



LOW CARBON LIVING
CRC

Building better decisions

**Why good evidence is used
(and ignored) in the built
environment sector**



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AECOM Imagine it.
Delivered.

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Cover & page 12: Medibank Place, Melbourne
Photo: Earl Carter/HASSELL

Contents

LONG STORY SHORT	1
THE BUSINESS IMPERATIVE	2
THE POTENTIAL OF EBDM	3
OUR RESEARCH	4
KEY INSIGHTS	5
KEY DRIVERS OF EBDM	10
A NOTE OF CAUTION	11
HOW TO REAP THE BENEFITS OF EBDM	12
REFERENCES	13



Multiplex, 499 Swanston Street,
Melbourne
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LONG STORY SHORT

Are your professional decisions as evidence based as you like to think they are?

Evidence-based decision making (EBDM) is a framework that has yielded huge benefits in fields ranging from medicine to social policy. While the concept is becoming popular in the built environment sector and terms such as “evidence-based design” are now widely used, our research has shown that EBDM is not in fact widely practised, and certainly not to its full potential. Valuable opportunities are being lost as a consequence, including opportunities to create better buildings and increase the expertise of the professionals who make pivotal decisions about how buildings are designed and completed.

This document:

- » **outlines EBDM and its potential**
- » **describes current industry practices and how these fall short of EBDM**
- » **highlights under-exploited sources of high-quality information, and**
- » **offers strategies to promote the use of EBDM.**

It is a product of **Closing the Loop**, a comprehensive four-year research project undertaken by the Cooperative Research Centre for Low Carbon Living (CRC LCL) and its partners. It has been written for senior decision makers working in the built environment sector and is based on insights provided by more than 200 senior industry professionals. Building Better Decisions is one of a series of CRC LCL guides aimed at improving decision-making practices in the built environment sector and connecting decision-makers with the best available evidence.



National Australia Bank
headquarters, 700 Bourke
Street, Melbourne
Photo: Multiplex

THE BUSINESS IMPERATIVE

High-performance buildings and workspaces aim to minimise environmental impacts whilst also improving the health, comfort and productivity of the people who work inside them. As such, they are a growing priority for businesses and governments around the world.

Australian researchers and industry experts have identified a multitude of tools, materials and practices to optimise the design and development of such buildings, however our research has shown that these valuable resources are often under-used by or unknown to industry decision makers. Opportunities to benefit from cutting-edge solutions and create better buildings are being lost as a consequence.

In addition, the decision-makers are missing out on valuable opportunities to enhance their expertise through the process of searching for, evaluating

and using the best and most up-to-date evidence, both from within and outside their own organisations. This is a critical issue. We live in knowledge-intensive, fast-changing times and if businesses in the sector are to gain and maintain a competitive edge, they need managers with superlative decision-making skills and current expertise.

Swiss Re, Sydney
Photo: Nicole England/HASSELL



“Embedding evidence-based decision making into culture and practices within organisations will equip them to create places and buildings that are innovative, future-focused, sustainable, competitive and that genuinely support the wellbeing and productivity of the people living and working in them. This will require leadership and access to credible research.”

PROFESSOR KEN MAHER
HASSELL Fellow, ASBEC President

THE POTENTIAL OF EBDM

Experience and intuition are valuable but can be risky if left unchecked.

Our study draws on established research which shows that EBDM, if used to its full potential, could bring significant benefits to Australia's built environment sector. EBDM leads to high-quality decisions and the ongoing development of up-to-date expertise among managers, architects and other built environment professionals. Ultimately, it leads to better buildings.

EBDM emerged within the field of medicine more than 20 years ago, led to notably better outcomes, and has subsequently expanded into other disciplines, such as criminal justice, education and social policy. It encourages decision makers to employ multiple sources of evidence, including practical experience and the best available scientific evidence.

EBDM improves decision making by challenging individual judgements based in personal experience or entrenched beliefs with evidence from research and practice. Experience and intuition are valuable but can be risky if left unchecked. Being critical and searching for the best available evidence help steer decision-makers away from cognitive biases, fads and out-dated beliefs (1,2).

If you would like to know more about EBDM, the **Centre for Evidence Based Management** (cebma.org) is an authority in the field and its website contains a range of useful resources.



Figure 1

Evidence-based decision making involves cross-pollination from four different sources.

Westpac headquarters, Kogarah
Photo: Nicole England/HASSELL

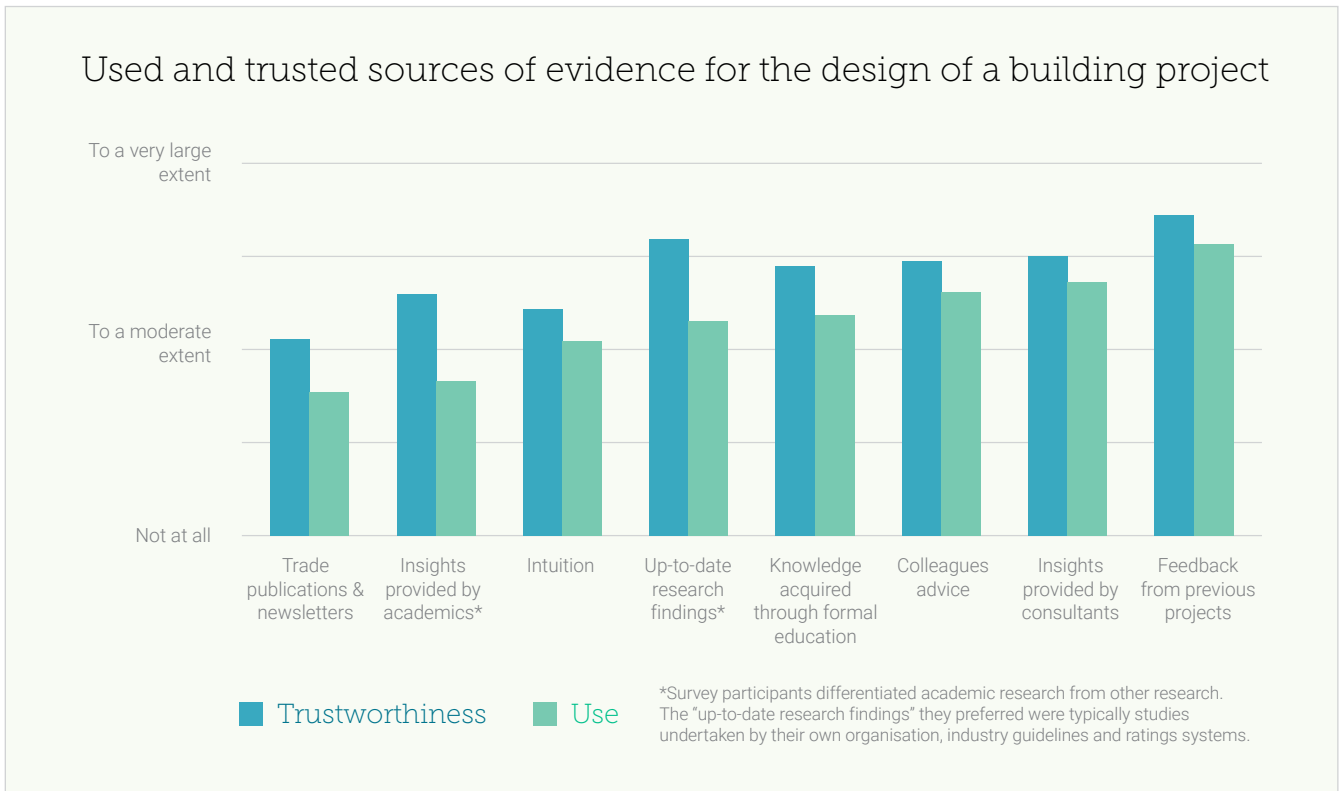


This document is part of a four-year research project that set out to:

- » examine how decisions are currently being made during the inception, design and development of high-performance buildings
- » compare those practices with EBDM, and
- » Identify strategies that might encourage the adoption of EBDM.

We analysed anonymous online surveys from a cohort of more than 200 senior built environment professionals from around Australia, including developers, managers, architects and engineers, and conducted separate in-depth interviews with 18 individuals.

Our research and subsequent analysis have uncovered a range of insights, the most significant of which are outlined in the pages that follow.



1. Preferred evidence

Identifying the sources of evidence currently used by decision makers was one of our first tasks and much of our analysis rests on those primary findings.

Our survey showed that decision makers are influenced by a range of sources of evidence when making decisions (See figure 2, above). Some sources are trusted but not necessarily then used to the same extent and some potentially valuable sources of evidence tend to be disregarded. This indicates that EBDM is being employed to some extent, but not to its full potential.

2. Risky assumptions

As figure 2 shows, feedback from previous projects is the most commonly used source of evidence for decision-makers. Case studies that demonstrate the efficacy of designs and practices are seen as particularly valuable. We see this as compatible with EBDM, with some caveats.

In practice, feedback from clients is often difficult to collect and when it is collected, it is rarely undertaken systematically. As such, decision makers are relying heavily on feedback that is far from ideal. Perceptions of the people who actually use the completed buildings and spaces often remain unexplored and there is an over-reliance on anecdotal feedback.

This is a critical issue. The lack of feedback increases the risk of misguided or ill-informed decisions. EBDM, by contrast, involves the systematic collection and communication of feedback so managers know

Figure 2

Sources of evidence used and trusted for the design of a building project.





“Buildings aren’t just spaces people work inside. When they’re done well and draw on gold-standard information, they can help people learn faster, heal faster and feel more productive. The design and construction of workspaces can also improve, in direct and meaningful ways, the profitability of a business and its environmental and societal impacts. This is why the quality of the buildings we create really matters.”

DR DENNIS ELSE

Executive director, sustainability, safety and health, Multiplex

National Australia Bank,
Melbourne
Photo: Multiplex

what is working as anticipated and what is not. This helps build expertise for future projects.

Our in-depth interviews and analysis suggest that the reliance on feedback from previous projects may in part be a consequence of the risk-averse nature of the building industry. Building developments require large capital investments and decisions made early in the process can have long-term economic consequences. As such, decision-makers may hesitate to innovate, preferring instead to follow familiar pathways and existing projects with a history of successful implementation.

3. Influential consultants

Decision makers view consultants as important assets and perceive them as highly influential and trustworthy. The growing complexity of the built environment sector means decision makers turn towards specialised consultants more often. Importantly, decision makers see consultants as a way to make evidence-based decisions, trusting that the consultants’ recommendations are based on the best available evidence.

This represents both a risk and an opportunity. Consultants are a potential channel to connect decision-makers with high-quality evidence, including the types of evidence they tend to disregard. There is also the possibility, however, that the consultants are not tapping into the best available evidence.

4. Valuable colleagues

The expertise held within an organisation is a highly influential resource and informal networks are a key asset for decision-makers. Numerous organisations also rely on internal information-sharing systems to post questions about their projects and connect with expertise within their organisation. This exchange of know-how is a valuable EBDM practice and should be encouraged.

“I’ve seen the industry become more risk averse than it was 10 to 15 years ago ... because of the economic climate. Now it’s much more about squeezing as much as you can out of minimal margins and just taking care of risk.”

STUDY PARTICIPANT, SPECIALIST CONSULTANT

5. Resistance to research

While decision-makers perceive up-to-date research findings as highly trustworthy, they actually use them to a lesser extent than the sources described above.

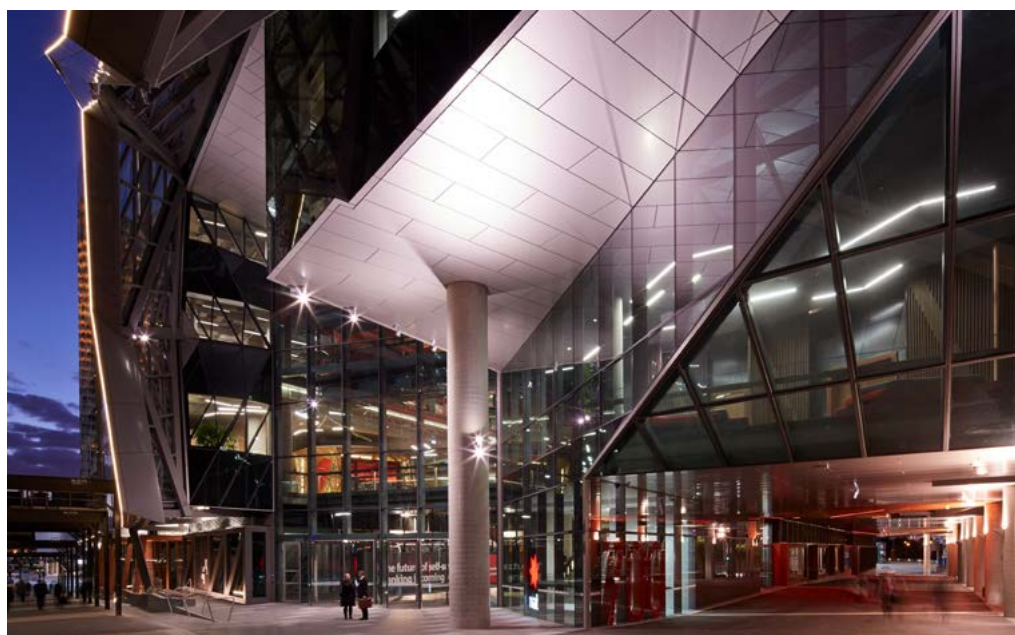
Decision makers reported that a lack of time as well as difficulty understanding and applying research findings are barriers to their utilisation. Furthermore, searching for relevant scientific research is often not seen as part of their role.

We would argue that to be effective, decision makers need to be critical of the evidence they use and able to question assumptions. As such, searching for relevant research is an essential part of their role – as it is in any profession with a fast-growing base of knowledge – and staying up-to-date with best practices is in his or her best interest. Failing to do so can be likened to a medical practitioner failing to keep up with current health research.

6. Tricky definitions

To complicate matters, when decision makers refer to “scientific research” they do not mean “academic research”. In fact, few decision makers are regularly exposed to or access academic research. The “scientific research” impacting their decision-making tends to be data collected by their own organisations, information published by industry bodies such as the Green Building Council of Australia and the Australian Sustainable Built Environment Council.

This represents another important opportunity. As with consultants, industry bodies may be well placed to connect decision-makers with a broader range of evidence. These organisations, however, will need to ensure that the guidelines and other information they promote are in turn based on the best available evidence.



National Australia Bank,
Melbourne
Photo: Multiplex

“We don’t necessarily know how to tap into academic research as much, or to filter it for what we’re looking for.”

STUDY PARTICIPANT, BID AND DESIGN MANAGER

7. Unwelcome evidence

Our research indicates that academics are rarely considered a helpful source of evidence for decision-makers in the built-environment industry. Their work is often perceived as disconnected from the realities of industry and lagging behind a fast-moving sector.

built environment sector is to benefit from the valuable resources being developed by universities, then academia and industry will need to find ways to collaborate more effectively and influence each other’s practices for mutual benefit.

As previously mentioned, however, few decision makers have any actual exposure to academic research. If the

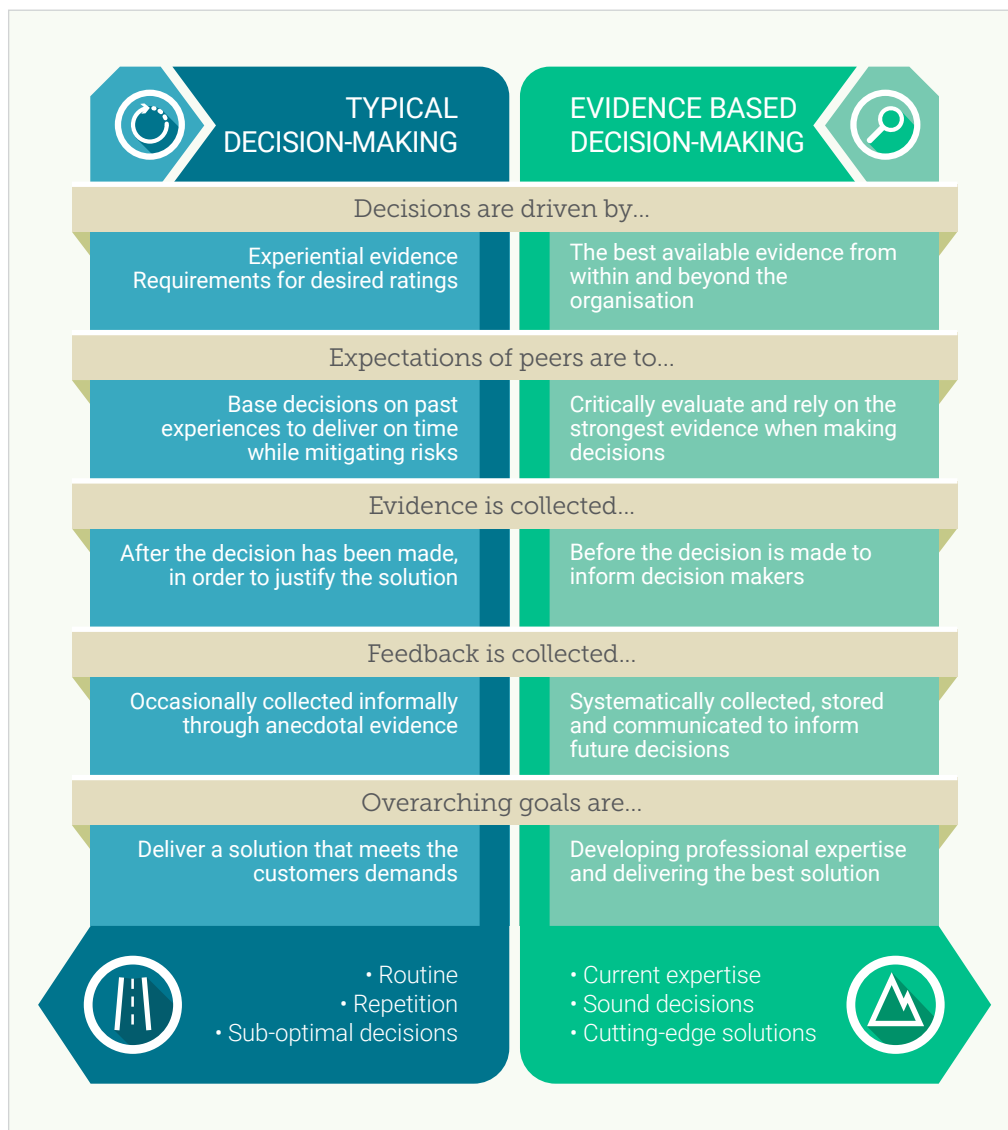


Figure 3

Typical decision making versus evidence-based decision making.

“Over time, to a large extent, things become ‘this is the way it’s been done in the past and no one’s been sued, therefore we’ll stick to this.’”

STUDY PARTICIPANT, SPECIALIST CONSULTANT

8. Settling for less

In the early stages of a building development project, decision-makers are faced with high levels of complexity and a need to mitigate risks with short lead-times. In addition, they are called upon to adhere to a range of building regulations, standards and, if required by the client, sustainability and other rating systems.

This often leads them to follow familiar decision-making processes which limits exploration in search of an optimal solution. As such, decision makers may miss the opportunity to consider a broader range of evidence and settle for a less innovative solution.

9. ‘Decision-based evidence making’

Some decision makers practise “decision-based evidence-making” or cherry-picking evidence to justify a decision that has already been made.

EBDM, by contrast, involves collecting evidence before the decision is made in order to inform all stakeholders rather than to convince them of the merit of a solution after a decision has been made.

Some survey participants indicated they don’t have time to practice EBDM. We would argue that if time can be found to collect evidence after a decision is made, then it must be possible to find time beforehand instead, and this would provide a better return on investment.

10. Cutting-edge expertise

Our research has shown that decision-makers tend to view the satisfaction of client demands as their overarching goal. Satisfied clients are, of course, important, but EBDM offers more. It not only helps to create better products, it increases decision-maker expertise and helps them explain to clients why particular solutions are being recommended. Ultimately EBDM increases the expertise of both decision maker and client.

Hub Southern Cross,
Melbourne
Photo: HASSELL



“Universities are developing high quality, innovative research but it is very difficult for practitioners to know about it, access it and have the time to assess it. We need industry and researchers working together on industry’s projects to leverage the scientific evidence to its fullest extent in the decision making process.”

BRETT POLLARD
Sustainability leader, HASSELL

KEY DRIVERS OF EBDM

A third and final phase of our research involved analysing the data through the lens of a behaviour change theory* to identify factors that make individuals and organisations more likely to practise EBDM.

Our analysis suggests the following:

Individuals who have a disposition, at work, to learn and develop their skills are more likely to have a positive attitude towards EBDM and to put it into practice. This trait can, to some extent, be activated and developed. Organisations keen to foster EBDM stand to benefit from taking this into account during staff selection and training processes, particularly with management positions that have a strong influence on the decision-making process.

Peer behaviour and expectations have a strong influence on decision makers. Decision makers are often placed under pressure to make decisions quickly and are constrained within a framework shaped by stakeholders. Organisations that want to foster EBDM must clearly demonstrate that they embrace the practice and explicitly state that they expect decision makers to use the best available evidence. Promoting and discussing projects where evidence-based decision making has been applied also encourages others within the organisation to follow suit.



Multiplex headquarters, Melbourne
Photo: Multiplex

Managers are influenced by the culture and common practices within their organisations and the industry at large. Often, they are expected to follow well-established routines and standardised decision-making processes. Standard protocols can increase efficiency, but they also limit exploration and, with that, opportunities to identify novel, potentially optimal solutions. The literature on organisational learning suggests that balancing standardised processes with exploration leads to greater expertise and better outcomes (3). This balance is highly compatible with EBDM.

* The Theory of Planned Behaviour (TPB) (4) is used in context of behaviour change and has been applied in many disciplines. It posits that behaviour is preceded by a perceived ability to adopt the change and an intention, and the latter is influenced by three key factors:

1. the attitude towards the behaviour
2. the social norms regarding the behaviour
3. the perceived ability to put it into practice.

A NOTE OF CAUTION

While evidence shows that EBDM benefits decision makers and organisations, context should not be ignored.

EBDM is likely to be of greatest benefit when reliable data is available and the context permits time for further analysis. If there is a high degree of urgency or uncertainty around a project and the decision maker has accumulated experience with feedback, the practitioner's intuition might be an effective guide for decision making (5,6).

Several participants in our study also expressed concern that EBDM might stifle innovation. Architects in particular were concerned about "being constrained by evidence".

We would argue that EBDM is not a constraint, but rather a practice for exploring different solutions in order to identify the best option. Furthermore, the data from our study indicates that those who practise EBDM are better able to identify and implement innovative solutions.

"So you've got people who are naturally creative and they don't want to be constrained by data, so there's a tension between the artists and the pragmatists."

STUDY PARTICIPANT, ARCHITECT

HOW TO REAP THE BENEFITS OF EBDM

Our recommendations for organisations wanting to improve decision making:

1	<p>COLLECT AND ANALYSE FEEDBACK SYSTEMATICALLY</p> <p>Collecting feedback from occupants of completed buildings is particularly important.</p> <p>Systematic collection and analysis of feedback increases staff expertise, provides a more comprehensive and relevant body of evidence for future decision-making, and reduces reliance on anecdote and biased information.</p>	
2	<p>DON'T DISREGARD ACADEMIC RESEARCH, BE PART OF IT</p> <p>There is an abundance of valuable academic research to support the design and development of high performance buildings that is currently being overlooked. Explore it, but don't stop there. Both academia and industry stand to benefit enormously from greater collaboration. Academics would be better able to understand the real-world challenges faced by industry and industry would be connected to cutting-edge research.</p>	
3	<p>DEMONSTRATE THAT YOUR ORGANISATION EMBRACES EBDM</p> <p>Make it clear that managers are expected to practise EBDM. Allow managers and decision makers the time necessary to practise EBDM - this means making time before decisions are made. Promote the view that every project is an opportunity to increase expertise. Ensure evidence-based decisions undertaken by staff are promoted and discussed within the organisation to encourage others to follow suit.</p>	
4	<p>PROMOTE USE OF INTERNAL INFORMATION-SHARING SYSTEMS</p> <p>Expertise held within organisations is valuable and trusted, and encouraging staff to post questions and discuss their projects improves outcomes.</p>	
5	<p>BALANCE STANDARDISED PROCEDURES WITH EXPLORATION OF NOVEL EVIDENCE</p> <p>Following well-known paths can mean missing out on optimal, cutting-edge solutions. Balancing standardised processes with exploration leads to better outcomes and greater expertise.</p>	

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