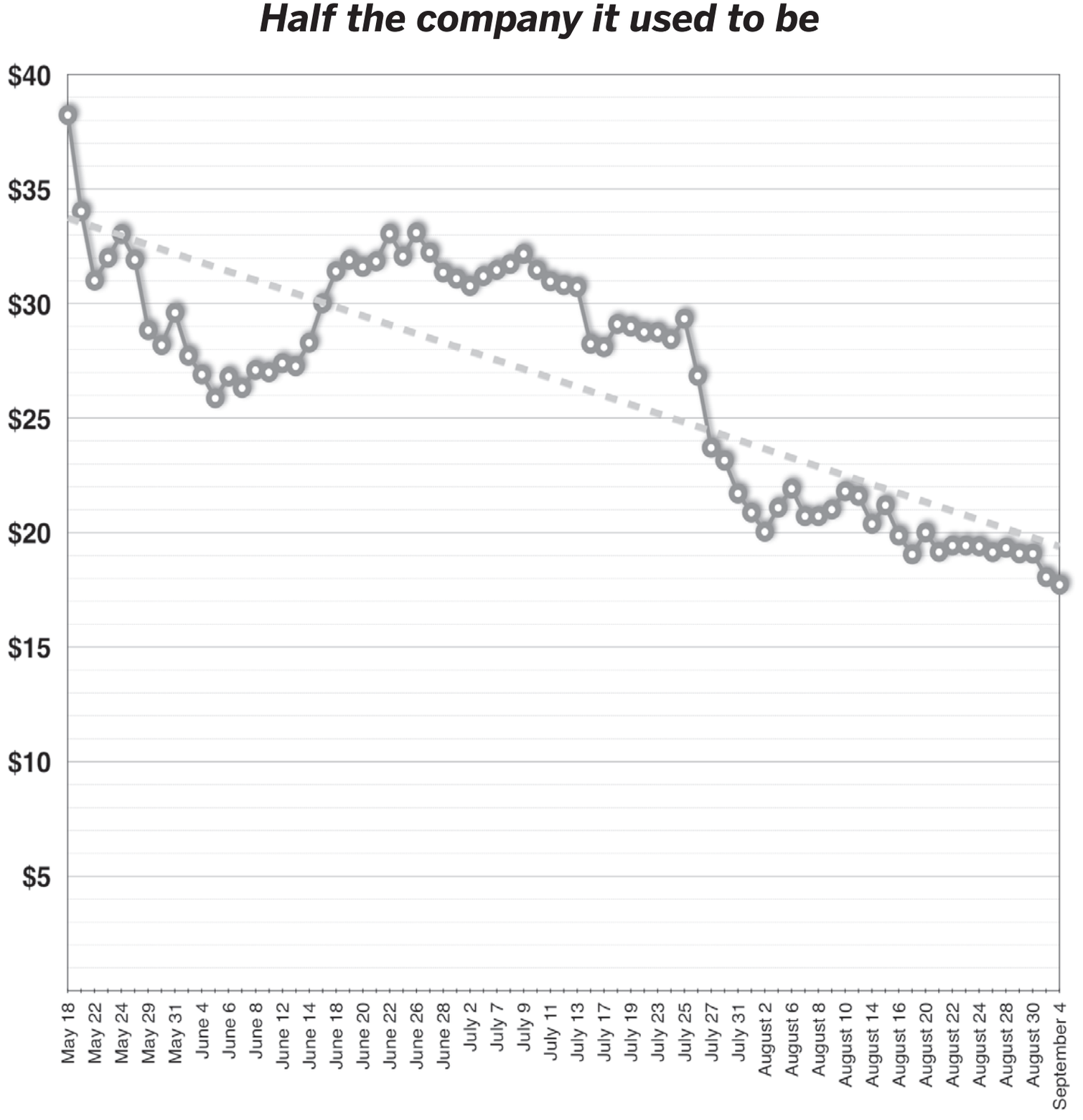
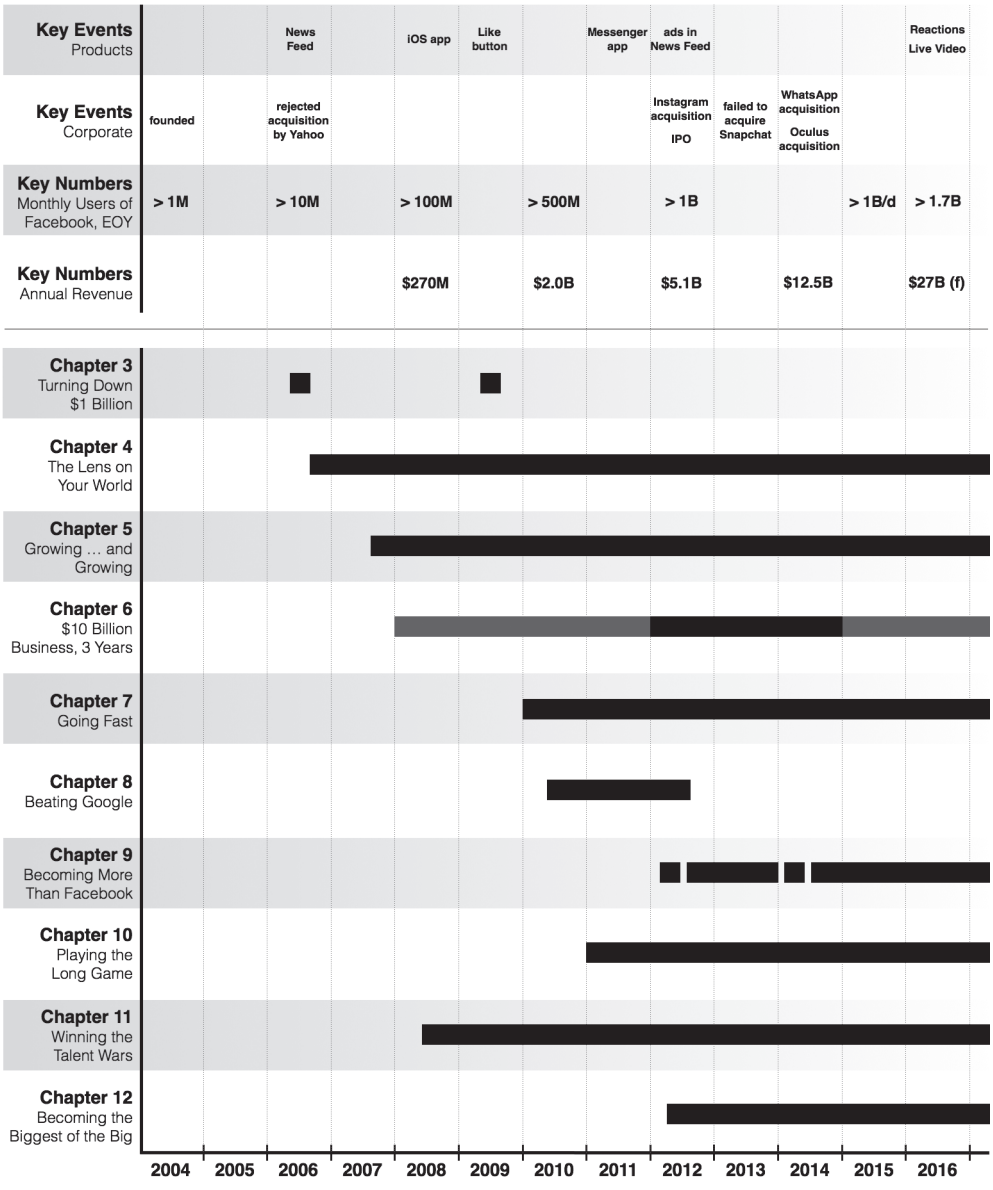


Figure 1-1. Facebook's closing stock price following its 2012 IPO (May 18–September 4)



Upcoming chapters in context of Facebook's timeline, key events and numbers

	Time	Possible Value
Feature	Months	$*n*0,000,000
Product	Year	$*n*00,000,000
Company	Years	$*n*0,000,000,000
Mission	Decades	$*n*00,000,000,000

Table 3-1. Time frame and possible value of various business objectives

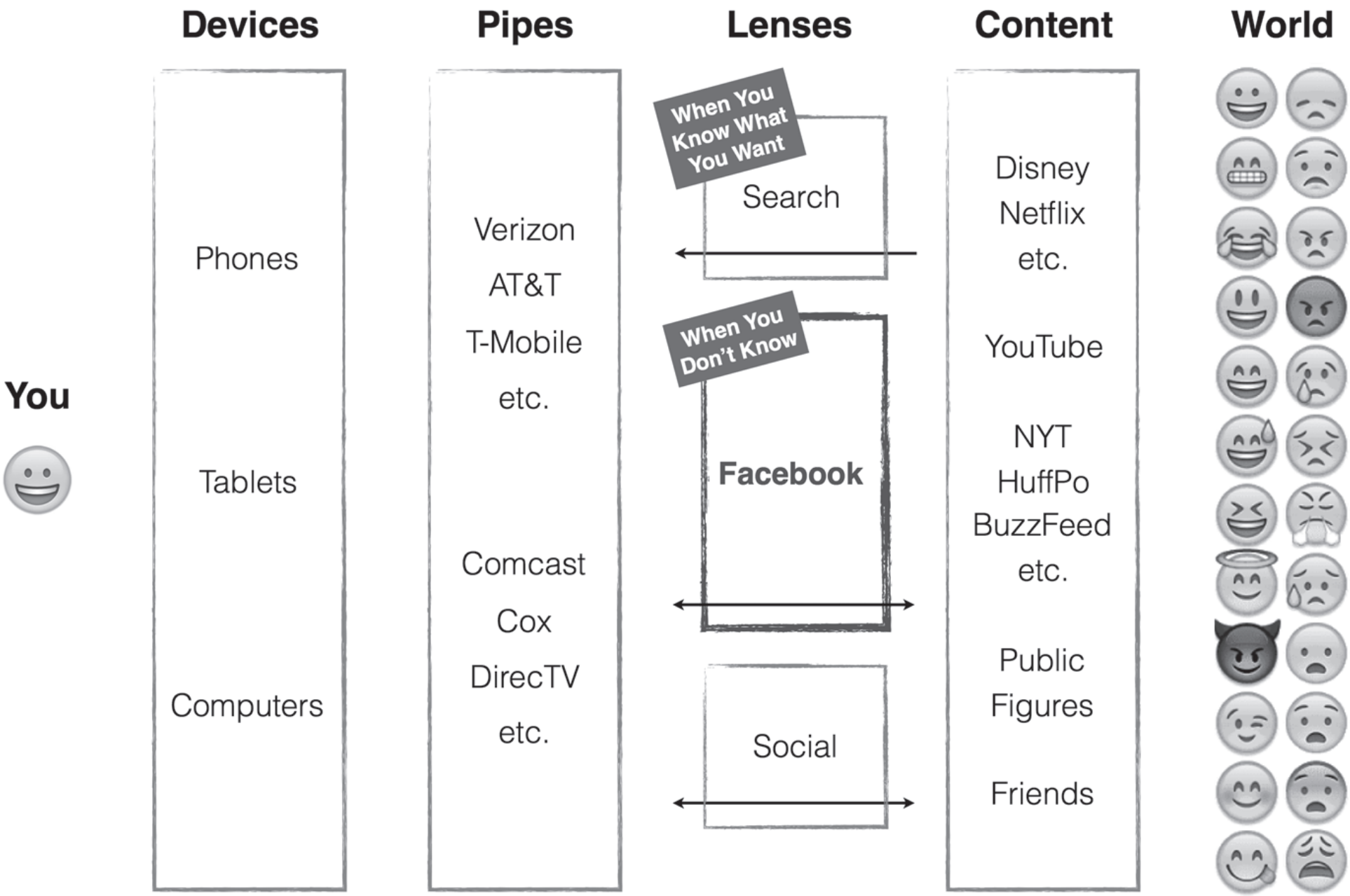


Figure 4-1. The flow of information between you and the world

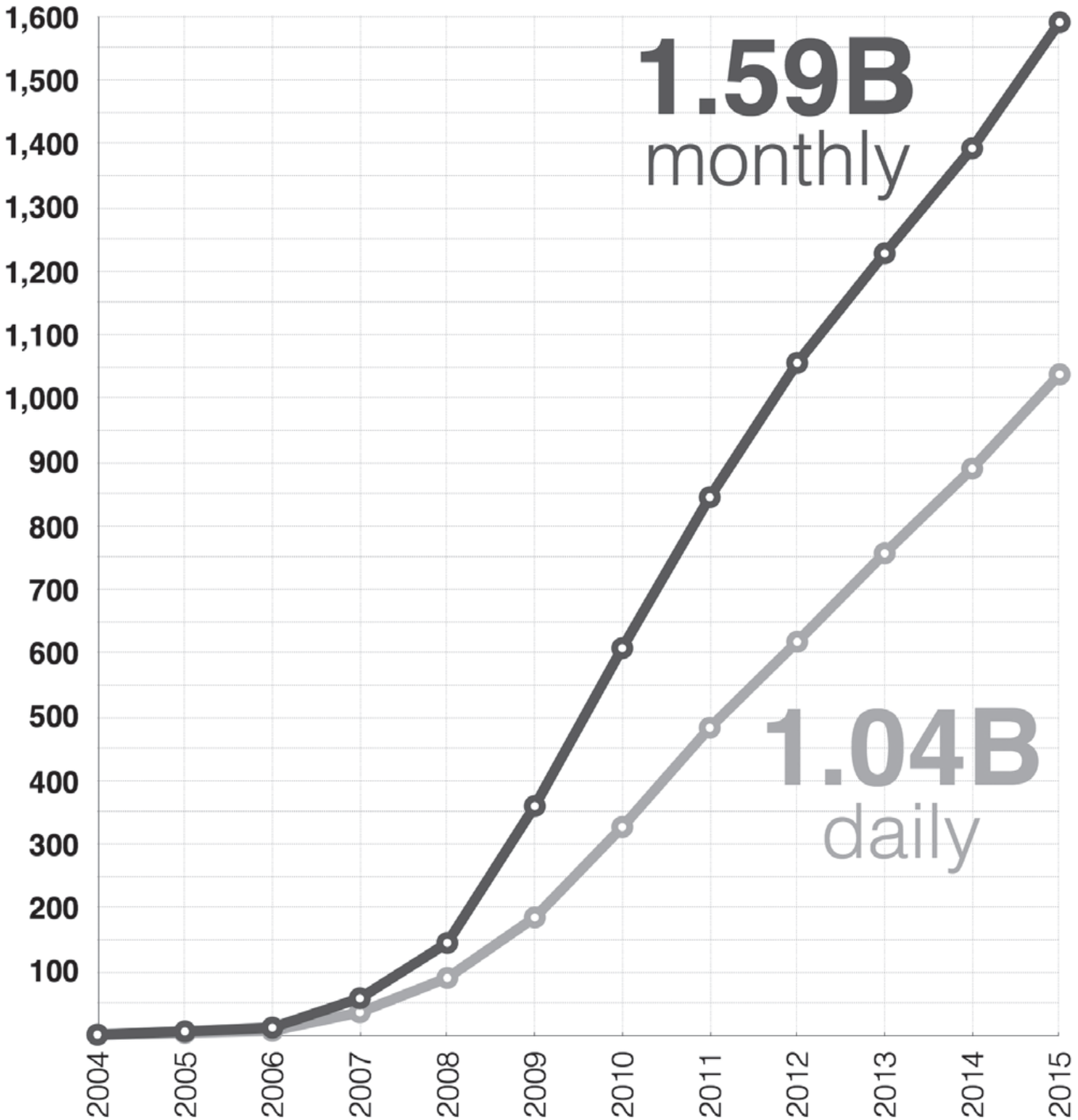


Figure 5-1. Growth of Facebook's monthly and daily active users globally (millions)[1]

$$\text{Active}_t = \text{New}_t + \text{Retained}_{t-1} + \text{Resurrected}_{t-[n]} - \text{Churned}_{t-1}$$

Although your users make up one large group, they are composed of four very different cohorts:

- **New**: People who joined for the first time in the current period via acquisition and activation techniques. They have the least experience with the product and need to be nurtured carefully.
- **Retained**: People who used the product in the current period *and* the prior period, a strong sign of engagement and perceived product value. By far the most important—and hopefully largest—cohort.
- **Resurrected**: People who used the product at some time in the past—but not in the prior period—and have returned in the current period through reacquisition techniques. An audience that hangs in the balance as they may be as likely to depart for the long term as they are to stay. What can be done to keep them?

e-mail platforms, as well as operating in gray areas obtaining contact information from public web pages of other services without using provided—and controlled—access methods, known as "scraping."

To understand the importance of contact importing to Facebook's growth, take a look at the math involved in creating virality in a business with so-called network effects like Facebook. To grow exponentially, you have to be able to translate one new user into a little more than one additional new user. If U is the original user and UF are the user's friends, it looks like this:

$$\text{Invites}_{U} \times \text{E-mail click rate}_{UF} \times \text{Facebook sign-up rate}_{UF} > 1$$

Here's an example: a user sends 100 invites to friends, those friends click on the invite 30% of the time, and those clickers complete the Facebook sign-up 5% of the time:

$$100 \times 30\% \times 5\% = 1.5$$

Presto, that first user is responsible for bringing 1.5 *new* users to Facebook.

Contact importers ensured that the first number in this equation was as high as possible. The way invite e-mails were composed controlled the second number, and the simplicity of the Facebook sign-up flow controlled the third. Even small changes in the individual components have a large compounding effect on the eventual outcome. Taking the same example a few steps further, if it went on with similar numbers for three "generations" of new users, it would look like this:

$$(100 \times 30\% \times 5\%) \times (100 \times 30\% \times 5\%) \times (100 \times 30\% \times 5\%) = 3.4$$

The first user would actually be responsible for bringing 3.4 people onto the platform. But if the number of invites in each case had been just 80 instead of 100 (or Facebook's sign-up conversion had been just 4% instead of 5%), it would have been just 1.7 people. Half as many. Powerful stuff!

For resurrection, Facebook relied on an old medium—e-mail—and a much older human motivation: curiosity. Resurrection targets were already users of Facebook with existing connections to friends, so sending the occasional e-mail to them about what their friends were doing—that

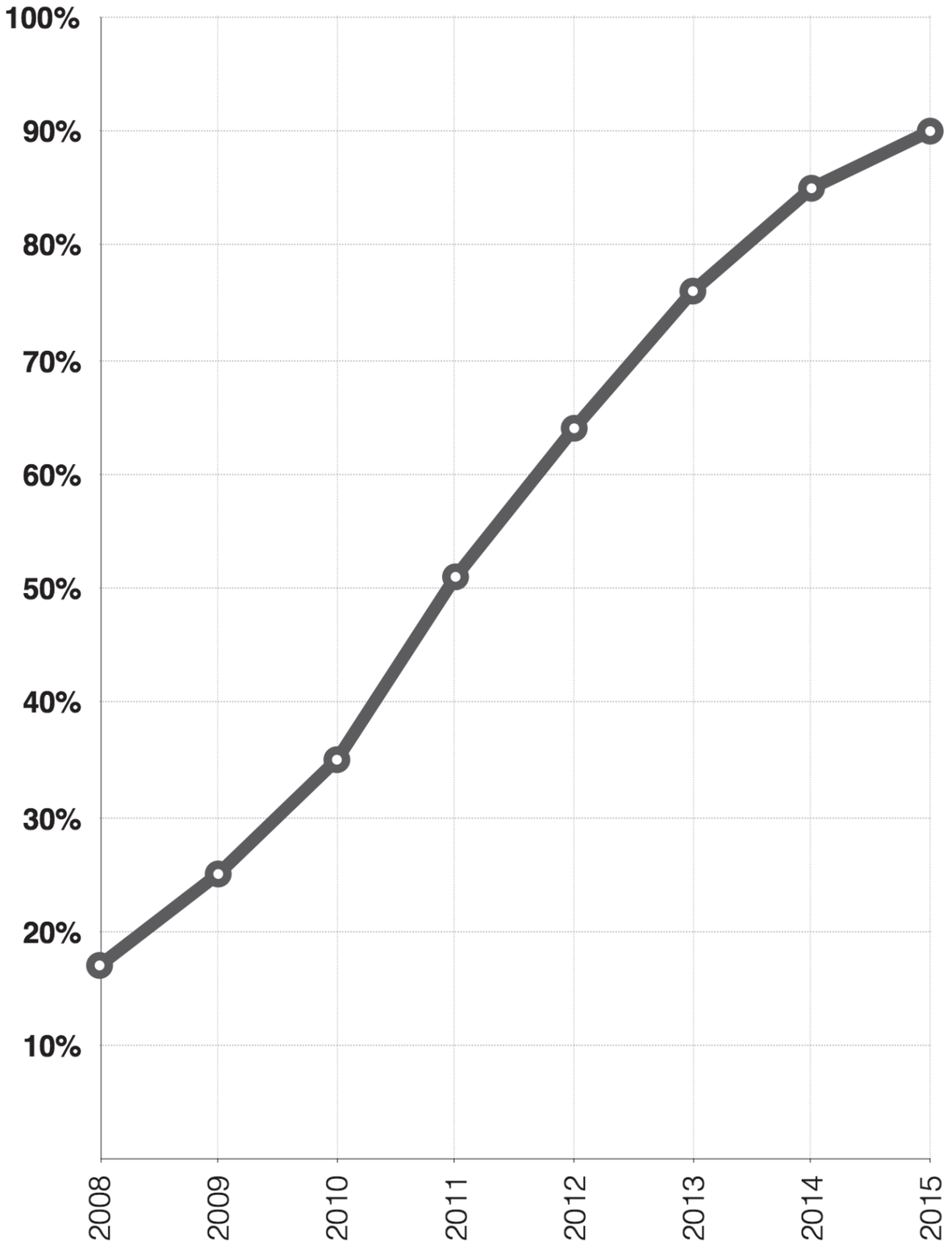


Figure 5-2. Percentage of monthly global Facebook users accessing via mobile[2]

	Population	Internet Penetration	Internet Users	Facebook Penetration (of Internet)	Facebook Users	Inc. FB: Winning FB Pen. (56%)	Inc. FB: Good FB Pen. (68%)	Inc. FB: Avg. Internet, FB Pen.	Inc. FB: Good Internet, FB Pen.	Inc. FB: Likely by 2022
Global	**7,260**	46%	3,340	48%	1,599	591	780	369	978	1,044
North America	**357**	**88%**	**314**	**68%**	**213**					
US	321	87%	281	68%	192					
Canada	36	93%	33	64%	21					
Latin America	**617**	**56%**	**345**	**86%**	**297**					
Brazil	204	58%	118	88%	103					
Mexico	122	49%	60	92%	55					
Colombia	48	59%	28	84%	24					
Argentina	43	80%	35	78%	27					
Europe and Middle East	**1,058**	**69%**	**727**	**49%**	**359**					
Russia	146	71%	103	11%	11	47	59			
Germany	81	88%	72	40%	29	5	20			5
Turkey	78	60%	46	89%	41					
France	66	84%	55	58%	32					
UK	65	92%	60	64%	38					
Italy	61	62%	38	74%	28					
Spain	46	77%	36	62%	22					
Africa	**1,158**	**29%**	**331**	**38%**	**125**					
Nigeria	182	51%	93	16%	15	37	48		73	73
Ehtiopia	99	4%	4	100%	4			42	67	42
Egypt	88	55%	48	56%	27					
Dem. Rep. Congo	79	3%	2	80%	2			27	43	27
South Africa	55	49%	27	48%	13		5		13	5
Tanzania	51	15%	8	36%	3		2	9	22	9
Kenya	45	71%	32	16%	5	13	17			13
Asia Pacific	**4,069**	**41%**	**1,649**	**32%**	**522**					
China	1,362	50%	674	0%	3	375	456			375
India	1,252	30%	376	36%	136	74	119	186	468	256
Indonesia	256	31%	78	100%	78			40	104	104
Pakistan	199	15%	29	79%	23			49	89	49
Bangladesh	169	32%	54	52%	28			16	54	16
Japan	127	91%	115	22%	25	39	53			39
Phillipines	110	43%	47	100%	47				31	31
Vietnam	94	50%	47	74%	35				15	

Table 5-1. Population, Internet penetration and Facebook penetration (millions, Q4 2015)

	Population	Internet Penetration	Internet Users	Facebook Penetration (of Internet)	Facebook Users	Inc. FB: Winning FB Pen. (56%)	Inc. FB: Good FB Pen. (68%)
Nigeria	182	51%	93	16%	15	32	73
Ehtiopia	99	4%	4	100%	4	42	67
Dem. Rep. Congo	79	3%	2	80%	2	27	43
South Africa	55	49%	27	48%	13	1	13
Tanzania	51	15%	8	36%	3	10	22
Kenya	45	71%	32	16%	5	7	17
Uganda	37	32%	12	15%	2	8	16
Ghana	26	19%	5	58%	3	4	10
Cameroon	24	11%	3	54%	1	5	10
Cote d'Ivoire	23	23%	5	35%	2	4	9
Angola	20	25%	5	66%	3	3	6
Senegal	14	50%	7	24%	2	2	5
South Sudan	12	16%	2	8%	0	3	6
Gabon	2	39%	1	54%	0	0	0
TOTAL	669		205		55	148	297

Table 5-2. Intended AMOS-6 satellite coverage country population, Internet penetration and Facebook penetration (millions, Q4 2015)

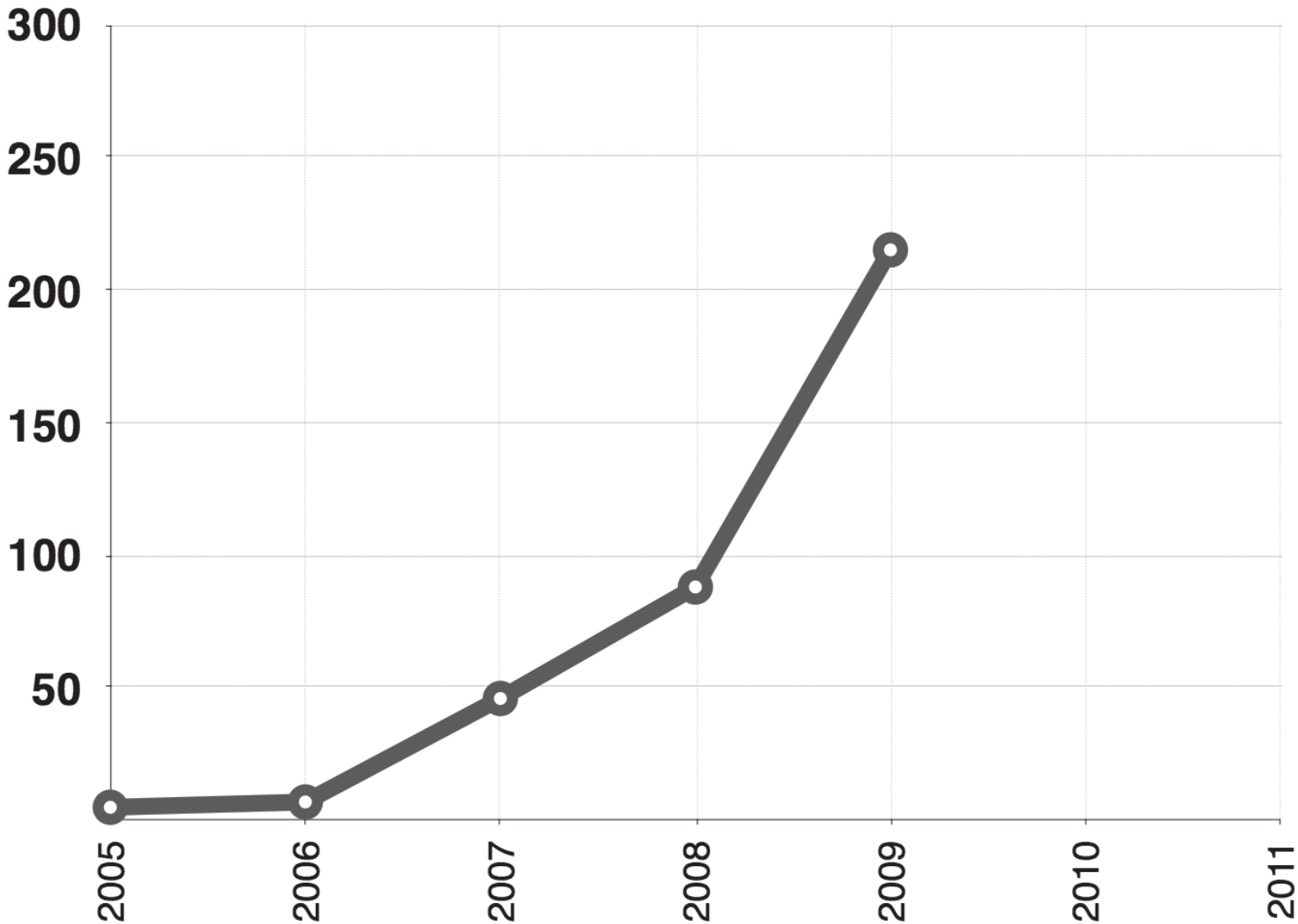


Figure 7-1. New Facebook monthly users (millions)

	Number of Things	Size of Things	Number of Sources	To Number of People	Algorithm?
Early Yahoo	Medium	Small	one	100's of millions	—
Netflix	Small	Huge	one	10's of millions	Simple
YouTube	Billions	Big	millions	over a billion	Simple
Google Search	Trillions	Small	one	over a billion	Complicated
WhatsApp	Billions	Small	over a billion	over a billion	—

Table 7-1. Scale and complexity of delivering various Internet services

	North America	Europe	Middle East	Africa	Latin America	Asia Pacific
Facebook	**20%**	**16%**	**23%**	**15%**	**35%**	**10%**
Facebook	16%	16%	14%	5%	25%	8%
Instagram	4%		7%		3%	2%
Whats App			2%	10%	7%	
Google	**24%**	**24%**	**26%**	**9%**	**29%**	**20%**
Youtube	21%	21%	23%	5%	23%	18%
Other	3%	2%	3%	4%	6%	2%
Next Largest	**4%**	**2%**	**4%**	**7%**	**2%**	**3%**

Table 7-2. Percentage of mobile Internet traffic (Sandvine, Q4 2015)

	Cache Success
Browser (your device)	65%
Edge (Internet intersection)	34.5%
Origin (data center)	14.5%
Backend (server)	9.9%

Table 7-3. Percentage of requests served by various Facebook caching levels

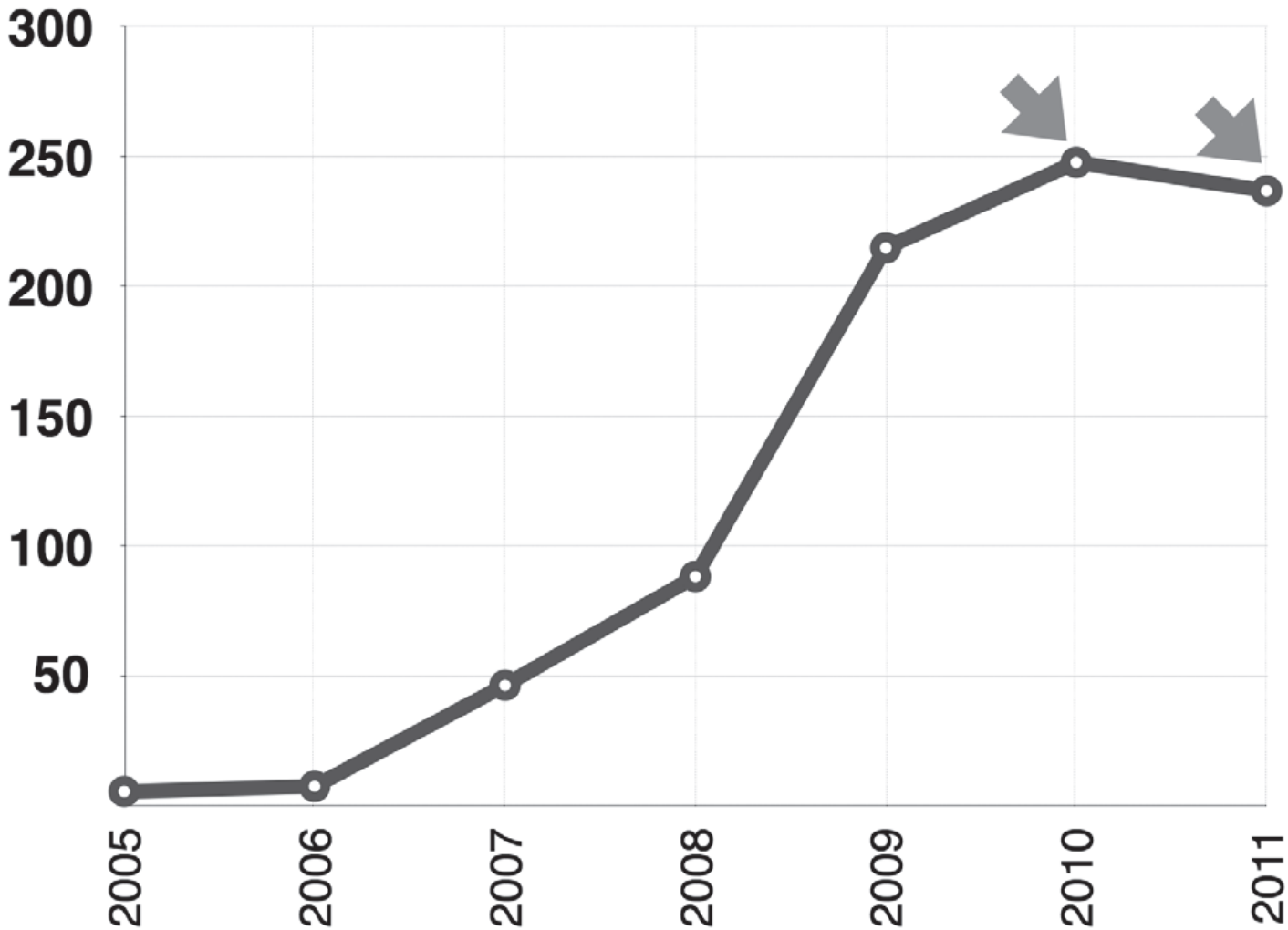


Figure 7-2. New Facebook monthly users (millions)

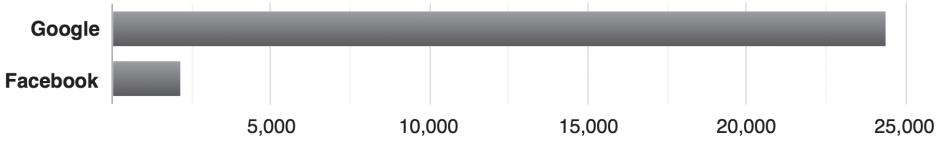


Figure 8-1. Employees (end of 2010)

On the business front, Google commanded 15 times Facebook's annual revenue at $29.3 billion vs. $1.974 billion and 14 times the net income at $8.5 billion vs. $606M.[2] Yes, Google's *profits* were four times greater than Facebook's *revenue*. (See Figure 8.2.)

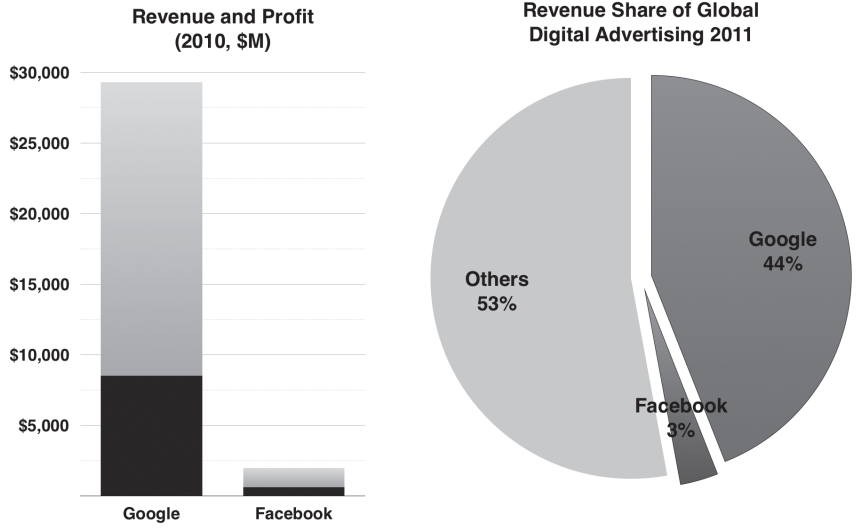


Figure 8-2. Revenue, profit and revenue share of global digital advertising

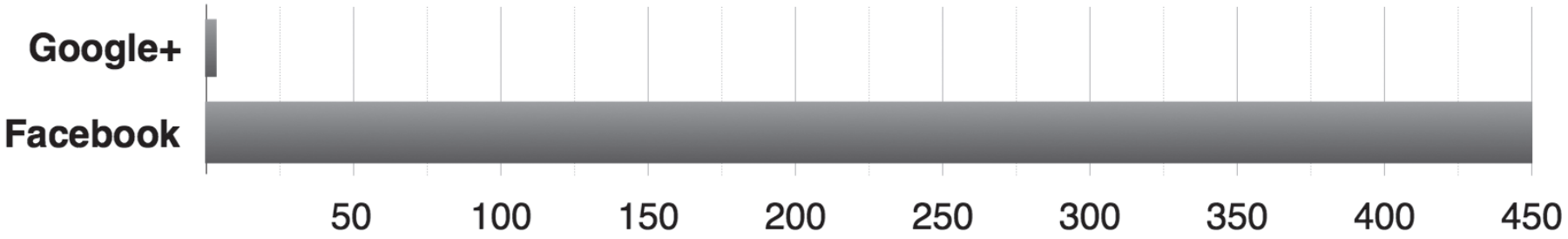


Figure 8-3. Minutes used per person per month

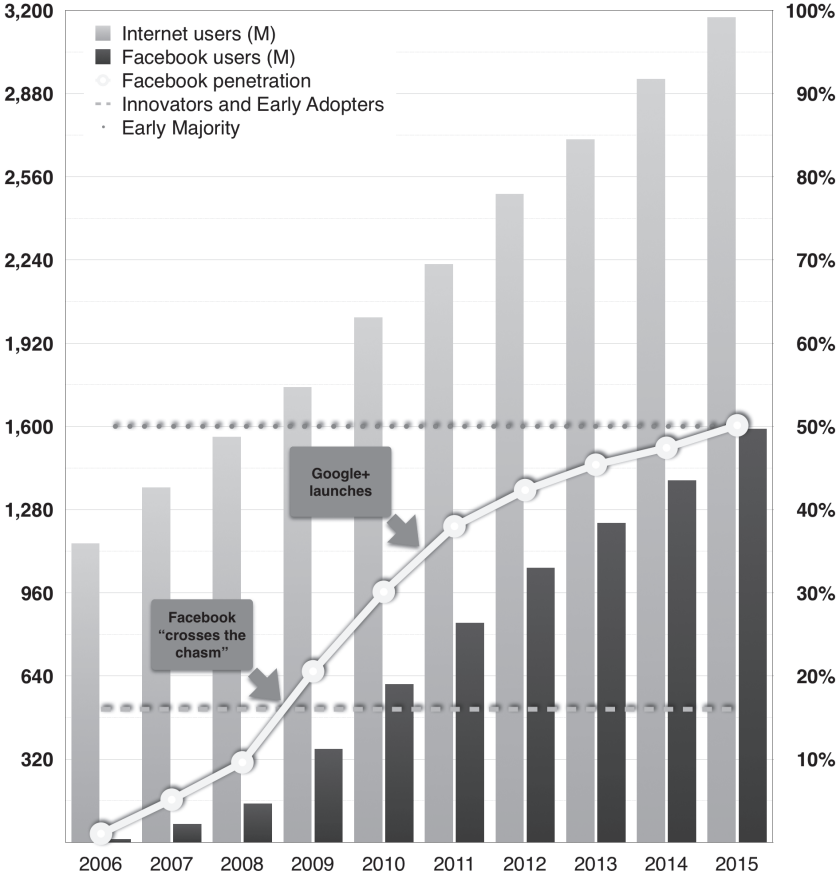


Figure 8-4. Facebook penetration among global Internet users

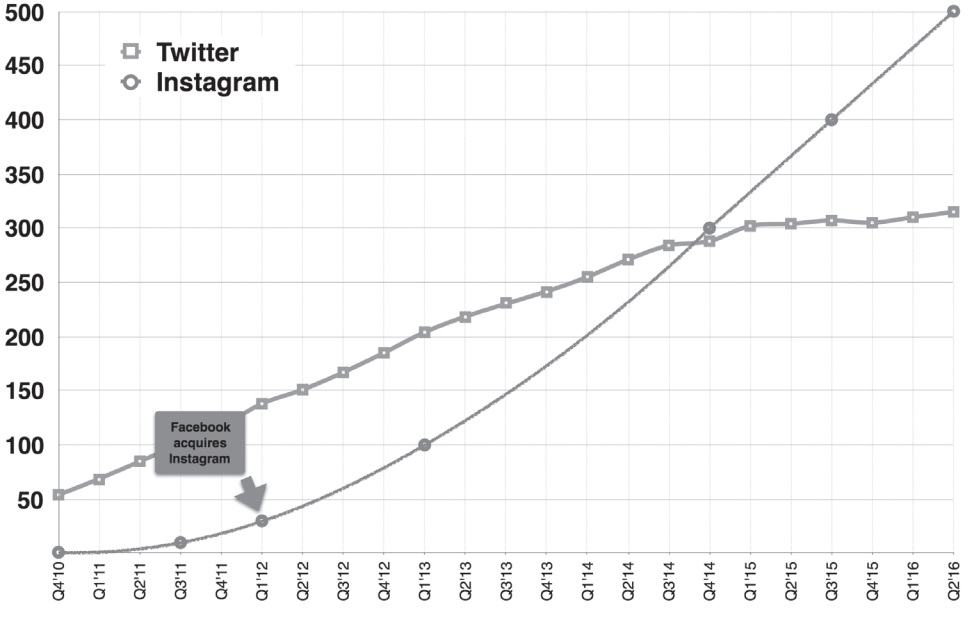


Figure 9-1. Twitter vs. Instagram global monthly users (millions)

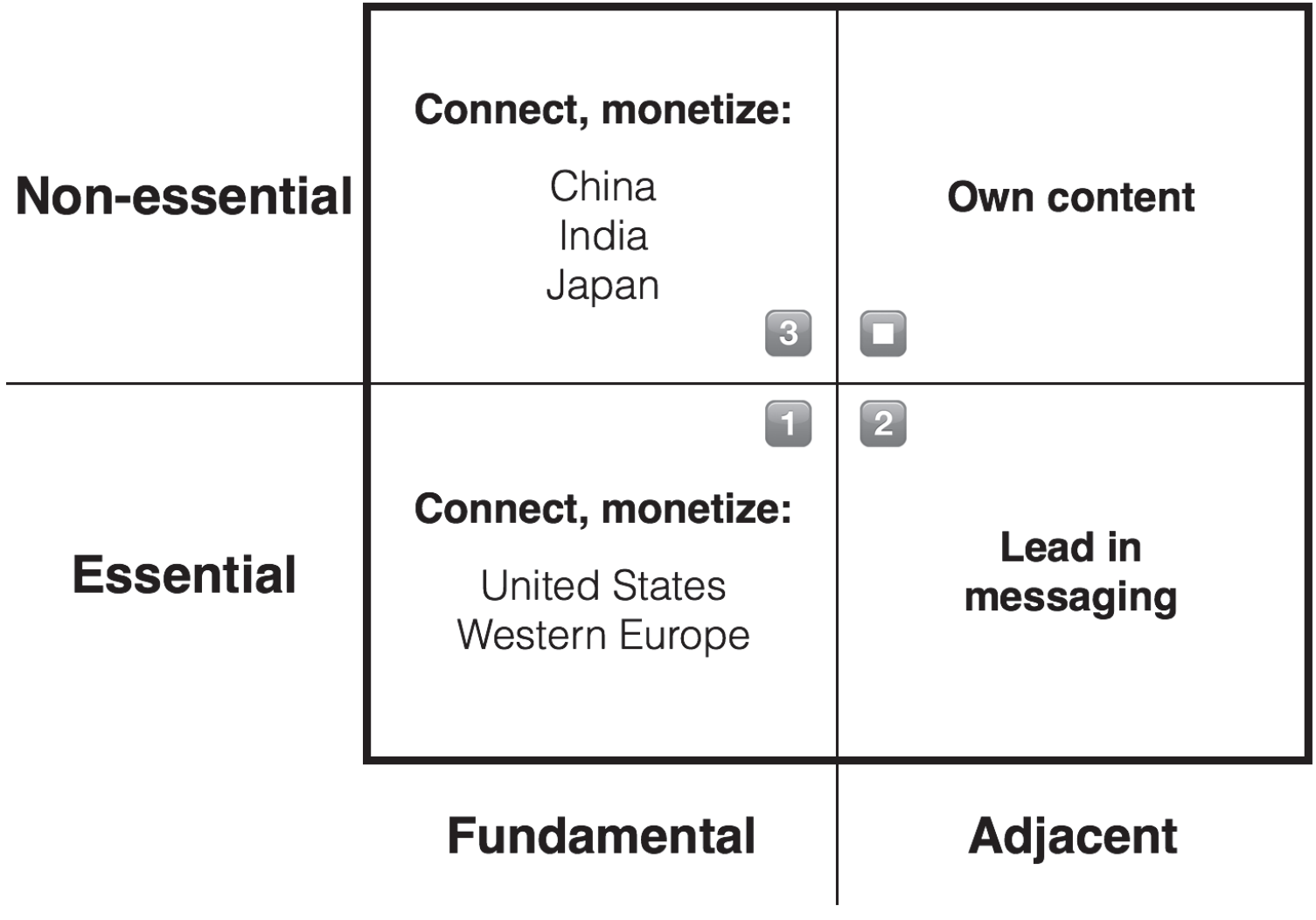


Figure 10-1. Framework for evaluating projects for prioritization

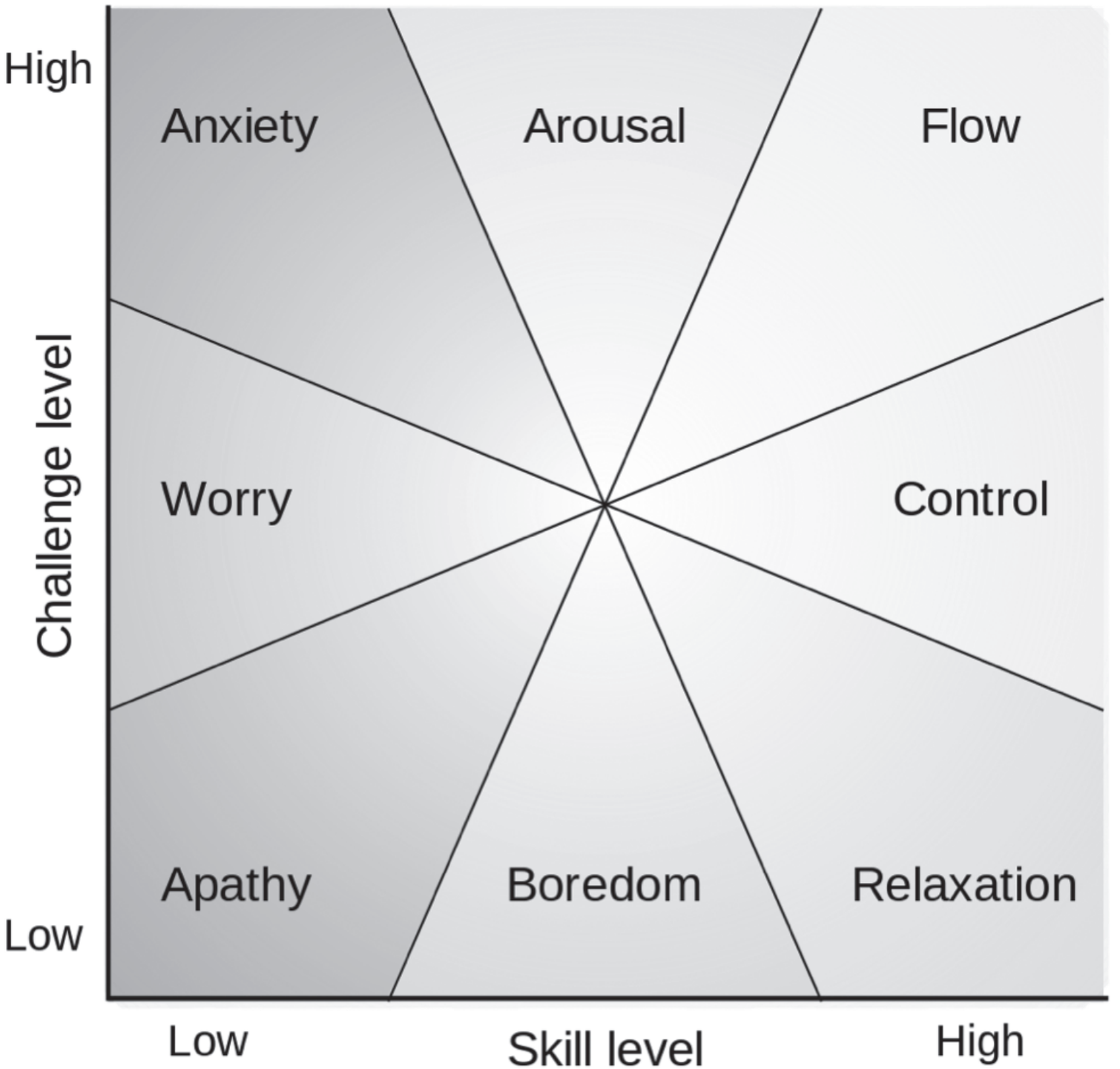


Figure 11-1. Mental states brought about by various combinations of skill and challenge

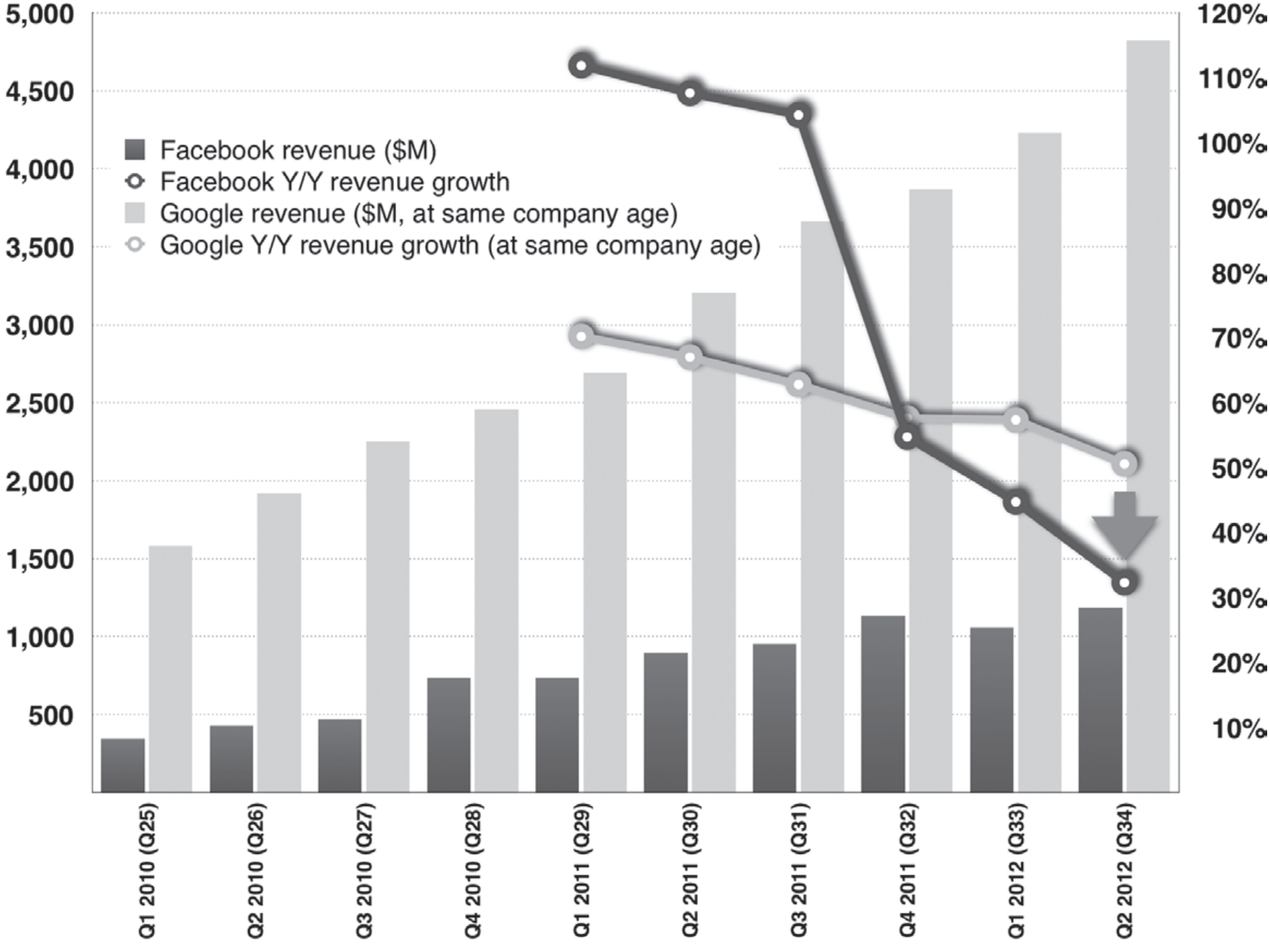


Figure 12-1. Facebook and Google revenue and revenue growth at same age as a company[1]

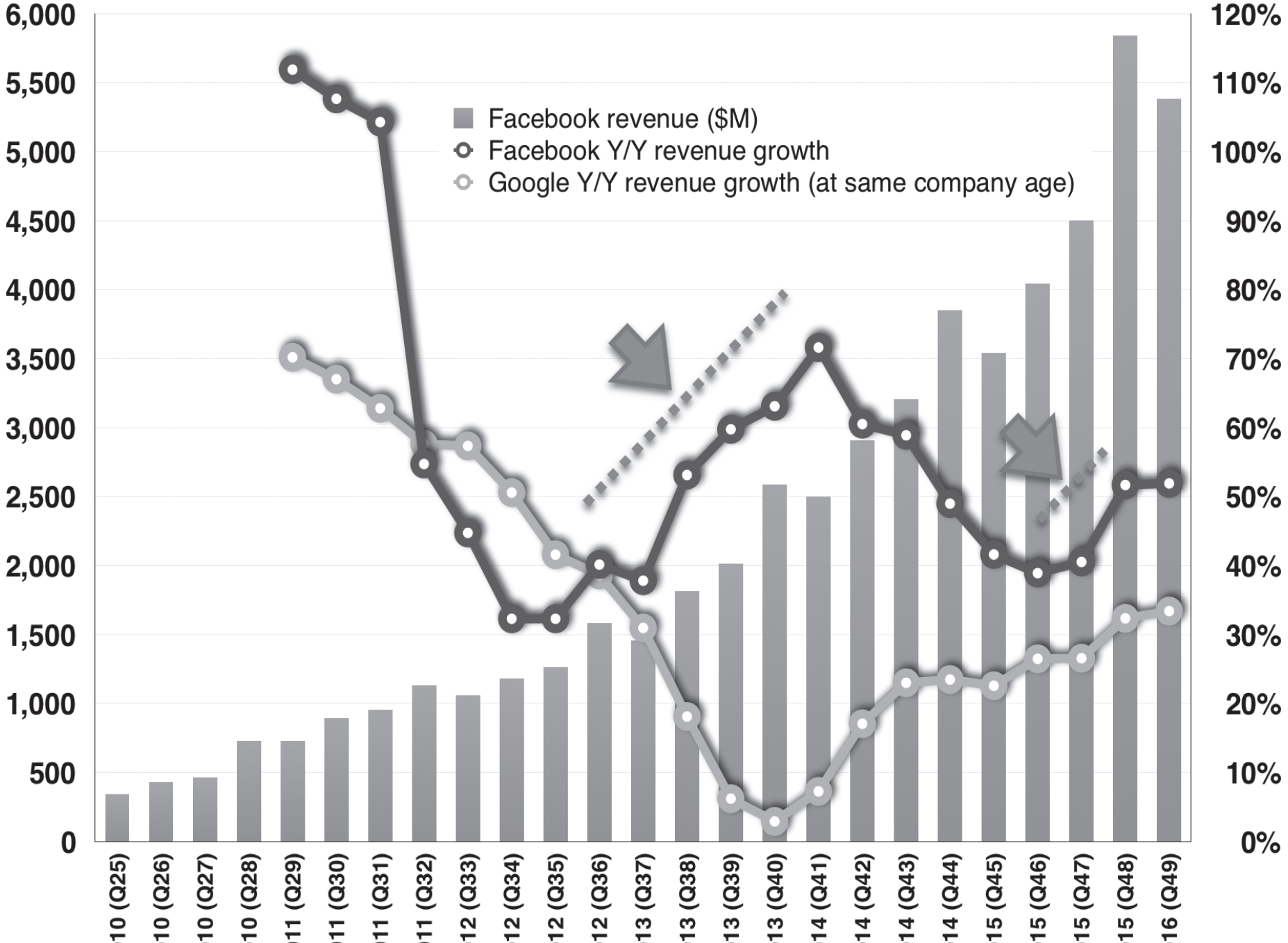


Figure 12-2. Facebook and Google revenue and revenue growth revisited

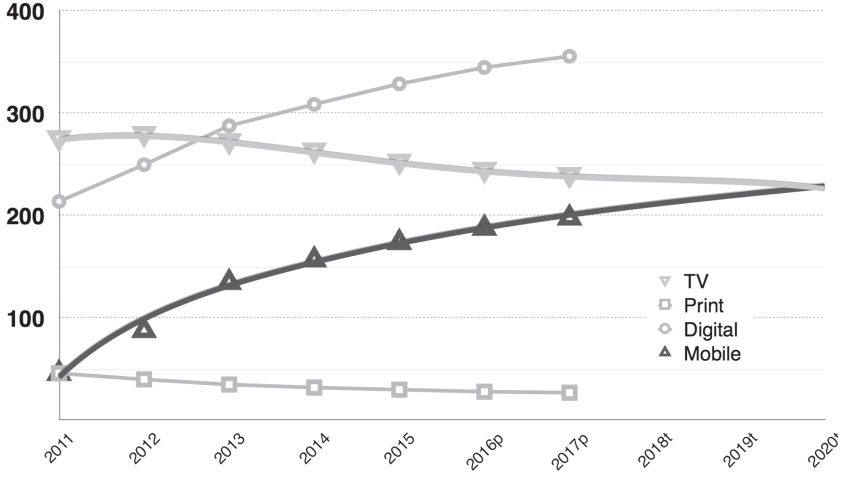


Figure 12-3. Average time spent per day for U.S. adults (minutes)

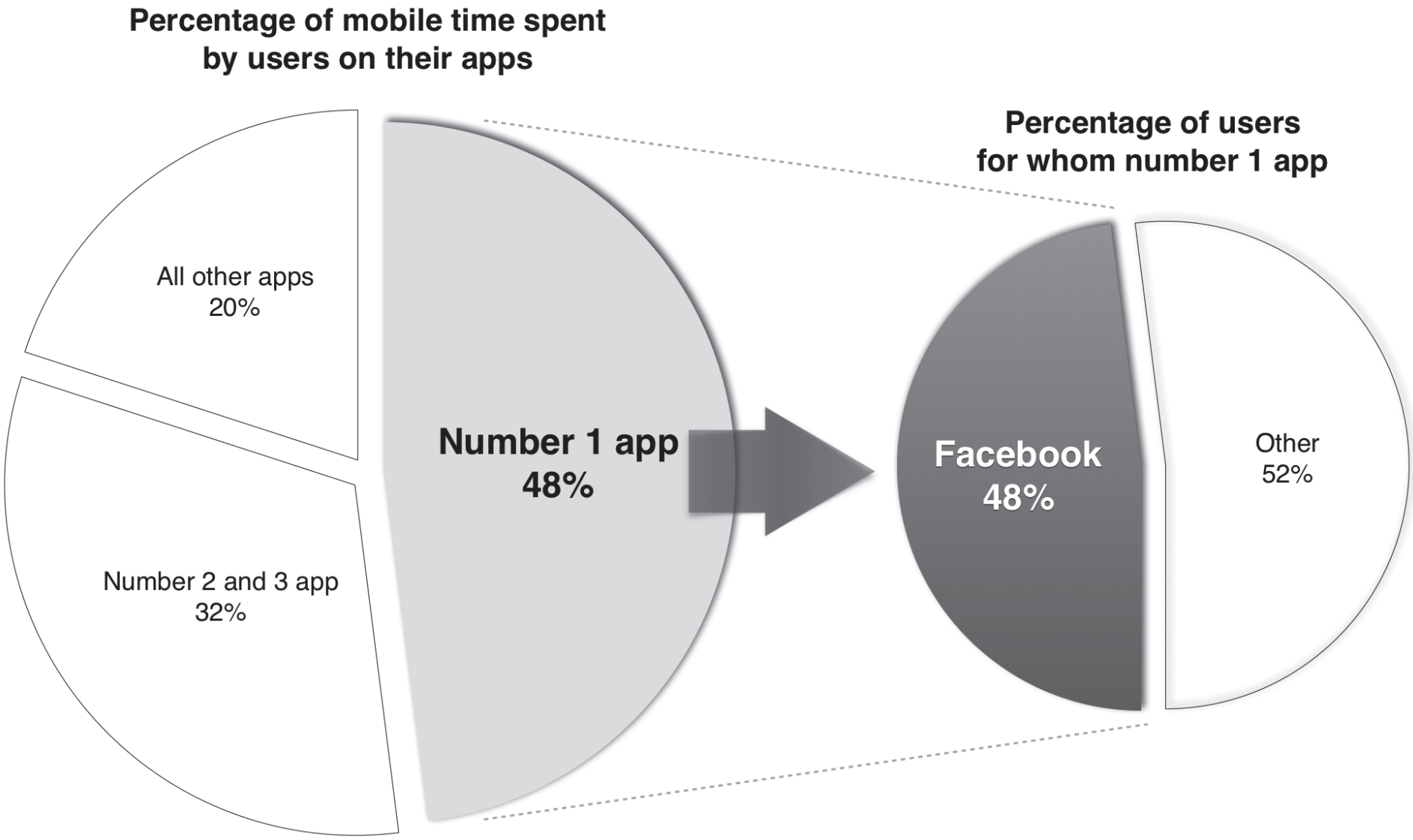


Figure 12-4. Percentage of time spent by users on their apps and share for Facebook

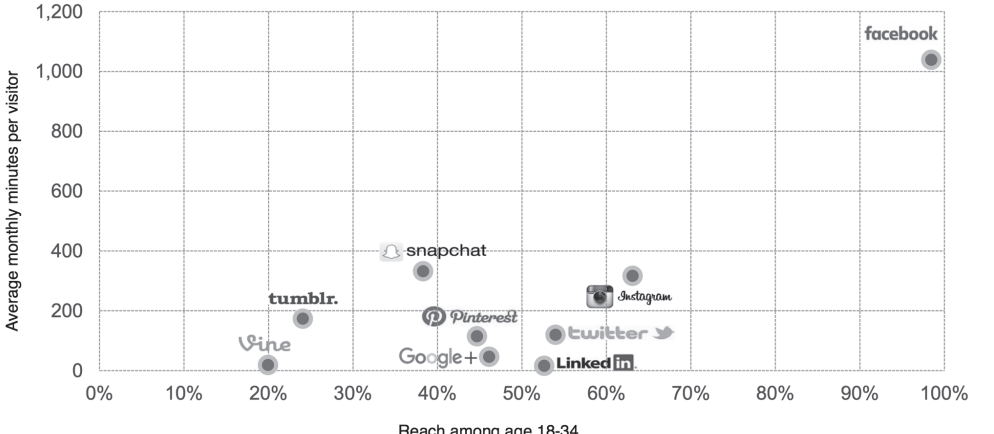


Figure 12-5. Age 18–34 digital audience penetration vs. engagement of leading social networks

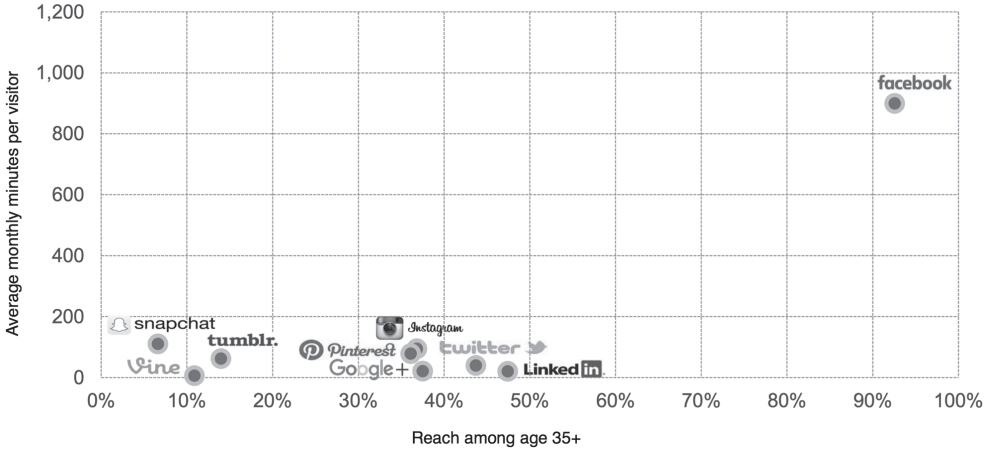


Figure 12-6. Age 35+ digital audience penetration vs. engagement of leading social networks

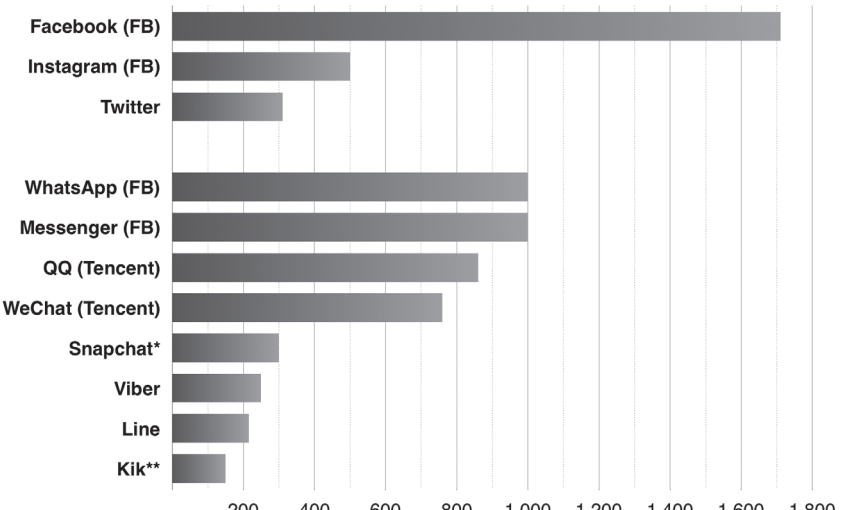


Figure 13-1. Global monthly users (millions, circa Q4 2015 to Q2 2016)[1]

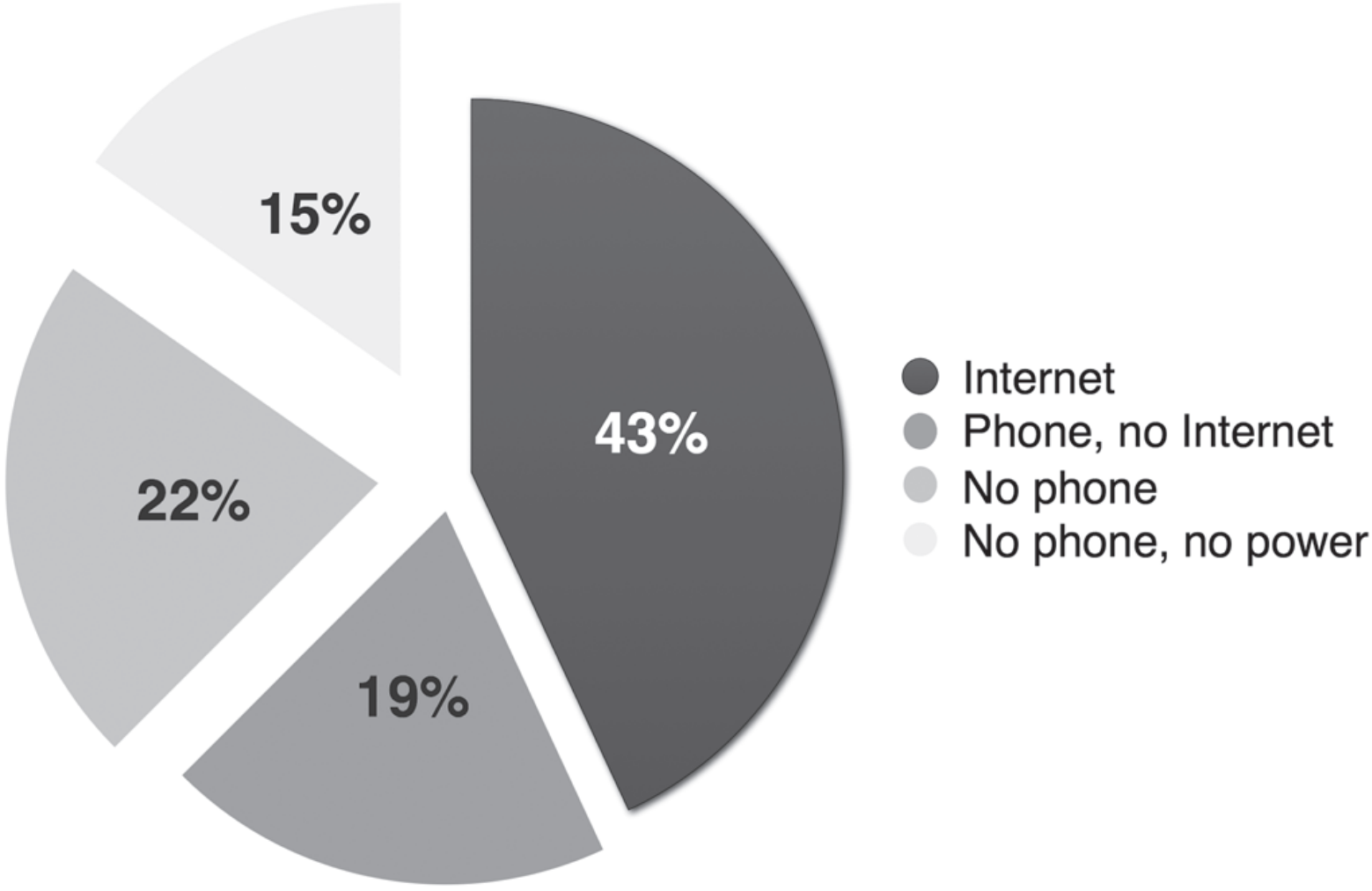


Figure 14-1. State of infrastructure for the world's population

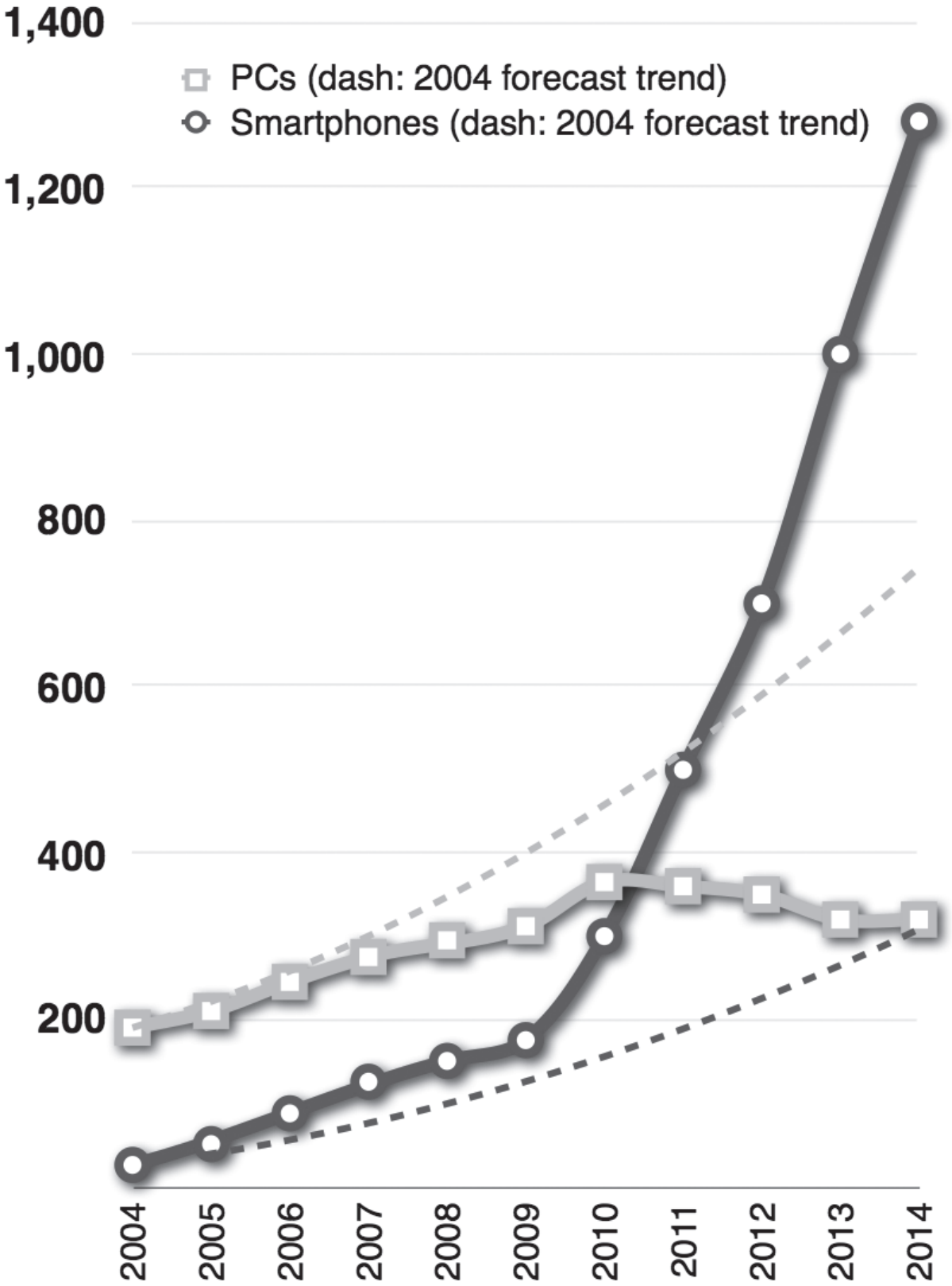


Figure 15-1. Global sales of PCs and smartphones (millions)