloud's upskilling survey recognised the importance of hands-on/practical work in cloud skills training, with 80% saying it was extremely important.

STEP 4
EXPAND THE REACH OF CLOUD SKILLS IN THE ORGANISATION

BUILD MOMENTUM BY SCALING OUT THE MODEL TO OTHER TEAMS AND PROJECTS

The team is your unit for planning upskilling and fostering the new ways of working needed to drive value with cloud. You now have a model for replicating the unfreezing-change-refreezing process to other teams and projects.

Because the team had full project ownership, they've been able to experiment with their new skills and discover how they apply to day-to-day work. They've had scope to use their new DevOps and agile capabilities in the fullest sense, and have focused on the value delivered in each sprint. They've become your cloud champions.

Momentum snowballs as others see their success ("They're delivering in 8 weeks! It would normally take us a year!"). And it's then easier to unfreeze other teams and business units, so you can continue the upskilling process in a structured, sustainable way.

"Customers are delighted with how efficient teams are now"

Global IoT lead

In our previous set-up, lots of product decisions came to me. A big change in our cloud evolution was empowering each product owner to make those decisions.

It made a huge difference. **As example, a team delivered a new microservice in a few weeks. Previously, it would have taken months.** With the new skills and agile set-up, the product owner was able to say: "Yes, this is a priority," and do what was needed.

Customers loved it because their interactions with the team were more to the point. We had lots of positive feedback saying how much easier it was to work with us and get things moved forward. Gone were the frustrating Chinese whispers, with requirements getting lost in translation as they moved through the department.

Customers appreciate how efficient the new set-up is. And this is key – if we make our customers happy, we get more investment and support from the business.

"

With the new skills and agile set-up, the product owner was able to say: "Yes, this is a priority," and do what was needed.

PRACTICAL STEPS FOR EXPANDING THE REACH OF CLOUD SKILLS IN YOUR ORGANISATION

1. | **Replicate the model with other teams**

Shine a spotlight on the pilot team's success, so you build momentum and generate interest from others in the business. Demonstrate how the new skills and ways of working have led to achieving KPIs and promoting business value, delivery efficiency and delivery flexibility. Promote these achievements using internal communication channels that reach the people suitable for upskilling in future phases.

Then, scale out Steps 1 to 3 with other teams, using your growing in-house cloud capabilities to support with the next unfreezing, changing and refreezing process of upskilling:

- Identify your next group of 'friendlies' with different roles to form the basis of new teams – make sure you continue to cut across tech and business functions

- Structure teams with champions from the initial pilot, so you have people modelling best practice and evangelising for the new ways of working

- Have new team members complete the Cloud Skills Self-Assessment and categorise them in the Involvement with Cloud vs Role Type Matrix

- Conduct a skills gap analysis for the new team members and develop training pathways based on Appendix 3

- Choose a new pilot project with a manageable timeline and blast radius – and that continues to scale out the wider technical strategy you're implementing, with demonstrable results for the team and stakeholders

- Depending on the team's skills gaps, offer agile coaching to reinforce what cloud champion team members are driving

Training that Works

AT NORDCLOUD, WE HAVE YEARS OF EXPERIENCE DELIVERING TRAINING ON ALL 3 MAJOR HYPERSCALERS, ACROSS DIFFERENT GEOGRAPHIES AND INDUSTRIES.

We conducted an upskilling survey to understand the main value drivers for cloud training. Here's what you can learn from the responses:

When training is delivered as part of a cloud transformation/migration, it drives delivery flexibility for the company

On average, respondents scored their company's **delivery flexibility 14% better post-training** if the upskilling was part of a wider initiative (compared with people who went on training to build up their own knowledge)

Team training delivers more value than ad-hoc training for individuals

Those who attended courses with their team saw, on average, almost **13% better delivery flexibility** and **8% better delivery efficiency** than those whose training was organised ad-hoc

HR and Talent Development are great training sponsors

Respondents who went on training sponsored by HR/Talent Development said the business value from their **newly acquired cloud skills was 15% higher than those who trained on their own initiative**

**The more training, the better**

Unsurprisingly, people who went on multiple training courses found their company **became better at delivering value flexibly and efficiently** than those who went on only 1 course

2. | Build up a Cloud Centre of Excellence

It's an iterative process – addressing organisation-wide skills gaps. You build momentum team by team as you replicate the first 3 steps. Having a Cloud Centre of Excellence (CCoE) gives you firm foundation for that iteration.

Your CCoE is a core team of cloud champions who spearhead best practices as you roll out within the organisation. It's a vehicle for expanding cloud in a systematic way, harnessing new skills and bringing them together so you have a structure for sharing competence.

When you have a CCoE centralising cloud competencies, the organisation benefits from a shared service feeling for cloud rather than having pockets of experience spread across the business. This makes it easier to expand cloud skills and ways of working in an organised, efficient and sustainable way – that maximises the value cloud delivers to the business.
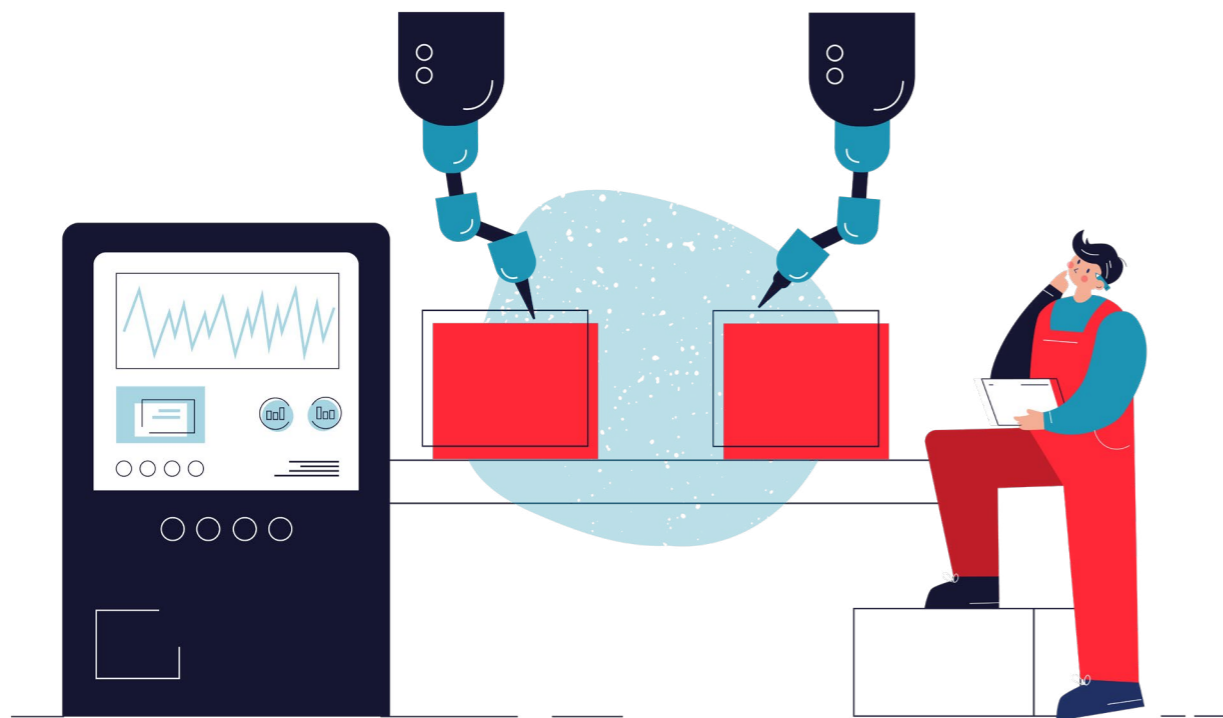
WHY A CLOUD CENTRE OF EXCELLENCE?

The organisation has a shared service for harnessing cloud skills, so you have a robust mechanism for expanding skills in a systematic way

Almost all companies with a dedicated cloud team find them effective in supporting cloud transformation – the main benefits are increased security, lower costs and higher agility

Succeeding with enterprise-wide transformation requires a centralised unit to develop cloud capabilities – leading as well as governing through the change

Development units want and should focus on adding value by building products, not on concentrating on foundational cloud capabilities and services

FINAL CHECKLIST
THE TECH LEADER'S CHECKLIST FOR MANAGING CLOUD UPSKILLING

YOU NOW HAVE A BEST-PRACTICE FRAMEWORK FOR UPSKILLING MULTIDISCIPLINARY TEAMS TO SCALE OUT CLOUD ADOPTION. AND THE BUSINESS IS POSITIONED TO REAP THE BENEFITS:

THE BUSINESS HAS THE SKILLS NEEDED TO INNOVATE QUICKLY, AND CAN ACT PROACTIVELY RATHER THAN REACTIVELY

People have the skills they need to drive value and velocity. Momentum is building across the business, so skills gaps are progressively closing. Releases are more frequent, customers are more engaged, and the business has more efficient, effective ways of delivering digital services.

PEOPLE HAVE NEW WAYS OF VALUING THEMSELVES.

Because you're linking upskilling to the business and technical strategies, people have a clearer picture of the important role they play. And because they're empowered to develop stories, evaluate them and decide how to deliver them, you get the collective pride that comes with ownership. And that helps keep the excitement and momentum going.

YOU HAVE BUY-IN FOR UPSKILLING – AND THERE'S RECOGNITION OF THE KEY ROLE IT PLAYS IN DELIVERING VALUE

People are speaking a common language, and there's a stronger, more efficient value chain linking customers and tech teams. You have proof of concept for upskilling and have less resistance scaling out. As a result, you have the impetus needed to make headway on closing skills gaps, so you minimise the risk of being left behind and maximise value to the business.

TRAINING IS NOW SEEN AS AN INVESTMENT RATHER THAN A COST

And IT is being perceived as a value driver rather than a cost centre. The success around business value, delivery flexibility and delivery efficiency are proof of the vital role cloud skills play in improving the business' approach to product and service delivery – and securing an ongoing competitive advantage.

HERE'S AN EASY CHECKLIST WITH THE PRACTICAL STEPS WE COVERED

☑ **Envisage the skills required for a cloud-enabled future**

- ☐ Use the Deductive Strategy to Skills Process – to identify cloud skills that support the technical strategy and enable the business strategy
- ☐ Conduct an "as-is" analysis of your organisation's cloud skills level by having staff complete the self-assessment questionnaire (see **Appendix 2**)
- ☐ Complete a Involvement with Cloud vs Role Type Matrix to map out roles within the organisation
- ☐ Conduct a skills gap analysis to determine the most appropriate upskilling journey for each role group
- ☐ Develop training pathways for tech and non-tech team members using the best-practice steps in Appendix 3

☑ **Enable people to work with the new skills in the new way**

- ☐ Choose a pilot project that slices vertically across functions and can be delivered in approximately 8 weeks
- ☐ Structure rewards to incentivise cloud-enabled ways of working
- ☐ Identify 3-8 'friendlies' with different roles to be in your multidisciplinary pilot team, bringing gatekeepers in early. Give this team full project ownership – with room to experiment and fail along the way
- ☐ Give teams agile coaching so they have a neutral expert providing hands-on support with implementing the new operating model

☑ **Embed the new skills and ways of working**

- ☐ Involve leaders throughout the project lifecycle – so being at the vanguard feels supported and like a good career move
- ☐ As well as coaching and/or co-staffing, provide mentoring for key team members so they truly integrate their new skills and can be cloud champions as you scale out

☑ **Expand the reach of cloud skills in the organisation**

- ☐ Replicate the model with other teams, using your expanding in-house capabilities to support with the next stage of unfreezing, changing and refreezing of new skills
- ☐ Build up a Cloud Centre of Excellence that centralises competencies and provides a shared service feeling, so there's a community of newly skilled experts demonstrating the value of a cloud-enabled future

SKF

CASE STUDY
SKF: TECHNICAL ENABLEMENT & AGILE EMPOWERMENT TO CREATE DIGITAL SERVICES

SKF IS A GLOBAL MANUFACTURER OF BEARINGS USED IN INDUSTRIES FROM AEROSPACE AND AGRICULTURE TO MINING AND ENERGY. JENS GREINER, GLOBAL MANAGER – DIGITAL SOLUTIONS, GIVES INSIGHT AND ADVICE ABOUT THEIR JOURNEY.

Q: What business challenges were you trying to overcome when you started the cloud journey?

We have service contracts with customers where engineers monitor bearing performance and provide necessary maintenance. It's time-intensive work, and it's a cost-competitive market.

We wanted to develop a cloud-based predictive maintenance application that would remotely monitor bearing performance, reducing the need for site visits while improving responsiveness for our customers. The driver was a clear business need to offer better services more profitably.

Having envisaged that business objective, our technical strategy involved a digital layer that enabled continuous interaction between products, customers and us. We knew it would need machine learning, data lake capabilities, and databases for analytics, and decided to go for AWS and use a microservice architecture.

Q: How were you managing upskilling before starting work with Nordcloud?

We had cloud experience in the German teams – we'd started the journey back in 2000 and used a private cloud from 2004 until 2012. So there was a base level of understanding. The team started out as 2 developers but quickly

expanded to 20, including remote members.

Feedback was that things felt inefficient and that there wasn't enough visibility of other people's workstreams. Even though I'd run workshops and everyone was familiar with the Agile Manifesto and the Scrum Guide, we were struggling with the implementation around enabling people to work with in the new way, particularly the mindset shift.

It became clear that we needed external agile coaching support to work alongside the team and embed agile practices.

Q: What learning pathways were implemented and what was the experience like for tech and non-tech people?

With Nordcloud's input, we decided on a bottom-up approach to enabling the team. Scott, the agile coach, spent 3 weeks just

joining meetings and listening, building a picture of how we were working. Based on his diagnosis, we restructured into 3 smaller, multidisciplinary teams that included a product owner, a scrum master and developers with different specialties.

We clearly divided responsibilities within the team, so roles were well defined and upskilling requirements were clear.

Q: What were key milestones in embedding new skills and ways of working?

1. Restructuring the teams was a key milestone – this gave us a manageable unit for agile and technical enablement.

2. An offsite team day we had about 2 months in, which included the remote teams who visited us for this event. Nordcloud ran it as an open space with discussions

	NEW FOCUS	**UPSKILLING**
Product owners	"What are we trying to do?" Defining stories	Individual coaching on user stories, learning how to develop, expand, refine and prioritise them
Developers	"How do we implement it?" What tech is required	Individual coaching on evaluating stories (and rejecting them when required) Technical on automation, CICD pipeline, microservices
Scrum masters	"How do we stay integrated and on track?" Managing sprints and scrums	Individual coaching on how to run effective scrums, with coaches then shadowing them in daily stand-ups to offer support

on different topics. The coaches and I were moderators taking notes while the team discussed the challenges. This had a big impact. To change the culture, the individuals needed to identify the problems themselves.

For example, the topic of code reviews – a consensus emerged that this was an issue where we needed a better way of working. Retrospectives felt boring – we agreed to try a new format. It got really granular – should cameras be mandatory in meetings, so there's more connection with the remote teams?

Because the teams were recognising and workshopping the challenges, there was more impetus for change. They felt in control, not that this was something imposed onto them.

3.   Implementation of a new product ownership framework. As Chief Product Owner, I had been heavily involved in all the roadmaps, architecture and technical dealing. With the new multidisciplinary teams having more autonomy, I was able to relinquish day-to-day control to individual product owners, giving me more time to focus on the overall roadmap and customer value.
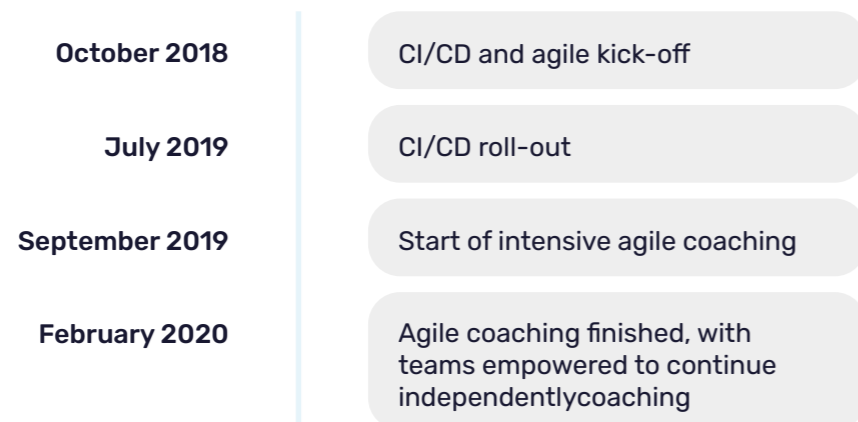
Under the new framework, product owners now have responsibility for months 0-3 in the roadmap, deciding on features to be deployed. Months 4-9 are my responsibility, so we stay aligned to the vision.

Q: How long did it take until people felt confident in the new tools and ways of working?

From the time we realised upskilling was required for agile to be effective, it took about 8 months for the teams to be enabled from a technical perspective. This was in terms of getting the first real version of the CI/CD pipeline finished. This is important, because without the pipeline, development processes took an awfully long time, which undermined and even prevented agile thinking. With automated integration, testing and deployment, we can roll out releases quickly. You can see the impact sooner and you can react - which is exactly what you need to be agile.

The technical training started before the agile coaching, so the teams were comfortable with the environment before we delved into the conversations around delivering value every sprint, having, for example, a

SKF UPSKILLING TIMELINE

October 2018	CI/CD and agile kick-off
July 2019	CI/CD roll-out
September 2019	Start of intensive agile coaching
February 2020	Agile coaching finished, with teams empowered to continue independentlycoaching

"

Bring an agile coach in as early as possible. I tried to do it on my own, but I didn't have the bandwidth or experience. Get an external expert who's objective and understands how to embed skills.

- Jens Greiner, Global Manager – Digital Solutions, SKF

common pipeline. It was a reasonable pace. For the agile element of the journey, it took about 6 months to transform and then another 6 months before we felt like experts. I'm pleased at how quick the process has been, and having the coaching was instrumental in this.

But of course, this is about lifelong learning as we continue to expand skills within the teams and wider organisation. The aim was to reach a tipping point where we no longer needed coaching and could own our journey going forward. In fact, the Nordcloud coach even said: "You no longer need me – the teams are enabled to run with it now."

Q: What benefits have the cloud skills and ways of working delivered to the business?

It's tied in with value discovery, delivery efficiency and delivery flexibility. There have been improvements across the board.

For example, customers like how efficient teams are. We're now delivering a microservice in weeks, where it used to take months. This is because product owners are empowered to decide on priorities and make it happen.

Q: What advice would you give to peers in other companies in terms of lessons learned and pitfalls to avoid?

1.   Bring an agile coach in as early as possible, and have someone familiar with your context. I tried to do it on my own, but I didn't have the bandwidth or experience. Get an external expert who is objective and understands how to support cultural transformation.

2.   Take a bottom-up approach. Team buy-in makes a huge difference. It's about leading, coaching and empowering. From my perspective, this sometimes means accepting decisions I'm not super happy with because I'm respecting the team's autonomy.

3.   Have a failure-friendly culture where vulnerability is encouraged. In a traditional waterfall setup, success is defined at the beginning, so you can't kill a project partway through if it's not working. You waste money because you're pursuing something that won't deliver the right value.

Agile is about accepting continuous, small failures and giving scope for creativity and openness. It's about giving people the ability to adjust as they go to find the best solution for the customer. This is a mindset shift – that failure can be good, and that it doesn't mean people aren't doing their best.

"AS-IS" ASSESSMENT OF YOUR ORGANISATION'S TOPICS FOR CLOUD SKILLS

SELF-ASSESSMENT

Have the people your organisation/team individually **complete the Self-Assessment Sheet**

TOPICS FOR CLOUD SKILLS

Consider the results at Topics for Cloud Skills level to determine whether they meet your organisation's needs based on the role of the person completing the assessment

AVERAGE SCORES

An average score close to **0 signifies No/Low Knowledge**

An average score close to **1 signifies Medium Knowledge**

An average score close to **2 signifies High Knowledge**

HOW TO SELF-SCORE

No/Low Knowledge

- Completely or almost completely new concepts and practices
- Would struggle to define what concepts and practices are
- Has only high level understanding of concepts and practices

Medium Knowledge

- Knows / has come in contact with key concepts and practices
- Would be able to explain key concepts and practices
- There are some gaps in knowledge

High Knowledge

- Is able to lead a session on the topic
- Is a problem solver that is also able to practically work on the areas
- People look to the person for advice

CLOUD SKILLS SELF-ASSESSMENT

🔴 Knowledge   ⚫ Practice

Topics for Cloud Skills	How would you rate your understanding around...	Rating (0=No/Low, 1= Medium, 2= High)	Average Score
CLOUD & PLATFORM BASICS	🔴 What the cloud is and how it works	☐	
	🔴 Cloud computing and deployment models – advantages and benefits	☐	
	🔴 Core services available on cloud platforms	☐	☐
	🔴 Basic security, privacy, compliance and trust considerations	☐	
	🔴 Common building blocks for services running in the cloud	☐	
TECHNICAL ESSENTIALS (FOR THE PLATFORM)	🔴 Platform terminology and concepts	☐	
	🔴 Foundational infrastructure services	☐	
	🔴 Security measures	☐	☐
	🔴 Data strategies	☐	
	⚫ Management tools - deployment, storage, monitoring, logging, diagnostics	☐	
SECURITY IN THE CLOUD	⚫ Architecting and building to protect against common threats	☐	
	⚫ Protecting data at rest and in transit Automated, reproducible security checks	☐	
		☐	☐
	🔴 Log monitoring, processing and analysis	☐	
	🔴 Threat identification and mitigation	☐	
	⚫ Security assessment best practice in the cloud	☐	
DATA UTILISATION	🔴 Best-practice data science processes	☐	
	⚫ Using built-in algorithms	☐	
	⚫ Managing deep learning workloads	☐	
	⚫ Using solutions inside a Big Data ecosystem	☐	☐
	🔴 In-memory analytics and data storage	☐	
	⚫ Ingesting, transferring and compressing data	☐	

Topics for Cloud Skills	How would you rate your understanding around...	Rating (0=No/Low, 1= Medium, 2= High)	Average Score
ARCHITECTING FOR CLOUD	🔴 Architectural principles, frameworks and best practices	☐	☐
	🔴 Making infrastructure scalable, reliable, and highly available	☐	
	⚫ Leveraging managed services to enable greater flexibility and resilience	☐	
	⚫ Boosting infrastructure efficiency to increase performance and reduce costs	☐	
ADVANCED ARCHITECTING FOR CLOUD	⚫ Applying best-practice frameworks and deployment mechanisms	☐	☐
	⚫ Connecting on-premises data centres to the cloud	☐	
	⚫ Designing and moving large data stores	☐	
	⚫ Enhancing performance	☐	
	🔴 Data and infrastructure security	☐	
	🔴 Understanding different architectural designs	☐	
DEVOPS ENGINEERING	🔴 Platform-specific technical elements	☐	☐
	🔴 Continuous integration	☐	
	🔴 Security and compliance	☐	
	⚫ Issue monitoring	☐	
	⚫ Automation within the CI/CD pipeline	☐	
DEVELOPMENT IN THE CLOUD	⚫ Using containers	☐	☐
	⚫ Leveraging the CI/CD pipeline	☐	
	⚫ Developing for scalability	☐	
	⚫ Utilising platform tools to streamline development	☐	

Topics for Cloud Skills	How would you rate your understanding around...	Rating (0=No/Low, 1= Medium, 2= High)	Average Score
ADVANCED DEVELOPMENT IN THE CLOUD	⚫ Analysing monolithic architecture to determine logical break points	☐	☐
	⚫ Migrating from a monolithic architecture using best practice principles	☐	
	⚫ Recommending appropriate cloud services for developing microservice-based, cloud-native applications	☐	
	🔴 SysOps and DevOps interdependencies necessary to deploy microservices	☐	
KUBERNETES	🔴 Microservices best practices	☐	☐
	🔴 How to implement	☐	
	⚫ Installing and configuring	☐	
	⚫ Deploying applications	☐	
	⚫ Scaling and managing	☐	
SYSTEM OPERATIONS IN THE CLOUD	⚫ Infrastructure management specific to platform	☐	☐
	🔴 Virtual networking	☐	
	🔴 Security	☐	
	⚫ Access Management	☐	
	🔴 Automation	☐	
	⚫ Resource consumption management	☐	

BEST PRACTICE TRAINING PATHWAY: PRACTICAL STEPS FOR ROLLING OUT A CLOUD UPSKILLING PROGRAMME

1. Cloud basics training for everyone

Cloud basics training gives everyone a common language. Tech people gain a consistent foundation given differing starting points of cloud awareness. And low/non-tech people who will be interfacing with the solution know what questions to ask along the journey.

The outcome of this training is for everyone to understand:

• What the cloud is and how it works

• Cloud computing and deployment models – advantages and benefits for the business

• Core services available on the platform you're using

• Security, privacy, compliance and trust considerations

• Common building blocks for services running in the cloud

"

In my experience, people aren't as equipped for cloud as you think they are. A common pitfall is to overestimate readiness and capabilities, even among experienced techies. When you start with the basics, it gives everyone a common language.

- CTO

2. Architecting training for infrastructure and development

A common roadblock for cloud deployment is that infrastructure and development struggle to grasp the bigger picture as they emerge from their traditional silos. If cloud basics is the common language they need with their business colleagues, architecting is the driving licence for working together effectively in the cloud.

"

My advice is not to focus on certifications as the end goal. Value is the end goal. Certifications testimonialise the training and help with morale and retention. But a certification isn't worth much if people aren't able to apply the skills effectively to deliver value.

- Vice President – Talent Acceleration

3. Technical training based on role (Involvement with Cloud vs Role Type)

This will depend on knowledge starting levels and company cloud ambition.

The aim is to empower people with the knowledge they need to use the new features and tools. From system operations and Kubernetes to data warehousing, the key is to build the skills base while providing the coaching that embeds them into working practices. For example, serverless is a common gap on the infrastructure side, and advanced training helps move to an approach based on stateless servers but stateful services.

You can also contact us to get a tailored recommendation.

"The only source of knowledge is experience."

– Albert Einstein

THIS GUIDE IS ONLY THE FIRST STEP IN YOUR CLOUD SUCCESS YOURNEY. NOW IT'S ALL ABOUT TAKING ACTION AND IMPROVING BY DOING.

Upskilling - A toolkit to enable cloud success

CONTACT NORDCLOUD TRAINING

TRAINED ORGANISATIONS ARE 80% FASTER TO ADOPT CLOUD AND 3.8 TIMES MORE LIKELY TO MEET CLOUD ROI REQUIREMENTS.

Nordcloud is a European leader in cloud transformation, migration, application modernisation, managed services and training.

Clients say working with us is like having a compass for their cloud journey – you have cloud-native experts guiding best practice, pre-empting pitfalls, providing essential technical support and helping you achieve better, faster results.

We help you overcome skill shortages and mismatches, building up your capabilities to scale out cloud adoption.

FASTER RESULTS

We're cloud pioneers with a 100% cloud heritage. This means we're not just jumping on bandwagons or superimposing trends on to legacy ways of working. You get better, faster results because you have cloud natives guiding your journey.

EMPOWERED TEAMS

We're commercially focused, using proprietary tools and technologies that help you maximise the cost savings and value potential of the cloud. From technology to training, from design to DevOps, you get the support needed to capitalise on cloud benefits.

GLOBAL CLOUD LEADERSHIP

We're a leading partner for all 3 public cloud platforms – Microsoft Azure, Google Cloud Platform and Amazon Web Services – and are a Visionary in Gartner's Magic Quadrant for Public Cloud IT Transformation Services. You get impartial advice that accounts for your entire tech stack – and is based on your best interests.

Contact us to discuss your cloud journey

CONTACT US

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