



INSIGHT

Economic Strategies as Digital Goods go 3D

In Margaret Wenté's recent piece in the Globe and Mail, [The next job bubble to burst may be yours, professionals](#), she addresses an interesting point. There is a persistent assumption that digital economy jobs are very secure, and that by transferring and encouraging these creative worker types, we'll all be better off in the 21st century. However, the underlying economies of scale of production and consumption in the coming era of strong competition in the knowledge industries may result in fewer digital producers of content dominating the world's consumption. There used to be dozens of good search engines; now Google, Microsoft's Bing and Yahoo's search, dominate the market. Artificial intelligence will increasingly come into play in the coming years, replacing higher-level jobs much as ATMs have replaced many bank tellers. Wenté argues that much of the grunt work of lawyering, for example, has already been displaced by smart search engines.

Here is the punch line. As tools replace professionals, industries will evolve, and some will disappear. Tools generally are not the exclusive property of the knowledge creation foundries, as most tools are effectively copied by the open source community within a few years of their commercial release. Open-source tools are often as good if not better than their commercial counterparts, over time. High capital costs of new entrants into an industry have traditionally been an effective means of market exclusion; reducing the capital costs of new entrants to zero could have widespread consequences on established and new industries. Even the first-mover advantage cannot be relied on to help in the long run: who uses Lycos for search today? As 3-D modeling and printing technologies go mainstream, the ability to acquire, improve and create new designs from existing designs moves to the masses. This adds a new element: the digital creation revolution will soon touch many industries, from clothing to construction to pharmaceutical.

The game for corporations in this new world seems to be to employ one of a relatively few strategies to extract profit.

Strategies

Strategy #1 is to use the greatly reduced cost of production to produce goods that you sell to the public at previous set prices, taking the difference between the two as a kind of "digital rent". That would be the strategy of cell phone providers, for instance, as the cost per bit of information sent over the air has come down by a factor of 1000 since voice technologies for cell phones were dominant. This extends to the relatively new game of getting your customers to produce digital goods or ideas for digital goods for free, which you then manufacture and sell to your customers.

Strategy #2 is to use forced artificial scarcity to make digital goods artificially scarce. This approach justifies the customer repurchasing goods and builds a revenue stream for purchased digital goods. For instance, [HarperCollins has done some math on old books](#) and has decided that after 26 borrowings from a library, the typical book is in too poor a condition to lend out again. They are now requiring libraries to buy new copies of their digital books after 26 loans using digital rights management to delete the electronic book after its 26th return. This strategy may be characterized as "artificial" since digital goods do not naturally expire or degrade.

Strategy #3 is to engage customers in a subscription model directly and build in the cost of paying people to provide upgrades into the subscription. This is the World of Warcraft model, where \$30/month covers all upgrades to the software. Well, mostly.

Strategy #4 is to employ a micropayment system to incrementally derive revenue from your product, and offer it at low or zero initial cost. Two families of such payment systems exist: the Apple App Store model, where the payments are low (\$1 - \$3 for most apps), and new users pay the development costs; and the Google and Facebook models, where the micropayment system is stochastic: rather than users paying \$0.003 every time they visit a page, the provider is paid \$3 in ad revenues every time a user buys a featured product, but the probability of a particular ad resulting in a purchase is 0.1%.

Strategy #5 is the so-called "freemium" model, where providers offer a base level of content for free, but provide premium content for an additional price. This is often hybridized with strategy #4, where the additional level of content is the suppression of built-in advertising.

Strategy #6 is the consultation model. Here, providers offer all the code and content for free, and recover their investment by consulting in the provision and use of the model. Many large information technology companies have partially or completely adopted this model.

Strategy #7 is to find places where there is real scarcity. For example, many music acts have put an increasing focus on the non-replicable experience of physical concerts, which are then in turn re-monetized with recordings, event t-shirts, concert movies and so on. There is another tendency to make their in-person events more complex, as with Tafelmusik's Galileo Project, which combines music, performers moving around, and projected images.

Analysis

Strategies #1 and #2, while appearing the most attractive to producers, are not generally stable over the long term; they can be viewed as transition strategies. Strategy #1 is fine until the open source movement finds a different way to provide the same value to consumers that a firm or set of firms previously had the exclusive ability to produce. One counter-strategy is to find a government rule or regulation that takes the new competitor out of the market, as [Voyageur and Trentway did with Allo-Stop](#). Strategy #2 suffers from the same failing; it works well in an exclusive market, but it is outcompeted by the other strategies in terms of consumer price burden, ultimately leading to price collapse as the number of actors able to engage increase.

The key insight here is that given the dramatic potential for non-trivial change in the revenue-generating industries, particularly in the service industries that form 70% of Canada's GDP, it is worth thinking about the future state of play with an eye towards policy consequences. Moving too quickly into the policy space could get policy makers a policy black eye, as the EU government found with their overly restrictive IP legislation that is currently being challenged by member states. However, as the state of play evolves, and particularly as 3-D printers with enhanced capabilities move out of the hands of hobbyists and into Staples and Rona, the consequences for important Canadian industries may be non-trivial. Why buy a new dress off the shelf when you can custom-make it from the template online and print it on your neighbourhood's garment printer?

Policy Questions

1. Given the dynamic and unstable nature of the transition, what education, skills retraining and research funding policies make sense to enable the Canadian labour pool to thrive?
2. As there are more and more players who have the ability to create and innovate, the enabling function provided by Canadian support programs will have to apply across a lot of sectors. How will we get innovation policy right?
3. What IP and patent policies will encourage content creation while maintaining a balance between large firms and smaller, more nimble operations?
4. What other changes will this imply for the Canadian economy at large, and our place in the world?

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