
Chapter 20. Network Effects, Portals and Economics

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Introduction to Network Effects, Portals and Economics

Context

This chapter follows on from chapter 19 and develops further the treatment of electronic commerce.

Introduction

The idea of a 'network effect' or 'network externality' is well known in economics. In this unit, its consequences within a networked environment are explored. Portals have developed as a way of harnessing and controlling (and even exploiting) people accessing the Internet. They are among the items exhibiting a network effect. We examine their emergence and their possible development. We also investigate portal economics, that is, the ways in which portals affect Internet economics, including the ways that the owners of portals can make money.

Examples drawn from this rapidly changing area are used to illustrate and explore the relationships between the many factors relating to portals, portal economics and Internet economics in general.

Objectives

At the end of this module, you should be able to:

- understand the concept of network effect (or network externality) and explore its consequences in a networked environment;
- analyse the emergence, reasons for, and possible future development of portals.
- investigate portal economics.

Content

Network effects (or network externalities) are exhibited 'when the value of a product to one user depends on how many other users there are'. (Shapiro and Varian, HBS Press, page 13).

It is not hard to see that fax machines, telephones, modems and e-mail programs all exhibit network effects. (Imagine the value of the only fax machine in the world to its owner, and then consider the increased possibilities for its use as the number of other fax machines increases.) These products are all communication devices, and their network effects derive from the fact that they only give value when they are attached to a network so that they can take advantage of the connectivity it provides.

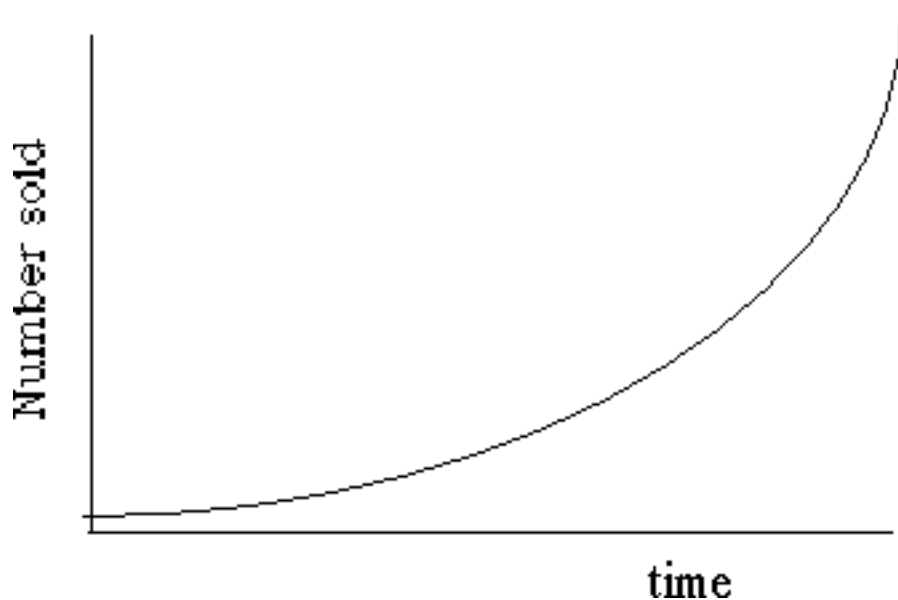
But there are other things that exhibit network effects. Standards are one. The more a standard is adopted, and as more people acquire products conforming to a standard, so each of those people acquires more value from the standard in terms of the continuity, compatibility and so on of the products conforming to the standard. Similarly, brands exhibit network effects. As more people acquire a branded product, so each of them acquires more value from it in terms of trust, guaranteed quality and so on.

Standards and brands are especially important for information technology products, the users of which will be connected not only by computer networks but also by social networks. Standards are needed to ensure compatibility, and branding for reliability.

To Do

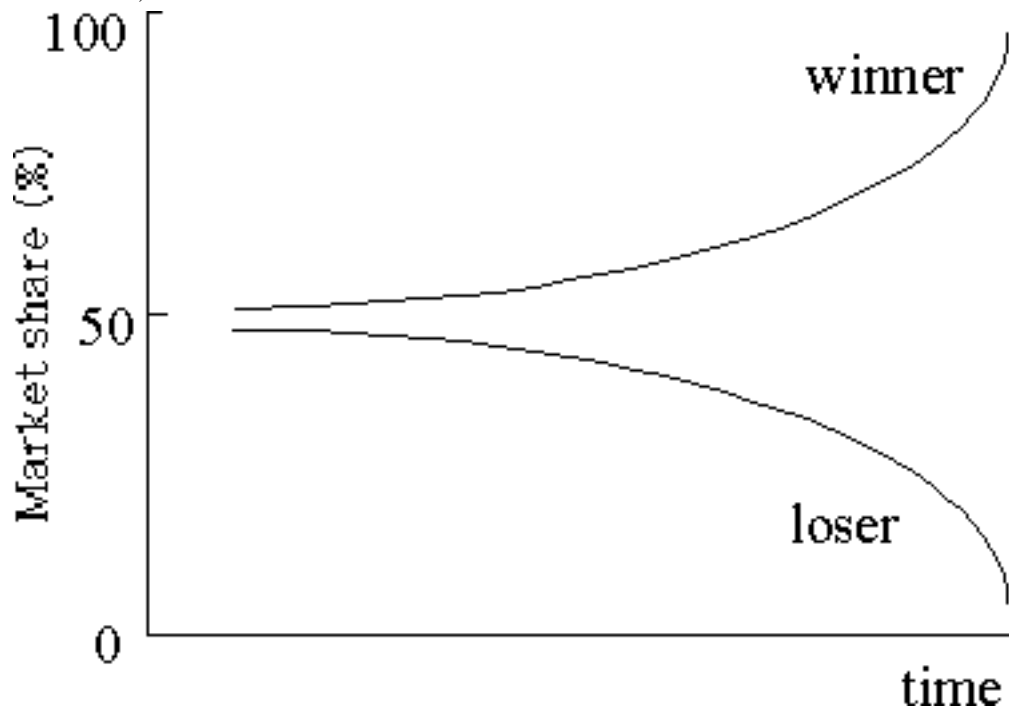
Do Review Questions 1 and 2.

Items subject to powerful network effects (successful ones, at least) tend to sell slowly at first until they reach a point at which explosive growth occurs. This is caused by positive feedback: as the number of products sold increases, more users find it worthwhile to buy the product, more existing users can persuade potential users, more service and support facilities will be established, more compatible products will be developed, and so on. The diagram illustrates this:



Sales of, for example, fax machines and e-mail programs have followed this pattern.

The effect of this pattern on competition is shown in the next diagram, which shows two competitors beginning on equal terms at an early stage, after which one reaches the critical mass needed to trigger explosive growth, while the other does not. Think, perhaps, of Microsoft and its competitors, or of how the PC, Ethernet and VHS video recorders have come to dominate their markets.



The diagram suggests that, in circumstances where network effects are dominant, the emergence of monopolies is inevitable.

To Do

Do Review Questions 3, 4 and 5.

Carry out Activity 1.

Portals

Portals, the gateways to the Internet, help their users to find the information, goods and services they need, and pass them to the relevant Web sites, sellers and providers.

A portal exhibits network effects in that the value of a portal to one user increases with the number of other users. As the number of users increases, several possibilities emerge. Increasing numbers of users can persuade and recruit yet more. Each user has more fellow users to consult and share with. The operator has the opportunity to make more profit, and to use it to provide better services which, in turn, can attract more users. These possibilities all exhibit the positive feedback that can cause a portal to exhibit network effects.

The original portals were search engines. At the time of writing, Google claimed to have the largest number of users: the other dominant portals were Yahoo, MSN, Excite, Infoseek, America Online, Lycos and Netscape.

To Do

Carry out Activity 2.

Search engines emerged as portals because many people used them as an access point to the Web, but only to search for something. As soon as they found it, they left for the site that had what they wanted. More recently, portals have tried various ways of encouraging their users to stay: one is customisation as, for example, with My Yahoo. Behind this and other attempts at 'stickiness' is the desire to retain potential customers so as to have longer to tap their economic potential. Another attempt to improve portals can be seen with the emergence of so-called 'vertical portals', that is, portals that specialise in one area, and try to provide everything their users could conceivably need within it. The classic example is Amazon, which became a book portal. Anyone needing a book, or anything connected to books, is more likely to go directly to Amazon than to begin with a search from a general or non-specialist ('horizontal') portal.

Of course, portals, whether horizontal or vertical, provide links to other sites. General portals naturally provide links to specialist sites. The emergence of vertical portals rather reverses this trend in that they often provide links to general sites. Further, horizontal portals have been aggregators of users, and vertical sites have been prepared to pay to be associated with them for the delivery of appropriate customers. If vertical portals continue to increase in importance, it may be that horizontal portals will be prepared to pay the vertical portals to acquire their users.

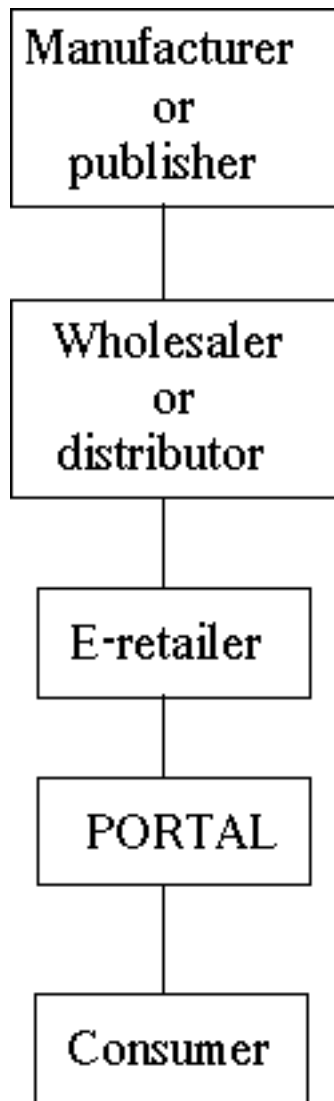
To Do

Do Review Questions 7 and 8.

Carry out Activities 3 and 4.

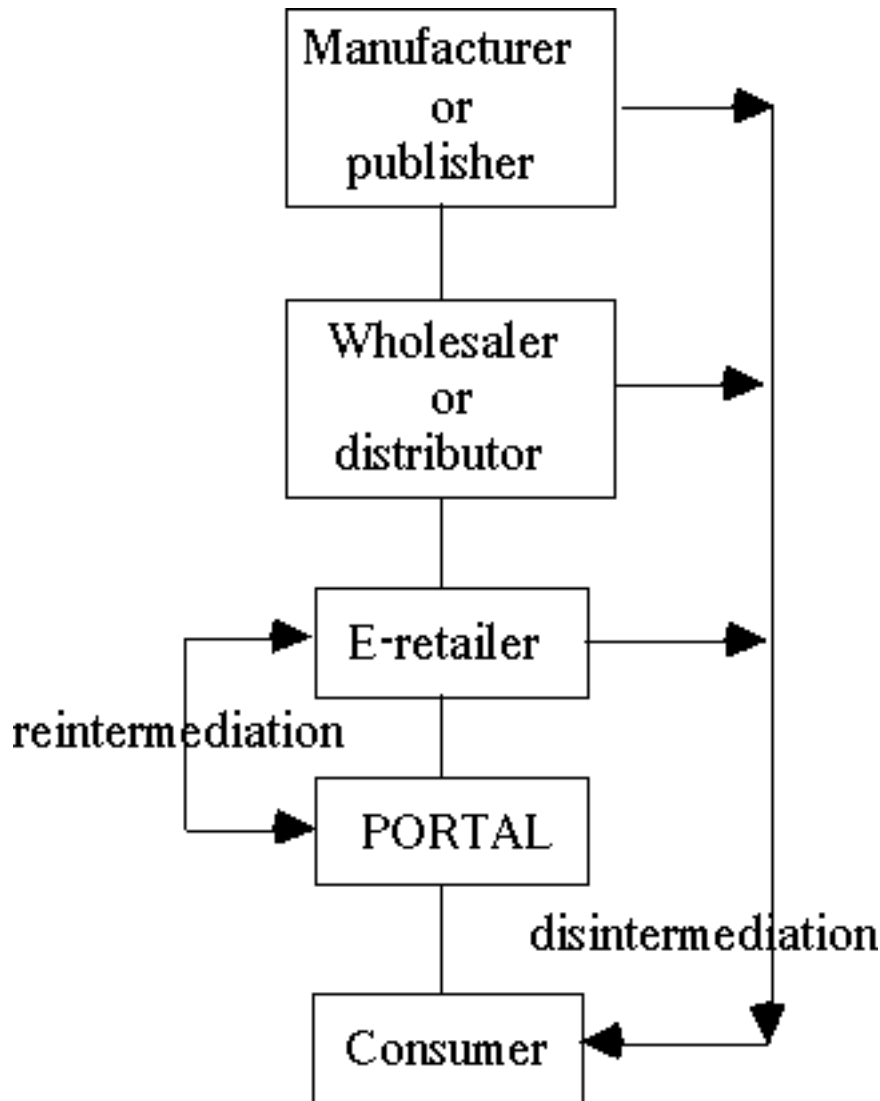
Portals and intermediation

One way of illustrating the state of flux in the emergence of portals is to look at the situation regarding portals as intermediaries. The position of the portals in the chain linking customers and producers can be illustrated in the following way:



This shows how portals are situated to link customers to e-retailers who, in turn are connected to wholesalers and distributors who act for the manufacturers of products and the publishers of information.

This chain contains several intermediaries and, as the next diagram shows, although electronic commerce has provided the opportunity for inserting intermediaries, it also provides the opportunity to remove them.



Portals and on-line retailers are both intermediaries, and have been introduced for the convenience of customers. But the connectivity of the underlying network allows customers to go directly to manufacturers or wholesalers or retailers if they want to.

So, if a portal wants to retain its position as an intermediary, it must remain attractive to its customers. At the same time, if customers see no benefit in using intermediaries, they can, as long as they know how to, bypass them.

To Do

Do Review Question 9.

A Brief History of Portals

One way to convey the turbulent nature of portal development is to recount its history. The following list gives a brief and somewhat simplified account of the evolution of portals. The stages identified here are not necessarily successive: they can and do overlap.

- Stage 1 Search engines emerge as portals with the recognition that they are the first port of call for many people when using the Internet.
- Stage 2 Internet Service Providers, including AOL, set up their own portals for their members. These sites usually include a search engine to make them 'stickier'.

- | | |
|---------|--|
| Stage 3 | Vertical portals emerge with the recognition that sites like Amazon, CDNow, eToys and outpost are a first port of call for many people, and not only when they need the respective service specific to the site. |
| Stage 4 | General portals establish links with vertical portals in competition with vertical portals which establish links to general portals. |
| Stage 5 | The so-called 'destination sites' emerge with the aim of retaining their users and offering them everything they might possibly need. Amazon is again in the forefront of this trend. (Incidentally, AOL always aimed to be a destination site although it did so before the name was coined.) |
| Stage 6 | Destination sites compete with vertical portals that are attempting to dominate their specific categories. |

This list shows that developments at Amazon are intimately involved with the evolution of portals. It is interesting to recount a brief history of Amazon in a vein similar to that just given for portals. It shows not only how Amazon has changed to retain its position as an intermediary, but also reveals how its innovations have led to developments that have come to be recognised as portals of one kind or another. The next list, then, gives a simplified account of Amazon's stages of development.

- | | |
|---------|--|
| Stage 1 | Amazon begins as a virtual book shop with no stock of its own. |
| Stage 2 | To cement its position, it provides value-added features such as access to its catalogue, extra information about books, reviews from its customers, and suggestions for alternative and supplementary purchases. At this stage it has become what is recognised as a vertical portal. |
| Stage 3 | It starts to provide its own warehousing operation. Now it is becoming less virtual. |
| Stage 4 | It branches out to sell not just books but also music and electronics. Now it becomes less vertical, although it could still be seen as an information (or perhaps infotainment) portal. |
| Stage 5 | It branches out even further, by also selling software, video games and home improvement items. At this point it is no longer simply a vertical portal, and has become more of a destination site. |

Portal Economics

The point of creating a portal is, of course, to make money for its owner. How to make money from a portal is not immediately clear, and means of doing so are in the course of being invented. Information, products and services can be sold at the portal or, having acquired customers wanting to buy, the portal can pass them to another, appropriate, site at a price. In addition to this, advertising will play a part. As with conventional media, the money to be made from advertising is proportional to the size of the audience that can be delivered to look at them. In this way, audience aggregation and flow may be important aspects of an economic model for a portal. One other avenue is to collect information about the visitors to the portal and their activities while there: this information may be valuable in its own right, and represents another possible source of revenue. Again, the amount any potential revenue is proportional to the number of visitors.

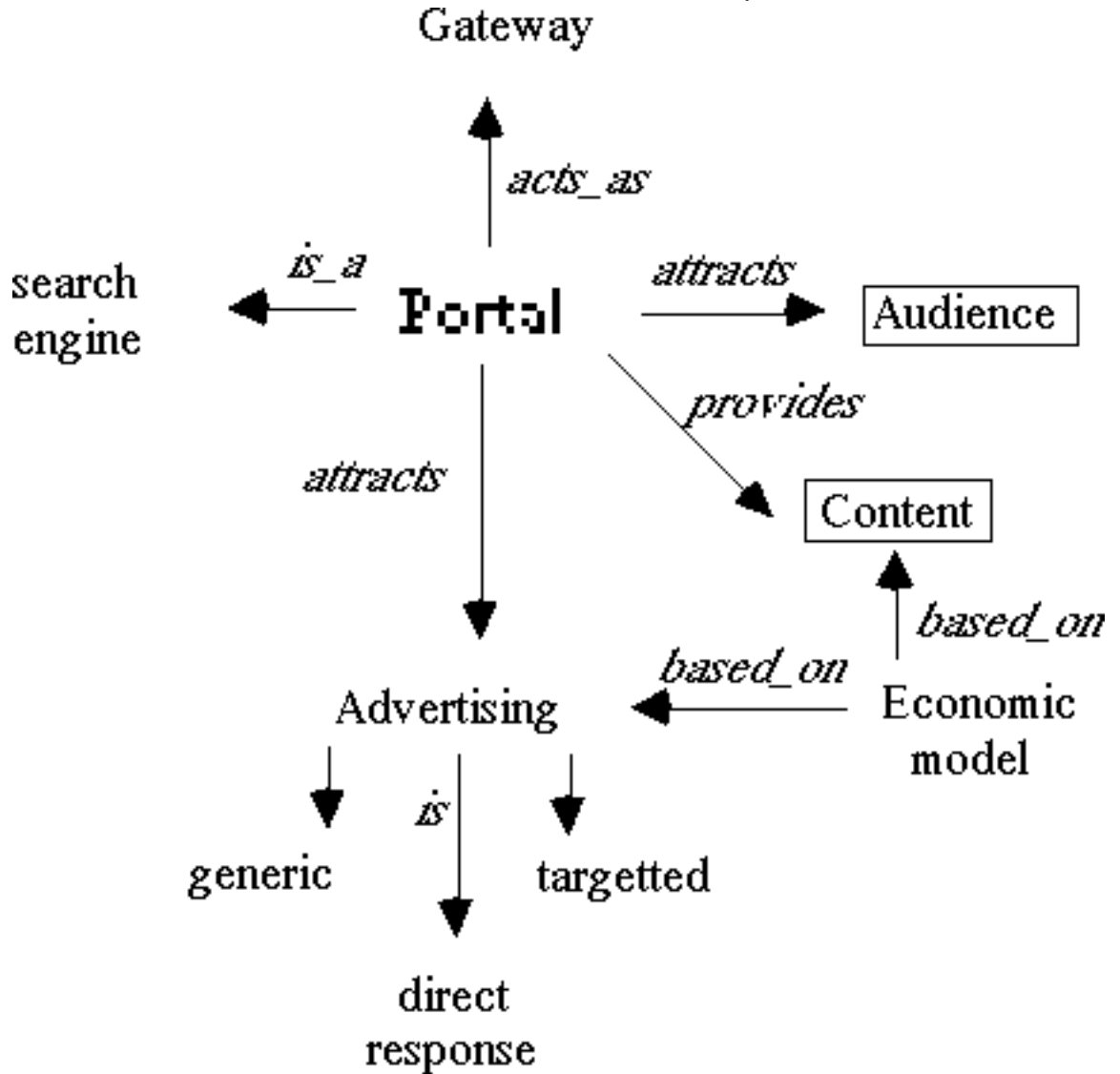
The sale of information content is problematic in that users of the Web have been indoctrinated with the view that information is free. The sale of physical goods is not yet at a level of proficiency to compare with that of real world alternatives. The most widely sold items are books and CDs, the content of which could be delivered over the network, so that they could be treated as information goods as easily as physical goods. Service provision may prove to be the most promising way to generate revenue.

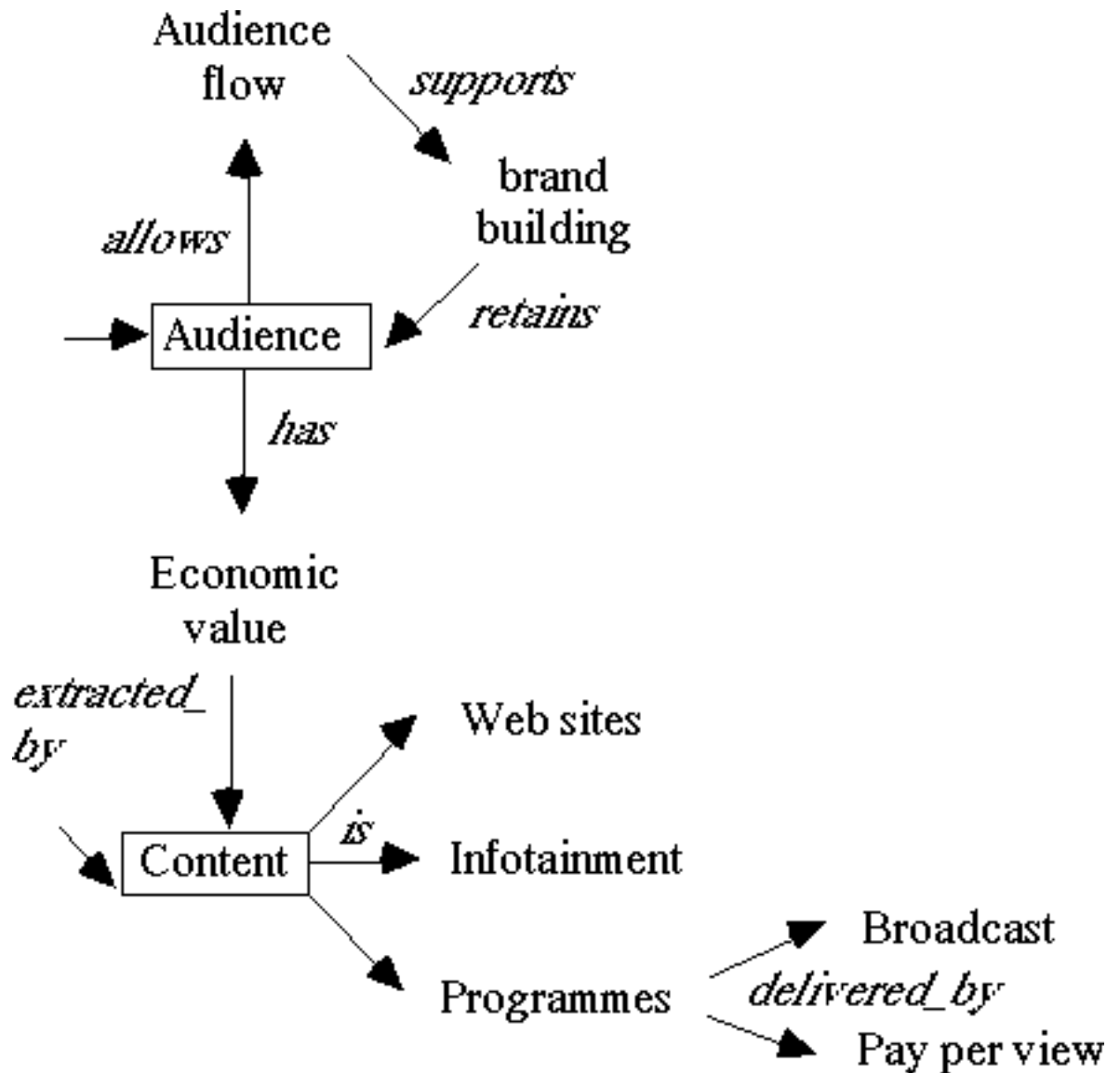
As with television, revenues can be collected from advertisers for showing their advertisements. A charge can also be made for the audience flow that allows an audience to be delivered to another site.

These economic models borrowed from television can be and, indeed, have been, implemented, but models better suited to this new medium must surely exist.

The collection of information about users and their activities is subject to certain constraints, since it must respect their right to privacy. Even so, visitors to portals and sites are often willing to exchange personal information for something that the operator of the site can offer in exchange. And, when information has been collected, if it should contain patterns of behaviour and if it is susceptible to their extraction, then that information can be of considerable value.

The major issues affecting portals and portal economics, and the relationships between these issues are shown in the following diagrams. The two diagrams are interconnected: they overlap via their common 'Audience' and 'Content' nodes both of which are surrounded by boxes.





To Do

Do Review Questions 10 and 11.

Carry out Activities 5, 6, 7, 8 and 9.

Activities

Activity 1 - Microsoft

The ongoing anti-trust case against Microsoft in many jurisdictions stems, in part, from Microsoft's monopoly position. Could it be argued that Microsoft has benefited from network effects, and that its monopoly position is, to that extent, inevitable?

You can find a discussion of this activity at the end of the chapter.

Activity 2 - 'winner'

Investigate the situation regarding the emergence of a 'winner' in the 'contest' between portals. Is a single winner emerging? If not, why not?

You can find a discussion of this activity at the end of the chapter.

Activity 3 - vertical portals

Find sites that could claim to be vertical portals for, respectively, the purchase of CDs, the purchase of computer hardware and software, and for e-mail.

You can find a discussion of this activity at the end of the chapter.

Activity 4 - analogies

Devise suitable analogies taken from the real world for each of the following:

- a general portal,
- a vertical portal,
- A general portal linked to vertical portals,
- A vertical portal linked to a general portal.

You can find a discussion of this activity at the end of the chapter.

Activity 5 - portals & vertical portals

Determine the current situation with portals and vertical portals. What are the main portals? Which are the emerging vertical portals and what are their specialist domains? How is the balance between portals and vertical portals emerging?

You can find a discussion of this activity at the end of the chapter.

Activity 6 - loop

With reference to the diagrams and, in particular to the arrows leaving the Audience node, explain the loop passing through the nodes 'Audience flow', 'brand building' and back to 'Audience' as a positive feedback loop that could contribute towards a network effect.

Explain the value of 'brand building' for a portal from the point of view of consumers.

You can find a discussion of this activity at the end of the chapter.

Activity 7 - content

With reference to the diagrams and, in particular to the arrows leaving the Content node, expand on the items that comprise Content. In particular, explain, perhaps with the aid of examples what is meant by infotainment. Regarding programmes, refer back to the technique that enables the transmission of radio and TV programmes on the Internet, explain from the consumer's point of view the difference between broadcast programming and on-demand programming, and explore the respective payment schemes appropriate to these forms of transmission.

You can find a discussion of this activity at the end of the chapter.

Activity 8 - links

The diagram includes nothing to represent the collection and use of information about the Audience. Starting from the Audience node, add appropriate links to the diagram to represent this.

You can find a discussion of this activity at the end of the chapter.

Activity 9 - portals

Discuss the relative merits for a portal of either simply linking to other sites and charging them per click, or forming a confederation with other sites so that customers can click freely between the sites and the members of the confederation can share their overall profits between them.

You can find a discussion of this activity at the end of the chapter.

Review Questions

Review Question 1

What are the positive feedback elements that cause the network effect experienced by a successful communications product?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 2

What are the positive feedback elements that cause the network effect experienced by a successful standard product?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 3

Examine the two graphs shown above. Could the 'loser' in a contest where the winner has harnessed the network effect still maintain increasing sale over the period of the contest?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 4

What were the types of item involved in the contests won by Microsoft, Ethernet and VHS, and who were the 'losers'?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 5

In a 'contest' between competing products, why does the technically superior product does not necessarily emerge as the 'winner'?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 6

What extra benefits follow when one product does win the contest with its competitors,?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 7

What is a portal?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 8

What are 'horizontal' portals and 'vertical' portals?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 9

What is meant by 'reintermediation' and 'disintermediation'?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 10

What are the revenue generating opportunities open to the operator of a portal?

You can find an answer/comment for this review question at the end of the chapter.

Review Question 11

How is it possible for a portal operator to sell goods at a loss but still to make a profit?

You can find an answer/comment for this review question at the end of the chapter.

Discussion Topics

1. At the time of writing, hardly any on-line sites are making money. How do you explain this?
2. Before the .com bubble burst, how was it for the share prices of Internet companies to soar? What caused the bubble to burst?
3. Audience flow is essentially an adaptation of the television model of 'selling eyeballs' to advertisers. Is this a good economic model for the Web? Can you think of better ones?
4. Propose a possible e-business and develop a plan for its implementation.
5. Discuss technologies used on on-line sites.

Answers and Comments

Activity 1

The argument can certainly be made, and Microsoft's lawyers did so. Other arguments were also put, however. These are widely reported in both electronic and physical media.

Activity 2

At the time of writing, no single winner is emerging, essentially because the situation is so fluid, with portals constantly inventing new ideas and taking new forms. It could be that if the situation ever stabilises, a more static contest can take place from which a winner may emerge.

Activity 3

Sites that could reasonably claim to be such portals are, respectively, CDNow.com, outpost.com and hotmail.com.

Activity 4

A general portal can be seen as analogous to one of the gateways in the wall of a walled city in that such a gateway is the outsider's point of access to all that the city has to offer.

A vertical portal is analogous to a specialist shop.

A general portal linked to vertical portals is analogous to an information point in a shopping mall that can direct customers to the specific shop that they need. (Note that the information point is an access point for shops, and is not itself a shop.)

A vertical portal linked to a general portal is analogous to a shop in a mall that can direct you back to the information point.

Activity 5

Compare your findings with the situation described here. It will be interesting to know how much it has changed and why.

Activity 6

This loop attempts to catch the following chain of ideas: If a portal has attracted an audience, it is in a position to control the flow of that audience. This can support brand building by rewarding the consumers who use the portal, thereby reinforcing their loyalty. This in turn, will act to retain the audience and will also serve to attract further visitors to the portal's audience. This enlarged audience provides for a larger flow, more people to support brand building, which retains them and attracts others, and so on.

From the point of view of its users, building a portal's brand makes it more visible and attention-catching, not only for them but more especially for potential new visitors.

Activity 7

Infotainment, as a mixture of information and entertainment is appropriate to all levels of education and training. On-line education can be enlivened by intermixing it with entertainment. Value can be added to entertainment by interspersing it with information.

The technique that enables the delivery of programme material is analogue-to-digital conversion. From a consumer's point of view, broadcast programmes must be received when they are broadcast, but on-demand programmes can be received at the consumer's behest. By and large, subscription is a suitable form of payment for broadcast delivery of programmes while pay-per view is more appropriate for on-demand delivery.

Activity 8

Links could be added to represent the following relations:

- Audience provides Information
- Information is consolidated in Database
- Information is used-for (Targetted) Advertising
- Database has Economic value

Activity 9

Charging per click amounts to making a charge for losing a customer, whereas forming a confederation is more like constructing a large destination site where consumers will stay.

Review Question 1

As more people communicate in a particular way, and with the aid of a particular device, they generate increasing influence, pressure and even necessity for other people to communicate in the same way.

Review Question 2

As more people make use of a standard, by using a standard device, they generate increasing practical and economic reasons for other people to communicate in the same way.

Review Question 3

Yes. It is possible that while the share of overall sales expressed as a percentage drops dramatically, the sales expressed in numbers of items could continue to increase.

Review Question 4

Operating systems, local-area networks and video recorders. The respective 'losers' included the Macintosh Operating System, token ring LANs and Betamax.

Review Question 5

If the product that first reaches the point at which the network effect takes effect, it will win the contest regardless of its technical proficiency.

Review Question 6

When one product holds a large percentage of the market, it becomes the de facto standard. This provides yet another avenue for network effects to come into operation.

Review Question 7

An access point to the facilities of the Internet.

Review Question 8

General-purpose portals and specific portals.

Review Question 9

Respectively, the addition and removal of intermediaries.

Review Question 10

They include the selling of content, services, advertising and information about visitors.

Review Question 11

It is possible by, for example, making more from advertising and selling customer information than is lost on the selling of goods.