OSBR.CA

The Open Source Business Resource

SEPTEMBER 2010

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PUBLISHER
The Open Source Business Resource is a monthly publication of the Talent First Network. Archives are available at: http://www.osbr.ca

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ISSN
1913-6102

The editorial theme for this issue of the OSBR is Keystone Companies. A keystone company is the member of a business ecosystem that owns, operates, and evolves the platform. The origin of the keystone concept is a good example of the importance of interdisciplinary lessons, which was the theme of last month's issue.

In an architectural arch, the wedge-shaped piece of stone in the centre is called the keystone. It is regarded as holding all the other stones in place and the arch would collapse if it were removed. Although most arches would collapse upon the removal of any of the other stones, the keystone is usually the final stone put in place during construction and is required to realize the structural integrity of the arch. Accordingly, in addition to its central physical position in the arch, it has been given a symbolic position of disproportionate importance in relation to the other stones.

The strong symbolism of the keystone has lead to the term being applied to other situations and systems where one element exerts disproportionate influence over the other elements and therefore plays a role in maintaining the integrity of the system. In particular, the term has been adopted in the biology literature using the concept of a keystone species in an ecosystem or community. In turn, the concept and its related research have been applied to the management literature where, instead of a keystone species, a particular organization or company plays the role of a keystone in a business ecosystem.

In biology, the defining characteristic of a keystone species is that its influence is disproportionate to what might be expected based simply on its total biomass in the community. A classic example is the North American beaver (*Castor canadensis*), which exerts a disproportionate effect on its habitat through its dam-building activities. Although the "keystone" label is applied to the species, it actually reflects the role the species currently plays within a specific ecosystem. Thus, the keystone concept is context dependent; the importance of a species in one community may be different from its importance in another.

The keystone species concept has been the subject of intense debate and research activity over the past 40 years. Biologists wish to identify and study the effects of keystone species primarily to guide conservation management. The keystone species concept suggests that management efforts can be focused on protecting an individual keystone species, and these focused efforts also theoretically provide protection for the other species that depend directly on the keystone or indirectly on the community it maintains.

In business management, the keystone species concept proved to be a useful interdisciplinary lesson, but not before another concept was borrowed from biology. The framework of the biological ecosystem concept was first applied to the business management field by James Moore in 1993 when he introduced the term “business ecosystem” in his article “Predators and Prey: A New Ecology of Competition” (http://hbr.org/1993/05/predators-and-prey/ar/1). Moore used this new term to describe an economic community of organizations that co-evolved their capabilities around a particular innovation and work cooperatively to meet the needs of customers.

Building on Moore's work, others have extended the business ecosystem concept and suggested that the keystone species

concept in biological ecosystems can be usefully applied to business ecosystems. In particular, through their book *The Keystone Advantage* (http://tinyurl.com/2wgw55q), Marco Iansiti and Roy Levien popularized the concept of strategically minded keystone companies that, "shape and coordinate the ecosystem, largely by the dissemination of platforms that form a foundation for ecosystem innovation and operations."

In this issue of the OSBR, the authors offer different perspectives on a new approach for small technology companies, industry associations and business development organizations to generate revenue. The new approach builds on the keystone company concept.

Michael Weiss, Associate Professor with Carleton University's Technology Innovation Management program, asks whether the term "keystone" should be used as a noun or adjective. By comparing the use of the term in different fields, he demonstrates that the keystone concept is poorly articulated in the business literature, which may limit our thinking about what a keystone company is and can be.

Tony Bailetti, Associate Professor with Carleton University's Sprott School of Business and Department of Systems and Computer Engineering, introduces a project to create a toolkit that includes everything that is required to support a new approach to grow the revenue of a platform owner.

Michael Ayukawa, founder of Cornerportal, describes the creation of a platform to anchor a global deal-generating business ecosystem. The Open Global Commerce platform will increase the quantity and quality of transnational deals by enabling collaboration and co-creation among participants and stakeholder groups.

Elias Majic, founder of Ottercall, outlines his approach to creating a platform for language learning. Through his analysis of existing language learning solutions, and the development of his company's market entry strategy, Elias demonstrates the advantages and challenges of a multi-sided approach.

Eduardo Moraes, from non~linear creations, emphasizes the importance of trust in a marketplace. His research demonstrates how opinions of trust can be measured and how they affect a customer's uncertainty and belief in solutions presented by suppliers. Eduardo discusses the implications of this research for keystone operators.

Howard Rosenblum, from Carleton University's Technology Innovation Management program, shares his experiences helping an existing business decide whether it should migrate from its traditional, standalone approach to become the owner of a multi-sided platform. The lessons learned can be applied to any small company or organization weighing the pros and cons of migrating to the new approach.

James Makienko, from Carleton University's Technology Innovation Management program, shares his experiences helping a technology company define a set of value propositions for a multi-sided platform to answer the question: "How do you motivate potential participants to pay to join a platform?"

We encourage readers to share articles of interest with their colleagues, and to provide their comments either online or directly to the authors.

The editorial theme for the upcoming October issue of the OSBR is Sales Strategy and submissions will be accepted up to September 15th. November's theme is Economic Development and submissions are due by October 1st. Please contact me (chris.mcphee@osbr.ca) if you are interested in making a submission.

Chris McPhee

Editor-in-Chief

Chris McPhee is in the Technology Innovation Management program at Carleton University in Ottawa. Chris received his BScH and MSc degrees in Biology from Queen's University in Kingston, following which he worked in a variety of management, design, and content development roles on science education software projects in Canada and Scotland.

"Conceit spoils the finest genius. There is not much danger that real talent or goodness will be overlooked long; even if it is, the consciousness of possessing and using it well should satisfy one, and the great charm of all power is modesty."

Louisa May Alcott

The gopher tortoise is an unassuming land animal that inhabits sandy regions of the southeastern United States. Like many other desert inhabitants it needs to seek shelter from the heat of the sun. Gopher tortoises are very adept at digging burrows in which they can hide during the peak hours of the day. These burrows offer shelter to many other species that are not able to dig underground. Without the burrows dug by tortoises many types of rodents and snakes would not be able to survive. The existence of the gopher tortoise in its ecosystem affects the health of many other species. For more information, see the Gopher Tortoise Activity Book (http://tinyurl.com/yoax5n).

The gopher tortoise is an example of a keystone species or keystone. As in biological ecosystems, some companies or institutions in business ecosystems are instrumental for the better well-being of others. They play the role of a keystone. In this article, we examine the question of what makes a keystone a keystone. We introduce two perspectives on that question: one provided by ecology, the other by network analysis. We then review how the term keystone is used by the literature on business ecosystems.

Two lessons that readers should take from this article are that the keystone concept, as used by the majority of the business ecosystem literature, is not clearly articulated, and that there are many unresolved issues in applying the concept to business ecosystems.

Keystones in Ecology

In ecology, keystone is an adjective. It identifies a group of organisms — the keystone species — as essential to the existence of a community or ecosystem. A species is “keystone” if it is instrumental for the well-being of other species. It creates a stable environment for the other species. This definition links back to the stone at the apex of an arch that locks the other stones into place (http://tinyurl.com/2bk7ko2). The notion of keystone has been anchored around two concepts: abundance and interaction.

Keystone species have a disproportionally high impact on their ecosystem relative to their abundance (Power et al., 1996; http://tinyurl.com/2c2pwdx). Abundance can be measured in terms of the proportional biomass (http://tinyurl.com/23awlqo) of a species, that is, its biomass relative to the total biomass of the ecosystem. This means that the contribution of a keystone species to the productivity (http://tinyurl.com/c2e4kz), diversity, or abundance of other species is higher than what would be expected based on their share of the ecosystem population.

We also consider a species keystone, if its removal from the ecosystem leads to the extinction of other species. Species interact through intricate webs of consumption (predator-prey relationships, http://tinyurl.com/5oscot) and dependencies. For example, species depend on other species to provide vital resources. A species whose removal does not lead to the extinction of other species is considered "minor" (Brown and Vincent, 1992; http://tinyurl.com/26pmzjq). Network analysis provides us with an arsenal of techniques to reason about the interactions of players in an ecosystem.

Keystones in Network Analysis

Network analysis approaches to determine key players (keystones) in networks follow a common pattern (Kilkenny and Nalbarte, 2000; http://tinyurl.com/36reg2z):

1. Model an ecosystem as a network of players (nodes) and relationships (links).

2. Determine the importance of a player or group of players.

3. Test how sensitive the network is to the removal of specific players.

The approaches are based on metrics to determine the centrality and cohesion of a network. Blockmodeling can be used to extract the functional groups or roles filled by the players in the ecosystem.

One approach to determining key players in a network uses a two-pronged analysis (Borgatti, 2006; http://tinyurl.com/2vdonm3). First, identify key players that disrupt or fragment the network. Then, identify players to seed with information to ensure optimal diffusion of the information through the network. The former provides an answer to the question of who the brokers and gatekeepers in an ecosystem are that facilitate and control resource flow. The latter helps us optimize the flow of resources, such as money and information, through the ecosystem.

Key players in a network provide cohesion and enhance efficiency (Kilkenny and Nalbarte, 2000; http://tinyurl.com/36reg2z). Their removal results in a fragmented network in which players can only interact with other players in the same fragment, but not with players in other fragments. Efficiency can be expressed in terms of the length of the shortest path between the remaining species after the removal of a key player. Path length is a measure of how many intermediaries need to touch a resource on its way from one player to another.

Keystones in Business Ecosystems

The business ecosystem literature describes key players as keystones (Iansiti and Levien, 2004; http://tinyurl.com/33hupmz). Keystones have also been conceptualized as catalysts or shapers.

Catalysts introduce customers in one customer segment to customers in another customer segment (Evans and Schmalensee, 2007; http://www.catalyst-code.com/thebook/). As a catalyst, Google offers search services to users and sells ad placement on search results to advertisers. Catalysts have three responsibilities: create a community, provide information that helps customers find each other, and establish rules of conduct. The focus of catalysts is on reducing transaction costs (http://www.businessdictionary.com/definition/transaction-cost.html).

Shapers are companies that "seek to alter relationships among large numbers of independent entities to create more value for all concerned" (Hagel et al., 2010; http://tinyurl.com/2wmye5a). A shaper provides a common vision for the ecosystem; a platform that allows ecosystem members to access the resources of other members and helps attract new members to the ecosystem; and demonstrates its commitment to the platform through its actions. Apple has reshaped the music industry by the creation of the iPod/iTunes ecosystem. As in the case of Apple, a shaper often captures a disproportionate amount of the value created.

While the current business ecosystem literature has contributed new ways of examining how businesses can create and capture value, it has been criticized for its narrow interpretation of ecological concepts. Some of the common misperceptions about keystones are:

1. *There is only a single keystone in an ecosystem.* In fact, an ecosystem can contain many keystones. For examples, one needs to look no further than the wireless ecosystem (Basole, 2009; http://tinyurl.com/2v7bkrk) or the mashup ecosystem (Weiss, 2009; http://tinyurl.com/352jjmg). Adobe is a member of Microsoft's Windows ecosystem, but at the same time it is the keystone for its own ecosystem anchored around Flash (http://tinyurl.com/26buxod).

2. *A keystone is the dominant player in an ecosystem.* No. Some keystones are created as a common resource by a group of organizations that want to share risk and reduce cost. Ownership and control of the common resource is jointly held between those organizations. The Eclipse Foundation (http://www.eclipse.org/org/#about) is a good example of this model. Its reason for being is to nurture an open source community around the Eclipse platform and to ensure the availability of complements that enhance the platform.

3. *Keystones are active leaders of their ecosystems.* This assumes a top-down view of the world. However, the opposite can also be true. Applying the findings from ecology, a keystone can be a company that provides important resources that many other companies rely on, for example, a semiconductor fab (Mutscher, 2010; http://tinyurl.com/2ar6xct). Being a keystone has more to do with supplying the ecosystem with resources than being in charge.

Conclusion

The business literature uses the term "keystone" primarily as a noun. Looking back at what we learned about the ecological and network perspective on keystones, doing so, although it is convenient, may limit our thinking about what a keystone is and can be:

- Keystone as a noun suggests an active entity, driven by the need to become a keystone and to capture most of the value created.

- Keystone as an adjective characterizes an entity without implying that the entity has to take an active role in becoming a keystone or capturing as much value for itself as possible. Being a keystone is much more about enablement than it is about control.

This notion of "keystoneness" is broader than what the business ecosystem literature portrays. That said, the question whether to use "keystone" as a noun or an adjective may, indeed, be academic. However, there is a lesson for us trying to apply concepts from ecology to business, and there are a multitude of unexplored opportunities for research and creating new businesses anchored around keystones.

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"Treat others as you would like to be treated."

First incarnation of the Golden Rule
Code of Hammurabi (1780 BC)

In this article, we describe the Keystone Off-The-Shelf (KOTS), a project to create a toolkit for platform owners. The toolkit will include everything that is required to operate a platform that supports a new approach to grow the revenue of small technology companies.

The organizations expected to benefit the most from the KOTS project are:

1. Small technology companies that wish to grow their revenue.

2. Organizations that wish to develop regional economies, technology, or industrial sectors.

3. Companies and non-profit organizations that wish to migrate their operations from the traditional one-sided approach to the new multi-sided stakeholders approach to revenue generation.

4. Academic programs that are willing and able to innovate to solve significant real-world problems.

KOTS provides opportunities for platform owners to become central players in their communities by helping small technology companies grow their revenue. The business ecosystem literature refers to these central players as keystones (Iansiti and Levien, 2004; http://hbswk.hbs.edu/item/3967.html).

The name KOTS builds on the keystone concept and the acronym COTS, which stands for "commercial off-the-shelf" (http://wikipedia.org/wiki/Commercial_off-the-shelf). COTS refers to computer software and hardware systems with commercial support that are ready-made and available for sale, lease, or license to the general public. COTS are alternatives to in-house developments or one-off development projects and offer significant savings in development and maintenance costs.

Introduction

Small technology companies, economic development organizations, and industry associations can generate revenue by operating platforms that enable paying participants to achieve better outcomes than those they could achieve without the platform.

A platform owner is responsible for concurrently delivering value to the various groups of platform participants (e.g., by enabling participants to close more and better deals or reduce time-to-cash) and system-level outcomes desired by the community that is anchored around the platform (e.g., more high paying jobs, more private investment, greater talent attraction and retention).

The KOTS project provides a ready-made toolkit for platform owners that includes everything that is required to operate a platform. KOTS develops, maintains, and evolves the technology, as well as the contractual and informational instruments owners of platforms require. This toolkit supports a new approach to grow the revenue of small technology companies, as described by the author in a recent OSBR article (Bailetti, 2010; http://tinyurl.com/2fzzp8w).

KOTS makes it easier and safer for a platform owner to:

- assure the coherent development of its platform's technology
- reduce platform development and maintenance costs

- encourage investments from their strategic partners
- attract a large number of paying platform participants
- manage and maintain the health of the community it serves

The KOTS project develops a platform that enables a small technology company to meaningfully interact with the various groups that affect or are affected by its development and commercialization decisions. The KOTS project supports an agile approach to revenue generation. Small technology companies co-create products and services and complement other participants' products and services rapidly, and incrementally, using their particular and continuously evolving growth formulae.

A top management team of a small technology company can use the platform to:

- incorporate the interests of all the external and internal groups who can affect or are affected by the company's objectives into their development and commercialization decisions
- co-create value across different stages of the development and commercialization life cycles
- build trust in their work practices and market offers

The purpose of this article is to provide an overview of the KOTS project and the new approach to development and commercialization that it supports. We first describe the project's goal, objective, deliverables, and leadership. Next, we compare the new approach to development and commercialization that KOTS supports with two traditional approaches. We then identify the culture that best supports the new approach and provide an overview of the three key conceptual building blocks of this approach: integration of stakeholders' interests into development and commercialization decisions, value co-creation, and trust building. Finally, we provide the conclusions.

Project Goal, Objective, Deliverables, and Leadership

The goal of the KOTS project is to design, develop, test, and release ready-made components for platforms designed to help small technology companies grow their revenue anywhere in the world. KOTS components include: software and hardware systems, applications, tools, educational resources and programs, bylaws, membership agreements, best practices, intellectual property policies, business models, and process rules and constraints.

The objective of the KOTS project is to provide technology, as well as legal and informational instruments, that make it easier and safer for a small technology company, economic development organization, or industry association to:

1. Operate a platform that enables multiple groups to co-create specific assets (e.g., deals, solutions to customer problems, white papers).

2. Deliver the system-level outcomes desired by the community anchored around the platform.

3. Set a price structure for an organization to become a platform participant, transact with other platform participants, and acquire market offers from platform participants .

4. Manage relationships with platform participants (e.g., membership agreements, intellectual property policy, account management, escrow services).

5. Shape behaviours (e.g., rules and constraints for platform participants' interactions, inducement mechanisms).

6. Support the internal organization of the platform owner (e.g., bylaws).

7. Become sustainable (e.g., develop business models, select the groups of platform participants, identify the size of the groups participating in the platform, determine value propositions, create community health dashboards, analyze externality matrices).

The deliverables of the first phase that ends March 30, 2011 are:

1. A software system integrated with a communications infrastructure that supports value co-creation by different types of organizations.

2. By-laws to govern member interactions, membership agreements, and an intellectual property policy that complements the software system.

3. Lessons learned from validating KOTS with 20 companies, Lead to Win (http://www.leadtowin.ca), and economic development organizations.

4. Suggestions on ways Lead to Win can support an innovation system across Canada, as well as support other organizations responsible for the health of innovation systems in specific product markets.

5. A list of gaps in the KOTS approach and a plan to fill them.

The KOTS project is led by the faculty and graduate students of Carleton University's Technology Innovation Management program (TIM, http://carleton.ca/tim/). A leadership position in the KOTS project provides TIM faculty and students the opportunity to:

- produce theses and projects that advance our knowledge in the new approach to launch, operate, and grow small technology companies
- publish articles that establish a global brand as KOTS experts
- produce and disseminate content that educates talented managers worldwide on how to design and operate growth-seeking technology companies
- strengthen their relationship with industry and economic development organizations, as well as leading multi-sided platform and stakeholder theoreticians worldwide
- develop expertise in developing the regional economy
- develop expertise in a communications-enabled software system
- prepare and test complementary assets to a communications-enabled software system

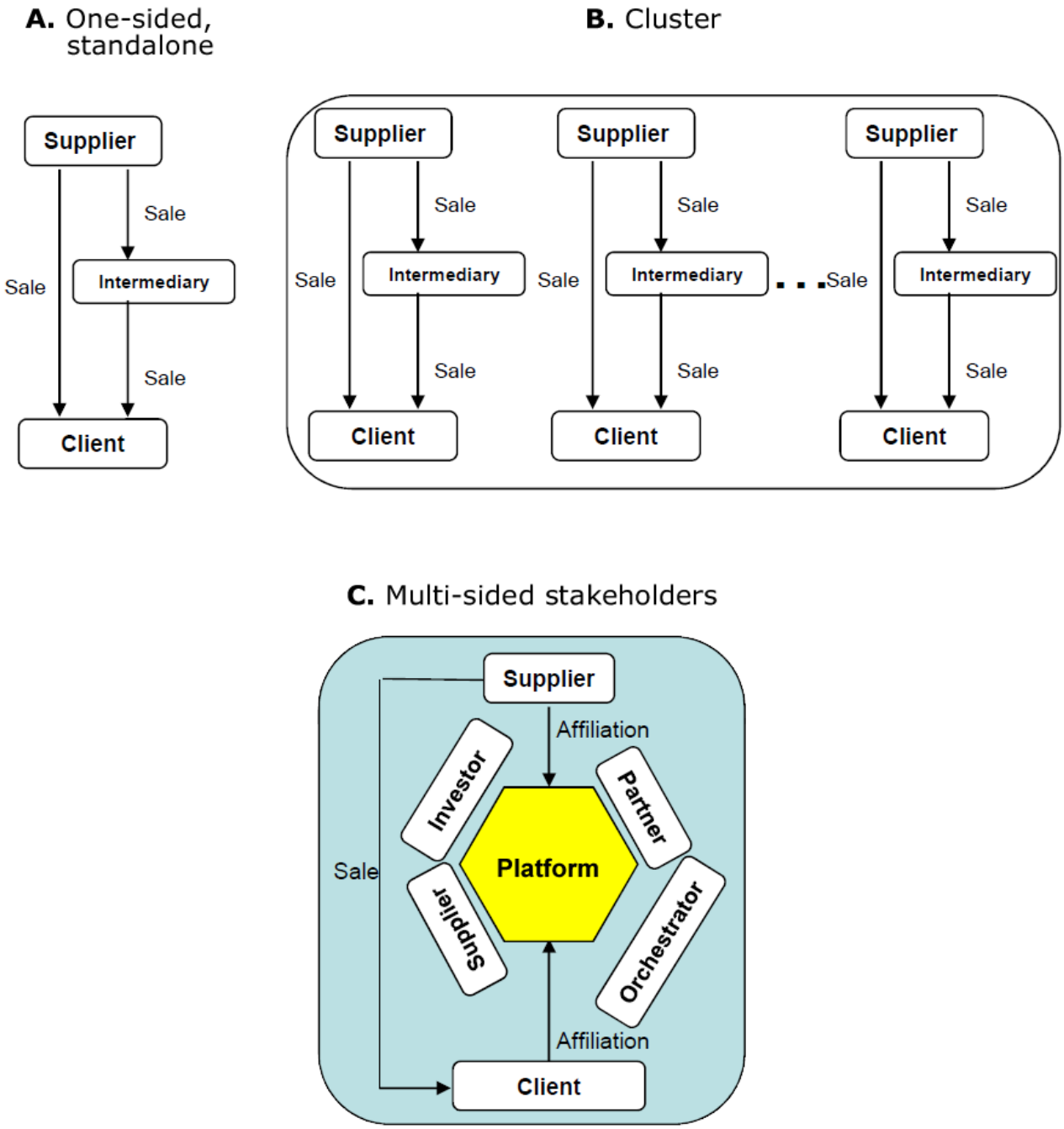
A New Approach

Traditional development and commercialization models take too long and cost too much. Traditional models expose founders of technology companies to excessive risk and significantly decrease their equity ownership over time. Moreover, academics continue to question the economic benefits delivered by traditional economic development models such as clusters (Kukalis, 2010; http://tinyurl.com/2b8ymoz). A new approach to development and commercialization is required.

Figure 1 illustrates the difference between the traditional one-sided, standalone approach to development and commercialization (Model A), the cluster approach (Model B), and the proposed multi-sided stakeholder approach (Model C).

The traditional standalone approach (Model A) pushes a supplier's products, services, and solutions to customers, either directly or through intermediaries. The cluster approach (Model B) pushes market offers with other companies in the same industry or regional cluster. In

Figure 1. Three Models of Development and Commercialization



the multi-sided stakeholders approach (Model C), the supplier uses a multi-sided platform to interact with customers and all other company stakeholders to develop and market its offers. Stakeholders include complementary technology providers, product and skill partners, investors, and community leaders.

Model C is much more than the multi-sided platform model economists commonly use to explain the behaviour of electronic markets, such as auctions, online-dating, and job boards. The main benefit of the multi-sided stakeholder model is that it enables organizations of different types to rapidly co-create products, services, and solutions. Model C also goes beyond decreasing search and transactions costs; it is more about growing sustainable revenue than reducing costs. The focus is to create new things that deliver value to customers and to all the organizations that contribute to the company's development and commercialziation initiatives. Model C requires a company to access skills that are dispersed globally and attract organizations to share its development, commercialization, and risks. Model C helps a company build capabilities to differentiate offers for which customers are willing to pay.

Culture That Supports Model C Companies

When faced with decisions about development and commercialization, a top management team experiences a tension between self-interests, owners' interests, and other stakeholders' interests. We adopt the perspective that organizational culture is what guides a top management team when resolving this tension. Organizational culture is comprised of: (i) assumptions about reality that are taken for granted; (ii) criteria used to make decisions; and (iii) work practices that embody the assumptions taken for granted and criteria used to make decisions.

We argue that the culture that best supports Model C companies is very different than the cultures that support Model A and Model B companies. The culture that best supports a Model C company is one that: (i) incorporates the interests of all company stakeholders into development and commercialization decisions, not just self-interests and company owners' interest; (ii) co-creates value; and (iii) builds stakeholders' trust in the company's work practices and market offers.

Key Conceptual Building Blocks

This section provides an overview of the three key conceptual building blocks of the new approach: integration of stakeholders' interests into development and commercialization decisions, value co-creation, and trust building.

A company is a collection of stakeholders; these are external and internal groups who can affect or are affected by the company's objectives. All company stakeholders can be organized into: (i) the company's top management team, (ii) the company's owners, and (iii) other stakeholders, such as customers, employees, go-to-market partners, complementors, and suppliers. We focus on the extent to which a company's top management team is concerned about the interests of other stakeholders when making development and commercialization decisions.

The ways that top management teams of Model C companies think about their relationships with other stakeholders, as well as the tradeoffs they must make among competing stakeholder claims,

are very different from those of top management teams operating Model A and Model B companies. To generate profitable revenue, the top management team of a Model C company will make development and commercialization decisions that adhere to the interests of all stakeholders, not just the interests of the top management team and company owners. This top management team will take other stakeholders' interests into account even when doing so does not appear to be in their self-interest. To them, implicit contracts with other stakeholders are no less binding that their explicit contracts with company's owners. In contrast, to generate profitable revenue, the top management team of a Model A or Model B company will make development and commercialization decisions that mostly adhere to the interests of only one other stakeholder group: potential customers.

Top management teams of Model C companies are better able to turn the concern for the interests of all stakeholders into profitable revenue much better than managers of Model A and Model B companies.

The November (http://tinyurl.com/2cuwcff) and December (http://tinyurl.com/25a6tfj) issues of the OSBR in 2009 were dedicated to value co-creation. The 10 articles published are evidence of the interest in the topic. Although we have not yet implemented a co-creation protocol in KOTS, at this stage it is sufficient to say that central to Model C companies are two propositions:

1. All stakeholders are able to become co-creators of value.

2. Company's top management team must incorporate all stakeholders' interests in their development and commercialization decisions.

A considerable amount of literature has examined trust in the last decade. Trust is an important aspect of an inter-organizational relationship and ability is an antecedent of trust.

There are at least two outstanding research questions that concern us: (i) how to increase trust in the platform owner and (ii) how to increase trust in platform participants. Eduardo Moraes' article on this issue of the OSBR deals with the latter question. We need to wait for good answers to the former question.

The KOTS project will build trust by providing the interfaces and controls for platform participants to:

- share information on their perceptions of other participants' ability, integrity and benevolence
- define expectations regarding deadlines, punctuality, work styles, and policies and procedures that pertain to all value-creation activities
- communicate frequently
- keep track of what is delivered relative to what was promised
- tell the truth always
- take responsibility for the work carried out
- be who they are

Conclusion

Top management teams of Model C companies generate greater revenue by: (i) making development and commercialization decisions that regard the interests of other stakeholders in addition to, and sometimes more highly than, their own, (ii) co-creating value at all stages of the development and commercialization life cycle; and (iii) building trust in their market offers. This is why Model C companies are more powerful agents for economic development than Model A and Model B companies.

The KOTS project offers to change the way small technology companies worldwide develop and commercialize their products, services, and solutions.

We wish to acknowledge the cash contribution of the NRC Industrial Research Assistance Program (http://nrc-cnrc.gc.ca/eng/ibp/irap.html) and the in-kind contribution of the Innovation Leadership Team (http://www.ocri.ca/innovation-leadership-team) to the KOTS project.

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Recommended Resources

The new approach to development and commercialization that KOTS supports builds on the following research areas:

Stakeholder theory
- Freeman, Wicks, and Parmar, 2006 (http://tinyurl.com/25a8uu)
- Jones, Felps, and Bigley, 2007 (http://tinyurl.com/2avlk6s)

Multi-sided platform design rules
- Boudreau and Hagiu, 2009 (http://tinyurl.com/2c5t77o)
- Evans, Hagiu, and Schmalensee, 2008 (http://tinyurl.com/kn8hqd)

Value co-creation
- Payne, Storbacka, and Frow, 2007 (http://tinyurl.com/2dy29xr)

Trust models
- Schoorman, Mayer, and Davis, 2007 (http://tinyurl.com/2acab72)

"How do you get people to come together over extended periods of time, working together, contributing different perspectives, different experiences and skill sets, to jointly problem solve over an extended period, and learn from each other in the process and scaffold towards new sets of knowledge that just are not available today?"

John Hagel III

The Ottawa Centre for Research and Innovation (OCRI; http://ocri.ca) and Carleton University (http://carleton.ca) have envisioned the creation of a keystone anchoring a global deal-generating business ecosystem centered in Ottawa, Canada. Through the support and common resources of the ecosystem, small and medium companies located in five international capital cities will be better able to construct and close more transnational deals through a process of collaborative and open co-creation. This is the Open Global Commerce (OGC) value proposition: "Deals Without Borders."

Background

There is as they say, a "Big Shift" underway; the notion is that we are no longer a world where static pools of knowledge and simple transactions lead to success. We are now in a world where participation in knowledge creation and complex trust based relationships determines success (Hagel, 2009; http://tinyurl.com/kkxma5). This means that the basis of competition is shifting away from cost driven linear chains of production (a model of experience curves and diminishing returns) and simple transactions to one of characterized by rapid learning through diversity, new knowledge co-creation, and trust-based relationships (a model of positive network effects and increasing returns). A manifestation of this shift may be seen in the "spikiness" in an otherwise flat world (Florida, 2003; http://tinyurl.com/2dgvn9); we have mega-centres of extreme density, diversity, and economic opportunity where there is a dynamic confluence of innovators, implementers, financers, and consumers.

This shift has not suddenly appeared and has not gone unnoticed by regional development organizations, many of which had embraced a model of regional economic development based on the clusters concept of Michael Porter (http://tinyurl.com/26h7y6f). While perhaps successful from the point of view of regional development, the tangible benefits to firms has become less clear. A recently published study by Sal Kulkakis shows that semiconductor and pharmaceutical firms located in industry clusters do not financially outperform their peers; in fact, there were no significant differences seen between clustered and non-clustered firms in the early stages of the industry life cycle and they actually performed worse than their peers in the latter stages of the life cycle or during periods of industry contraction (http://tinyurl.com/2b8ymoz).

The OGC Value Proposition

OGC exists to make it easier, less expensive, lower risk, and faster to develop and close trade, investment, and research related deals on a global basis. OGC will deliver increasing returns to all members through their investment in the relationships grounded in global deal creation.

OGC solves what is said to be missing from regional cluster models: an effective means for the clustered companies to effectively link to complementary firms outside their geographic region in a manner that drives opportunities for partner-

ship and collaboration. In this regard, the limitations of the locally bound networks that are central to the regional cluster model are quite apparent. OGC builds on the concept of "global pipelines" that has emerged: channels of communication from regional cluster firms to players outside the region (Bathelt, Malmberg, and Maskell, 2002; http://tinyurl.com/29mur8k). These pipelines are recognized to be rich sources of new ideas, innovations and perspectives (Andersen and Lorenzen, 2007; http://tinyurl.com/25h7aol). It is also acknowledged that forming these trans-local relationships requires hard investments, compared to local "buzz" networking; they do not naturally emerge in any meaningful density or become well established without effort.

However, going back to the premise of the Big Shift, we can see that it is important not to get caught up in the metaphor of global pipeline. Global pipelines give the impression of smooth flowing, linear, point-to-point supply chains or sales channels. But what is needed is a multiplayer collaboration network with bursts of activity driven by new opportunities. Also for a global ecosystem like OGC, the global network should be a resource for all members to share, develop, and support for the common good. This is the network that forms the foundation for collaboration and a cooperative environment. This is where co-created solutions are developed with the new knowledge openly shared to members of the community in trust-based relationships.

This leads us to the core value propositions of the OGC business ecosystem: OGC exists to enable the co-creation of deals through the sustained collaborative efforts of a global network of trusted partners with superior and diverse knowledge. This value proposition includes commercial, trade, investment, or research deals.

The OGC platform works because it is based on the principles of open innovation, where the emphasis on knowledge sharing and co-creation both demands and enables an environment rewarding high trust among its members. This itself is linked to the common or shared risks and benefits that are central to partnering on a business deal. In this manner, the partnering network in the OGC ecosystem gets stronger with every deal closed. In short, OGC delivers increasing returns to all its members through their investment in the relationships grounded in global deal creation. So not only does the ecosystem get stronger with every new player added, it gets stronger with every new deal closed. This investment in the value of the partnering network leads us to the second core value proposition for the OGC ecosystem: OGC exists to enable the execution of deals more rapidly, more cost effectively, and at lower risk than outside the network.

By focusing the collaboration on delivering revenue building business deals we are delivering very tangible value back to the cluster membership. Deals are also very effective to build trust with all participating players. So by investing in efficient and prolific deal making, we are simultaneously supporting an efficient means to build trust among all players in the ecosystem. A strong network of trusted partners brings an ability to not just share risk, but reduce risk with the superior knowledge that a global network of diverse partners can bring. And the cumulative investment in the relationships both accelerates and enhances the process of co-creation among the members. Operating under a common umbrella of governance and norms brings efficiency to both formal and informal transactions between the members. These efficiencies mean that many more deals emerge and these are a better fit with the capabilities of small and medium enterprises (SMEs). In a sense, we are

expanding the market for global deals, beyond that which is served by multi-national enterprises. This in turn provides the revenue opportunities for SMEs that are being looked at to provide the growth in high value jobs in many regional centres.

OGC does more to enable cost-effective and trusted-partner global deal making for smaller companies. The global network of partners establishes the environment for partnering in the co-development of new solutions that would not easily emerge without the diversity in perspective and knowledge that comes from a global network of many firms. This leads to the defining element of OGC: its global network of firms and institutions. Headquartered in Ottawa, the national capital of Canada, the OGC network initially aims to link five national capital cities: Beijing, Ottawa, Stockholm, Washington DC, and Delhi.

Why capital cities? Ottawa, given its status as the capital of Canada, has established channels of communication to many capital cities and benefits from the embassies and consulates located in the region. Global trade deals can face real or perceived barriers that could benefit from the insights of those connected to international trade policy setting.

These particular capital cities are targeted by OGC based on strong existing relationships and a meaningful overlap of their regional technology clusters (e.g. photonics, wireless, health sciences, biotech, and telecommunications). To accommodate the geographic and cultural spread, the ecosystem platform has been designed to overcome the geographic, language, and temporal challenges for such trans-global partnering. This brings us to the third and last core value proposition: OGC members will have the opportunity to access the creative knowledge flows and the new competitive architectures uncovered through direct and sustained participation in deal-based activities.

Perhaps the most challenging shift for companies to internalize is to recognize that competition is less about what you know today and more about rapidly learning about tomorrow. This thinking is still ingrained in the value of patent protection and tries to ignore the rapidly decreasing half-life value of knowledge in general. There are signals from the market that competition has shifted towards design innovation, rapid appropriation and use of new knowledge, and the need to learn faster by discovery and iteration. As stated by the OECD Open Innovation for Global Networks (*http://tinyurl.com/242jbjt*):

"The most important benefit of open innovation to companies is that it provides a larger base of ideas and technologies. Companies look at open innovation as a close collaboration with external partners – customers, consumers, researchers or other people that may have an input to the future of their company. The main motives for joining forces between companies is to seize new business opportunities, to share risks, to pool complementary resources and to realize synergies. Companies recognize open innovation as a strategic tool to explore new growth opportunities at a lower risk. Open technology sourcing offers companies higher flexibility and responsiveness without necessarily incurring huge costs."

OGC brings this opportunity for large multinationals to join the network and actively participate in the open innovation process in the ecosystem. By sponsoring the platform and contributing to proposals, they get insight into the flow of opportunities and can develop relationships with the companies that are developing the solutions. This first-hand learning and position of trust with the

players involved puts them in a very privileged position compared to those relying on market study reports and press releases.

Conclusion

OGC is being created based on three value elements that are common to all members of the ecosystem:

- OGC exists to enable the co-creation of deals through the sustained collaborative efforts of a global network of trusted partners with superior and diverse knowledge.

- OGC exists to enable the execution of deals more rapidly, more cost effectively, and at lower risk than outside the network.

- OGC members will have the opportunity to access the creative knowledge flows and the new competitive architectures uncovered through direct and sustained participation in deal-based activities.

OGC is an international trade keystone anchoring a business ecosystem that brings together players from five national capital cities in a trusted environment, centered on rapid co-creation of superior deal-winning solutions. Quite simply, OGC delivers “Deals Without Borders."

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OTTERCALL: A LANGUAGE LEARNING COMPANY

"Language as the technology of human extension whose powers of division and separation we know so well, may have been the Tower of Babel by which men sought to scale the highest heavens. Today computers hold out the promise of instant translation of any language into any other code or language."

Marshall McLuhan

Using computer-assisted speech recognition to evaluate the pronunciation of a speaker, Ottercall provides its customers with feedback on how to improve their language skills. In this article, Ottercall's plan to enter a crowded competitive environment will be described. The article first describes the language-learning market and the points of difference between existing solutions. Next, it will outline the various strategies and decisions considered by Ottercall in developing its market entry strategy. Finally, the lessons learned through this process will be shared.

Language Learning Market

Table 1 shows that hundreds of millions of people speak a second language. For the most part, these language learners rely on traditional, didactic methods where the teacher instructs the pupil face-to-face in a classroom environment. Desktop language learning software, such as Rosetta Stone (http://rosettastone.com), automates the role of the teacher to enable the student to effectively learn a language. However, comprehensive desktop solutions tend to cost in the neighbourhood of $500, which is beyond what many consumers can afford. Recently, more affordable options have become available through online language learning applications such as Babbel (http://babbel.com) and Livemocha (http://livemocha.com).

Table 1. Secondary Speakers of Major Languages in 1997

Rank	Language	Number of Learners
1	French	190 million
2	English	150 million
3	Russian	125 million
4	Portuguese	28 million
5	Arabic	21 million
6	Spanish	20 million
7	Chinese	20 million
8	German	9 million
9	Japanese	8 million
Total		571 million

Source: The World's 10 most influential Languages, http://www.andaman.org/BOOK/reprints/weber/rep-weber.htm

Comparing Existing Approaches

Rosetta Stone, Babbel, and Livemocha are three of the more popular language learning solutions. Figure 1 illustrates that Rosetta Stone and Babbel use a traditional approach; money flows from the learner to the company in exchange for language learning products or services.

Figure 2 illustrates Livemocha's approach. It includes a second shareholder group: instructors that collaborate with learners through an online platform. In-

Figure 1. A One-sided Language Learning Model

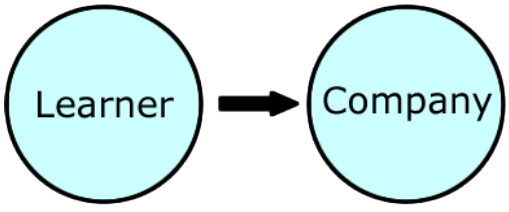
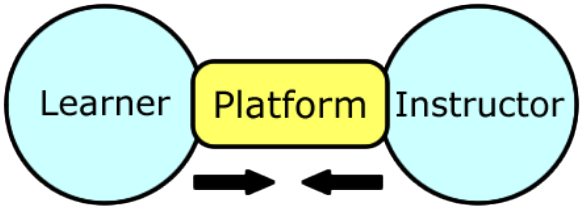


Figure 2. A Two-sided Language Learning Model



structors create content such as flash cards, grade quizzes, and provide learners with feedback. Largely due to the value added through the involvement of two sides, Livemocha has attracted over 5 million members in over 200 countries since 2007.

A Multi-sided Approach

To increase the benefits of collaboration, Ottercall will implement the new approach described by Bailetti in the June issue of the OSBR (http://tinyurl.com/32jlwm7). The new approach is developed further by several authors in this issue. Figure 3 illustrates that Ottercall is designing a multi-sided platform that includes the following stakeholder groups: learners, language schools/instructors, software developers, educational software companies, and researchers. Table 2 provides the value proposition for each stakeholder group.

Co-creation in Language Learning

Co-creation is "any act of collective creativity that is experienced jointly by two or more people" (Sanders and Simons, 2009; http://tinyurl.com/23uzq25). It is a special case of collaboration where the intent is to create something that is not known in advance (Pedrosa, 2009; http://tinyurl.com/28vfbc7). Co-creation also can be thought of as a form of customer-driven development, as espoused by Steve Blank (http://steveblank.com).

With the one-sided approach to language learning used by Rosetta Stone and Babbel, there is no co-creation. All the creation is performed by the language software company. They create the product and make it available to customers in exchange for money.

In the case of Livemocha's two-sided approach, there are elements of co-creation

Figure 3. Ottercall's Multi-sided Language Learning Model

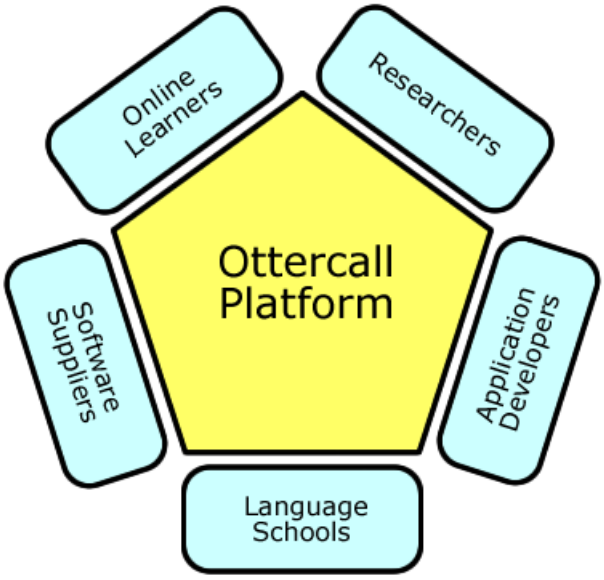


Table 2. Value Propositions for Ottercall's Multi-sided Language Learning Platform

Side	Value Proposition
Online learners	• save time and money • easier access
Software suppliers	• revenue from sale of complementary products • clear path to monetization
Researchers	• free access to data (e.g., audio and analytics)
Application developers	• revenue from sale of complementary products
Language schools	• revenue from long-tail, niche languages • increased revenue through access to more students

on the learner side and between the learner and instructor sides. Instructors are able to create flash cards to help learners practice. Learners can answer questions from the course content that instructors can then grade. The scored content is available for everyone to view and learn from. Learners can also collaborate with other learners to practice speaking the language using chat and audio features.

A key advantage of Ottercall's multi-sided approach is that it enables co-creation by allowing members of the different sides to take over specific tasks to contribute value. This will give Ottercall a competitive advantage in the face of well-established incumbents. The benefits include reduced risk, new relationships, new knowledge, and new capabilities.

Without the co-creation element, there would be excessive risk in building the entire system from scratch. A substantial investment of resources would be required to develop the system and despite any amount of research efforts, it would not be clear until the solution was complete whether it would meet the needs of customers and attract sufficient demand to be profitable. Incorporating co-creation throughout the process will motivate users and partners to contribute their time, efforts, and resources. Involving participants will make the product more likely to satisfy their needs because they are the target user and also partners in creation.

Pursuing co-creation will form new relationships between participants in the platform that will tighten their bond and turn them into stronger stakeholders. Building these relationships have been shown to stimulate engagement in co-developing innovations (Pedrosa, 2009; http://tinyurl.com/28vfbc7). For example, third-party software developers will form relationships with the instructors and learners that use their offering.

Ottercall will need a way to motivate stakeholders to participate. By offering the promise of acquiring new knowledge for participating in the co-creation process, they will be more likely to participate. For example, third-party software developers can engage instructors to gain more domain knowledge in order to create a better product.

Other examples of co-creation that may occur include:

- instructors collaborate to create course content
- learners rank the instructors and lessons so that other learners can choose content based on the rankings
- instructors' communication with learners is recorded for other learners to learn from
- learners create audio and metrics that researchers will consume
- software developers create applications that instructors can offer to learners
- instructors and learners rank the applications so that other learners and instructors can choose which applications to use based on the rankings
- using metrics and data collected from learners, researchers can determine best practices and how to improve the platform to optimize learning
- educational software companies can collaborate with instructors to create additional services for their offering

- educational software companies can integrate third-party applications into their offering

Perhaps the main reason for Ottercall to facilitate co-creation is the belief that through new capabilities, a superior end product will result. Involving other participants in the co-creation process ensures that the product will be built with the right capabilities to solve their problem. For example, enabling instructors to define their own content will allow them to offer the exact functionality to their respective learners.

Platform Trust

Companies must not underestimate the importance of trust when building a platform that requires significant investment from participants. Technology news sources are littered with controversial stories about multi-sided platforms, such as Facebook or Apple, in conflict with their partners over trust issues. Executives are understandably hesitant to put the future of their company in the hands of the platform owner if trust is in doubt. Large corporations such as Facebook or Apple encounter trust issues. The challenges are even greater for startups.

In this issue of the OSBR, Moreas describes three dimensions of trust: ability, integrity and benevolence. These must be established by both Ottercall and its platform participants. Not only does Ottercall need to deliver a great solution but it also needs to convince participants that it has the ability to deliver, the integrity to deliver, and the benevolence to deliver.

Opensourcing code, blogging about results, and receiving positive reviews will ensure that participants believe in Ottercall's ability to perform. Establishing Ottercall's integrity requires an open dialogue with participants using public discussion forums that are free from moderation, providing data to researchers for free, and announcing goals in advance. Ottercall wants its participants in the platform to succeed and the success of the platform's participants equates to Ottercall's success. Accordingly, Ottercall will seek ways of demonstrating its benevolence. For example, Ottercall will seek partnerships with non-governmental organizations (NGOs) that otherwise could not afford to transact in the platform.

The same dimensions of trust need to exist inside the platform between the different participants or else no transactions will occur and Ottercall will fail. In order to establish the ability of participants, a ranking and commenting system will be established where participants can rank each other and leave comments. In essence, these metrics are a demonstration of the level of trust in that particular participant. The ranking and commenting system would also establish the integrity of participants. Trust will be reflected in high rankings; distrust will be reflected in low rankings. Benevolence is more difficult to foster among participants in the platform since they each have their own motivations for participating. By being an open and benevolent company, Ottercall hopes that the same culture is adopted by participants.

Designing the Platform

Within the overall multi-sided approach, Ottercall is currently making design decisions to define the platform. These decisions impact the sources of revenue, the quantity and quality of co-creation opportunities described earlier, and the degree of control retained by the platform owner. But these decisions are not mutually exclusive; the multi-sided approach allows for multiple revenue-regeneration approaches to be pursued simultaneously with a single platform.

The first decision is to bridge the gap between the existing language learning classroom infrastructure and the shift to teacherless software applications. The platform will allow classrooms to offer web-based solutions to both local and remote students. The instructors would save money by not requiring all students to attend classes and make additional money through access to new remote students via the platform. Students would be able to get easier access to classes and get certifications that would normally require them to attend classes.

The second decision is to address the underserved market for languages that are not being offered by the incumbent language learning companies. Participants will be encouraged to co-create niche language content.

The third decision addresses the bias toward language learners in existing language learning platforms. In other platforms, the language learners tend to be the side that is subsidized, even though they are the side that the revenue comes from. Ottercall would subsidize the instructor's side, to encourage more instructors to join the platform. In turn, more revenue-generating learners will come to the platform, particularly in search of niche languages. By providing more control to the instructor, they will be more motivated through co-creation to produce more content that can in turn be offered to learners. A clear monetization system that lets instructors set their own prices allows the different sides to co-create content that the entire platform would benefit from.

The fourth decision addresses the lack of an API or "store" that lets third-party developers create applications for the platform. Instructors and learners would benefit from complementary offers from third-party applications, including flash cards, memorization systems, and language games for learners or analytics and grading tools for instructors.

The fifth decision is whether or not to pursue an open source strategy. This maintains the least amount of control of the platform, but could stimulate the growth of the platform through even greater co-creation opportunities. Participants would be able to customize the solution to best fit their needs and commit useful features back into the repository so that everyone can benefit.

Conclusion

Co-creation enables small firms without a definitive concept of what the finished product will look like to setup a means of facilitation to tackle big problems they otherwise could not. Through collaboration with learners, instructors, software developers, researchers, and language learning companies, Ottercall will facilitate the creation of strong products and services that solve real problems and provide value to participants.

Compared to a traditional single-sided approach to language learning, Ottercall's multi-sided approach holds promise for reducing the risk faced by most start-ups, but by no means guarantees success. By encouraging co-creation and the development of trust between participants, Ottercall will improve its chances of growing revenue in a space where well-established incumbents exist.

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"Trust is essential to good market operation because ultimately it decreases operating costs and risk exposure. A well-trusted marketplace will need to spend less in attracting customers and in managing their interactions, which means that it will be much easier to scale."

Marco Iansiti and Roy Levien

Trust is very important to companies that participate in electronic markets and the keystone organizations that operate these markets. No company wishes to deal with a keystone that is not trustworthy or purchase a solution from a supplier that it does not trust. To grow a community, the keystone and the suppliers that are its marketplace members must be trusted.

Providing users of a marketplace with tools to measure trust in suppliers' solutions may reduce transaction costs and increase the number of deals closed. The objective of this paper is to examine how to measure trust in suppliers' solutions offered in a marketplace. The discussion on how to measure trust in a keystone is deferred to a later paper.

This paper is organized into six parts. The first part defines trust and the second examines the concept of trust transitivity, which is the use of indirect trust in a trust network. The third part describes how trust can be measured. The fourth provides an overview of the author's research, which examined how the numbers of observations about a solution-supplier's ability, integrity, and benevolence affect a customer's uncertainty and belief in the solution offered in the Eclipse Marketplace. The fifth part discusses the implications of this research for keystone operators. The last section provides conclusions and summarizes the relevance of this research.

What is Trust?

Trust is an element of the relationship between two parties, a truster and a trustee. A working definition of trust is drawn from the work by Mayer, Davis, and Schoorman: "Trust is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the truster, irrespective of the ability to monitor or control that other party" (http://tinyurl.com/3xqz2qb). Trust is, therefore, a willingness to take risk. Moreover, individuals take risks only when they have something to gain.

The three dimensions of trust are: ability, integrity, and benevolence. Ability refers to the truster's belief that a trustee is able to deliver a given product or service in a given manner. Integrity refers to the truster's belief that the trustee will fulfill agreements as promised. Benevolence is the truster's belief that the trustee wants to do good for the truster. These dimensions embody the main elements that one can observe about a trustee. One will decide whether or not to trust based on the trustee's ability to deliver, integrity to deliver, and benevolence to deliver. When the parties have never before had a business interaction, the truster seeks indirect evidence to support a decision.

Trust Transitivity

Trust can be established from the truster's direct experience with the trustee or can be indirectly derived from recommendations made by others.

Trust transitivity is the use of indirect trust in a trust network. A trust network is established when one party derives indirect trust in a third party through their relationship with someone they trust directly. For example, Alice wants to con-

tract a Java developer, but she does not know anyone who she can really trust who has the required skills. Alice trusts Bob, and Bob knows and trusts Charlie as a good Java developer. The trust network is established: Alice -> Bob -> Charlie. The level of belief or disbelief that Alice has in Bob will contribute to Alice's final decision whether or not to hire Charlie. Consequently, even though Bob's trust opinion of Charlie will not be the only factor in Alice's hiring decision, that opinion will hold a degree of influence in her final trust decision.

In this example, Bob's direct experience working with Charlie was essential for establishing Alice's indirect trust in Charlie. This concept extends to organizational trust. As Bruce Yandle argues, mechanisms that ensure trust include "the reputational capital of the service firm or owner, and recommendations from other customers [...] that can be assessed directly only through experience" (http://tinyurl.com/2cnjm53). Therefore, leveraging experience from other customers helps a truster to establish indirect trust in a service or product supplier. But, what if there is no direct experience to draw upon? In the next section, a method of measuring indirect trust by observing a supplier's interactions is described.

Measuring Trust in a Marketplace

Trust can be measured using an approach called Trust Network Analysis with Subjective Logic (TNA-SL). With TNA-SL, it is possible to calculate values of trust opinions and to combine multiple trust opinion values. In the example above, TNA-SL enables us to measure Alice's level of belief in Bob and Bob's level of belief in Charlie, and then to combine them to determine an estimated indirect level of belief of Alice in Charlie. These trust opinion values are measured based on the number of positive and negative observations that Alice has about Bob, and the number of positive and negative observations that Bob has about Charlie.

TNA-SL can be used to measure trust opinion values of marketplace members about products and services offered by suppliers in that marketplace. Trust opinion values can be calculated based on the community members' feedback about the solutions and services published in the marketplace. It is also possible to measure the trust opinion values about the members themselves based on their activity and participation within the community.

Research

In the author's master's thesis, TNA-SL was used to examine whether or not providing additional observations on a solution-supplier's ability, integrity, and benevolence help decrease a customer's uncertainty and increase a customer's belief about the supplier's solution. This research used 621 observations on members and suppliers' solutions inferred from information collected from the Eclipse Marketplace website (http://marketplace.eclipse.org). Observations about 232 members and 16 solutions were drawn from two solution categories in the Eclipse Marketplace: Documentation and Team Development.

The research delivered:

1. A model to measure trust in suppliers' solutions offered in a marketplace.

2. An approach to automatically calculate trust values of solutions offered in a marketplace.

3. Insights on ways to increase trust and decrease a customer's uncertainty about a solution offered in a marketplace.

The research results suggest that customer uncertainty decreases with additional observations on solution-suppliers. All scenarios we examined show that uncertainty decreases when additional information about a solution supplier's ability, integrity, and benevolence are made available. On average, uncertainty values decrease 3.23% when observations were added.

Providing additional observations on solution-suppliers does not necessarily increases the belief in a solution. Belief increases or decreases based on the judgment made about such observations to identify them as positive or negative.

Providing ways to allow solution-supplier's to share knowledge with marketplace members, for example by releasing whitepapers, makes it possible for potential customers to identify which suppliers share and which suppliers do not share information with the community. While the group that shares their knowledge would have their belief value increased, the second group identified as not willing to share would have their belief decreased.

Implications for Keystones

A marketplace is operated by a keystone that supports the platform and the community anchored around the platform. A customer goes to a marketplace when they trust the keystone that is operating it is a legitimate platform operator and community hub. The trust network for a vendor neutral marketplace can be represented as: customer -> keystone -> members -> suppliers.

Keystone operators can take advantage of the research findings described above by providing as much information as possible about their members and about the solutions announced in their marketplaces. This will allow members to make observations along the three dimensions of trust:

1. Ability: the keystone should enable observations that show a solution suppliers' ability help to increase customer's belief. Solution-suppliers should provide as much evidence as possible about their ability to deliver a solution.

2. Integrity: keystone operators can enable solution-suppliers to show their integrity to potential customers by providing them with ways that attest their correctness to deliver what they said they would deliver.

3. Benevolence: if the keystone wishes to act in the best interest of their customers, it should provide suppliers with as many mechanisms as possible to allow them to show their benevolence. It is on the suppliers' hands to use such mechanisms to gain customers' belief in their solutions. Information that shows a solution-suppliers' benevolence should always be made public on a marketplace website. Examples include suppliers participating in organizations that advocate on behalf of customers and statements from suppliers that their success depends on their customers' success.

Conclusion

Trust can be defined as the "willingness to take risk". This willingness depends upon positive observations about a trustee's ability, integrity, and benevolence. When no direct observations about a supplier or the supplier's solution are available, then trust transitivity (relying on the recommendations of others) becomes important. In a marketplace operated by a keystone, the members should be encouraged to provide customers with recommendations of products and services.

The potential benefits of the results of the research described in this paper are:

- reduced transaction costs for members who access a marketplace
- increased number of deals closed by marketplace members

This research is relevant because it provides an approach to calculate trust opinion values of the solutions offered in the marketplace operated by the keystone. These trust opinion values are visible and may be able to reduce members' search and information costs.

This research is also relevant to the academic community for two reasons. First, the research provides concrete examples of how to calculate trust opinion values in a real marketplace. Second, this research brings together two separate literature streams: trust network analysis with subjective logic model proposed by Jøsang et al. (http://tinyurl.com/37pjexz) and trust dimensions analysis by Mayer et al. (http://tinyurl.com/3xqz2qb).

Finally, this research is relevant to operators of keystones for two reasons. First, the research can guide a keystone to help its members increase trust in their solutions. Second, the research shows how the keystone can increase the trust that organizations place on the solutions offered in its marketplace.

To be trusted, a keystone should provide tools that enable users of its marketplace to assess the ability, integrity, and benevolence of the suppliers of solutions posted in the marketplace. TNA-SL can be used to make visible the level of trust in the services and products published in the marketplace.

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"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

Albert Einstein

Traditional development and commercialization models take too long, cost too much, and expose founders to excessive risk. A new approach for small technology companies to generate revenue has been proposed (Bailetti, 2010; http://tinyurl.com/2fzzp8w). In the new approach, the top management team of a small technology company uses a a platform to co-create value by collaborating with all the stakeholders of its development and commercialization decisions and builds trust on its work practices and market offers.

The purpose of this article is to provide the lessons learned from working with a top management team of a profitable business that uses a traditional approach to development and commercialization and wishes to migrate to the new approach. The article will be useful to managers and owners of existing small companies and vendor-neutral, non-profit organizations that wish to grow their businesses.

The article is organized as follows. First, a hypothetical situation of a musical band illustrates the options available to a company that wishes to increase its revenue. This example is based on our work with a local technology. Next, we describe the lessons we learned while preparing the plan to migrate the existing company to the new approach to generate revenue. The hypothetical situation is used to illustrate the lessons learned. Finally, conclusions are provided.

A Hypothetical Example

Consider an existing, small musical band that would like to increase its revenue. At present, the band generates revenue selling recorded music through its website and local music stores, as well as performing concerts. Feedback from customers is limited. To grow revenue, the band can use one of three models:

A. Continue to operate in the traditional, standalone mode. The band can invest more time and money pushing sales through its website and local music stores and perform more concerts. This is akin to attempting to increase revenue by doing more of the same.

B. Become a player in a multi-sided platform operated by another company. Band members can become active platform players in somebody else's platform. They can use the platform to interact with music agents, their fans, and the fans of other musicians.

C. Become a platform owner. The band can operate and evolve a multi-sided platform on its own or with others. Using this model the band has control over the structure of the platform that provides the best-long term benefits for them.

For Model A and Model B, the band's revenue is directly related to their effort's level. If the band stops recording new albums or performing concerts, their revenue will decrease. Model C provides the band with revenue from (i) charging for recordings and performing concerts; (ii) charging an access fee to the platform; and (iii) charging transaction fees to platform participants.

In the next section, we summarize the lessons learned while helping a top management team of a local company decide whether or not to migrate their existing technology business from the traditional approach (Model A) to the new approach (Model C). We use the band example outlined above to illustrate the lessons we learned.

Lessons Learned

Lesson 1: The top management team of an existing company will need good answers to the following questions before considering migrating their Model A company to a Model C company:

- What changes do I need to make to my existing Model A company to become a Model C company?
- What are the benefits and costs of migrating to a Model C company?
- Why and how will the Model C company generate more revenue than the Model A company?
- What parts of my existing Model A company can we migrate "as is" to a Model C company? What do we need to throw away?
- What should the platform of the Model C company look like?
- Can we concurrently operate both a Model A business and a Model C business?

Lesson 2: All stakeholder types must be identified. A stakeholder is a group that affects or is affected by how the band develops and commercializes its products and services. Using Model A, the band will perceive fans that pay for the band's recordings and concerts as their customers and the only relevant stakeholder group. Using Model C, the band's stakeholder groups include agents, other bands' fans, service providers, suppliers, venue owners, and so on.

Lesson 3: Top management teams operating Model A companies will incorrectly perceive the platform of the Company C model as a mere second channel to market. The platform of a Model C company enables co-creation between the company and: (i) its stakeholder groups; (ii) other platform participants, and (iii) stakeholders of other platform participants. Using Model C, the band will be able to use the platform to create value with other bands and their stakeholders.

Lesson 4: The platform of a Model C company is not the product or service of the Model A company. The platform of a Model A company is designed to meet the needs of only one stakeholder group: customers. The platform of Model C company is designed to meet the needs of multiple stakeholder groups. Early in the process of migrating from Model A to Model C, the top management team of a Model A company sees its own product or service platform as the platform to use as a Model C company. This is akin to wanting to design a product without understanding the problem the customer wants the product to solve. In the band example, the products in the Model A company were the songs produced by the band and sold to the fans. For the Model C company, the band's music is part of the platform, but is not the focal point.

Lesson 5: Define what value the various stakeholder groups will derive before designing the platform. Avoid defining platform features early in the migration process. At the start, it is important to identify the stakeholder groups that will pay to become platform participants and the reasons why they will pay. To define platform features and the architecture of participation you need to know what value each stakeholder group will derive from the Model C company.

Lesson 6: To design a Model C company you need to consider seven dimensions (Bailetti, 2010; http://tinyurl.com/2fzzp8w). These dimensions are represented by the steps we followed:

1. Define the community outcomes and the "bumper sticker" phrase that will represent them in five words or less.

2. Identify the stakeholder groups and the value proposition for each group.

3. Identify the number of participants for each stakeholder group.

4. Define the price structure (i.e., platform access fees and transaction fees).

5. Identify the platform type and key features.

6. Define the governance structure.

7. Identify the community health metrics that will be tracked.

Lesson 7: The design process is iterative. For example, the community outcomes, the bumper sticker, and the value propositions for stakeholder groups were revisited a number of times. Each time one component of the design was improved, all other components were re-evaluated.

Lesson 8: The bumper sticker is used to brand the community that is anchored around the platform of the Model C company, not the products and services that will be delivered by the Model C company.

Lesson 9: The selected stakeholder groups affect the nature of the desired community outcomes and the bumper sticker. To illustrate what happened in our case, assume that the first definition of the bumper sticker was: "Greater freedom for independent musicians" and the two stakeholder groups were Fans and Musicians. The Fans stakeholder group was defined as the fans of independent music that want to follow their favorite bands and find new music. The Musicians stakeholder group was defined as different independent bands that want to attract a larger audience.

Initially, the rationale was that musicians could gain exposure to a wider fan base and that the fans could gain an easy way to find out about other bands. However, it was discovered that there is little incentive for either stakeholder group to pay a fee. It was decided that this initial attempt was a simplistic view of the stakeholders of the Model C company. It was clear that other stakeholder groups could bring significant value to fans and musicians and would be willing to pay. As a result, we added two stakeholder groups and redefined the previous two, as shown using the band example:

1. Fans: fans of the independent arts who seek new artists.

2. Musicians: bands that want to make more money from their music.

3. Licensees: groups, such as film makers, that would benefit from access to musicians and are interested in licensing the music instead of purchasing it.

4. Venue owners: owners of bars, independent movie theaters, and other venues that want access to new and unique products.

The new stakeholder groups require a revision of the initial bumper sticker, such as: "Building a profitable independent arts community."

Lesson 10: Those closest to the problem of migrating to Model C company benefit from outside perspectives. Moving from a Model A company to a Model C company requires a change in business model paradigm.

Lesson 11: Stakeholder groups should be defined in terms of the value they wish to extract from the platform instead of their attributes. The initial tendency is to define stakeholder groups in terms of their attributes, such as size, nature of their business, location, and occupation. A much better way is to identify stakeholder groups based on their needs. In our example, instead of having film

makers, radio stations, restaurant owners, and advertisers as separate groups, they are all part of a larger group that has a need to license music.

Lesson 12: Each stakeholder groups needs a different customer value proposition. Each stakeholder group has a different reason for paying to become a platform participant. The Model C company must ensure that each value proposition is communicated effectively to the members of the stakeholder group and that the platform delivers the value promised.

Lesson 13: An "externality matrix" proved to be a valuable tool for describing and defining the features of the platform. A critical aspect of the platform is that a platform participant of a shareholder group must derive value from an increase in the number of participants in the other shareholder groups. These network effects, also known as network externalities, must exist for the Model C company to generate profitable revenue.

An externality matrix can be applied at any stage in the platform design phase. Table 1 shows an externality matrix using the band example. Each cell in the table relates the value of adding one more member of a stakeholder group (columns) to the other groups (rows). Using our example, adding more fans provides the fans with a stronger voice to get more and better music, adding more musicians gives the fans more choice, adding more licensees gives the musicians the opportunity to earn money from royalties. The matrix provides an indication of the strength of the proposed business model of Model C companies; the more items per cell and the greater the strength of each item, the higher the probability of success.

Table 1. Externality Matrix Showing the Value Derived Between Groups

<table>
<tr><th></th><th>More Fans</th><th>More Musicians</th><th>More Licensees</th><th>More Venue Owners</th></tr>
<tr><td>Fan</td><td>Greater demand for more and better music</td><td>More choice</td><td>More opportunity to hear their favorite artists in other media</td><td>More opportunity to see their favorite artists</td></tr>
<tr><td>Musician</td><td rowspan="3">More customers</td><td>More collaboration opportunities</td><td>Opportunities to earn money from royalties</td><td rowspan="2">Greater awareness of their existence</td></tr>
<tr><td>Licensee</td><td>Easier to find musical talent for soundtracks</td><td>Reduced cost through shared lessons from diverse experiences</td></tr>
<tr><td>Venue Owner</td><td colspan="2">Larger talent pool to draw from</td><td>Shared risk of acquiring new talent</td></tr>
</table>

Lesson 14: Creating a platform can provide ideas for new offerings. In the process of considering various scenarios for interactions among stakeholder groups, ideas for new products and services emerged. These ideas may affect the existing Model A business. For example, in the process of designing the company platform, we realized that a new process could be created from the existing products offered by the Model A company.

Conclusion

Using the new approach embodied by Model C companies requires a different thought process than the one used to create a Model A company. Traditional businesses are focused on finding customers, determining what is valuable to them, and delivering it in a form for which they are willing to pay. The new approach is about creating a balance between active participants, where everyone gains and provides value to everyone else. This business model has the potential to solve many of the problems small businesses are facing, but it requires thinking beyond the current buyer/seller relationships.

The process of migrating or complementing an existing business with this new approach is still in the exploratory stage. It is hoped that this article will generate greater interest and encourage others to search for opportunities to use the new approach.

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Q. How do you motivate potential participants to pay to join a platform?

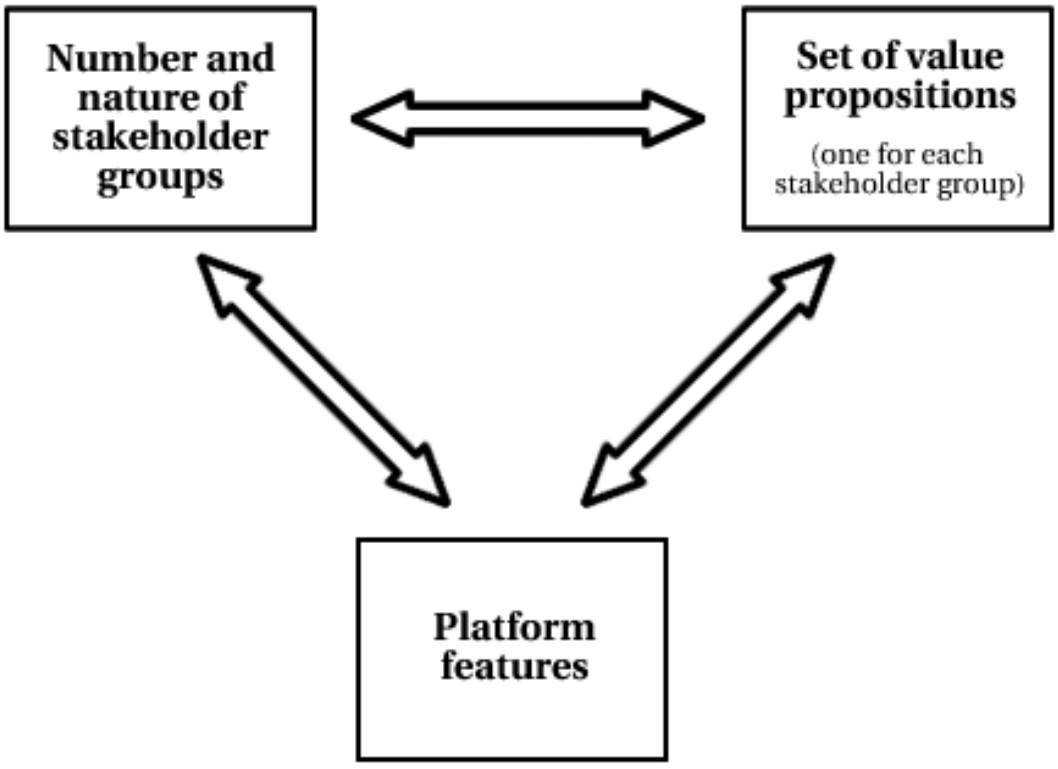
A. A company that operates a multi-sided platform must convince participants to pay an affiliation fee to access the platform. The challenge is to determine what it will take to motivate the participants to pay to collaborate with each other.

To motivate participants to pay an affiliation fee, a multi-sided platform must deliver unique value to the various stakeholder groups its sides represent. For example, if a platform is designed to generate revenue from three stakeholder groups: developers, users and researchers, it must deliver unique value to each of these three groups. Developers must receive more value from participating in the platform than the value received from not participating in the platform. The same holds true for users and researchers.

To generate revenue, a platform must be designed to deliver compelling value propositions for each stakeholder group. To illustrate how this can be achieved, we will describe five lessons learned while defining value propositions for a technology company.

Lesson 1: Defining value propositions for multiple stakeholder groups at the same time is a challenge because the platform features and the number of platform groups are not known with certainty. Figure 1 shows that the definition of multiple value propositions, platform features and the number of stakeholder groups are interdependent.

Figure 1. Key Dependencies in Platform Design



A process and tools are needed to concurrently define the number and nature of stakeholder groups, value propositions, and platform features.

Lessons 2: Each value proposition is comprised of three or fewer statements that describe the platform's points of difference that deliver the greatest value to a particular stakeholder group. The points of difference should be defined in terms of the next-best alternative available to the stakeholder group.

Lesson 3: The multiple value propositions need to be internally consistent. To make sense, a value proposition for a stakeholder group needs to be consistent with the value propositions of the other stakeholder groups. Viewing each side of the platform as a single-sided market segment may result in the development of a set of single-sided value propositions that are inconsistent with each other.

Lesson 4: The process of defining multiple value propositions is highly iterative and requires significant domain knowledge. For example, one can start with "system integrators" as a stakeholder group, but as value propositions are being prepared you may realize that "co-creators" is a better stakeholder group.

Lesson 5: After a set of value propositions is prepared, the strength of the externalities between the stakeholder groups should be assessed. This is required because the value of the platform increases only if the value to a platform participant increases with the size of the participants in the other stakeholder groups.

Figure 2 illustrates an externality matrix. We started with 6 x 6 matrix (36 cells) given that we were considering six stakeholder groups. For each XY cell we asked the question, if we increase the number

Figure 2. Externality Matrix

1. Increasing the number of:

2. Results in value to:

	Buyers	Sellers	OEM	Service/Tool Providers	Researchers & Educators
Buyer					
Seller					
OEM					
Service/Tool Providers					
Researchers & Educators					

of platform participants in stakeholder group X, how does this affect the value to platform participants in stakeholder group Y? We then captured the answers in the cells. If the answers were similar, we merged the cells. For example, Figure 2 illustrates that all the answers for the Research and Educators column were the same for all cells.

Conclusion

Creating a multi-sided platform from scratch is a challenge. Future research will provide answers to some of the obstacles we encountered. There are numerous challenges that result due to the recursive dependencies. But the answer to the question is clear: if you want to motivate potential participants to pay to join a multi-sided platform, the platform must deliver unique value to the various stakeholder groups its sides represent.

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Begin with a thought-provoking quotation that matches the spirit of the article. Research the source of your quotation in order to provide proper attribution.

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Any quotations or references within the article text need attribution. The URL to an online reference is preferred; where no online reference exists, include the name of the person and the full title of the article or book containing the referenced text. If the reference is from a personal communication, ensure that you have permission to use the quote and include a comment to that effect.

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If this is your first article, include a 75-150 word biography.

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