

NETWORK EXTERNALITIES AND OPEN INNOVATION

CARL JOACHIM KOCK

ABSTRACT

The purpose of this class segment is to introduce the concept of Open Innovation (OI) to students in a strategy class in an MBA or Master's Program. In order to integrate this material in a typical Strategy curriculum, it is combined with another core topic, i.e., Network Externalities and Platform Markets. The latter should be part of any modern strategy syllabus already, and thus serve as a convenient bridge to introduce Open Innovation concepts that by their very nature are extremely closely related to externalities and platforms. More specifically, the platform nature of innovation brokers, as a particularly visible and important element of OI, is utilized to develop insights into both topics simultaneously.

Prerequisite	None – should be part of a capstone Strategy Class
Objectives of the lecture	<p>This lecture combines the logics of network externalities and open innovation. It proceeds by:</p> <ol style="list-style-type: none"> 1. Developing the logic of network externalities and especially platform markets, 2. Develops the basic logic of open innovation and helps students to understand that an open innovation approach essentially turns the innovating firm into a 'platform' with all the implications developed in the first part of the lecture, 3. Finally, Innocentive and other innovation brokers are examined as clear examples of institutionalized platforms for open innovation and strategic implications are drawn.
Workload	160 -180 minutes teaching; 2 h self-study.
Learning outcomes	<p>Knowledge</p> <p>LO #115: To remember and understand basic concepts of OI and their relationships.</p> <p>LO #51: To Understand Innovation As The Result Of The Interaction Among Economical, Technological, Organizational And Social Factors.</p> <p>Skills</p> <p>LO #99: To understand and assess networks and collaboration networks.</p> <p>LO #70: To Elaborate And Specify How Firms Can Benefit From Open And User Innovation.</p> <p>Competences</p> <p>LO #86: To Be Able Formulate A Critical Understanding Of The Factors That Contribute To Innovation.</p> <p>LO #64: To apply, analyze, evaluate and design strategic decision making with regard to the implementation of relevant open innovations mechanisms in the organization.</p>

Reading List	<p>Chao R.; The Ins and Outs of Open Innovation; Darden School Technical Note, 2013</p> <p>Chesbrough, H. W. 2006. Open Business Models: How to Thrive in the New Innovation Landscape. Harvard Business School Press Books</p> <p>Christensen, C. M., Bower, J. L. 1996. Customer power, strategic investment, and the failure of leading firms. Strategic Management Journal, 17: 197-218.</p> <p>Cohen, W., Levinthal, D. 1990. Absorptive capacity: A new perspective on learning and innovation. Administrative Science Quarterly, 35: 128-152.</p> <p>Eisenmann, T.; Parker, G.; Alstyne, M.W. Van. 2006. Strategies for Two-Sided Markets. Harvard Business Review, 84: 92-101</p> <p>Kock C. J., Salmi P., and Torkkeli M.; The "Open Innovation" Paradigm: A Contingency Perspective Journal of Industrial Engineering and Management, Vol 2, No 1, pp 176-207, 2009.</p>
European Qualifications Framework (EQF) Level	Levels 6, 7.

LECTURE CONTENT

Organization

The lecture as described in this teaching note is based on a double-session (2x80 or 90 minutes) format that can be taught together or on separate days. The following two readings should be assigned ahead of class:

- An excerpt from "Open Business Models: How to Thrive in the New Innovation Landscape" by Henry Chesbrough; specifically, the chapter "Innovation Intermediaries".
- "Strategies for Two-Sided Markets" by Thomas Eisenmann, Geoffrey Parker and Marshall W. Van Alstyne, Harvard Business Review.

Furthermore, one workgroup should be tasked beforehand with preparing a short presentation (for the beginning of the second session). The task formulation should be along these lines: "Please read the excerpt from the Chesbrough book with particular attention to the description of 'InnoCentive'; after that, please check out innocentive.com and do whatever additional research you can to derive information about the current state of that firm. Prepare a short presentation (5 minutes) that provides an introduction of this firm, its business model and current state of the business to the rest of the class".

The rest of this note makes a proposal of how to structure the interactive lecture based on the attached slide set.

Overview

In the initial session, the lecture first develops a basic understanding of the topic of network externalities and platform markets, illustrating the concept and key issues with a number of small examples. After the class has reached an understanding of these issues, the teacher should introduce the notion and key rationales for OI with the implication that the need to bring together sources and seekers of innovation naturally connects this with the externality/platform logic.

Once the class has understood the basic premises, the assigned workgroup will make a presentation on InnoCentive that gives the class the idea of immediacy and actuality and a starting point for a detailed examination of the network/platform issues that an innovation broker like InnoCentive faces. Besides exploring how this firm promotes OI on one hand and is related to platform markets on the other, a practical and broader implication will be developed by applying the logic of network externalities to examine the future prospects of InnoCentive. In particular, the question is whether this firm might be able to generate a 'lock-in' and become the only Innovation Broker by leveraging network externalities to marginalize other existing or prospective brokers, or not.

NETWORK EXTERNALITIES AND PLATFORMS

I typically start a lecture on network externalities and platforms by showing Slide #2 and simply stating that there are some products or technologies that become MORE valuable to each user the more users there are. With the slide still up I then explain the basic intuition by the example of the phone (simply raising your mobile phone in the air neatly underscores that...).

- I simply ask: if that was the only phone in the world, how much would it be worth?

The correct answer is, of course, ZERO – since the value of the phone does not come from consuming it (like a candy bar), but from connecting people. The phone only starts being of value to its

owner if there are others with a compatible technology that can receive calls. Obviously, the more others, the more valuable the phone becomes! This discussion should proceed relatively fast if the students have read the assigned technical note on platform markets – yet, it is vital to go through the next steps to ensure that they really understand how the different issues are linked together.

I continue by identifying this effect in the phone industry as a ‘direct’ (or ‘same side’) network externality (NE) and push the students to consider if there are other types. If it does not come up naturally, I prompt:

- Think of something like a videogame system (Nintendo, Sony...) – are there NEs in that system?

This discussion should uncover a couple of key concepts:

- NEs in the case of videogames are primarily ‘indirect’ (or ‘cross market sides’) – the more gamers, the more incentive for a third party (game developers) to create good games, which creates value for the gamers, incentivizing more gamers to join the system, prompting more developers to come in, etc. – a ‘virtuous cycle’ emerges!
- Also, in the case of video games we can identify 2 separate products associated with distinct players: hardware (the game base station required to play game cartridges/software) and software (the actual games).
- Hard and software are strong ‘complements’ – you need to have BOTH to create value for the customer!
- The hardware, in this case, essentially becomes a platform that mediates between gamers and game developers (I mention this, but do not push the point at this time).

The slide ‘Types of NE’ makes some of the technical distinctions apparent, while the two following slides help to make the distinction between traditional value chains and platform markets.

I then force the students to consider the implications of ‘increasing returns’ / NE:

- What happens if you have two incompatible technologies (networks) and strong increasing returns?

The discussion should lead the students to identify that strong externalities lead essentially to a monopoly position – the larger network (whether based on direct or indirect externalities) becomes ever more a centre of attraction for, e.g., gamers and developers alike, starving the other network to extinction.

Moving to the slide ‘Network Races...’ I continue this thread by suggesting that this feature of NE might make for some pretty heated competition. To illustrate these dynamics, I bring up the case of

VHS vs. Beta, which students will recognize as those 'old videocassette technologies' (the choice of an old system is intentional – it illustrates that NEs have been around for a while, shaping competition in various markets; also, students will typically bring up the successor technologies – DVD, Blue Ray, which have gone through similar cycles again!).

- *I ask: do you remember those old VCRs – which technology, VHS or Beta was considered 'better'?*

Several students will typically immediately recollect that Beta was considered technically superior to VHS. I ask:

- *Which one won?*

Well, VHS, even though it was inferior! I illustrate that on the blackboard by drawing a small (VHS) and a larger (Beta) rectangle next to each other to signify the value of the 'base station' (the actual video cassette recorder).

- *So, why did the inferior technology carry the day?*

This discussion should connect to the logic of NE and uncover a number of key points:

- VCR technologies had indirect (cross side) NE – the hardware becomes more valuable if software, in this case content in the form of movies etc., is available (you could, of course, also record content from your own TV, but how many VCR users did that? I recall the joke of the VCR still blinking '12:00' after many years – because the user never read the instructions or did anything but put in a tape...).
- Thus, movie studios were 'complementors' in this industry.
- If you (a hardware maker, e.g. Sony who promoted the Betamax system) can get lots of movie studios to make their movies available for your system, you add a large amount of value to your system – I signify that by drawing additional rectangles on top of the first (just now the total height of the rectangle for VHS is much larger than that for Beta).
- If your system offers more value overall – you win! Competition with NE is not decided on the value of the 'base' product alone, but on the combined value of that base and the available complementary products.

If this does not come up during the discussion I then prompt:

- *That is great – if you get the most complements you win the competition – but which firm will win? How do you get to the position where you offer all the content and therefore attract all the customers?*

The ensuing discussion should uncover the 'chicken and egg problem' of platform markets – once you have all customers, all complementors have NO choice but to work with you, and once you have all the content there is NO point for a customer to go elsewhere. So, one side of the market is with you because the other one is with you as well, and that other side is with you because the first one is with you...

- *Again, great, but how do you get there if one (or both) sides are missing?*

The ensuing discussion should at least touch on the following:

- You (a base station or 'platform' owner) need to 'invest' to get the self-reinforcing cycle going; once you have some customers you might get some complementors, which will attract more customers (or vice versa).
- These investments may include subsidizing one side of the market (examples: videogame systems typically sell the base station at or below costs, Google, Facebook and many other firms give their basic service 'away'), advertising, subsidizing the distribution chain, paying licensing fees for initial content (subsidize the software side...) etc.
- The NE self-reinforcing cycle starts when at least 'some' elements of one side are 'on board'.
- Once you get to a 'critical market share' the NE may become so strong that your system 'locks-in' the market, and the other system(s) dies away.

At this point I explain that market share in an NE race is indeed critical, as after all, if you are the largest network already, the self-reinforcing cycle should lock YOU in and others out – yet, what counts is NOT 'current share'; rather, the key is the share that a system commands when the market matures (use the animated life cycle graph for this). The example that brings this to life is the fate of Netscape: this early Internet browser had an absolutely commanding lead of over 90% of the browser market in the late 1990s (see e.g. Wikipedia); yet, within a few short years Microsoft managed to reverse this trend completely to >90% share for itself by 2000 (read the story here: <http://www.theguardian.com/global/2015/mar/22/web-browser-came-back-haunt-microsoft>) and essentially lock-in its own browser, the Internet Explorer. The explanation for this lies in the fact that Netscape might have had >90% share of the market at the time – but this represented only a tiny fraction of the potential market, which was just developing as the number of people joining the Internet skyrocketed. In other words, Netscape dominated the early adopters of the Internet (90% of, say, 5%...), but as the Internet use itself moved into the fast growth phase, this early lead meant nothing! During the fast growth phase, millions of people entered the Internet for the first time, often buying new computers with a Microsoft operating system and a pre-installed Internet Explorer. Having no prior experience or loyalty (switching costs...) with Netscape, these people simply clicked the Explorer button, and the rest is history.

A similar story can be told for Apple's success with iTunes – while the music industry was near-paralyzed by Napster & Co's facilitation of Music piracy, Apple recognized that music piracy was most likely committed by a rather small group – teenagers/twenties with no money, but ample time, technical knowledge and early Internet access (in schools, universities). However, the large majority of the 'rest of us' was not part of that 'early adopter' (of 'music over the internet') group, for pretty much the exactly same reasons (have money, but no time, no technical knowledge, no Internet connection yet – but a healthy respect for authority and no desire to risk a job for a 99c song...). It was that latter large market that the legal, easy-to-use, efficient iTunes software and store addressed...

I then twist the story back to VHS vs. Beta – these technologies had a large potential market; if millions of households had a VCR, the complementors (movie studios) might see this as a rather lucrative way to sell more movies. That is the lure – the large potential FUTURE market!

- Yet, when VCR technologies were introduced in the late 1970s did movie studios immediately embrace that new technology as an opportunity or did they see that as a threat?

Prompted like that, students will most likely realize that most movie studios perceived VCRs more as an extension of the threat that the TV already posed; movie studios typically gross a lot more per viewer in movie theatres – the proliferation of TVs had already undermined the movie studios' business model significantly as people shunned the cinemas. Arguably, being able to choose freely the content at home would exacerbate that trend!

Hence, the firms promoting either Beta (Sony) or VHS (JVC, Matsushita/Panasonic, etc.) could not count on the open reception and high willingness of complementors to participate (parallels to Apple and iTunes should be obvious) and rather had to work hard to convince movie studios to provide content for their budding new hardware technologies. This was likely to require some investments (hard/long negotiations, advertising, licensing fees, maybe even acquiring studios – think of Sony Pictures...) to get them aboard one of the VCR technologies.

- Ok, so each hardware sponsor tries to get movie studios to sign up. Now, if a movie studio actually starts to see VCRs as an opportunity to sell more movies, can they now just start making movie cassettes for both systems or do they have to focus on one?

This question probes into the logic of 'multi-homing costs' – i.e., the question of whether a certain market-side can easily move/switch between different networks or platforms. In this case, the discussion should reveal that multi-homing costs are fairly high, as converting large libraries of movie titles into physical 'cartridges', warehousing them, pushing them into the supply chain etc. involves high costs. Doing so for two incompatible systems is essentially prohibitive.

The implication is that movie studios need to pick a side and have then relatively high switching costs to leave that side again. Naturally, this implies further that each studio would like to pick the side that offers it the biggest potential return – in other words, each studio wants to bet on the eventual winner, the company that dominates the market at maturity! Yet, it is not clear at all which hardware would-be standard will be the winner -- and this is precisely what triggers the network race (slide; note: these are not real numbers, the slide is just for the purpose of illustrating the process of the race): each firm or consortium behind one of the technologies tries to sign up as many studios as possible, which would then lead to a self-reinforcing cycle with more customers buying the respective VCR, creating more incentives for the next studio and so on; yet, as one system starts to lead, the backers of the other system will re-double their efforts and thus draw out the competition until a 'critical share' or 'tipping point' is reached. While difficult to predict ex-ante, with hindsight it is pretty clear where this tipping point lies – it is essentially the point at which everybody becomes convinced that one technology will, in fact, win! VHS will carry the day! Once that is clear, even those complementors that have bet on the 'wrong' technology might jump horses mid-race, thereby increasing the virtuous cycle for the winning system and creating a vicious cycle for the losing one. The result is monopolization of the market by one system. To the extent that the firms behind the winning platform have managed to maintain 'ownership' of the platform (Nintendo, e.g., installed a security chip in its consoles, which allowed the firm to decide later on who could create compatible software and who would be excluded), that is the period of monetarization, while the preceding race to the tipping point is often characterized by high investments and low/negative returns (the heated race between Sony, Nintendo and Microsoft in modern game stations comes to mind).

Before summarizing the NE discussion, I ask one more question:

- *Having a monopoly position is of course great for the platform owner – but are they at risk of being replaced by another platform?*

Some students will mention the aforementioned situation of being early in a life cycle and therefore having lots of uncommitted customers entering the market; yet, apart from this special situation, the whole logic of NE is that all the value for either side of the market is WITH the dominant platform; customers do not stand to gain from trying out other platforms (especially if that would incur additional costs – e.g. buying a new base station – which serve as potent switching costs), while also the complementors have little to gain in supporting a new platform that serves a comparatively tiny fraction of the market (i.e., low potential sales). Hence, entry at a similar technological level is essentially impossible at this point. On the other hand, if a new entrant could, from the very beginning, provide so much more value with a new technology that the combined value of existing hardware and software libraries is checked, entry might become feasible again. I illustrate this by going back to the rectangles from earlier and draw a third one that is taller than the earlier 'winner'

technology. In the early videogame industry, for instance, Sega surpassed Nintendo's 8-bit system with a 16-bit system that provided such superior graphics that customers saw more value in Sega's system even with only a small game library; likewise, Blue Ray players offered such an advancement in video resolution that a small initial library was enough to lead people to switch from DVD (or VCR) technologies.

To conclude this part, I summarize the 'key logics of NE' (slide) and platform markets.

Ideally, the class takes a break at this point.

OPEN INNOVATION AND INNOVATION PLATFORMS

Transitioning from the basic NE logic to Open Innovation I ask:

- *What is an innovation?*

I condense the ensuing discussion into the traditional definition by Schumpeter (slide) as a 'new combination of existing and new resources...' and then ask:

- *Well, do YOU, or your firm, have all those resources in-house?*

In the resulting discussion, I make sure that at least the following points are covered:

- Even the largest firms do NOT have even a fraction of the brainpower of their industry (here, the example of P&G – a couple of thousand in-house R&D scientists vs. >1 million outside – is nicely illustrative). Thus, what are the chances of coming up with the BEST ideas consistently?
- Also, innovation is about 'combining' – besides your core business, there might be inspiration from various other, related areas – most of them are likely outside your firm...
- Related to the last point: trying to innovate outside your core competence likely lacks in scale economies.
- Many students will also tie this in with the logic of exploitation/exploration and incremental vs. radical or disruptive innovations (especially if these topics were covered in earlier classes) – relying on your own experience sounds like the definition of exploitation...

- *What is the typical process of innovation in a firm?*

This question expands the previous discussion by considering the 'regular' R&D process (which allows us to draw the regular in-house process as a baseline on the blackboard): Scientists 'R'esearch

► scientists, production people and marketing 'D'velop ► Marketing 'C'ommercializes - RDC. A process that is mainly in-house, but may involve, e.g., supplier or customer input (focus groups, requests, etc. – a simple version of 'openness'...) (see also Chao, 2013).

- *Do firms use ALL of their good ideas?*

This question should elicit a discussion on what happens with ideas that are not turned into products or services:

- they could be sold or licensed to someone else;
- they are often neglected;
- sometimes they might be intentionally held back (fear of cannibalizing own products – Kodak and digital cameras come to mind; they were at the forefront of developing these, but held back, in part, in fear of cannibalizing their razor-and-blade business model around film. A neat way to prompt discussion on this is 'why is iTunes run by a tech firm and not one of the music companies themselves...');
- similarly, fear of giving up a 'great market' (thus, rather not commercializing the idea to begin with – see the Chesbrough chapter).

If the last point does not come up naturally, I prompt:

- *What might be the reasons for firms seeming to waste so many good ideas?*

Besides fear of cannibalization, students typically mention issues that are related to organizational inertia, such as:

- the market is judged as unattractive;
- the current customers are not interested;
- the new products are initially inferior to what is already on the market
- etc.

These issues mirror the work of Christensen and Bower on Disruptive Innovation (1996) – the pertinent example is the disc drive industry, where leading firms developed new generations of hard drives, but found that the current customers were not interested; shelving those innovations, the firms concentrated on developing their existing products further, thereby allowing new firms (especially those started by disgruntled engineers, formerly of the incumbent firms, whose innovation had been passed over) to develop the next generation products and eventually taking over market leadership... – more recent examples include the music industry and iTunes, Kodak/Polaroid and the digital revolution, or Nokia and the touch screen phone...

- So, on one hand, there are lots of good ideas outside the firm that we typically don't consider, and on the other hand, there's great stuff inside our own walls that we often neglect – what shall we do?

Open up!

- Well, what, exactly, does that mean?

This is a broad question regarding the content of the innovation process as well as its organization. Make sure that at least the following issues are covered:

- making the boundaries of the firm more permeable
- bring in MORE customer input
- bring in MORE supplier input
- NEW: bring in inventors
- partner with other firms
- allow your own intellectual property (IP) to be offered to others
- accordingly: change the organization from the internal R, D and C, to an internal & external R & D, and facilitate 'other' firms to do the same!

- What are the potential advantages and disadvantages or 'problems' of 'opening up'?

Put the following two categories on the board – you will need them later! For more background, please see Kock, Salmi and Torkkeli, 2009.

Key potential advantages:

- More ideas
- Faster development
- Integration of new perspectives
- Better customer reception
- Better coordination with suppliers
- Less waste of great ideas (related to that: fewer disappointed members own staff who had worked at ideas that were shelved...)

Key potential DISadvantages:

- More nodes/interactions may actually slow down things.
- More actors/external actors may lead to inefficiencies as there are less established routines of working together, incompatible systems etc.
- Requires a high level of existing absorptive capacity (i.e., the ability to recognize, make sense and

act on knowledge outside the firm (Cohen & Levinthal, 1990)) from the focal firm – otherwise absorbing knowledge might not work.

- Problems of accessing (or offering) key pieces of IP – the Arrow Information Paradox discussed in the Chesbrough chapter (i.e., to decide whether a piece of IP is worth anything for the buyer; the seller must demonstrate it, thereby essentially giving the information away for free... The example of Steve Jobs's visit at Xerox' Palo Alto Research Center (PARC) comes to mind, where Jobs got the inspiration for the graphical user interface and the mouse (e.g: <http://fortune.com/2014/08/24/raw-footage-larry-tesler-on-steve-jobs-visit-to-xerox-parc/>).

- If the actors expect this, they will not offer their IP in the first place ► Market failure!
- Related to the last point: Potential leakage of key capabilities from interacting with others for 'own' innovation or simply from selling IP.

- *Do you see parallels with the discussion we just had on platform markets?*

► ideally, the firm becomes a platform between idea generators and customers; self-reinforcing NE would ensue – the more ideas ► the more customers ► the more ideas...

In fact, the platforms we discussed earlier – VCRs, iTunes – or App stores – are extreme examples of just this: a firm creates a way for many other actors to come together and create new sources of value for clients that they reach through the platform; when Procter & Gamble uses a system called connect + develop (www.pgconnectdevelop.com/) to crowdsource innovation that it then includes in its products, it does essentially the same, save for actually producing the products itself, while in the aforementioned platforms the production task is typically performed by the complementors themselves. The instructor may wish to probe these similarities and differences a bit deeper with the students.

- *At this point I call up the student work group that has prepared the presentation on InnoCentive.*

This approx. 5 min presentation should provide a good overview of the current state of affairs of this Innovation Broker and will most likely highlight the current numbers of idea sources and seekers.

Once the presentation concludes, I continue:

- *Many thanks to the group for their insights on InnoCentive! Let's connect the dots a bit – to what extent does InnoCentive create a 'solution' to the 'problems' that Open Innovation poses?*

The discussion should identify the logic of an innovation broker as a platform approach (tying in with the discussion in the first session) to make OI feasible on a larger scale. Specifically, the follow-

ing points should be touched (probe with additional questions if necessary):

Arrow Information Problem

- As described in the Chesbrough chapter, the broker provides a solution to the Arrow information paradox by serving as a reliable intermediary that both parties can trust. By tying each side (seeker, source) elaborately into legal agreements and only disclosing just enough to each side, the broker can assure that payments are made – *and that the market comes to exist in the first place!*
- The broker also provides a way to get to a ‘critical mass’ – few firms are big enough to attract a large amount of innovation sources all on their own (P&G is a rare positive example...); thus, by creating a separate market place that brings together sources and MANY seekers (many different firms), the broker logic allows for a more attractive situation for both sides.
- This is a result of cross-side network externalities - the more seekers, the more interesting the market becomes for a source and vice versa.
- Note: there are no or even negative ‘same side’ externalities – which firm wants its competitor to have access to the same IP it does?

Complexity/missing knowledge of how to work with external actors/absorptive capacity

- InnoCentive developed capabilities of its own that helped to streamline the process and connect the actors – note how the Chesbrough chapter describes how InnoCentive created ways to help firms define challenges etc.

Leakage of information or capabilities during the process

- InnoCentive’s use of ‘private rooms’ and supervision helps to alleviate fears of IP leakage (this is related to, but on top of overcoming the basic market failure of the Arrow paradox – even if an innovation source feels comfortable working with a firm, the firm might now be exposed to information leakage as well, as the would-be innovator gains access to privileged information potentially beyond the innovation challenge in question – InnoCentive’s safeguards help, as do the various safeguards described for the InnovationXchange model described in the latter part of the Chesbrough chapter)
- So, InnoCentive thus solves many of the problems we have identified by establishing a platform beyond any individual firm so that it can draw in more elements of each market side. Yet, how did InnoCentive overcome the usual chicken&egg problem discussed earlier?

Students will likely recall that InnoCentive was basically boosted by their parental relationship with Eli Lilly, who served as the ‘seed’ on the ‘seeker’ side of the new market. This, in turn, drove an influx

on the solver side, thereby making the market more attractive for additional firms as well.

Now we enter the final round where we bring together the OI and NE logic even more explicitly:

- *How sustainable is this OI facilitation logic? Specifically, will InnoCentive become a monopoly – or will another Innovation Broker take such a position and end it for this one?*

The ensuing discussion should revolve around the three basic issues that the “Strategies for Two-Sided Markets” reading identifies as key for a ‘lock-in’ (use the animated slides ‘Winner takes all’ for this).

Network Externalities

- Here, the students should reflect on how, exactly, seekers and sources gain from each other. Much of that issue should have been discussed earlier – the class should come to the conclusion that the whole logic of OI is that bringing together these two sides creates additional value, so, strong NE!

Multi-homing costs

- Students will likely argue that the various services that InnoCentive provides and that strongly facilitate the generation of OI also act as deterrents/switching costs for seekers and sources to go with another provider.
- Probing more deeply, it appears to be the seeker side (firms) that is most involved here and requires assistance in framing their needs correctly. Thus, this side should be relatively ‘sticky’, once they tried it.
- Yet, the fact that repeat business – even from Lilly – was not very strong initially, dampens this idea!
- Also, some students will argue that once InnoCentive taught a firm successfully how to do OI on a platform, that firm could now easily use other platforms as well (that may have similar safeguards regarding IP leakage, but perhaps offer fewer services – like e.g. no coaching on how to phrase offers... - and, as a result, lower fees! Note that the Chesbrough chapter implies that InnoCentive charges about 29% on top of the awards firms have to pay for successful sources – see p. 10: the awards totaled \$333,500, and the total amount of awards and fees was \$430,000 --- Thus, as a nice aside, the teacher could ask the students to calculate the number: how much does InnoCentive actually charge?)
- For the source side, since they apparently do not need much advice and can rather simply sign up, the switching costs are probably lower.

- Interestingly, the higher switching costs for the seekers seem to come at the expense of a lower penetration on this side of the market (the chapter suggests that InnoCentive had a much larger number of sources than seekers – illustrating the double-edged sword of platforms; make it easy and they come in large numbers, but may leave just as fast; make it more ‘involved’, require more of an investment, the numbers will grow slower, but be more sticky).
- In conclusion, there seem to be switching costs, but primarily on the seeker side, and not very high...

Special needs and tastes

- Generally, if the whole market is relatively undifferentiated in needs and preferences, then, given strong NE, one should expect a lock-in to just one network; if there are, however, special needs and thus groups that do not really benefit ‘each other’ by being in the same network, multiple platforms might co-exist (or perhaps lock-in to smaller sub-segments of the industry). To drive this point home, ask a trick question:
 - *Did Facebook lock-in the total market of online social interactions?*
 - The answer is ‘no’ – while they are pretty pervasive, there is at least one rather large network that they split the market with: LinkedIn; the reason being that people like to separate private and business lives (in fact, many people will be on both networks).
 - Another illustration is the survival of Apple during the PC era – despite the extreme appeal of the open MS-DOS platform, Apple managed to scrape by with a few percentage market share, as the design community (separate, very specific need) preferred the Mac... (By the way, offering an operating system and inviting complementors to add software is certainly one version of OI – the overall value of the ‘system’ is co-created by many actors!)
 - For InnoCentive, students will point out that their strength seems to be Chemicals – and that both the seekers and sources are fairly specialized in this area.
 - Accordingly, while it is likely that InnoCentive will lock-up the OI platform spot in this particular industry, it is much less likely that it can expand the OI-platform to other industries as well.
 - If it did, the question would be whether the existing seekers or sources would contribute (i.e., jumpstart) NE in a new industry, or whether InnoCentive would have to literally start from scratch (chicken&eggs all over again...), in which case its current lead would be meaningless and another platform would have an even chance of dominating the OI-platform of that industry.
 - Students might discuss which industries might be close enough to have a synergetic link; in those industries InnoCentive could leverage its existing network to overcome the chicken&egg problem before others get the idea... (this can be linked to the example of BIG that seems to be focused on just one industry and is only expanding in small steps to a related one).
 - A risk for InnoCentive would be if another platform ‘enveloped’ its own approach. Yet, the spe-

cific, rather deep technological needs of seekers and sources in the Chemical industry makes that seem less likely.

In conclusion, InnoCentive is on a good path to dominate the OI-platform in chemical industry (and maybe related ones) for the foreseeable future, but its lead is not unassailable – ironically, by teaching seekers how to do it, it makes itself vulnerable to 2nd movers that economize on such expenses and offer a budget OI-platform – the Arrow Information Paradox at work again!

KEY TAKE-AWAYS

I then sum-up the whole class with the aid of the last content slide:

- Network externalities are extremely potent and key to many modern business models.
- OI is a way to hypercharge your business by moving into an externality world.
- InnoCentive provides a platform to institutionalize that externality world and involve enough actors to make this whole thing feasible.

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