Skills in Context

A guide to the skill ecosystem approach to workforce development

NEW SOUTH WALES
DEPARTMENT
OF EDUCATION
AND TRAINING

Australian Government

Department of Education, Employment and Workplace Relations

Acknowledgements

This Guide has been produced as a project funded under the Skill Ecosystem National Project and administered by the New South Wales Department of Education and Training on behalf of the Department of Education, Employment and Workplace Relations.

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It is the result of many people's ideas and experiences. These include the many participants in skill ecosystem projects, the staff of the Department of Education and Training and most importantly, the Skill Ecosystem Advisory Committee members who have been the strongest advocates of the skill ecosystem model and have helped develop its practical application.

The Department of Education and Training would like to acknowledge the funding support provided to the skill ecosystem program by two bodies. Firstly, by the NSW Board of Vocational Education and Training which commissioned the initial Australian research that advocated skill ecosystem as a new direction. Second, we are grateful to the Australian Government which provided funding between 2003 and 2008 through the Department of Education, Employment and Workplace Relations (formerly the Department of Education, Science and Training) for skill ecosystem activities.

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ISBN 978 1 921084 37 9

Table of Contents

Introduction

This guide has been prepared to provide an overview of the skill ecosystem approach in theory and practice. It is designed for use by government education authorities which may be interested in further developing this approach as well as for industry and regional organisations considering whether the skill ecosystem model of workforce development might be a useful one for them to pursue.

Trainers and training organisations interested in deepening their partnerships with industry around skills development will also find the guide relevant to their work.

The guide is in two parts.

Part One introduces the skill ecosystem concept and discusses the skill ecosystem approach to workforce development.

Part Two draws on the experience of the NSW Department of Education and Training in managing skill ecosystem projects. It describes the challenges faced by past projects in establishing and implementing their visions, and suggests strategies for achieving successful outcomes.

Hyper-links to web-sites that contain additional information are provided throughout the document, and there is a reference list at the end. The NSW Department of Education and training can be contacted to obtain more details about and copies of web-site documents.

Part One

Skill ecosystems - what are they?

A skill ecosystem is a self-sustaining network of workforce skills and knowledge in an industry or region. Any defined industry sector, such as the South Australian wine industry or the super funds management industry in Melbourne and Sydney, has an associated skill ecosystem.

A useful contrast can be made between high and low skill ecosystems. Competitive advantage, high wages and a strong capacity for innovation are associated with the former. In low skill ecosystems, by contrast, low productivity, low wages and a low value-add business strategy tend to reinforce one another.

A key question is why some firms, industry sectors and regions choose to pursue high skill strategies while others do not? What are the factors or levers that influence firms to pursue a skill-based competitive edge?

The economic conditions, structure of industry and labour markets are clearly important. So too are business settings such as workplace culture, job design and management capability.

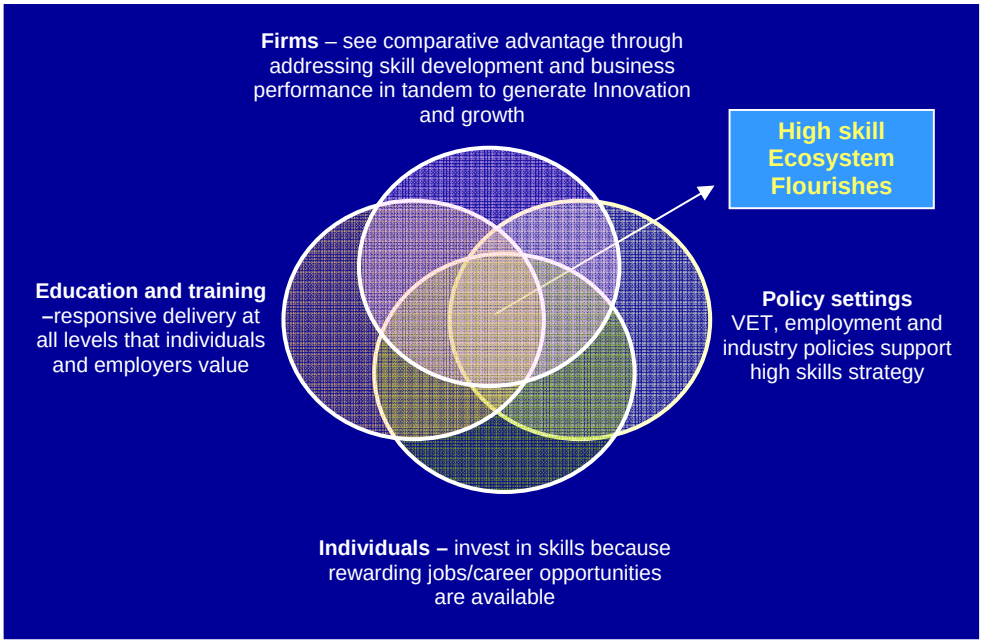
The role of the education and training system - both in terms of its responsiveness to the needs of industry, and the influence it exerts on industry parties in support of one direction or another, is also critical.

Finally, as shown in the diagram, the disposition of individuals is important as they make decisions about whether to engage in training and education.

The skill ecosystem approach emphasises that these decisions are made in a context which either supports, or alternatively, discourages, individuals form pursuing work-related learning.

Where did the term come from?

The ecosystem concept has been adapted from biological science for broader audiences.



When used in the business literature it conveys the inter-dependency of factors that give rise to business success in generating innovation, growth and competitiveness.

David Finegold coined the term 'skill ecosystem' to focus on the associated skills base required to underpin this growth. His work looks at the factors that continually replenish the high skills base in Silicon Valley, California (see overleaf).

Silicon valley – an example of high skill ecosystems

According to Finegold, there are four elements required to create and sustain high skill ecosystems (HSEs):

- a catalyst
- fuel or nourishment
- a supportive host environment
- a high level of mutual interdependence.

He argues that in Silicon Valley, a large surge in government spending on military research and hardware in the 1940s and 50s provided the *catalyst* for the aerospace industry to take off. Another critical factor for both the aerospace and biomedical clusters was the interaction between researchers and industry. In both cases regional universities acted as *catalysts* and *sources of nourishment* for these industries, establishing well-trodden pathways between universities (including their management schools) and high-tech local firms.

Once established, the HSEs began to attract overseas-born workers 'in many cases bringing with them extended family and personal networks that further strengthen global reach and the viability of the HSEs' (1999:67).

Features of the *supportive environment* that made it attractive to 'knowledge workers' and subsequently allowed Silicon Valley's HSEs to thrive include:

- Infrastructure (transportation, telecommunications and serviced business parks)
- A regulatory environment that made it easy to start a business and take it public, and also bankrupt without severe penalties if the business does not succeed.
- Flexible work arrangements.

Of most interest from a skills perspective are the *inter-linkages* within the HSEs that made them 'knowledge-sharing networks' rather than just companies located in the same region. In electronics and health, the firms typically had flat structures and focused on one specialised product or service. This meant frequent partnering with others that had complementary expertise.

In addition, the employment system – highly paid, short-term contracts – encouraged the circulation of people across organisations, as did the 'wealth of intermediate institutions that provide a forum for people to meet and exchange learning' (1999:70).

Firms came together through intermediaries to pursue initiatives such as improved technical training that were to their mutual benefit. However, Finegold argues that the main way professionals and technicians developed their skills was through informal means such as working with others in their networks to overcome technical challenges. The organisational form of the HSEs facilitated this form of knowledge creation and diffusion.

Source: Finegold (1999) 'Creating self-sustaining, high-skill ecosystems', Oxford Review of Economics 15(1).

Workforce development and skill ecosystems

In Australia, the skill ecosystem concept has been used to come up with new ways in which vocational education and training bodies can engage with industry.

In the early 2000s, the NSW Board of Vocational Education and Training published a series of reports that examined how the changing nature of work in Australia was affecting training and skills. *Beyond Flexibility* (2001) recommended that government establish a 'work, skills and innovation initiative' in order to foster experimentation based on the skill ecosystem idea.

Since then, a number of projects have been funded to focus on and strengthen the skill ecosystem in a particular industry or region. The aim was to improve collaboration between vocational education organisations and industry, to increase workforce sustainability in tight labour markets and to better align training with industry development needs. For more on the program's history, visit the skill ecosystem website.

The skill ecosystem approach can be seen as one model for industry-VET partnership work. It is also closely linked to 'workforce development', a term used more recently in training circles that also signals activities that not only include, but go beyond training.

Around Australia

State governments have taken a lead in promoting broader responses to skill-industry alignment under the banner of 'workforce development'. South Australia's *Better Skills, Better Work, Better State* policy states:

Workforce development is an over-arching concept that links skills with the way work is organised. It signals a better balance between the acquisition, use and renewal of skills in the workplace, and is an appropriate response to the implications of demographic change and ageing on the labour market.

The policy sets out a strategy to promote both a globally competitive economy and a socially inclusive community. It sees the fostering of a high skilled workforce engaged in quality employment as a key strategy to achieve both goals and envisages government policies across many areas supporting each other:

In the past, the provision of education and training was seen as the main mechanism for developing the workforce. A workforce development approach recognises there is a far broader range of policies, systems and structures which - when used together - can create and sustain the workforce.

Industry development, industrial relations, health care, the availability of child care or aged care, education, migration, superannuation and retirement patterns all affect the shape of the workforce and influence people's ability to participate within it.

In Queensland, the government has funded *Skills Formation Strategies* in a number of industries and communities to effectively address skill shortages, again on the understanding that these often have multiple causes and that different stakeholders need to work collaboratively:

Skills formation strategies develop relationships and networks between these groups to identify real causes of skills shortages and develop appropriate solutions.

Common features of skill ecosystems

Australian Government funding provided the opportunity to test and refine a skill ecosystem approach to workforce development. After an initial funding round that supported different types of projects, the Department of Education and Training and the project partners worked together to distil the key features that distinguish an ecosystem approach based on what worked best. The midterm evaluation provides more details about the lessons learned.

Here are some common features that characterise the skill ecosystem approach:

- They address the labour market and workplace issues affecting skill, as well as considering educational and training responses
- Each project works through the evidence of the problem to be addressed and shows why and how labour supply strategies can make a difference (i.e. it is not a 'one size fits all' approach)
- Stakeholders are committed to addressing a broad agenda rather than narrow business interests. This means balancing the diverse and sometimes conflicting interests of small, medium and big business, managers and employees, as well as job-seekers and the wider local communities
- Interventions are designed across an industry or region, not just at an individual firm level
- There is an emphasis on building industry capability to more systematically plan and manage skill development in ways that can be sustained by both individual businesses as well as at an industry and/or regional level.

These criteria were set out in advice to applicants. They informed the work of the Skill Ecosystem Advisory Committee and were also a response to stakeholder requests for more precise guidance about what a skill ecosystem approach entails. In responding to these requests, the Advisory Committee also developed advice for projects pursuing different types of strategies. The table on page 9 summarises the criteria.

Projects that are creating a new model through experimentation, and managers of programs who fund these initiatives, need to strike a balance. They need to balance allowing scope for industry networks to identify and respond to their own issues, with working within a project framework that reflects what has been learned about what works.

Criteria for Skill Ecosystem Strategies

Skill Ecosystem Strategies need to have the following characteristics:

1. They address both supply and demand sides of the skill equation (i.e. they focus on the availability or development of skills, and their utilisation).
2. They seek to achieve both improved business performance and positive outcomes for individual employees.

Within this framework, the criteria below define specific minimum expectations for individual strategies. Individual networks will inevitably refine their focus to concentrate on one or two central issues, but it is important to note that the skill ecosystem approach is by definition multi-dimensional.

Requirements for all strategy types

1. Managers of the participating businesses or organisations are in broad agreement on the scope of the problem and are prepared to trial and share possible solutions.
2. The Skill Ecosystem Strategy reflects explicit agreement to consider and measure the impact of skill development initiatives on:
    - Business performance.
    - Job content/skill levels, both for the target group and the wider workforce.
    - Rewards and recognition within the industry/ workplace.
    - Career paths for target group and broader workforce.
    - Perceived value of initiative to the business, employees, and (where relevant) customers.
    - How industry/businesses will embed and sustain the changes.
3. The proposal is clear, coherent and convincing.
4. The project proponent has the capacity to implement the strategy successfully.
5. Lead organisations can demonstrate that they are representative, and able to extend the learnings acquired through the skill ecosystem strategy to others.
6. A convincing case is made for how the Skill Ecosystem Strategy will be continued, replicated and/or extended to other parts of the industry if successful. The relevance of the learnings from the strategy to other industries is demonstrated.
7. Issues of intellectual property (IP) ownership and potential commercial conflicts of interest are explicitly identified and managed. For example, where specific consultants or content owners and/ or Registered Training Organisations stand to benefit commercially from project implementation, consideration is given to whether this is appropriate, cost sharing options and how the IP or resources can be made more widely available.

Additional requirements applying to different strategy types

Strategy type 1: supply of labour	Requirements
Strategies that focus on: • Attraction and retention strategies such as career path development. • Rural/remote area attraction and retention. • Targeting new labour market pools. • Developing managerial capacity to aid retention.	• Strategy connects with and doesn't duplicate other programs and organisations operating in this area – Careers Advice Australia, Job Network, Indigenous organisations. • Proposed new job/career pathway is consistent with training package qualification streams. • Industrial implications are explicitly identified and negotiated. • Impact on job roles and boundaries of related jobs is explicitly identified and negotiated.
Strategy type 2: supply of skills	**Requirements**
Strategies that focus on: • Addressing the rapid change that industries or workplaces are experiencing. • Responding to the need for complex or deeper skill development. • Innovation in training delivery through industry input. • Exploring the role for the public provider in emerging markets.	• New delivery model or programs are integrated with mainstream VET system. • Implications for updating and revising existing training packages and qualifications are identified and taken up with relevant policy arm (typically Industry Skills Councils). Where international standards are relevant, a process for linking these to national competency standards is established and implemented. • The respective responsibilities of industry, the individual and the government for skill acquisition and development are identified.
Strategy type 3: utilisation of skills	**Requirements**
Strategies that focus on: • Changing work roles or job design. • Adjusting employment arrangements. • Matching of work roles to the available labour. • Encouraging the growth of industries that contain high skill jobs. • Developing workplace and industry capacity to support the application of skills.	• The strategy involves upskilling and cross-skilling (not deskilling or the creation of a low skilled pool). Pathways for career progression are available and learning development options identified. • Where the project involves business development, a workforce development element also needs to be strongly present. • The organisation's capacity to fund the new roles after the pilot stage is considered. • Employee consultation and representation in the change process is built in to address issues including industrial implications and career development. • Where the strategy is led by a training organisation, the organisation has the capacity to add value and work in partnership with content experts.

What have skill ecosystem projects done?

As is evident from the project profiles skill ecosystem approaches are as much about business strategies and workplace culture as they are about training. They are about developing holistic responses to workforce development needs rather than promoting a particular type of training solution or serving the interests of particular businesses.

And importantly, the projects are not only concerned with how skills are developed, but also whether the skills are utilised and how they affect business and personal outcomes. Typical issues the skill ecosystem projects tackle include:

- Improving business performance outcomes by delivering relevant skills that are effectively utilised.
- Improving work opportunities and rewards for learners and employees.
- Supporting and improving the diverse ways that people learn new things and acquire new skills.
- Assisting industry to better understand and manage workforce planning and development in the context of limited and highly competitive labour and skills markets.
- Positioning training organisations to understand and respond to industry needs.

To date, skill ecosystem projects have:

- Developed alternative employment arrangements to support skill development in the racing industry.
- Brokered new relationships between training organisations, small firms and researchers in the water industry.
- Developed a strategy for inter-service cooperation in mental health services.
- Redesigned allied health service roles in aged services.
- Developed innovative models for linking business development with skill development in the digital content industry.

The program is currently supporting three ambitious projects in dairy foods manufacturing, mobile digital content and disability services.

Why do it?

Traditionally skill shortages have been met by an increase in the supply of workforce skills, typically measured in terms of qualifications. While this might sound appropriate, the reality is less straight forward.

There is often a poor fit between skills required and skills supplied. At the same time as employers are citing skill shortages as a constraint to growth, 37 per cent of employers reported that employees have skills beyond those required and only five per cent reported that their employees lacked sufficient skills (Watson 2008:11).

Across the workforce, 27 per cent of people are over-educated for their current jobs and are underutilising the skills they acquired through education and training (Linsley 2005:128).

This apparent contradiction highlights the limitations of supplying skills into labour markets in the absence of understanding who needs them and where they are located, which skills are needed and how they will be used.

In conclusion

Training cannot be the answer unless we fully understand the problem. Offering training without understanding the needs it is trying to meet is a risky business. From a business perspective it can result in substantial outlays with no performance payback. For the training organisation, it can lead to claims that the training is off-target or irrelevant. For employees, it can lead to cynicism and disengagement from the training offered. From a government perspective, it does not make best use of the public funds invested.

From broader economic and community perspectives, the potential benefits in terms of improved productivity and better, more rewarding jobs are unlikely to materialise.

That's why in some cases, and especially where there are chronic and persistent skills issues, a broader approach is needed.

Part One of this guide has presented an overview of the skill ecosystem concept. In the Australian context, skill ecosystems have provided a framework to define a set of criteria for the particular types of industry-training partnerships that should attract public support.

This approach rejects the notion that any and all ecosystems are desirable. Ecosystems simply provide a framework for understanding complex relationships and considering the factors that support skill utilisation and development in industry and communities.

Some skill ecosystems deliver economic outcomes based on fostering and developing skills and providing good work opportunities, others do not.
The skill ecosystem program has sought to influence the drivers that, through building high skill ecosystems, will deliver positive outcomes for industry, employees and communities.

Part Two explores the process of developing and implementing a skill ecosystem project. Drawing on the experiences of the projects implemented to date, it provides an insight into the options, strengths and pitfalls of different approaches.

Part Two

Establishing and implementing skill ecosystem projects

This section describes the practical issues and challenges in initiating and implementing skill ecosystem projects. It covers the following topics:

- Project purpose
- Project scope and scale
- Measuring outcomes
- The project team
- Project management
- Implementation
- Sustaining project achievements
- Program support.

Establishing project purpose

The broad purpose of skill ecosystem projects (as discussed in Part One) is to better position industry and training stakeholders to identify and manage workforce development at an industry, sector or regional level.

Projects address either a persistent industry problem or an emerging business opportunity.

Industries suited to this way of working are typically experiencing chronic and persistent labour and skill shortages and/or are serving fast-changing, dynamic markets.

Skill ecosystem projects aim to push the boundaries of conventional assumptions. They try to build collective capability to analyse and question, rather than adopt a generic, one-size-fits-all set of solutions.

The project focus often develops organically. However, simply experiencing a common problem does not necessarily mean stakeholders will commit to working collaboratively to share possible solutions. Early project work involves clarifying and teasing out the priority business and skills issues that stakeholders can agree to work on together.

There are some common pitfalls for first-timers in defining the project purpose. Most relate to leaping to solutions before understanding the problem.

Parties often start out with assumptions about skill-related problems or opportunities. For example, it might be assumed that difficulty recruiting people is due to a shortage of skills in the labour market, while the real problem may be unattractive working conditions or the lack of child-care so people can access employment.

Project experience demonstrates the importance of challenging commonly held perceptions before settling on the project purpose or anticipating solutions, as the examples in the box overleaf indicate.

Examples

The Queensland civil construction industry faces chronic labour shortages. Rather than assume that the best option was to meet this with base level training, the *Skill Formation Strategy* project tracked the experiences of three people from different backgrounds, all interested in entering the industry.

They found that lack of information about job opportunities was a significant barrier to entry. An evidence-based approach supports projects to challenge assumptions and direct resources to achieve the most effective outcomes.

In this case, the industry prioritised the establishment of a central point of contact for employers and job-seekers, providing information on industry training and employment.

In another example, Manufacturing Learning Australia (MLA) has recently investigated the role of skills in helping small and medium process manufacturers to compete globally. Their consultations found that, contrary to the common assumption that upskilling is the primary way in which businesses can compete more successfully in a globalised economy, most manufacturers felt that their survival strategies (such as diversifying their product range) did not require formal training or skilled employees.

In many cases, their manufacturing processes were too narrow in focus, or the techniques they used were not taught through formal systems. MLA concluded that 'the most immediate need was for higher level business training targeting owners and managers, rather than operator-level training' (MLA 2007:3).

Program management tip:

In the second round of the skill ecosystem program, groups were given a small allocation of funds to more thoroughly research and develop their project propositions.

They were supported by workshops and specialist advice during the developmental process, and their strategies evolved over this time. An excerpt from the template used to encourage thoughtful engagement with the evidence is overleaf.

Refer to the skill ecosystem website for more information about the process.

The following questions, with explanatory text, were used to guide project networks in diagnosing their issue.

1. Industry details

1.1 Provide a detailed descriptor of the industry sub-sector
(eg 'dairy product manufacturing' rather than 'dairy industry' or 'manufacturing industry').

1.2 Provide a brief industry profile:

This could include but is not limited to:

- key products and services
- number of people employed
- volume and value of production/service activity
- value of exports (if applicable)
- key aspects of industry structure – eg size of private vs. public or community sector, geographic spread, key players in the market
- recent trends (patterns of growth; rationalisations and restructuring etc)
- key occupations in the industry and the ones you are targeting in the strategy.

2. Issues/problems and challenges

What are the workforce issues and challenges the *Skill Ecosystem Strategy* in your industry aims to address?

2.1 Issue(s)
Identify the general issue(s)
(eg workforce shortages of ...; the adequacy of training for ...)
i.
ii.,
iii., etc

2.2 Details

Provide more specific statements that expand on 2.1. (eg Energy distribution authorities face difficulties in maintaining an adequate supply of workers to undertake the checking of lines, cables and other infrastructure in rural and remote parts of Australia)

and/or unpack the different elements of the problem (eg The work is currently undertaken by x workers, many of whom are near retirement age. It is difficult to attract new entrants to these positions in rural areas because there is a mismatch between the level of skills required at entry level and the skills and knowledge of the available workforce etc…).

Key Points

- The project's problem or focus needs to be *sufficiently complex* to require a multi-level response.
- A simple issue such as poor design or delivery of training may be more efficiently handled without the broad engagement that characterises skill ecosystem work.
- The problem needs to be one which participants see as a priority and where there are clear and mutual advantages in working together to find solutions.

Establishing project scope and scale

Although skill ecosystem projects all have a scope that extends beyond the enterprise to the industry and/or region, projects differ in terms of their scope and scale.

Example

External pressures for change are leading to new harvesting systems and the use of new technology in forestry.

The Tasmanian Government's *Forestry Industry Product Care* project tracked the points where log damage occurs to identify ways of increasing the share of timber being salvaged for high value added uses. It recommended strategies to promote forest log care, to be trialled in tandem with the introduction of personal digital assistants.

Strategies involved the development of new licensing requirements and state-wide advertising to change industry culture across the supply chain.

Different approaches offer advantages and drawbacks.

- Industry-level, state-wide or national projects are well positioned to respond to some structural impediments and can be better placed to tackle policy-level change.
- On the downside, state-wide and national projects can struggle to move from policy to practical implementation unless they have a decentralised implementation model.
- Regionally based projects conceived as broad community development initiatives can end up concentrating on specific industry priorities to maintain interest and focus.

  For example, the Western Downs *Skill Formation Strategy* projects based in Dalby and Chinchilla in Queensland found a broad community focus useful to stimulate involvement early on. As the projects matured, it became important to narrow the focus to concentrate on particular industries and issues that the projects could influence. Subsequently, a focus on community solutions was regained.
- Regionally based projects that target specific industries are most useful when the region/industry participants are seen as leaders with sufficient credibility and critical mass to drive and disseminate models of good practice.

Measuring outcomes

Skill ecosystem projects seek to embed change in the relationships, business systems, practices and performance outcomes of industry, enterprises and VET providers. The impact on different stakeholders needs to be considered when measuring project outcomes. For example:

- Enterprise-level impacts might look at whether the initiatives affect the capacity of the businesses to attract and retain labour or skills; whether new skills are effectively utilised; and how this is reflected in business performance indicators
- Outcomes at an industry level might include the strategy's impact on industry/sector/regional capacity to manage skill and labour shortages
- VET-targeted measures would look at issues such as how training providers are responding to industry needs. What strategies were most effective? Why were these not already occurring and what can be done to ensure these strategies are made more widely available?

Strong stakeholder relationships are a key feature of ecosystem projects. While such relationships help projects succeed, they can constrain open discussions about evaluating project outcomes, particularly when relationships are still forming. Project participants are sometimes anxious about establishing a track record and can be defensive when it comes to reflecting on what has worked and what hasn't.

It is important that projects are encouraged and required to reflect on their experience. This is not only fundamental to effective project management and governance but is essential to contributing to the wider understanding of ecosystem work.

Key Points

- Each project network needs to develop its own, multi-level performance matrix to track progress.
- Such a matrix would identify the areas the project seeks to influence, the indicators it will use to identify progress and the data it will require.
- Data will need to be collected by industry, business and training providers.
- Each project needs to negotiate agreement early on in the workplan to identify responsibilities and timing for collecting this information.
- Some outcomes will be publicly reported while some of the business level information may be for the detailed advice of the businesses only, with more general information being available to the project network.

The following table contains examples of outcomes and measures for issues typically addressed by skill ecosystem projects.

Skill ecosystem performance matrix

Aspects	Indicative Outcomes	Indicative Measures
Product specifications, business strategy	New products, services and/or markets.	Industry indicators such as growth in exports and domestic sales
Business performance	Improvements in business outcomes: productivity, product or service or quality.	Internal business indicators that businesses usually measure routinely
Work organisation and job design	Improved application of skills through job design and technology selection which stimulate and support skill development.	Business-level indicators such as throughput time; changeover time (in a manufacturing environment); improvements in quality standards. It could also be measured from an employee perspective. More formal options for collecting this qualitative information include tools such as job satisfaction surveys. Less formal options could invite employee comment at regular staff or toolbox meetings.
Employee relations	Alignment of human resources and industrial relations practices to support and reinforce skill-centred job design. For example, policies on: • recruitment and selection • form of employment • contract arrangements • reward and recognition • classification/career structures and • training.	Business-level indicators. Examples of quantitative measures could track trends in: • labour turnover • absenteeism • disputation • time to recruit new employees • opportunities to learn and apply skills. Qualitative feedback from both front line managers and employees could also be collected. Frontline managers are well placed to pick up on whether people feel that their work is rewarding and valued. Employees themselves could be directly invited to provide this feedback. Another business-level measure could look at whether business stakeholders are better able to define, measure and manage the skill development of their employees.

Workforce capacity	There is a closer alignment between people's skills and knowledge and job requirements. Future skills and knowledge requirements are identified and actively managed.	Most of the employee relations measures above are measurable at the individual business level. It is equally important to asses changes in the industry's collective capacity to plan and manage workforce development issues. This will often be reflected in specific actions such as establishing a central labour registry. In this case, a measure would look at how many businesses actively contribute to and use the data base. Some projects aim to expand the labour pool by drawing on untapped or non-traditional labour pools such as older workers or women returning to work. These projects could look at awareness of the initiative in the target communities as well as the numbers of people entering the industry from these sectors and their experience.
Training interventions	The level and type of training, and modes of delivery, are relevant to the needs of industry. Positive outcomes for individual learners, and for industries, businesses and supply chains.	Data from businesses, trainees and training providers needs to be collected. Possible starting points are: *Question*: Are participating businesses more able to access the support they need to support skill development? *Data*: This could be measured by surveying participants. Eligible but non-participating businesses could also be canvassed to identify why and whether they would participate. *Question*: Are VET providers able to assist businesses in meeting their total skill development needs. *Data:* This measure could match industry expectations with capacity to respond and help to identify possible gaps. *Question*: Does training content, design and delivery of learning interventions meet learner needs and do they have opportunities to apply learning at work? *Data:* Learner and manager feedback *Question*: Has there been any change in the employer contribution to supporting workforce development? *Data*: Training budgets; support arrangements such as mentoring.

Key Points

- Projects need to be clear early on about the skill implications of the ecosystem approach in terms of outcomes for businesses and organisations. In the absence of defining a measurement framework it is easy to fall back on traditional and potentially inconclusive measures such as training participation rates.
- Projects will require multi-factor measurement frameworks that at a minimum, report outcomes at industry and enterprise level, and for VET.
- Strong stakeholder relationships are a feature of skill ecosystem projects. This can lead to a reluctance to evaluate unless the evaluation process is understood as a way of improving and refining the strategy.

Building a broad project team

Skill ecosystem projects have been initiated by many different types of organisations, from government agencies to TAFE Colleges to employer organisations. Organisations that have sponsored past or current projects include:

- Racing NSW
- National Disability Services (formerly ACROD)
- Dairy Australia
- SA Freight Council
- Meat and Livestock Australia
- Australian Industry Defence Network (NT)
- At All Events (a training consultant)
- Community Services and Health Industry Skills Council
- Queensland Community Services and Health Training Council
- EE-OZ Training Standards
- Office of Post-Compulsory Education and Training (Tasmania)
- Swinburne University of Technology, TAFE Division
- TAFE SA.

There are a number of answers to the question of who is best placed to initiate skill ecosystem projects. Whether the sponsoring party is an industry body, training provider or community development organisation, each option has advantages and potential drawbacks.

Advantages that sponsoring bodies typically bring to the table are existing networks. Many have a depth of industry knowledge and credibility and where networks have been pre-existing they often have a degree of maturity in managing and sustaining collaborative relationships. Some of challenges relate to the capacity of established groups to broaden their membership and their current agendas.

Project sponsors can also find it difficult to break out of their comfort zone, focusing instead on what they know. For example, where a training organisation takes the lead, projects tend to focus on training strategies, and they can be reluctant to invite other training providers to participate. Where industry bodies lead, projects often concentrate on industry or business rather than the skills issues.

Key Points

- Projects need to understand and manage the risks associated with the dominance of any stakeholder group in order to create strong and balanced outcomes.

Beyond the specific arrangements for initiating and sponsoring, skill ecosystem projects engage widely and are characterised by collaboration. Their strength relies on engaging people with a breadth of perspectives who can develop solutions that are beyond the scope of the individual players. The main candidates to participate in skill ecosystem projects to date are:

Industry stakeholders

- A network of enterprises
- Industry bodies – employers and unions
- Supply chains
- Regional clusters or networks.

Knowledge holders/training providers

- Registered Training Organisations
- Industry forums/bodies
- Material and equipment suppliers
- Technical/industry experts
- Co-operative Research Centres
- Centres of Excellence.

Government

- Training policy bodies
- Industry development agencies
- Sector-specific agencies eg primary industry, health, tourism, infrastructure
- Local government eg economic development advisers.

Community organisations

- Organisations servicing a region or a population group, such as youth services
- Community economic development agencies.

Key Points

- At a minimum, stakeholders should be decision-makers drawn from industry and training organisations and have credibility within their sector.

Example

National Disability Services' *National Workforce Issues Committee* oversees the *Disability services national workforce project*. The Committee is made up mainly of direct disability service providers, and includes at least one service from each state and territory.

Dairy Australia's *Manufacturing Advisory Committee*, made up of senior operational managers from Australia's major dairy foods companies, is overseeing the *Accelerating high end skills in the dairy manufacturing sector project.* Smaller manufacturers are represented on the committee by the Australian Specialist Cheesemakers' Association.

- The level of engagement is important. People with authority to make decisions on behalf of their constituent organisations or businesses, such as Chief Executives, need to be involved at a peak or policy level. Under this strategic framework projects often establish working parties that involve people with more direct 'hands-on' experience such as production managers or industry specialists.
- Where there are conditions for participation, they need to be spelt out upfront so that all parties are clear about the basis on which they are engaging. For example, in projects that tackle job redesign, employers may only engage if the industrial implications are quarantined during the trial. In other cases, where training organisations bring course design intellectual property to the projects, they may participate only on the basis that their IP is protected. Once conditions are made explicit, people can decide whether to participate on those terms.

Program Management Tip:

Industries/ecosystems which leverage off established networks and infrastructure have greater capacity for getting early runs on the board, which in turn builds ongoing participation.

Managing projects

There is no simple formula for managing and staffing skill ecosystem projects. Projects typically engage the services of a project manager. Skills and attributes required to support this role have been identified through successive projects and include:

- Stakeholder credibility.
- Sound knowledge of industry, VET system and the skill ecosystem approach.
- Understanding of workplace culture and practice, including role of workforce management and development, and informal and formal training.
- Effective communication/facilitation.
- Sound project planning and management.
- Analytical skills to design and oversee evidence-based research, apply findings and evaluate project progress.

Queensland's *Skills Formation Strategy* implementation unit has developed a Training and Development Plan which provides an example of how they are building capability of project managers.

As projects develop, the emphasis shifts to sourcing specific expertise such as technical input or facilitation skills. The next steps involve strengthening relationships with businesses, organisations or programs across the ecosystem that can sustain project initiatives beyond the funding period.

Key Points

- Projects have experimented with different approaches to structuring and staffing project roles. In some cases, the project manager also undertook the work of the project – doing research, facilitating information sessions and designing responses.

  The strength of this approach depends on the capacity and availability of the individual. As the projects mature reliance on project managers needs to be replaced by establishing roles within stakeholder groups to sustain project initiatives.

Example

Following a change in personnel, the NSW Central Coast mental health project moved to a more distributed model of project management. The lead industry body developed into the co-ordinator and banker, and made funds available to support other stakeholders to implement parts of the agreed strategy.

This approach directly supported changes in the activities of stakeholder organisations which are more likely to be sustainable in the longer term.

- Project outcomes can't be delivered by individuals – no matter how diligent they are (see box overleaf). The project manager needs to be able to communicate and engage a breadth of stakeholders who can take an active role in both steering as well as 'doing' the project.

Example

The Logistics Export and Assured Delivery project in South Australia looked at the operation of the supply chain to deliver fresh produce to export markets in Asia and the Middle East. It sought to map the 'cold chain' and where there were problems, identify the learning and operational implications.

The SA Freight Council sponsored the project, but project management was outsourced to a project management firm. These arrangements quickly led to challenges in establishing role clarity (including the respective roles and responsibilities of industry partners, consultants and VET providers) and the dilemma of splitting responsibility from capacity to deliver.

- Projects need to balance the tension between defining a detailed workplan at the same time as allowing the space and time for relationships to establish and for issues to emerge; between pressure to deliver conventional, measurable outcomes on the one hand, and providing opportunities to explore more relevant indicators as they emerge on the other.

  This 'organic space' is not a comfortable place for people looking for quick solutions and easily quantifiable results. Defining and measuring project outcomes that go beyond establishing networks is often the main challenge for these projects. The example of the Water Innovation Network project in South Australia illustrates the subtlety of this task.

Example

In South Australia, Torrens Valley and Regency TAFE Colleges worked with United Water International (Australia's largest private water company) to improve linkages between the VET sector, researchers and water industry businesses and users.

By doing this, Water Industry Network (WIN) stakeholders felt they could better position TAFE SA to address barriers to the adoption of innovative processes and technologies in irrigation and water conservation by growers. Activities included:

- information exchanges between the WIN partners.
- VET-industry forums in regions experiencing severe water management problems to explore barriers to uptake of relevant technology.
- a database mapping water industry research and development activities to TAFE SA training capability.

Outcomes over an 18 month period included:

- TAFE SA collaborated with Caroma Industries in testing and developing water saving plumbing fixtures.
- High technology water services companies in areas such as soil moisture measurement technology and plumbing installed software and systems at TAFE's Urrbrae campus. While TAFE used these facilities to train students, while the companies used them for staff development.
- TAFE SA and United Water collaborated in pioneering research into the storage and treatment of stormwater in aquifers for later use in urban water supplies.

- WIN members, including TAFE, collaborated with the CSIRO, six universities and three Cooperative Research Centres in a successful $6.7 million submission to the Australian Government to establish the International Centre of Excellence in Water Resource Management, based in Adelaide.
- TAFE SA's interactive video games unit, United Water and research mathematicians collaborated on computational fluid dynamics modeling. TAFE SA's contribution was to make modeling outcomes more accessible and comprehensible to non-mathematicians.

Although any one of these outcomes may have been implemented without a dedicated project, participants felt that strengthening of informal networks and information sharing was highly valuable in itself and created a basis for future collaboration.

Stakeholders need to drive projects, but do not necessarily have all the answers. Project activities stimulate new ideas and approaches. External input is most useful at critical points:

- The early development stages of identifying and testing the problem/focus of the project.
- Designing strategies to investigate issues.
- Interpreting the results and determining appropriate responses or solutions.

Program Management Tip:

The skill ecosystem program staff have supported the project manager's role by providing an external source of input and constructive feedback to the project team.

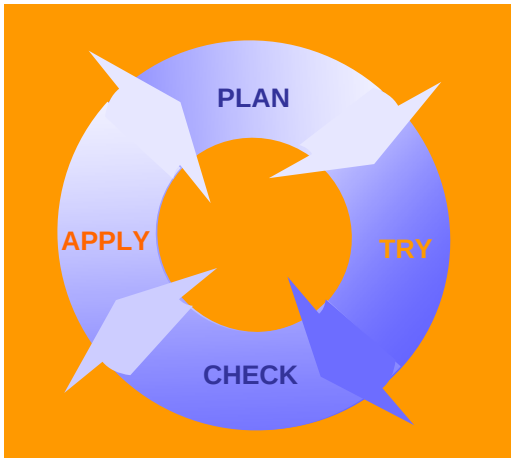
The Skill Ecosystem Advisory Committee established by NSW DET has been useful in acting as a sounding board and mentor to the projects.

The Committee comprises government and industry experts with experience in training, organisational change, workplace relations and the VET system (see page 31).

Committee members also help link projects to relevant resources and expertise.

Developing and implementing the strategy

Once the project infrastructure is in place and stakeholders have determined project focus and scope, the next step is to do something about it. The cycle of continuous improvement can be used to describe typical project activities.



PLAN: Just how much and what type of research is needed to support planning depends on what is already known. Some industries are already well aware of the issues and what needs to be done.

Provided the problems are a good fit with a skill ecosystem approach, there may be advantages to taking action to get some runs on the board. In other cases, more information may be needed.

The national disability workforce management project is one of the second round ecosystem projects. In this industry where workforce data is limited, research has been an important first step to better understand the current and potential workforce profiles as a basis for determining how best to improve recruitment and retention to deliver improved services to this sector. However, there is a risk that projects get stuck in the planning phase. Analysing the problem is only useful if it supports groups to do something about it. Projects struggle to move beyond planning when:

- The project initiators or managers are not from the industry and/or do not have strong industry relationships.
- Stakeholders are unsure about what to do next or have been convinced by project managers/ consultants to undertake lengthy research exercises. When undertaken by outsiders, or when research design is poor, these often confirm that a problem exists rather than shedding further light on it or identifying the actions required to address it.
- A lack of project planning means that there is no time to do anything with the research outcomes.
- An overly narrow project focus is adopted. Ideally projects should act as a conduit to expose participants to new information and thinking rather than restricting scope to confirming what is known and assuming the participants already have the answers.

As noted earlier, the second round skill ecosystem projects were able to draw on the expertise of the Skill Ecosystem Advisory Committee to refine and question the design and interpretation of their research agendas and project plans.

Program Management Tip:

The skill ecosystem strategy template developed by the Advisory Committee asked proponent organisations to think clearly about the internal logic of their strategy. They worked on their initial concept in a development workshop and then presented a more refined version to the Committee. Following comments, they then developed a final version.

TRY: This means trialling strategies and new arrangements to see how they work. This requires a number of businesses and in some cases, training providers, to test new approaches. If industry participants are not genuinely committed to the strategies, the project will come unstuck here. Often unforseen issues arise and need to be dealt with creatively. Worksites and organisations involved in trials need to understand clearly what time, resources and activities are involved.

Projects with a very wide scope (e.g. those that are industry and nation-wide) can find it difficult to engage at this more micro level. This is a problem given that broader policy settings are only effective if they influence business practices.

CHECK: Checking is about reviewing what worked and what didn't. The multi-faceted nature of skill ecosystem projects means that this needs to be done from different perspectives. Some questions commonly asked about the new approach/es are:

- Does it improve the way the trial businesses operate?
- How did people learn/apply skills before and after – were there any advantages/disadvantages?
- If the change is useful, why didn't this happen before? Are there obstacles that will make it difficult to sustain the approach?
- What can be done to improve it?
- How has it positioned the industry and VET sector to work more effectively together in the future?
- Has it changed the way employers view training and the training system?
- Will the changes made be lasting ones?

APPLY: Once the ideas have been planned and tested, this last step is about embedding good initiatives into sustainable practices. It underpins long term, ongoing improvements. It is about making new ideas a standard part of business and industry practice.

A number of projects successfully trialled new approaches but found that the changes didn't continue when key personnel changed.

Embedding new approaches shifts from a reliance on highly motivated and enthusiastic individuals to integrating changes in business systems, practices and performance measures for both industry and training providers.

Example

Racing NSW initiated a project in conjunction with a private RTO to explore the workplace drivers of skill formation and ways of building a learning culture in the racing industry. Mid-way through, a leadership change in the association removed support for skills-focused projects.

Despite this, using local supporters and intermediaries, a trial of permanent part-time (rather than day hire) riders employed by a regional club occurred. It pointed the way for more supportive workplace arrangements to attract, retain and develop people in this skills shortage-prone occupation.

Notwithstanding this success and the continuation of the new arrangement beyond the life of the project, broader replication and take-up did not occur because Racing NSW was not able to develop the central support systems needed to sustain the model.

In other projects, funding allowed the suspension of the 'business as usual' rule. When funding was no longer available the change evaporated. This was a recurring theme raised by TAFE participants in the first round ecosystem pilots.

Although the projects were seen as providing positive models, sustaining these approaches was conditional on dedicated funding due to the cost allocation methods in TAFE.

Projects will often encounter barriers that directly impact the ecosystem but are beyond their scope of influence during the trial phase, such as government policy and licensing or industrial arrangements. These need to be addressed later or referred to others to take up.

Program Management Tip:

One of the roles of the Skill Ecosystem Advisory Committee is to act as a clearing house to identify and refer wider policy issues so they are taken up by the appropriate forums.

Sustaining project achievements

Skill ecosystem projects seek, above all, to achieve lasting change in the industry ecosystem – how the different organisations and actors in the system work together to promote improved business performance and rewarding, high skilled work. Sustainability therefore needs to be at the heart of any strategy developed.

Sustainability can be achieved by the replication and adaptation of strategies from demonstration projects to other services, firms or parts of an industry. Or it can be achieved by sustaining the changes that the project has brought about – such as changed relationships or new policies. Yet another form of sustainability may involve embedding an innovative approach within the mainstream VET systems.

In the example below, change is being sustained through slow diffusion and reinforcement of the change in organisation policies.

Example

The Queensland aged services project examined service models and the potential for role redesign among patient care aides as a solution to current labour recruitment and retention problems among allied health professionals.

The Queensland Industry Training Council partnered with a large not-for-profit service provider to test a new role of an 'allied health assistant' who works under the supervision of an allied health professional, but has their own case load.

The new defined role was seen as an improvement to the myriad of less skilled tasks currently performed by such workers. Two workers were recruited to the new roles, one in acute care and one in community care.

One year after the project finished, the new roles are continuing despite a changeover in their occupants. They have been reinforced by the provision of a specialised training program and on-going monitoring of outcomes.

Knowledge of the model is slowly being diffused to managers and clinicians through the organisation, and is being integrated into the repertoire of possible roles local services can adopt.

A specific classification for the role will be included in the enterprise agreement, and for the first time, allied health assistants across the organisation in Queensland held their own network meeting.

This was seen as a crucial step in identifying a stronger identity for these workers, and it is envisaged that the model will be taken up more broadly as other staff leave or when other change creates new opportunities.

Experience so far indicates:

- Achieving lasting change requires deliberate planning and *active leadership.* Hoping that funded activities will inspire longer-term change is not a solid basis for sustainable outcomes.
- The expectation that initiatives should be sustainable needs to be made explicit early on. Participants in a number of projects from both the Skill Ecosystem Program and Queensland's *Skill Formation Strategy* programs suggested that project activities would be unlikely to continue once funding ceased.
- Changes modelled by these projects are fragile and highly dependent on the interest and enthusiasm of individual champions in the early stages. They become more robust when integrated into policies and practices of stakeholder bodies and when institutional obstacles to new practices are removed.
- Some projects run the risk of responding to the issues and interests of specific employers rather than industry or sector-wide issues. The ecosystem model is designed to stimulate practice and generate models beyond solutions for individual businesses. Projects need to establish whether the issues and strategies they are working with have wider relevance.
- The projects need to consider how to best model new approaches and practices to both industry and training providers. They also need to build in ways of handing over these skills and approaches so they shape the internal agendas and priorities of industry, education and training stakeholders.
- Not all project activities are worth sustaining. Activities or initiatives likely to last are those recognised as providing mutual benefits to the participants.
- The capacity and readiness of the stakeholders directly affects capability to sustain change. Where projects are established in under-resourced or poorly organised sectors, they will need more intensive and lengthy support. Unless this is available, such networks should not be funded for these ambitious projects.

Program Management Tip:

There may be opportunities to tie part of the funds to demonstrating capacity to sustain outcomes, or to reserve a small amount of funds, say 10 per cent, for ongoing support after the project has formally finished.

Program support

Program support has three distinct elements. One is to provide a touchstone for skill ecosystem network members as they undertake this project. This is important as the ecosystem concept is relatively new. It crosses over more familiar 'silo' approaches, in order to deliver effective, holistic solutions.

Bridging the often separate worlds of industry development, business management, regional development and skills is a demanding task and projects sometimes struggle to stay on track.

The second level of support is to identify where the challenges facing a project are beyond the project scope. For example, projects may be constrained by wider policy settings, funding arrangements or regional initiatives which require higher level intervention. The role of the agency or committee is to identify these issues and raise them in the appropriate forum.

The third level of support is about building a community of practice to consolidate project experience and look at how this can be applied more widely. This level of support needs the involvement of parties who can play a role in communicating and disseminating practice. These parties are likely to include industry bodies, government departments and training system decision makers.

Program Management Tip:

A crucial feature of this approach is that the projects are actively mentored, supported and evaluated.

Key Points

In addition to the project level measures it is important for individuals and organisations involved in managing skill ecosystem projects to consider:

- The level and quality of support and mentoring provided to projects.
- The extent to which systemic barriers to project initiatives are identified and addressed at a policy level.
- Strategies to encouraging learning from and dissemination of transferable features from projects.

What skill ecosystem leaders have said ...

'The Water Innovation Network...explored new roles for the VET sector within the product lifecycle from innovation through maintenance...It is the recognition of, and the action initiated to exploit, new innovation development roles for TAFE and the VET sector that were most encouraging.

...one of the learnings is that such cultural change is not immediate.

Inertia takes time to overcome and so, the outcomes from the project will continue to become evident as this change ripples through the innovation community.

WIN was designed to be a short-term intervention to connect people and organisations that need each other, but didn't realise how and why. By recognising that these communities 'trade in different currencies' and providing a common currency, the project enabled people to start to come together and trade. By providing planned opportunities for 'accidental connections', the project's activities encouraged these people to engage, collaborate and explore what value they could add to others'.

Source: Water Innovation Network South Australia (2004) Final Report, page 5.

'Relationship is everything...The mental health project has brought home the concrete realisation that skill issues are not necessarily resolved simply by skills...formation interventions alone.

Often the key challenge is to get effective intermediaries capable of identifying how the different elements of a system of skill formation and use can be better connected.

Success comes when such intermediaries can then broker new arrangements…for the development and deployment of labour.

Through focusing at the same time on the issues of workforce development and skill formation, and by trialling innovative strategies, the project outcomes have the capacity to enrich the Australian health service reform process'.

Source: Forming Skills in a Mental Health Ecosystem (2006) Final Report, page 31.

Next Steps

Skill ecosystem projects are a way of dealing with complex and challenging situations and project participants wrestle with the often messy way that economic, business, workforce development and industrial agendas intersect.

The complexity of this environment is at once a strength and a challenge. The ecosystem approach signals a maturity in workforce development initiatives as it transcends the more usual forms of industry-VET collaboration and partnership work. Ecosystem initiatives consider a broader range of factors affecting workforce development to deliver sustainable outcomes for individuals, communities and industry.

The work of this program to date has established the viability of the skill ecosystem approach and highlights the need for further development. It has demonstrated:

- A model that has effectively mobilised industry partners to go beyond commenting on what government should do, to take ownership and drive skill outcomes in the interests of both industry and employees.
- Strategies that are firmly grounded on evidence rather than on undifferentiated claims about skill shortages.
- A constructive approach to bilateral cooperation between federal and state governments and across departmental boundaries.
- An initial framework for defining and rigorously evaluating holistic responses to workforce development.
- The emergence of a community of practice that is building the expertise required to manage and support complex, multi-disciplinary initiatives that can deliver more effective, sustainable solutions.

The opportunity now is to consolidate and deepen this experience and to promote the wider adoption of skill ecosystem thinking within the vocational education and training system.

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For a list of full web addresses for the hyperlinked documents cited in this Guide, or if you would like paper copies of them, contact Industry Programs, NSW Department of Education and Training on phone (02) 9244 5535.

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