

## Towards a framework for co-creating Open Scholarship

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(Received 13 June 2011; final version received 20 June 2011)

A recent edition of ALT-J made a call for papers that looked at ‘theoretical approaches in digitally mediated environments’. A key part of this call was to use the Boyer Model of Scholarship as a frame of reference. The authors felt that there were limitations to this model which could be addressed in light of the recent moves to develop Open Scholarship.

Our concern with Boyer is that he suggests a separation between researchers, who ‘build new knowledge through traditional research’ and teachers who ‘study teaching models and practices to achieve optimal learning’. Boyer identifies four ‘Types’ of Scholarship, those of Discovery, Integration, Application and Teaching (DIAT), but places the responsibility for ‘creative work in established field’, with the traditional researcher role (Discovery). Furthermore this model implies a linear flow concerning how new knowledge becomes a part of teaching, implying that the teaching is mostly instructional, with a limited view of how new and emerging pedagogies might be utilised.

The Learner-Generated Contexts Research Group has been concerned to develop a co-creation approach to learning and find this separation curious. We argue that using the Pedagogy, Andragogy, Heutagogy (PAH) Continuum enables more flexible approaches, through a mix of PAH, allowing for a wide range of technology uses, which also changes the relationship to research.

We look at how we might both apply a co-creation approach to Boyer’s model, inspired by the Open Scholar movement, and also make DIAT more iterative and less discrete. Consequently we have both extended Boyer’s DIAT system to include Co-creating as an additional type and changed some ‘measures of performance’ to enable an iterative process of scholarship to emerge which also involves learners. We also examine how network effects ‘enable generative network effects to occur’ on scholarship and how applying Epistemic Cognition to evolving subject frameworks might enable the co-creation of research agendas.

The co-creation model of Open Scholarship is presented in a table designed to simulate debate on this subject.

**Keywords:** open scholar; scholarship; research; co-creation; contexts; teaching; PAH Continuum; epistemic cognition; open education resources; OER; networked learning

### Introduction

A recent edition of ALT-J made a call for papers that looked at ‘theoretical approaches in digitally mediated environments’. A key part of this call was to use the Boyer Model of Scholarship Boyer (1997) as a frame of reference upon which to base

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such new theoretical approaches. The authors felt that there were limitations to this, perfectly valid, model which could be addressed in light of the recent moves to develop a model of Open Scholarship (Anderson 2009), and other theories reflecting the ‘networked age’, such as Haythornthwaite in *New Forms of Doctorate* (2009) and our own Open Context Model of Learning and the Pedagogy, Andragogy, Heutagogy (PAH) Continuum (Luckin et al. 2010).

Our concern with Boyer’s Model lies in the fact that it suggested a separation between researchers, who ‘build new knowledge through traditional research’ and teachers who ‘study teaching models and practices to achieve optimal learning’. Boyer usefully identifies four ‘Types of Scholarship’, those of Discovery, Integration, Application and Teaching (DIAT), but arrogated the responsibility for ‘creative work in established fields’ solely to Discovery scholarship (the ‘traditional researcher role’). Furthermore this model also implies a linear flow concerning how new knowledge becomes a part of teaching, which suggests that the type of teaching that results is more instructional. In our opinion this reveals a perhaps limited view of how pedagogies, both existing and emerging, might be deployed by an experienced teacher.

The Learner-Generated Contexts Research Group has been concerned to develop a co-creation approach to learning and consequently find this separation curious. We would argue that using the PAH Continuum, in ways described by for example Cochrane (2010a), enables more flexible approaches to learning and teaching by using a mix of PAH (which also allows for a wide range of technology uses). This also changes the teacher’s relationship to ‘research’ through the development of ‘epistemic cognition’ in the learner (Avramides and Luckin 2007), or action research strategies (Cochrane 2010b).

So, in part inspired by the Open Scholar movement, we shall look at how we might both:

- (1) apply a co-creation of learning approach to Boyer’s model,
- (2) make the four-stage process more iterative and less discrete.

In so doing we will propose a framework for the ‘Co-creation of Open Scholarship’ as a way of taking forward the strengths of each of the models under review as we perceive them in 2011. We will do this by examining each ‘type of scholarship’ in Boyer’s DIAT model through reviewing the descriptors in detail before adding an additional type that we will propose calling ‘co-creating’.

We hope therefore in this paper to re-examine the notion of scholarship in the age of social media, update our view of learning theory in light of the developments of learning technology and deepen our views of the notion of co-creation in learning and research in the emerging ‘networked society’.

## **Background**

Marta Nibert (2001) in her analysis of Boyer’s modelling of the professional role of the academic within American ‘college faculty’, in their terms specifically the ‘professoriate’, explains that for both her and Boyer the concern is with defining ‘scholarly pursuits’ with a ‘balanced focus on all forms of scholarship necessary to meet the demands of the *information age*’. The beauty of Boyer’s model is indeed this

clarity; its limitations are that it perfectly describes a situation that had validity over a decade ago, since when we have had thorough-going changes, often in response to the aforementioned ‘demands of the information age’. These are mostly around notions relating to the various concepts of ‘Open’ ideas that were not available to Boyer and Nibert. However Boyer’s use of a clear structure of ‘types’ of scholarship, and the use of descriptors to define the related actions of professionals, enables the kind of discussion and review we are undertaking here. We are calling this the DIAT structure;

Discovery; the traditional researcher role,

Integration; focusing on making connections across disciplines,

Application; focusing on using research findings and innovations to remedy societal problems,

Teaching; which Boyer considers a central element of scholarship.

This provides a useful framework from which to review scholarship in the more ‘Open’ era of 2011. The DIAT model offers clear descriptors within each type of Scholarship and also defines what constitutes a scholarly career whilst attempting to create some balance of recognition across the phases of scholarship described. See

Table 1. Boyer’s Model of Scholarship.

Type of scholarship	Purpose	Measures of performance
Discovery	Build new knowledge through traditional research.	Publishing in peer-reviewed forums Producing and/or performing creative work within established field Creating infrastructure for future studies
Integration	Interpret the use of knowledge across disciplines.	Preparing a comprehensive literature review Writing a textbook for use in multiple disciplines Collaborating with colleagues to design and deliver a core course
Application	Aid society and professions in addressing problems.	Serving industry or government as an external consultant Assuming leadership roles in professional organisations Advising student leaders, thereby fostering their professional growth
Teaching	Study teaching models and practices to achieve optimal learning.	Advancing learning theory through classroom research Developing and testing instructional materials Mentoring graduate students Designing and implementing a programme-level assessment system

Table 1 for a full description of each of these types of scholarship.

### **Open Scholarship in a network society**

Terry Anderson's discussion of Open Scholarship was given as a keynote talk at the ALT-C Conference (2009) as part of a broader discussion of trends in learning and technology practices in the twenty-first century. He talks of moving from Communities of Practice to Networks of Practice, arguing that 'we are all in the change business', capturing the sense of flux that we are now trying to analyse here. Caroline Haythornthwaite in *New Forms of Doctorate* (2009) also discusses the impact of network effects on learning and scholarship. Building on the *Taxonomy of the Many* (Dron and Anderson 2008) Anderson looks at how learning is moving from the group to the collective, challenging Boyer's institution-centric approach. Anderson argues for a move to being an Open Scholar arguing that quality scholarship 'is peer and public reviewed, accessible, persistent, syndicated, commented and transparent' picking up on how the network effects of learning are being impacted upon by a range of social media, both generic and also dedicated to scholarly practice. Anderson additionally sees a key function of Open Scholarship as being 'empowering learners as future teachers'. Haythornthwaite amplifies this by defining 'learning is a relation that connects people', emphasising the relational and networked qualities of learning.

Anderson is focusing on the affordances of learning in the emerging world of Open Learning and examining its possibilities, whereas Boyer is looking at how professional scholarship can be embedded institutionally, whilst broadening its value by re-asserting the value of teaching, for example. Haythornthwaite (2009) looks more deeply and precisely at the effects that a range of networks are having educationally and sees the future as being characterised by ubiquitous learning in society. So we have three approaches, respectively focusing on institutions and professionalism, open learning and social media and ubiquitous learning and network effects.

Boyer is concerned to clarify the current role of professional scholarship within institutions whilst Anderson is arguing from a scholarly perspective for a move to a deeper view of networks as collectives, occurring simultaneously within and outside institutions. Haythornthwaite takes the rise of networks as a given and discusses learning in the 'networked age'. Indeed she prefers to see learning as an epiphenomenon of networks, with technology as a critical enabler of this or, as she puts it, 'technology is a mediator for network relations including the vital relation of learning' in a networked society. She sees learning as a networked relation consisting of learning relations, production, outcomes and spaces in an emerging participatory culture (*pace* Jenkins 2006).

Indeed, Haythornthwaite sees 'contributory, open and participatory practices' as signifying trends in learning which signify the 'emergent work' that 'teachers, learners, educators and researchers' should currently be engaging in. She draws her work together more coherently, as a summative social vision of future learning in a networked society, than Anderson. However Anderson is more discursive in his observations on Open Scholarship flagging a range of emergent practices which an Open Scholar might respond to, into which he adds Personal Learning Environments and social learning, amongst many others. He quotes Gideon

Burton ‘the Open Scholar is someone who makes their intellectual projects and processes digitally visible and who invites and encourages ongoing criticism of their work and secondary uses of any or all parts of it – at any stage of its development’.

For Anderson, being an Open Scholar represents a new type of education work which maximises: Social learning, Media richness, Participatory and connectivist pedagogies, Ubiquity and persistence, Open data collection and research processes and Creating connections.

However for Anderson the *sine qua non* of this process is the production of Open Education Resources (OER), which is perhaps both a little reductive and limiting on how we might usefully characterise being an Open Scholar.

As ‘change agents for the future’ Open Scholars are both ‘empowering learners as future teachers’, and also inducting their charges into being Open Students, which we read as the inter-generational work of developing co-creative practices in learning.

So Anderson’s work is concerned to identify a range of cutting-edge scholarly practices without fully detailing how they might be embedded within the institution, but perhaps with more of an emphasis on Gideon Burton’s notion of their ‘ethical value’. Haythornthwaite, however, is concerned to identify the emerging affordances of a range of networks and how that might affect ubiquitous learning within society. Boyer however is interested in the professional role of the researcher within an institutionalised ‘professoriat’. Our interest is in how we might synthesise these approaches, starting with the PAH Continuum as a model of co-creation that might prove useful.

### ***PAH Continuum***

The PAH Continuum is part of the Open Context Model of Learning (Luckin et al. 2010), and like Anderson and Haythornthwaite, it is cognisant of the affordances of new, networked, web 2.0 and later technologies for learning and is consequently designed to enable their emergence within the practices of teaching and learning.

We have argued in the Open Context Model of Learning that the PAH Continuum allows for a teaching and learning process to be developed which delivers good subject-based learning, the prime concern of educational policy-makers, whilst enabling collaborative learning strategies and creative forms of assessment to be deployed. Cochrane has demonstrated how this might be done using mobile technologies on the Product Design degree at Unitec, NZ (Cochrane 2010a) by incorporating it into the design of technology use, and into supporting the increasing self-management of learners. So we believe the PAH Continuum helps in incorporating open learning affordances and networked effects into institutional contexts, given appropriate institutional-readiness (Cochrane 2010b).

### **Developing Boyer’s types of scholarship**

So let us look at how we might review Boyer’s four types of scholarship in light of the approaches mentioned earlier, inspired variously by social media, digital tools, open learning and network effects.

<b>Discovery</b>	Build new knowledge through traditional research.	Publishing in peer-reviewed forums Producing and/or performing creative work within established field Creating infrastructure for future studies
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Figure 1. Discovery ‘type’ of Boyer’s Model of Scholarship.

### *Discovery*

For Boyer this is the phase of scholarship where new knowledge is built through traditional research. Whilst this is a reasonable description of subject-based research where new knowledge about say plant cells can be discretely studied and identified, it is less relevant to learning/interdisciplinary research. What it clearly identifies is how new knowledge that will be used in subject-based teaching will be determined. So for the moment we will leave the descriptors relating to Discovery as one type of scholarship unchanged as that is not our immediate concern. However, we will review them at the end of the article as part of considering how we might develop scholarship as an ongoing iterative process, after examining the whole of Boyer’s DIAT model (see Figure 1).

### *Integration*

The Integration phase of Scholarship in Boyer moves beyond the professional orientation of the traditional researcher, as described in the Discovery phase, to look at a narrowly defined notion of an ‘interpretation of knowledge’, including descriptors of practice and also with a focus on the production of learning materials. These are identified very practically, as literature reviews, textbook creation and course design, but somewhat traditionally. This ignores developments coming from the Learning Technology community over the past 15 years as described by, for example, Conole and Alevizou (2010) and the newer affordances of social media and its network effects (Haythornthwaite 2009). In our view, literature reviews themselves have also been supplemented by data mining techniques using a range of social media tools (Kelly 2011) A number of groups are also examining digital research practice in the age of social media and are producing fresh taxonomies in this field from the librarian’s perspective (British Library 2011) More importantly the process of learning content production is being transformed rapidly, most notably by the OER and Open Courseware (OCW) movements, so much so that Anderson in particular sees this as a key descriptor of being an Open Scholar. Additionally we are seeing a number of syllabus-free approaches to learning, such as those proposed by Sugata Mitra (2009) and Ian Cunningham (2005), who separate learning content from

<b>Integration</b>	Enable the use knowledge across disciplines.	Preparing comprehensive literature reviews Undertaking data mining analysis Producing Open Education Resources (OER) & Content Creation Tools Enabling generative network effects to occur
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Figure 2. Integration ‘type’ of Boyer’s Model of Scholarship (modified).

learning process, something Cochrane has also developed using the PAH Continuum in course design (Cochrane 2010a).

A more complex dimension is that of enabling ‘network relations’ (Haythornthwaite) to ‘emerge’, which might mean allowing new social groupings to emerge around new contexts, as suggested in the Emergent Learning Model (Garnett 2010), or by enabling ‘flocking’ (Dron and Anderson 2008). This suggests that we need an approach reflecting the divergent design of resources for appropriation and use in multiple contexts, rather than a convergent design process concerned with educational instruction within an institution. An integration phase of scholarship might be better served by a process of enabling knowledge to be opened out by networked effects and used in a more inter-disciplinary way in a range of contexts. So we suggest the set of descriptors as highlighted in Figure 2 (changes highlighted in red).

### Application

In the ‘Application’ type of scholarship Boyer’s looks for the external validation of the scholar through the application of their knowledge in other communities. Whilst this is certainly a valuable social process, we would rather the research professional started with developing their professional communities of practice through a collaborative mentoring process, as described by Cochrane (2010a) in his description of educational communities of practice as course teams. Whilst becoming sufficiently expert as professionals to be able to advise industry and government is clearly of value to the scholarly academic, and also to their host institution, a broader notion of public engagement should also be considered as we move to a more networked society, with more of a peer-to-peer focus (Shirky 2008) and away from the more traditional notion of institution to institution linkages to promote the career of one individual. This is closer to what Dron and Anderson call the ‘Taxonomy of the Many’ (2007) shifting the range and character of institutional linkages whilst adding in concerns with public engagement of HE Institutions as they evolve (NCCPE 2009).

The collaborative affordances of social media mean that possible new, networked effects (new partnerships, institutional models, new models of learning and teaching, new modes of innovation) need to be positively designed for institutionally, enabling what Garnett and Ecclesfield (2008) call ‘adaptive institutions working across collaborative networks’. So Boyer’s institutional descriptors in ‘Application’ need

<b>Application</b>	Aid society and professions in addressing problems through serving community and public needs and purposes	Mentoring colleagues collaboratively Serving industry or government as an external consultant Assuming leadership roles in professional organizations Empowering learners through co-creation to become future scholars Working with community groups and on public engagement strategies Using network effect to transform practice
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Figure 3. Application ‘type’ of Boyer’s Model of Scholarship (modified).

to be broadened beyond direct linkages just with industry and government, both of which are going through their own transformations anyway in the post web 2.0 world (Enterprise 2.0 and Gov 2.0). They need to be made adaptive, to be reflective of a broader range of stakeholder interests (as developed in the recent JISC Curriculum Development and Design initiatives 2010) and also to incorporate community responsibilities and ethical approaches, like those defined by Michael Gurstein concerning Community Informatics (2007) × (see Figure 3).

### Teaching

We feel that the existing descriptors in the Type ‘Teaching’ mostly reveal how little Boyer’s model reflects the range of transformations in scholarly practice effected by learning technologies and social media in recent years. This might best be exemplified in the five-year-old self-organised TeachMeet programme (2006). Again, whilst this has the merit of clarity in how it describes teaching responsibilities, the descriptors have been overtaken by events. For a start it is now not unusual to link together the processes of learning and teaching, and not just in Vygostky-based constructivist approaches, so it is impossible to discuss this Type without incorporating a greater degree of issues concerning learning and the role of the student, thus capturing the more participative approaches to education that have been emerging in recent years (Anderson 2009; Conole and Alevizou 2010; Cochrane 2010a).

In order to reflect this we have added the descriptor ‘Teaching as a reflective and dialogic practice promoting learning’, which also mirrors the work we have done on developing the PAH Continuum in the ‘Craft of Teaching’ (Ecclesfield and Garnett 2010). This more dialogic approach to teaching and learning as practice means that the notion that a teacher would merely ‘study’ a pre-defined approach to teaching in the classroom has been replaced by the potential for more andragogic, or negotiated, approaches to the process of learning. As Mitra (2009) has shown, resources can now be introduced from a range of contexts via the Internet so teachers need to be capable of ‘brokering’ learning (Jennings 2010) as resources can be introduced on the fly within the learning process by learners themselves. As Anderson indicates, learners now have personal learning networks extending beyond their immediate learning environment, so teaching needs to be capable of negotiating a range of learning contexts (see Figure 4).

<b>Teaching</b>	Promote Teaching as a reflective and dialogic practice promoting learning	Advancing learning theory through contextual research and practice Collaborating in the design and delivery of courses & learning programmes Brokering new learning processes Developing Open Students Designing and implementing responsive assessment systems
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Figure 4. Teaching ‘type’ of Boyer’s Model of Scholarship (modified).



**Co-creating**

Finally we look at the proposed additional ‘type of Scholarship’, that of co-creating. A key phrase in O’Reilly’s description of Web 2.0 (2005) is that it is in ‘permanent beta’ which might be highlighted as a factor in why some teachers resist new approaches to teaching, but which has transformed the way we now view a range of processes. We would argue that we are now in a world in which knowledge creation itself is in permanent beta, what Weinberger describes as Everything is Miscellaneous (2008), or the ‘post-digital disorder’. Consequently the notion of a linear process of knowledge creation with knowledge discovery as the role of researcher and knowledge transmission as the role of the teacher, as separate scholarly practices, has been replaced by a more fluid and dynamic process which we are only just beginning to understand. The emerging knowledge networks are no longer something about which we receive information from researchers, they are processes in which practitioners participate, and we need to design scholarship practices that reflect this.

The dynamic outline of Open Scholarship that Anderson has presented (2009) provides an insight into the ethical issues in developing this approach, whilst also indicating the ongoing range of initiatives in development that support an Open Scholarship approach, which will need to be adapted to as their mature and prove their scholarly value. Haythornthwaite’s more synthetic vision of scholarly practice anticipates some of the cultural shifts that might change that practice in more participatory, networked societies.

We see these as differing ways of addressing the positive aspects of the emerging ‘permanent beta’ world of knowledge resources and knowledge creation, but what we are trying to do here is to evolve the traditional notions of scholarship in light of these emerging theories of teaching and learning, post web 2.0, and integrate the worlds of scholarship, along with teaching and learning to reflect the changing qualities of knowledge in a networked world where the ubiquity of social media is a quality that also challenges our traditional notions of academic institutions. We think the essence of this lies in the notion of co-creating learning and so we have added this as an additional type of Scholarship, namely ‘Co-creating’.

We see the dimensions of this new view of scholarship emerging from the process of engaging in collaborative peer-to-peer networks, which would also practice interdisciplinary approaches, which might also be disruptive of existing subject disciplines. This disruptive quality is what we describe as heutagogy and we have indicated how that can be deployed in the learning and teaching process in the PAH Continuum (Luckin et al. 2010). The PAH Continuum is a framework of teaching and learning that allows for epistemic cognition to emerge by co-creating learning, and it is

<b>Co-creating</b>	Participating in the perpetual Beta of knowledge creation through the co-creation of learning	Engaging and collaborating in peer networks Engaging in activity to develop, disrupt or join up established fields Enabling Epistemic Cognition to be a part of evolving subject frameworks Creating infrastructure for future learning and research
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Figure 5. Co-creating ‘type’ Scholarship (proposed).

through epistemic cognition that new knowledge can be forged (Avramides and Luckin 2007), see Figure 5.

### Reviewing discovery

The discussion of the co-creation of Open Scholarship presented here, where we have also presented a deeper notion of the role of the co-creation of learning together with the learner, or the Open Student as Anderson puts it, also enables us to incorporate epistemic cognition into the learning process. However the inclusion of epistemic cognition also changes the description of Discovery as a type of scholarship because epistemic cognition, within the co-creation process described in the PAH Continuum, is capable of stimulating research agendas *within* the learning process. In which case we might wish to redefine Discovery as the ‘co-creation of research agendas’. So that Discovery as a type of scholarship might be better described as in Figure 6.

### Conclusion

So through examining Boyer’s traditional approach to scholarship and by contrasting it to a range of emerging practices, admittedly driven by new web and social technologies and the early responses of Anderson in his reflections on Open Scholarship, and Haythornthwaite in her reflections on networked societies, we believe that we can outline a framework in which a co-creation model of scholarship can be developed and recognised professionally. What is presented here is merely a proposed outline, which we hope will be discussed, torn apart and further developed. For now here is our proposition of what a co-creation model of Open Scholarship (Table 2) might look like in light of the above discussion.

### Caveat

We have not discussed many new pedagogies, such as Connectivism in this article, nor new approaches to scholarship, such as e-science or Technology-Enhanced Research. This is not because we think they have nothing useful to say: obviously they do. However, our starting point was to find a bridge between Boyer’s Model of Scholarship and Open Scholarship whilst taking account of relevant work, concerning the co-creation of learning. This then lead to a broadening out of the debate and the references used such that this might appear as an overview of networked learning theories, which it is not. We view this as perhaps the start of process of discussion and would obviously welcome the views of for instance Siemens (2005) and Downes (2005) from both their Connectivist and E-learning 2.0 perspectives, amongst many others.

<b>Discovery</b>	Aggregate new forms of knowledge through the co-creation of research agendas	Identifying useful domains for research Publishing collaboratively in peer- edited fora <i>Performing creative work in education</i> Dynamically supporting new infrastructures for learning
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Figure 6. Discovery ‘type’ Scholarship (proposed).

Table 2. Co-creation model of Open Scholarship.

Type of scholarship	Purpose	Measures of performance
Discovery	Aggregate new forms of knowledge through the co-creation of research agendas.	Performing creative work in education Identifying useful domains for research Publishing collaboratively in peer-edited fora Dynamically supporting new infrastructures for learning
Integration	Enable the use knowledge across disciplines.	Preparing comprehensive literature reviews return Undertaking data mining analysis Producing Open Education Resources (OER) & Content Creation Tools Enabling generative network effects to occur
Application	Aid society and professions in addressing problems through serving community and public needs and purposes	Mentoring colleagues collaboratively Serving industry or government as an external consultant Assuming leadership roles in professional organisations Empowering learners through co-creation to become future scholars Working with community groups and on public engagement strategies Using network effects to transform practice
Teaching	Promote Teaching as a reflective and dialogic practice promoting learning	Advancing learning theory through contextual research and practice Collaborating in the design and delivery of courses & learning programmes Brokering new learning processes Developing Open Students Designing and implementing responsive assessment systems
Co-creating	Participating in the perpetual Beta of knowledge creation through the co-creation of learning	Engaging and collaborating in peer networks Engaging in activity to develop, disrupt or join up established fields Enabling Epistemic Cognition to be a part of evolving subject frameworks Creating infrastructure for future learning and research

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