



PEARSON NEW INTERNATIONAL EDITION



Basic Marketing Research
Naresh K Malhotra
Fourth Edition

Pearson New International Edition

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Naresh K Malhotra
Fourth Edition

PEARSON

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APPENDIX

Statistical Tables

APPENDIX

Statistical Tables

TABLE Simple Random Numbers

Line/ Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	10480	15011	01536	02011	81647	91646	69179	14194	62590	36207	20969	99570	91291	90700
2	22368	46573	25595	85393	30995	89198	27982	53402	93965	34095	52666	19174	39615	99505
3	24130	48390	22527	97265	76393	64809	15179	24830	49340	32081	30680	19655	63348	58629
4	42167	93093	06243	61680	07856	16376	39440	53537	71341	57004	00849	74917	97758	16379
5	37570	39975	81837	16656	06121	91782	60468	81305	49684	60072	14110	06927	01263	54613
6	77921	06907	11008	42751	27756	53498	18602	70659	90655	15053	21916	81825	44394	42880
7	99562	72905	56420	69994	98872	31016	71194	18738	44013	48840	63213	21069	10634	12952
8	96301	91977	05463	07972	18876	20922	94595	56869	69014	60045	18425	84903	42508	32307
9	89579	14342	63661	10281	17453	18103	57740	84378	25331	12568	58678	44947	05585	56941
10	85475	36857	53342	53988	53060	59533	38867	62300	08158	17983	16439	11458	18593	64952
11	28918	69578	88231	33276	70997	79936	56865	05859	90106	31595	01547	85590	91610	78188
12	63553	40961	48235	03427	49626	69445	18663	72695	52180	20847	12234	90511	33703	90322
13	09429	93969	52636	92737	88974	33488	36320	17617	30015	08272	84115	27156	30613	74952
14	10365	61129	87529	85689	48237	52267	67689	93394	01511	26358	85104	20285	29975	89868
15	07119	97336	71048	08178	77233	13916	47564	81056	97735	85977	29372	74461	28551	90707
16	51085	12765	51821	51259	77452	16308	60756	92144	49442	53900	70960	63990	75601	40719
17	02368	21382	52404	60268	89368	19885	55322	44819	01188	65255	64835	44919	05944	55157
18	01011	54092	33362	94904	31273	04146	18594	29852	71685	85030	51132	01915	92747	64951
19	52162	53916	46369	58586	23216	14513	83149	98736	23495	64350	94738	17752	35156	35749
20	07056	97628	33787	09998	42698	06691	76988	13602	51851	46104	88916	19509	25625	58104
21	48663	91245	85828	14346	09172	30163	90229	04734	59193	22178	30421	61666	99904	32812
22	54164	58492	22421	74103	47070	25306	76468	26384	58151	06646	21524	15227	96909	44592
23	32639	32363	05597	24200	13363	38005	94342	28728	35806	06912	17012	64161	18296	22851
24	29334	27001	87637	87308	58731	00256	45834	15398	46557	41135	10307	07684	36188	18510
25	02488	33062	28834	07351	19731	92420	60952	61280	50001	67658	32586	86679	50720	94953
26	81525	72295	04839	96423	24878	82651	66566	14778	76797	14780	13300	87074	79666	95725
27	29676	20591	68086	26432	46901	20849	89768	81536	86645	12659	92259	57102	80428	25280
28	00742	57392	39064	66432	84673	40027	32832	61362	98947	96067	64760	64584	96096	98253
29	05366	04213	25669	26422	44407	44048	37937	63904	45766	66134	75470	66520	34693	90449
30	91921	26418	64117	94305	26766	25940	39972	22209	71500	64568	91402	42416	07844	69618
31	00582	04711	87917	77341	42206	35126	74087	99547	81817	42607	43808	76655	62028	76630
32	00725	69884	62797	56170	86324	88072	76222	36086	84637	93161	76038	65855	77919	88006
33	69011	65795	95876	55293	18988	27354	26575	08625	40801	59920	29841	80150	12777	48501
34	25976	57948	29888	88604	67917	48708	18912	82271	65424	69774	33611	54262	85963	03547
35	09763	83473	73577	12908	30883	18317	28290	35797	05998	41688	34952	37888	38917	88050
36	91567	42595	27958	30134	04024	86385	29880	99730	55536	84855	29088	09250	79656	73211
37	17955	56349	90999	49127	20044	59931	06115	20542	18059	02008	73708	83517	36103	42791
38	46503	18584	18845	49618	02304	51038	20655	58727	28168	15475	56942	53389	20562	87338

(Continued)

APPENDIX: STATISTICAL TABLES

TABLE (Continued)

Line/ Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
39	92157	89634	94824	78171	84610	82834	09922	25417	44137	48413	25555	21246	35509	20468
40	14577	62765	35605	81263	39667	47358	56873	56307	61607	49518	89656	20103	77490	18062
41	98427	07523	33362	64270	01638	92477	66969	98420	04880	45585	46565	04102	46880	45709
42	34914	63976	88720	82765	34476	17032	87589	40836	32427	70002	70663	88863	77775	69348
43	70060	28277	39475	46473	23219	53416	94970	25832	69975	94884	19661	72828	00102	66794
44	53976	54914	06990	67245	68350	82948	11398	42878	80287	88267	47363	46634	06541	97809
45	76072	29515	40980	07391	58745	25774	22987	80059	39911	96189	41151	14222	60697	59583
46	90725	52210	83974	29992	65831	38857	50490	83765	55657	14361	31720	57375	56228	41546
47	64364	67412	33339	31926	14883	24413	59744	92351	97473	89286	35931	04110	23726	51900
48	08962	00358	31662	25388	61642	34072	81249	35648	56891	69352	48373	45578	78547	81788
49	95012	68379	93526	70765	10592	04542	76463	54328	02349	17247	28865	14777	62730	92277
50	15664	10493	20492	38301	91132	21999	59516	81652	27195	48223	46751	22923	32261	85653
51	16408	81899	04153	53381	79401	21438	83035	92350	36693	31238	59649	91754	72772	02338
52	18629	81953	05520	91962	04739	13092	97662	24822	94730	06496	35090	04822	86774	98289
53	73115	35101	47498	87637	99016	71060	88824	71013	18735	20286	23153	72924	35165	43040
54	57491	16703	23167	49323	45021	33132	12544	41035	80780	45393	44812	12515	98931	91202
55	30405	83946	23792	14422	15059	45799	22716	19792	09983	74353	68668	30429	70735	25499
56	16631	35006	85900	98275	32388	52390	16815	69293	82732	38480	73817	32523	41961	44437
57	96773	20206	42559	78985	05300	22164	24369	54224	35083	19687	11052	91491	60383	19746
58	38935	64202	14349	82674	66523	44133	00697	35552	35970	19124	63318	29686	03387	59846
59	31624	76384	17403	53363	44167	64486	64758	75366	76554	31601	12614	33072	60332	92325
60	78919	19474	23632	27889	47914	02584	37680	20801	72152	39339	34806	08930	85001	87820
61	03931	33309	57047	74211	63445	17361	62825	39908	05607	91284	68833	25570	38818	46920
62	74426	33278	43972	10119	89917	15665	52872	73823	73144	88662	88970	74492	51805	99378
63	09066	00903	20795	95452	92648	45454	69552	88815	16553	51125	79375	97596	16296	66092
64	42238	12426	87025	14267	20979	04508	64535	31355	86064	29472	47689	05974	52468	16834
65	16153	08002	26504	41744	81959	65642	74240	56302	00033	67107	77510	70625	28725	34191
66	21457	40742	29820	96783	29400	21840	15035	34537	33310	06116	95240	15957	16572	06004
67	21581	57802	02050	89728	17937	37621	47075	42080	97403	48626	68995	43805	33386	21597
68	55612	78095	83197	33732	05810	24813	86902	60397	16489	03264	88525	42786	05269	92532
69	44657	66999	99324	51281	84463	60563	79312	93454	68876	25471	93911	25650	12682	73572
70	91340	84979	46949	81973	37949	61023	43997	15263	80644	43942	89203	71795	99533	50501
71	91227	21199	31935	27022	84067	05462	35216	14486	29891	68607	41867	14951	91696	85065
72	50001	38140	66321	19924	72163	09538	12151	06878	91903	18749	34405	56087	82790	70925
73	65390	05224	72958	28609	81406	39147	25549	48542	42627	45233	57202	94617	23772	07896
74	27504	96131	83944	41575	10573	03619	64482	73923	36152	05184	94142	25299	94387	34925
75	37169	94851	39117	89632	00959	16487	65536	49071	39782	17095	02330	74301	00275	48280
76	11508	70225	51111	38351	19444	66499	71945	05422	13442	78675	84031	66938	93654	59894
77	37449	30362	06694	54690	04052	53115	62757	95348	78662	11163	81651	50245	34971	52974
78	46515	70331	85922	38329	57015	15765	97161	17869	45349	61796	66345	81073	49106	79860
79	30986	81223	42416	58353	21532	30502	32305	86482	05174	07901	54339	58861	74818	46942
80	63798	64995	46583	09785	44160	78128	83991	42865	92520	83531	80377	35909	81250	54238
81	82486	84846	99254	67632	43218	50076	21361	64816	51202	88124	41870	52689	51275	83556
82	21885	32906	92431	09060	64297	51674	64126	62570	26123	05155	59194	52799	28225	85762

(Continued)

APPENDIX: STATISTICAL TABLES

TABLE (Continued)

Line/ Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
83	60336	98782	07408	53458	13564	59089	26445	29789	85205	41001	12535	12133	14645	23541
84	43937	46891	24010	25560	86355	33941	25786	54990	71899	15475	95434	98227	21824	19535
85	97656	63175	89303	16275	07100	92063	21942	18611	47348	20203	18534	03862	78095	50136
86	03299	01221	05418	38982	55758	92237	26759	86367	21216	98442	08303	56613	91511	75928
87	79626	06486	03574	17668	07785	76020	79924	25651	83325	88428	85076	72811	22717	50585
88	85636	68335	47539	03129	65651	11977	02510	26113	99447	68645	34327	15152	55230	93448
89	18039	14367	61337	06177	12143	46609	32989	74014	64708	00533	35398	58408	13261	47908
90	08362	15656	60627	36478	65648	16764	53412	09013	07832	41574	17639	82163	60859	75567
91	79556	29068	04142	16268	15387	12856	66227	38358	22478	73373	88732	09443	82558	05250
92	92608	82674	27072	32534	17075	27698	98204	63863	11951	34648	88022	56148	34925	57031
93	23982	25835	40055	67006	12293	02753	14827	23235	35071	99704	37543	11601	35503	85171
94	09915	96306	05908	97901	28395	14186	00821	80703	70426	75647	76310	88717	37890	40129
95	59037	33300	26695	62247	69927	76123	50842	43834	86654	70959	79725	93872	28117	19233
96	42488	78077	69882	61657	34136	79180	97526	43092	04098	73571	80799	76536	71255	64239
97	46764	86273	63003	93017	31204	36692	40202	35275	57306	55543	53203	18098	47625	88684
98	03237	45430	55417	63282	90816	17349	88298	90183	36600	78406	06216	95787	42579	90730
99	86591	81482	52667	61582	14972	90053	89534	76036	49199	43716	97548	04379	46370	28672
100	38534	01715	94964	87288	65680	43772	39560	12918	80537	62738	19636	51132	25739	56947

APPENDIX: STATISTICAL TABLES

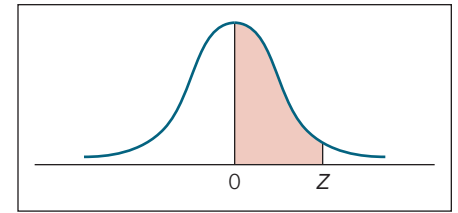
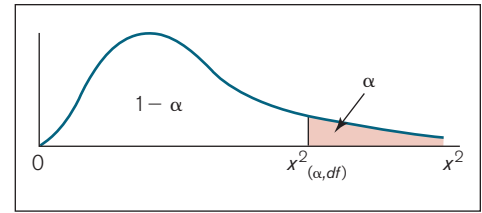


TABLE Area Under the Normal Curve

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
0.7	.2580	.2612	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.49865	.49869	.49874	.49878	.49882	.49886	.49889	.49893	.49897	.49900
3.1	.49903	.49906	.49910	.49913	.49916	.49918	.49921	.49924	.49926	.49929
3.2	.49931	.49934	.49936	.49938	.49940	.49942	.49944	.49946	.49948	.49950
3.3	.49952	.49953	.49955	.49957	.49958	.49960	.49961	.49962	.49964	.49965
3.4	.49966	.49968	.49969	.49970	.49971	.49972	.49973	.49974	.49975	.49976
3.5	.49977	.49978	.49978	.49979	.49980	.49981	.49981	.49982	.49983	.49983
3.6	.49984	.49985	.49985	.49986	.49986	.49987	.49987	.49988	.49988	.49989
3.7	.49989	.49990	.49990	.49990	.49991	.49991	.49992	.49992	.49992	.49992
3.8	.49993	.49993	.49993	.49994	.49994	.49994	.49994	.49995	.49995	.49995
3.9	.49995	.49995	.49996	.49996	.49996	.49996	.49996	.49996	.49997	.49997

Entry represents area under the standard normal distribution from the mean to Z.

**TABLE Chi-Square Distribution**

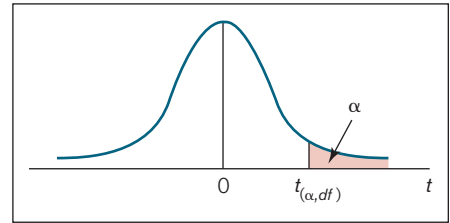
Degrees of Freedom	Upper-Tail Areas (α)											
	.995	.99	.975	.95	.90	.75	.25	.10	.05	.025	.01	.005
1			0.001	0.004	0.016	0.102	1.323	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	0.575	2.773	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	1.213	4.108	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	1.923	5.385	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	2.675	6.626	9.236	11.071	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	3.455	7.841	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	4.255	9.037	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	5.071	10.219	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	5.899	11.389	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	6.737	12.549	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	7.584	13.701	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	8.438	14.845	18.549	21.026	23.337	26.217	28.299
13	3.565	4.107	5.009	5.892	7.042	9.299	15.984	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	10.165	17.117	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	11.037	18.245	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	11.912	19.369	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	12.792	20.489	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	13.675	21.605	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	14.562	22.718	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	15.452	23.828	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	16.344	24.935	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.042	17.240	26.039	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	18.137	27.141	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	19.037	28.241	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	19.939	29.339	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	20.843	30.435	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	21.749	31.528	36.741	40.113	43.194	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	22.657	32.620	37.916	41.337	44.461	48.278	50.993
29	13.121	14.257	16.047	17.708	19.768	23.567	33.711	39.087	42.557	45.722	49.588	52.336
30	13.787	14.954	16.791	18.493	20.599	24.478	34.800	40.256	43.773	46.979	50.892	53.672
31	14.458	15.655	17.539	19.281	21.434	25.390	35.887	41.422	44.985	48.232	52.191	55.003
32	15.134	16.362	18.291	20.072	22.271	26.304	36.973	42.585	46.194	49.480	53.486	56.328
33	15.815	17.074	19.047	20.867	23.110	27.219	38.058	43.745	47.400	50.725	54.776	57.648
34	16.501	17.789	19.806	21.664	23.952	28.136	39.141	44.903	48.602	51.966	56.061	58.964
35	17.192	18.509	20.569	22.465	24.797	29.054	40.223	46.059	49.802	53.203	57.342	60.275
36	17.887	19.233	21.336	23.269	25.643	29.973	41.304	47.212	50.998	54.437	58.619	61.581
37	18.586	19.960	22.106	24.075	26.492	30.893	42.383	48.363	52.192	55.668	59.892	62.883
38	19.289	20.691	22.878	24.884	27.343	31.815	43.462	49.513	53.384	56.896	61.162	64.181

(Continued)

TABLE (Continued)

Degrees of Freedom	Upper-Tail Areas (α)											
	.995	.99	.975	.95	.90	.75	.25	.10	.05	.025	.01	.005
39	19.996	21.426	23.654	25.695	28.196	32.737	44.539	50.660	54.572	58.120	62.428	65.476
40	20.707	22.164	24.433	26.509	29.051	33.660	45.616	51.805	55.758	59.342	63.691	66.766
41	21.421	22.906	25.215	27.326	29.907	34.585	46.692	52.949	56.942	60.561	64.950	68.053
42	22.138	23.650	25.999	28.144	30.765	35.510	47.766	54.090	58.124	61.777	66.206	69.336
43	22.859	24.398	26.785	28.965	31.625	36.436	48.840	55.230	59.304	62.990	67.459	70.616
44	23.584	25.148	27.575	29.787	32.487	37.363	49.913	56.369	60.481	64.201	68.710	71.893
45	24.311	25.901	28.366	30.612	33.350	38.291	50.985	57.505	61.656	65.410	69.957	73.166
46	25.041	26.657	29.160	31.439	34.215	39.220	52.056	58.641	62.830	66.617	71.201	74.437
47	25.775	27.416	29.956	32.268	35.081	40.149	53.127	59.774	64.001	67.821	72.443	75.704
48	26.511	28.177	30.755	33.098	35.949	41.079	54.196	60.907	65.171	69.023	73.683	76.969
49	27.249	28.941	31.555	33.930	36.818	42.010	55.265	62.038	66.339	70.222	74.919	78.231
50	27.991	29.707	32.357	34.764	37.689	42.942	56.334	63.167	67.505	71.420	76.154	79.490
51	28.735	30.475	33.162	35.600	38.560	43.874	57.401	64.295	68.669	72.616	77.386	80.747
52	29.481	31.246	33.968	36.437	39.433	44.808	58.468	65.422	69.832	73.810	78.616	82.001
53	30.230	32.018	34.776	37.276	40.308	45.741	59.534	66.548	70.993	75.002	79.843	83.253
54	30.981	32.793	35.586	38.116	41.183	46.676	60.600	67.673	72.153	76.192	81.069	84.502
55	31.735	33.570	36.398	38.958	42.060	47.610	61.665	68.796	73.311	77.380	82.292	85.749
56	32.490	34.350	37.212	39.801	42.937	48.546	62.729	69.919	74.468	78.567	83.513	86.994
57	33.248	35.131	38.027	40.646	43.816	49.482	63.793	71.040	75.624	79.752	84.733	88.236
58	34.008	35.913	38.844	41.492	44.696	50.419	64.857	72.160	76.778	80.936	85.950	89.477
59	34.770	36.698	39.662	42.339	45.577	51.356	65.919	73.279	77.931	82.117	87.166	90.715
60	35.534	37.485	40.482	43.188	46.459	52.294	66.981	74.397	79.082	83.298	88.379	91.952

For a particular number of degrees of freedom, entry represents the critical value of χ^2 corresponding to a specified upper-tail area, α . For larger values of degrees of freedom (df) the expression $z = \sqrt{2\chi^2} - \sqrt{2(df) - 1}$ may be used and the resulting upper-tail area can be obtained from the table of the standardized normal distribution.

**TABLE t Distribution**

Degrees of Freedom	Upper-Tail Areas (α)					
	.25	.10	.05	.025	.01	.005
1	1.0000	3.0777	6.3138	12.7062	31.8207	63.6574
2	0.8165	1.8856	2.9200	4.3027	6.9646	9.9248
3	0.7649	1.6377	2.3534	3.1824	4.5407	5.8409
4	0.7407	1.5332	2.1318	2.7764	3.7469	4.6041
5	0.7267	1.4759	2.0150	2.5706	3.3649	4.0322
6	0.7176	1.4398	1.9432	2.4469	3.1427	3.7074
7	0.7111	1.4149	1.8946	2.3646	2.9980	3.4995
8	0.7064	1.3968	1.8595	2.3060	2.8965	3.3554
9	0.7027	1.3830	1.8331	2.2622	2.8214	3.2498
10	0.6998	1.3722	1.8125	2.2281	2.7638	3.1693
11	0.6974	1.3634	1.7959	2.2010	2.7181	3.1058
12	0.6955	1.3562	1.7823	2.1788	2.6810	3.0545
13	0.6938	1.3502	1.7709	2.1604	2.6503	3.0123
14	0.6924	1.3450	1.7613	2.1448	2.6245	2.9768
15	0.6912	1.3406	1.7531	2.1315	2.6025	2.9467
16	0.6901	1.3368	1.7459	2.1199	2.5835	2.9208
17	0.6892	1.3334	1.7396	2.1098	2.5669	2.8982
18	0.6884	1.3304	1.7341	2.1009	2.5524	2.8784
19	0.6876	1.3277	1.7291	2.0930	2.5395	2.8609
20	0.6870	1.3253	1.7247	2.0860	2.5280	2.8453
21	0.6864	1.3232	1.7207	2.0796	2.5177	2.8314
22	0.6858	1.3212	1.7171	2.0739	2.5083	2.8188
23	0.6853	1.3195	1.7139	2.0687	2.4999	2.8073
24	0.6848	1.3178	1.7109	2.0639	2.4922	2.7969
25	0.6844	1.3163	1.7081	2.0595	2.4851	2.7874
26	0.6840	1.3150	1.7056	2.0555	2.4786	2.7787
27	0.6837	1.3137	1.7033	2.0518	2.4727	2.7707
28	0.6834	1.3125	1.7011	2.0484	2.4671	2.7633
29	0.6830	1.3114	1.6991	2.0452	2.4620	2.7564
30	0.6828	1.3104	1.6973	2.0423	2.4573	2.7500
31	0.6825	1.3095	1.6955	2.0395	2.4528	2.7440
32	0.6822	1.3086	1.6939	2.0369	2.4487	2.7385
33	0.6820	1.3077	1.6924	2.0345	2.4448	2.7333
34	0.6818	1.3070	1.6909	2.0322	2.4411	2.7284
35	0.6816	1.3062	1.6896	2.0301	2.4377	2.7238
36	0.6814	1.3055	1.6883	2.0281	2.4345	2.7195
37	0.6812	1.3049	1.6871	2.0262	2.4314	2.7154
38	0.6810	1.3042	1.6860	2.0244	2.4286	2.7116

(Continued)

TABLE (Continued)

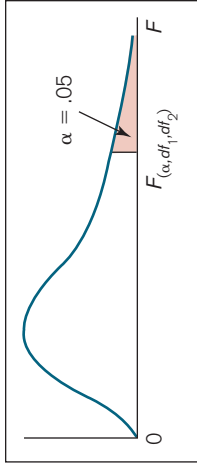
Degrees of Freedom	Upper-Tail Areas (α)					
	.25	.10	.05	.025	.01	.005
39	0.6808	1.3036	1.6849	2.0227	2.4258	2.7079
40	0.6807	1.3031	1.6839	2.0211	2.4233	2.7045
41	0.6805	1.3025	1.6829	2.0195	2.4208	2.7012
42	0.6804	1.3020	1.6820	2.0181	2.4185	2.6981
43	0.6802	1.3016	1.6811	2.0167	2.4163	2.6951
44	0.6801	1.3011	1.6802	2.0154	2.4141	2.6923
45	0.6800	1.3006	1.6794	2.0141	2.4121	2.6896
46	0.6799	1.3002	1.6787	2.0129	2.4102	2.6870
47	0.6797	1.2998	1.6779	2.0117	2.4083	2.6846
48	0.6796	1.2994	1.6772	2.0106	2.4066	2.6822
49	0.6795	1.2991	1.6766	2.0096	2.4049	2.6800
50	0.6794	1.2987	1.6759	2.0086	2.4033	2.6778
51	0.6793	1.2984	1.6753	2.0076	2.4017	2.6757
52	0.6792	1.2980	1.6747	2.0066	2.4002	2.6737
53	0.6791	1.2977	1.6741	2.0057	2.3988	2.6718
54	0.6791	1.2974	1.6736	2.0049	2.3974	2.6700
55	0.6790	1.2971	1.6730	2.0040	2.3961	2.6682
56	0.6789	1.2969	1.6725	2.0032	2.3948	2.6665
57	0.6788	1.2966	1.6720	2.0025	2.3936	2.6649
58	0.6787	1.2963	1.6716	2.0017	2.3924	2.6633
59	0.6787	1.2961	1.6711	2.0010	2.3912	2.6618
60	0.6786	1.2958	1.6706	2.0003	2.3901	2.6603
61	0.6785	1.2956	1.6702	1.9996	2.3890	2.6589
62	0.6785	1.2954	1.6698	1.9990	2.3880	2.6575
63	0.6784	1.2951	1.6694	1.9983	2.3870	2.6561
64	0.6783	1.2949	1.6690	1.9977	2.3860	2.6549
65	0.6783	1.2947	1.6686	1.9971	2.3851	2.6536
66	0.6782	1.2945	1.6683	1.9966	2.3842	2.6524
67	0.6782	1.2943	1.6679	1.9960	2.3833	2.6512
68	0.6781	1.2941	1.6676	1.9955	2.3824	2.6501
69	0.6781	1.2939	1.6672	1.9949	2.3816	2.6490
70	0.6780	1.2938	1.6669	1.9944	2.3808	2.6479
71	0.6780	1.2936	1.6666	1.9939	2.3800	2.6469
72	0.6779	1.2934	1.6663	1.9935	2.3793	2.6459
73	0.6779	1.2933	1.6660	1.9930	2.3785	2.6449
74	0.6778	1.2931	1.6657	1.9925	2.3778	2.6439
75	0.6778	1.2929	1.6654	1.9921	2.3771	2.6430
76	0.6777	1.2928	1.6652	1.9917	2.3764	2.6421
77	0.6777	1.2926	1.6649	1.9913	2.3758	2.6412
78	0.6776	1.2925	1.6646	1.9908	2.3751	2.6403
79	0.6776	1.2924	1.6644	1.9905	2.3745	2.6395
80	0.6776	1.2922	1.6641	1.9901	2.3739	2.6387
81	0.6775	1.2921	1.6639	1.9897	2.3733	2.6379
82	0.6775	1.2920	1.6636	1.9893	2.3727	2.6371

(Continued)

TABLE (Continued)

Degrees of Freedom	Upper-Tail Areas (α)					
	.25	.10	.05	.025	.01	.005
83	0.6775	1.2918	1.6634	1.9890	2.3721	2.6364
84	0.6774	1.2917	1.6632	1.9886	2.3716	2.6356
85	0.6774	1.2916	1.6630	1.9883	2.3710	2.6349
86	0.6774	1.2915	1.6628	1.9879	2.3705	2.6342
87	0.6773	1.2914	1.6626	1.9876	2.3700	2.6335
88	0.6773	1.2912	1.6624	1.9873	2.3695	2.6329
89	0.6773	1.2911	1.6622	1.9870	2.3690	2.6322
90	0.6772	1.2910	1.6620	1.9867	2.3685	2.6316
91	0.6772	1.2909	1.6618	1.9864	2.3680	2.6309
92	0.6772	1.2908	1.6616	1.9861	2.3676	2.6303
93	0.6771	1.2907	1.6614	1.9858	2.3671	2.6297
94	0.6771	1.2906	1.6612	1.9855	2.3667	2.6291
95	0.6771	1.2905	1.6611	1.9853	2.3662	2.6286
96	0.6771	1.2904	1.6609	1.9850	2.3658	2.6280
97	0.6770	1.2903	1.6607	1.9847	2.3654	2.6275
98	0.6770	1.2902	1.6606	1.9845	2.3650	2.6269
99	0.6770	1.2902	1.6604	1.9842	2.3646	2.6264
100	0.6770	1.2901	1.6602	1.9840	2.3642	2.6259
110	0.6767	1.2893	1.6588	1.9818	2.3607	2.6213
120	0.6765	1.2886	1.6577	1.9799	2.3578	2.6174
130	0.6764	1.2881	1.6567	1.9784	2.3554	2.6142
140	0.6762	1.2876	1.6558	1.9771	2.3533	2.6114
150	0.6761	1.2872	1.6551	1.9759	2.3515	2.6090
∞	0.6745	1.2816	1.6449	1.9600	2.3263	2.5758

For a particular number of degrees of freedom, entry represents the critical value of t corresponding to a specified upper-tail area, α .

**TABLE F Distribution**

Denominator df_2	Numerator df_1																			∞
	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120		
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5	241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3	
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50	
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53	
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63	
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.36	
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67	
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23	
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93	
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71	
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54	
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40	
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30	
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21	
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13	
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07	
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01	
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96	
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92	
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88	
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84	
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81	
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78	
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76	
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73	
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71	
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69	
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67	
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65	
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64	
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62	
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51	
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39	
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25	
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00	

(Continued)

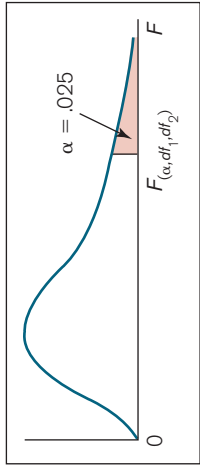


TABLE (Continued)

Denominator df_2	Numerator df_1																		
	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	647.8	799.5	864.2	899.6	921.8	937.1	948.2	956.7	963.3	968.6	976.7	984.9	993.1	997.2	1001	1006	1010	1014	1018
2	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39	39.40	39.41	39.43	39.45	39.46	39.46	39.47	39.48	39.49	39.50
3	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47	14.42	14.34	14.25	14.17	14.12	14.08	14.04	13.99	13.95	13.90
4	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90	8.84	8.75	8.66	8.56	8.51	8.46	8.41	8.36	8.31	8.26
5	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68	6.62	6.52	6.43	6.33	6.28	6.23	6.18	6.12	6.07	6.02
6	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52	5.46	5.37	5.27	5.17	5.12	5.07	5.01	4.96	4.90	4.85
7	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82	4.76	4.67	4.57	4.47	4.42	4.36	4.31	4.25	4.20	4.14
8	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36	4.30	4.20	4.10	4.00	3.95	3.89	3.84	3.78	3.73	3.67
9	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03	3.96	3.87	3.77	3.67	3.61	3.56	3.51	3.45	3.39	3.33
10	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78	3.72	3.62	3.52	3.42	3.37	3.31	3.26	3.20	3.14	3.08
11	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59	3.53	3.43	3.33	3.23	3.17	3.12	3.06	3.00	2.94	2.88
12	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44	3.37	3.28	3.18	3.07	3.02	2.96	2.91	2.85	2.79	2.72
13	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31	3.25	3.15	3.05	2.95	2.89	2.84	2.78	2.72	2.66	2.60
14	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21	3.15	3.05	2.95	2.84	2.79	2.73	2.67	2.61	2.55	2.49
15	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12	3.06	2.96	2.86	2.76	2.70	2.64	2.59	2.52	2.46	2.40
16	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05	2.99	2.89	2.79	2.68	2.63	2.57	2.51	2.45	2.38	2.32
17	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.98	2.92	2.82	2.72	2.62	2.56	2.50	2.44	2.38	2.32	2.25
18	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93	2.87	2.77	2.67	2.56	2.50	2.44	2.38	2.32	2.26	2.19
19	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88	2.82	2.72	2.62	2.51	2.45	2.39	2.33	2.27	2.20	2.13
20	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84	2.77	2.68	2.57	2.46	2.41	2.35	2.29	2.22	2.16	2.09
21	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80	2.73	2.64	2.53	2.42	2.37	2.31	2.25	2.18	2.11	2.04
22	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76	2.70	2.60	2.50	2.39	2.33	2.27	2.21	2.14	2.08	2.00
23	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73	2.67	2.57	2.47	2.36	2.30	2.24	2.18	2.11	2.04	1.97
24	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70	2.64	2.54	2.44	2.33	2.27	2.21	2.15	2.08	2.01	1.94
25	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68	2.61	2.51	2.41	2.30	2.24	2.18	2.12	2.05	1.98	1.91
26	5.66	4.27	3.67	3.33	3.10	2.94	2.82	2.73	2.65	2.59	2.49	2.39	2.28	2.22	2.16	2.09	2.03	1.95	1.88
27	5.63	4.24	3.65	3.31	3.08	2.92	2.80	2.71	2.63	2.57	2.47	2.36	2.25	2.19	2.13	2.07	2.00	1.93	1.85
28	5.61	4.22	3.63	3.29	3.06	2.90	2.78	2.69	2.61	2.55	2.45	2.34	2.23	2.17	2.11	2.05	1.98	1.91	1.83
29	5.59	4.20	3.61	3.27	3.04	2.88	2.76	2.67	2.59	2.53	2.43	2.32	2.21	2.15	2.09	2.03	1.96	1.89	1.81
30	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57	2.51	2.41	2.31	2.20	2.14	2.07	2.01	1.94	1.87	1.79
40	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45	2.39	2.29	2.18	2.07	2.01	1.94	1.88	1.80	1.72	1.64
60	5.29	3.93	3.34	3.01	2.79	2.63	2.51	2.41	2.33	2.27	2.17	2.06	1.94	1.88	1.82	1.74	1.67	1.58	1.48
120	5.15	3.80	3.23	2.89	2.67	2.52	2.39	2.30	2.22	2.16	2.05	1.94	1.82	1.76	1.69	1.61	1.53	1.43	1.31
∞	5.02	3.69	3.12	2.79	2.57	2.41	2.29	2.19	2.11	2.05	1.94	1.83	1.71	1.64	1.57	1.48	1.39	1.27	1.00

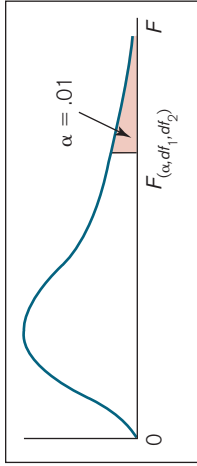


TABLE (Continued)

Denominator df_2	Numerator df_1																				∞
	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	6366		
1	4052	4999.5	5403	5625	5764	5859	5928	5982	6022	6056	6106	6157	6209	6235	6261	6287	6313	6339	6366		
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39	99.40	99.42	99.43	99.45	99.46	99.47	99.47	99.48	99.49	99.50		
3	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35	27.23	27.05	26.87	26.69	26.60	26.50	26.41	26.32	26.22	26.13		
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66	14.55	14.37	14.20	14.02	13.93	13.84	13.75	13.65	13.56	13.46		
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16	10.05	9.89	9.72	9.55	9.47	9.38	9.29	9.20	9.11	9.02		
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	6.88		
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	5.65		
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	4.86		
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	4.31		
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	3.91		
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	3.60		
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	3.36		
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.25	3.17		
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03	3.94	3.80	3.66	3.51	3.43	3.35	3.27	3.18	3.09	3.00		
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	2.87		
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	2.75		
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.83	2.75	2.65		
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	2.57		
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.30	3.15	3.00	2.92	2.84	2.76	2.67	2.58	2.49		
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	2.42		
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	2.36		
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.40	2.31		
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	2.26		
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.40	2.31	2.21		
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22	3.13	2.99	2.85	2.70	2.62	2.54	2.45	2.36	2.27	2.17		
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18	3.09	2.96	2.81	2.66	2.58	2.50	2.42	2.33	2.23	2.13		
27	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15	3.06	2.93	2.78	2.63	2.55	2.47	2.38	2.29	2.20	2.10		
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12	3.03	2.90	2.75	2.60	2.52	2.44	2.35	2.26	2.17	2.06		
29	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09	3.00	2.87	2.73	2.57	2.49	2.41	2.33	2.23	2.14	2.03		
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07	2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	2.01		
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.66	2.52	2.37	2.29	2.20	2.11	2.02	1.92	1.80		
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72	2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.73	1.60		
120	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56	2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	1.38		
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41	2.32	2.18	2.04	1.88	1.79	1.70	1.59	1.47	1.32	1.00		

For a particular combination of numerator and denominator degrees of freedom, entry represents the critical values of F corresponding to a specified upper-tail area, α .

Introduction to Marketing Research

Introduction to Marketing Research




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LEARNING OBJECTIVES

After reading this chapter, the student should be able to:

1. Define marketing research and distinguish between problem-identification and problem-solving research.
2. Describe a framework for conducting marketing research as well as the six steps of the marketing research process.
3. Understand the nature and scope of marketing research and its role in designing and implementing successful marketing programs.
4. Discuss the role of marketing research in gathering competitive intelligence.
5. Explain how the decision to conduct marketing research is made.
6. Discuss the marketing research industry and the types of research suppliers, including internal, external, full-service, and limited-service suppliers.
7. Describe careers available in marketing research and the backgrounds and skills needed to succeed in them.
8. Explain the role of marketing research in decision support systems in providing data, marketing models, and specialized software.

9. Acquire an appreciation of the international dimension and the complexity involved in international marketing research.
10.  Describe the use of social media as a domain to conduct marketing research.

11. Gain an understanding of the ethical aspects of marketing research and the responsibilities each of the marketing research stakeholders have to themselves, one another, and the research.

“As a user of marketing research, I gain so much from a well-crafted research project. You can implement marketing programs so much more vigorously when you are confident you understand what is currently important to the customer.”

Justin Stead
VP International, Fossil, Inc., Richardson, Texas

How Reebok Fits Shoes

Reebok, which was acquired by Adidas in 2006, designs, markets, and distributes sportswear and athletic footwear and equipment. In order to provide “complete comfort” for athletes and consumers, Reebok invests a lot of effort into its marketing research. Although the slogan belongs to Nike, when it comes to marketing research, Reebok just does it!

Reebok uses “time-use” research to determine how consumers spend their spare time. This type of information enables Reebok to identify opportunities for new products and markets and then design its marketing program to take advantage of them, as illustrated by the recently introduced line of custom-designed Ventilator shoes. The company uses a variety of methods to research time-use trends, including analysis of secondary data (data collected for other purposes, e.g., data available from publications, the Internet, social media, and commercial sources). It also uses qualitative research, such as focus groups (interviews with 8 to 12 people as a group); survey research via telephone, in the malls, and on the Internet; in social media; and interviews at consumers’ homes.

Management wanted to identify ways that Reebok could increase its market share. Analysis of secondary data showed that health club memberships had increased more than 10 percent in the early 2000s. Focus groups indicated that a new popular fitness activity was step aerobics (standard aerobics made more intense by the addition of a 3- to 7-inch platform, the “step”). Reebok then conducted a survey to determine the market potential of step aerobics and found that health club members were spending less time in the clubs by an average of 12 percent. The research also showed that the percentage of adults who exercised in the home had grown from 20 percent in 1990 to more than 30 percent in 2010. In response to these results, several research questions were framed around exercising at home.

Based on the results of this research, Reebok redesigned its home-step aerobics line, including home steps, video-tapes, aerobic shoes, and body weights. Product research indicated a strong consumer preference for the home-step aerobics line, and the new line was launched nationally. The home-step aerobics line has been very successful, and the popularity of these products has resulted in a Reebok step-workout program on ESPN.

Reebok’s in-house marketing research specialists were actively involved in defining and designing the research. However, Reebok contracted data collection and data analysis to external suppliers, who collected and analyzed the data using appropriate statistical techniques. External suppliers can also be used in writing the report, but presentation of the results to the management and assistance in implementation is the responsibility of Reebok’s in-house marketing research department. Reebok makes use of full-service suppliers who provide assistance in all the steps of the marketing research process, as well as limited-service suppliers who might handle only one or a few steps of the process. Its in-house marketing research department has helped Reebok introduce many successful products and marketing programs, enabling it to become a premier sportswear and athletic footwear company.

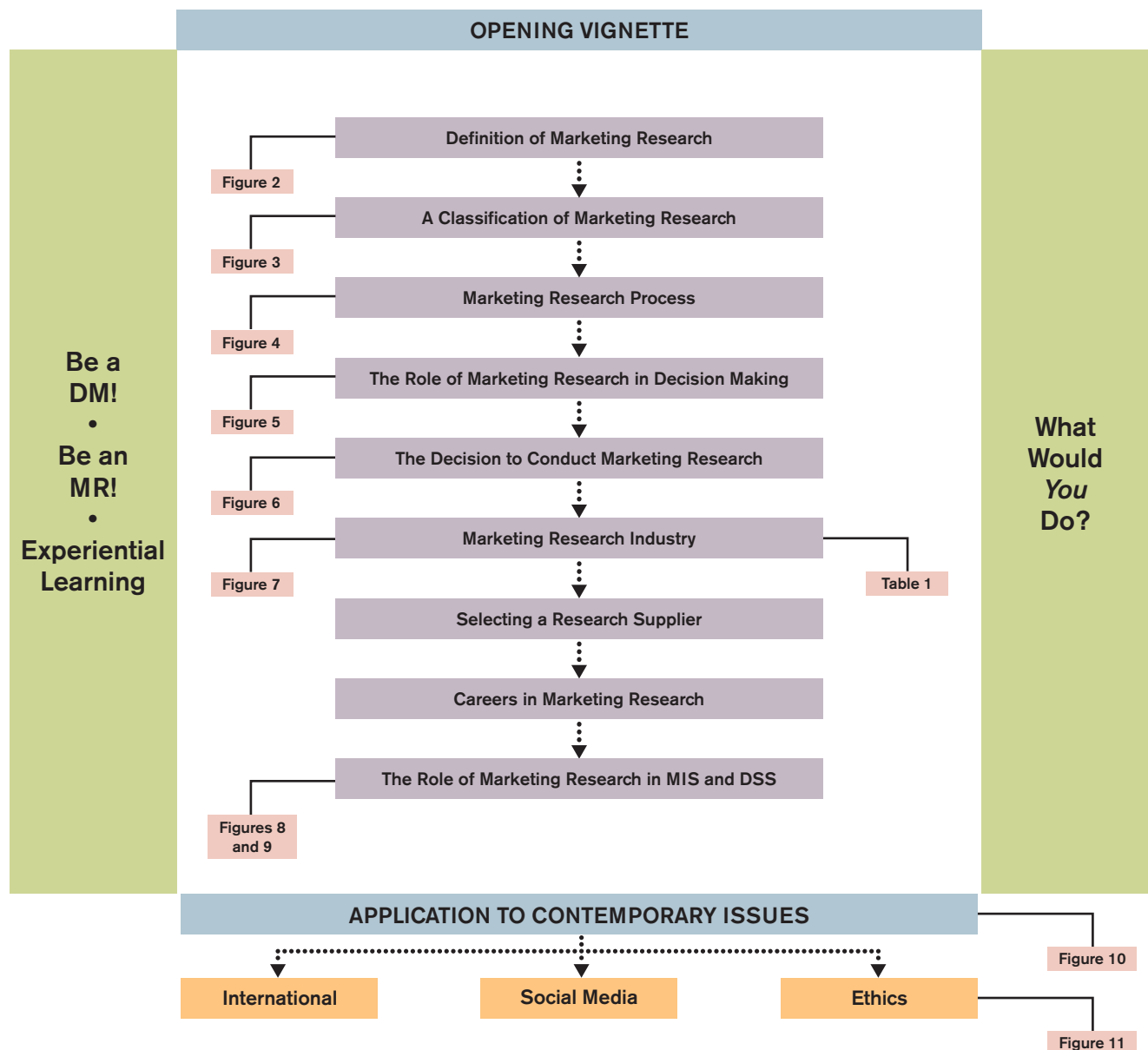
When time-use research revealed in 2010 that women all over the world were spending considerable time, money, and effort in toning and strengthening leg muscles, Reebok designed and marketed its EasyTone shoes as “an innovative footwear solution designed to tone and strengthen key leg muscles with every step.”¹

Overview

Marketing research is one of the most important and fascinating aspects of marketing. As the opening vignette illustrates, marketing research provides a company with valuable information that guides all of its marketing activities. In this chapter, we define and describe the two broad forms of marketing research: (1) research designed to identify problems and (2) research designed to solve problems. We explain the six steps of the marketing research process and take a look at how marketing research fits into the entire marketing decision process. We discuss the role of marketing research in making marketing decisions and gathering competitive intelligence. The marketing research industry consists of a variety of firms, and the field offers exciting career opportunities. We describe the contribution of marketing research to marketing information systems (MIS) and decision support systems (DSS).

The Internet has become integral to conducting marketing research and is used extensively in all phases of the marketing research process. Hence, information on the use of the Internet in marketing research is interwoven into the chapter, rather than discussed in a separate section of the chapter. We also discuss applications to contemporary issues of importance in the current marketing and marketing research environment: international marketing research, social media, and ethics. This chapter provides an introduction to these important application areas; an overview is presented in Figure 1. As can

FIGURE 1
Introduction to
Marketing Research:
An Overview



be seen in Figure 1, the opening vignette and Application to Contemporary Issues encompass all of the topics discussed in the chapter. We encourage a hands-on approach through the use of “Be an MR!” (Be a Marketing Researcher!) and “Be a DM!” (Be a Decision Maker!) boxes found in the chapter. These hands-on exercises use the Internet and other electronic sources to focus on the interaction between marketing research and marketing decision making. To further highlight this interaction, sometimes the “Be an MR!” box appears first, whereas at other times “Be a DM!” appears first. The research–decision-making interaction also is emphasized in the chapter by the “What Would *You* Do?” situation facing a real company. The situation is described and opportunities are provided to address the marketing research and the marketing management decisions facing the company. This hands-on orientation is further reinforced through the “Experiential Learning” exercises. Thus, we provide a better overall understanding of the key concepts and illustrate how applications can be made in other important areas that are discussed.

Definition of Marketing Research

We emphasize the importance of research in marketing decision making. **Marketing research** is the systematic and objective identification, collection, analysis, dissemination, and use of information that is undertaken to improve decision making related to identifying and solving problems (also known as *opportunities*) in marketing.

This definition gives marketing research a broad scope, and several aspects of the field are noteworthy. Marketing research involves the identification, collection, analysis, and dissemination of information (see Figure 2). Each phase of this process is important. Marketing research begins with the identification or definition of the research problem or opportunity. *Problems* often lead to *opportunities* in business, so from a research perspective, the two words often are used interchangeably. An investigation of each follows the same research process. For example, the discovery that adults were spending less time in health clubs and more time exercising at home represented a problem as well as an opportunity for Reebok. The problem was that when people were spending less time in health clubs, they also were using athletic shoes and equipment to a lesser extent, which resulted in decreased demand. The opportunity was more time spent exercising at home, which represented greater potential for shoes and home exercise equipment.

The range of data collection methods and the sources used to obtain the data vary in sophistication and complexity. The methods used depend on the specific requirements of the project, including budget and time constraints. The data are then analyzed, and the results are formally presented to the client and used in decision making.

marketing research

The systematic and objective identification, collection, analysis, dissemination, and use of information that is undertaken to improve decision making related to identifying and solving problems (also known as *opportunities*) in marketing.

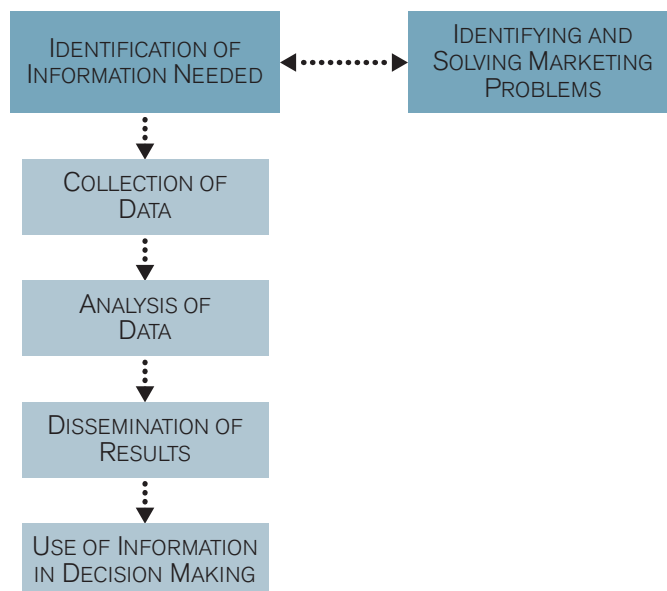


FIGURE 2
Definition of Marketing Research

Marketing research is systematic, which means that it follows a predictable path. A marketing research project is planned and documented. It has a scientific basis in that data are collected and analyzed to draw conclusions. The time-use research reported in the Reebok vignette is an example of this. Marketing research obtains its value from its objectivity. It should be conducted impartially, free from the influence of personal or political biases. This is easier said than done, because companies sponsoring the research sometimes pressure the researcher or research firm to generate “support” for a certain desired outcome. However, bending to this sort of pressure is a breach of the ethical codes of conduct that guide the profession. The notion that it provides an unbiased “outside,” or objective, opinion gives marketing research its value. Without that objectivity, results cannot be trusted, and the entire discipline is undermined.

The Internet is fast becoming a useful tool in the identification, collection, analysis, and dissemination of information related to marketing research. The Interactive Marketing Research Organization (www.imro.org), which was formed in 2000, is a worldwide association of researchers dedicated to providing an open forum for the discussion of best practices and ethical approaches to research being conducted via the Internet.

Research in Action

A CEO's View of Marketing Research

What does a time-pressed senior executive expect from in-house marketing researchers? Southern Company's (www.southerncompany.com) former chairperson, president, and CEO Allen Franklin offers some valuable insights on this question. Franklin described one manager–researcher exchange of which he was part as follows:

MARKETING RESEARCHER:	“What do you want?”
FRANKLIN (RESPONDING SLOWLY AND FEELING SLIGHTLY EMBARRASSED FOR NOT HAVING A READY ANSWER):	“What do you have?”
MARKETING RESEARCHER:	“I don't have anything, yet. That's why I am here.”
FRANKLIN (GROWING INCREASINGLY IRRITATED):	“Well, then, get out of here! You are keeping me from what I need to be doing!”

The implication of this exchange is that the researcher needs to understand the current context for decision makers. Researchers

can develop this understanding by scanning the business press, following developing stories, attending conferences within the industry, as well as conducting focused research projects. In short, the researcher needs to be curious and be one of the best learners in the firm. Franklin says it this way: “It is not data that are critical, but the people between the data and the management decision maker. Senior managers will tend to work with those who make the managers more comfortable. Comfort is not increased by 2-hour presentations that leave management saying to itself, ‘What are we going to do with that?’”

Here is one way a marketing researcher should approach a senior executive like Allen Franklin:

MARKETING RESEARCHER:	“We know the firm currently has this problem. We can resolve or minimize it by doing this study and acting upon what we learn.”
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Fortune magazine has named Southern Company the “most admired” electric and gas utility in America, in no small part due to its reliance on marketing research.²

Be an MR!

Be a DM!

Inside the World of Coca-Cola

Social Media

Visit Coca-Cola's Web site at www.coca-cola.com and click on the USA button. How does this site collect marketing research information? How would you improve the Web site in order to collect more or better marketing research information? How could social media be used in this respect?

As the brand manager for Coca-Cola, how would you use information collected on the Web site to market your brand more effectively?

The next section elaborates on this definition of marketing research by classifying the types of marketing research.

A Classification of Marketing Research

Our definition states that organizations engage in marketing research for two reasons: to identify and to solve marketing problems. This distinction serves as a basis for classifying marketing research into problem-identification research and problem-solving research, as shown in Figure 3.

Problem-identification research involves going below the surface to identify the underlying problem that the marketing manager is facing. Often these problems are not readily apparent or they are likely to arise in the future. Problem-identification research can be designed to analyze market potential, market share, brand or company image, market characteristics, and sales. It can also be used in short-range forecasting, long-range forecasting, and uncovering business trends. For example, Polo Ralph Lauren might undertake research to determine the size of the market for men's shirts, the projected growth rate of this market, and the market share of major brands. This research might reveal a problem. Say that although Polo's sales of men's shirts have been increasing, they have not been keeping pace with industry growth. Moreover, market research might determine that Polo has been gradually losing market share to competitors, such as Tommy Hilfiger.

Problem identification is the more common of the two forms of research and is undertaken by virtually all marketing firms. This type of research is used to assess the environment and diagnose problems. Information regarding changes in the market provides an initial alert to potential opportunities or problems. A firm that is operating in a growing market but suffering from a declining market share might be dealing with company-specific problems, such as ineffective advertising or high turnover in its sales force. In other instances, problems, such as declining demand, might be common to all the firms in the industry. Considering the economic, social, cultural, or consumer behavior trends can help to identify such problems or opportunities.

Once a problem or opportunity has been identified, a firm undertakes **problem-solving research** to address the problem. Most marketing firms conduct problem-solving research as well. Problem-solving research addresses many topics, including market segmentation and product, pricing, promotion, and distribution. Problem-identification research and problem-solving research go hand in hand, and a given marketing research project can combine both types of research.

problem-identification research

Research undertaken to help identify problems that are not necessarily apparent or that are likely to arise in the future.

problem-solving research

Research undertaken to help solve specific marketing problems.

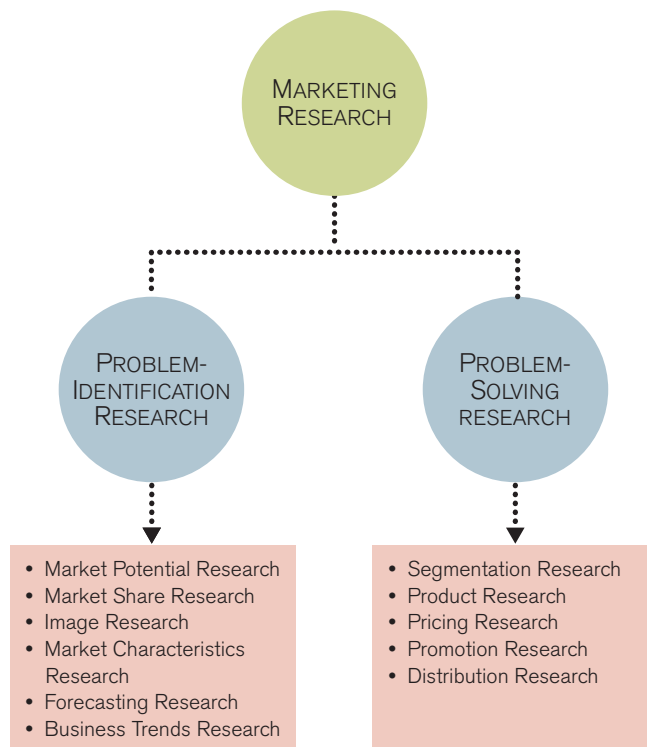


FIGURE 3

A Classification of Marketing Research

Research in Action

The Arch of Marketing Research at the Golden Arches

In the 1960s, McDonald's (www.mcdonalds.com) earned about \$170 million domestically; today, the company earns more than that in 2 days. Marketing research has played a vital role in fostering this growth. In 1968, McDonald's formed its marketing research department, which has grown dramatically since its creation. The most prominent aspect of its operation is that 85 percent of all McDonald's are franchises. McDonald's marketing research department actively supports these restaurants by conducting problem-identification and problem-solving research.

In 2005, problem-identification research in the form of customer satisfaction surveys (market characteristics research) revealed that in-store atmosphere and décor were becoming an increasingly important part of the customers' dining experience, even in fast-food restaurants. Based on subsequent problem-solving (segmentation and product) research, in 2006 McDonald's introduced its "Forever Young" brand by remodeling its restaurants, the first major redesign since the 1970s. This was done to keep the brand relevant and appealing to a younger generation of consumers. The new design includes the traditional McDonald's yellow and red colors, but the red is muted to terra cotta, the yellow is now golden for a more "sunny" look, and olive and sage green have been added. The concept consists of a new building design, as well as interior changes, such as recessed lighting,

classical music, and new paint and wall graphics. Re-imaged restaurants attract more customers and enhance perceptions of McDonald's as a place adults, not just kids, enjoy. The company plans to eventually incorporate the new look in all of its 13,700 franchised and company-owned U.S. locations.

As of 2011, the company is the world's leading food service retailer, with more than 32,000 restaurants in 117 countries serving more than 55 million customers each day. McDonald's success is a direct result of the problem-identification and problem-solving research that it undertakes on an ongoing basis.³



Source: © Jeff Green/CORBIS/All Rights Reserved.

Classifying marketing research into two main types is useful from a conceptual as well as a practical viewpoint. The McDonald's example illustrates that these two types of research often go hand in hand with problem-identification research leading to problem-solving research. Marketing research discovered that in-store atmosphere and décor were becoming an increasingly important part of the customers' dining experience (problem identification), and the solution was the introduction of the "Forever Young" brand by remodeling restaurants (problem solving). The Reebok vignette also illustrates this point. Problem identification involving analysis of secondary data, focus groups, and a market potential survey revealed that adults were spending less time in health clubs and more time exercising at home. Problem-solving research in the form of product research led to the redevelopment and introduction of the successful home-step aerobics line.

Be a DM!

Be an MR!

Major League Baseball Is Tickled Pink

Social Media

As the marketing director of Major League Baseball (MLB), what marketing strategies would you formulate to target female fans?

You have been hired by MLB to devise a marketing strategy for female fans. Visit www.mlb.com and search the Internet—including social media—as well as your library's online databases to obtain information on women's attitudes toward MLB. What kind of marketing research would you recommend?

marketing research process

A set of six steps that defines the tasks to be accomplished in conducting a marketing research study: problem definition, developing an approach to the problem, research design formulation, fieldwork, data preparation and analysis, and report preparation and presentation.

Marketing Research Process

The **marketing research process** consists of six steps (see Figure 4). This process is a general one and can be followed for conducting research in any functional area (e.g., marketing, finance, accounting, and so forth). We will provide only a brief overview here.

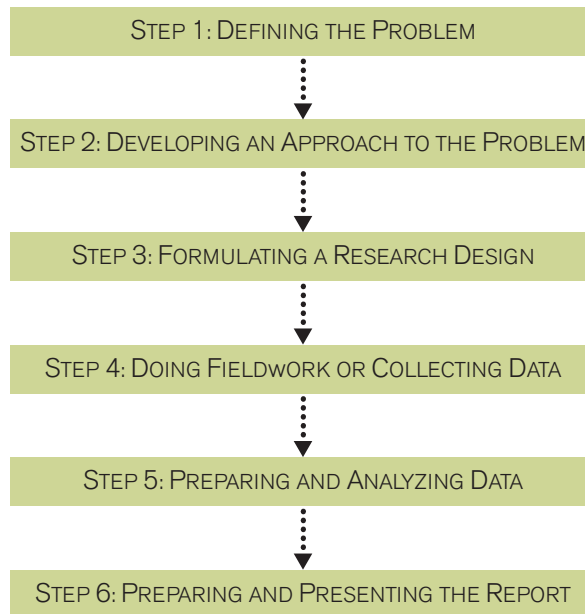


FIGURE 4
The Marketing Research Process

Step 1: Defining the Problem

The first step in any marketing research project is to define the problem. Researchers accomplish problem definition through discussions with decision makers, interviews with industry experts, analysis of secondary data including social media, and, perhaps, some qualitative research, such as focus groups. Problem definition involves defining the management-decision problem (what should the management do) and the marketing research problem (what information is needed). In the opening vignette, the management-decision problem was: What should Reebok do to increase its market share? The marketing research problem for Reebok was assessing the market potential for home-step aerobic products. Once the problem has been defined, the research can be designed and conducted properly.

Step 2: Developing an Approach to the Problem

Developing an approach to the problem includes formulating an analytical framework and models, research questions, and hypotheses. This process is guided by the same tasks performed to define the problem. In the opening vignette, several research questions were investigated related to exercising at home.

Step 3: Formulating a Research Design

A research design is a framework or blueprint for conducting the marketing research project. It details the procedures needed to obtain the required information. A study might be designed to test hypotheses of interest or to determine possible answers to the research questions, both of which contribute to decision making. Conducting preliminary or exploratory research, defining the variables, and designing appropriate scales to measure them also are part of the research design. The issue of how the data should be obtained from the respondents (e.g., by conducting a survey or an experiment) must be addressed. In the opening vignette, the research design involved analysis of secondary data and focus groups, and a survey was conducted to assess the market potential for home-step aerobic equipment. It also may involve designing a questionnaire and a sampling plan to select respondents for the study.

Step 4: Doing Fieldwork or Collecting Data

Data collection is accomplished using a staff that operates in the field. Fieldwork involves personal, telephone, mail, or electronic interviewing. Proper selection, training, supervision, and evaluation of the field force are essential to ensure high-quality data collection. Reebok

contracted fieldwork or data collection to external suppliers, who analyzed the data using appropriate statistical techniques.

Step 5: Preparing and Analyzing Data

Data preparation involves data-processing steps leading up to analysis. This includes the editing, coding, and transcribing of collected data. This entire process must then be verified for accuracy. The editing process involves an initial inspection of questionnaires or observation forms for completeness and reasonableness of responses. After this initial inspection, the response to each question is coded to ensure standardized entry into the computer. The data from the questionnaires are transferred onto storage media and then analyzed using different statistical techniques. These results are then interpreted in order to find conclusions related to the marketing research problem. In the opening vignette, Reebok contracted data analysis to external suppliers, who analyzed the data using appropriate statistical techniques.

Step 6: Preparing and Presenting the Report

The entire project should be documented in a written report that addresses the specific research questions; describes the approach, the research design, data collection, and data analysis procedures; and presents the results and the major findings. The written report is supplemented by tables, figures, and graphs to enhance clarity and impact and is usually accompanied by a formal presentation. Reebok might use external suppliers in writing the report, but presentation of the results to the management and assistance in implementation are the primary responsibilities of its in-house marketing research department. Reebok follows a research process that incorporates all six of these steps.

Although we have described the research process as a sequence of steps, it should be noted that these steps are interdependent and iterative. Thus, at each step the researcher should not only look back at the previous steps, but also look ahead to the following steps. As we show, the mar-

Definition of Marketing Research (Figure 2)	Marketing Research Process (Figure 4)
Identification of information needed	Step 1: Defining the problem
Collection of data	Step 2: Developing an approach to the problem
	Step 3: Formulating a research design
	Step 4: Doing fieldwork or collecting data
Analysis of data	Step 5: Preparing and analyzing data
Dissemination of results	Step 6: Preparing and presenting the report
Use of information	

keting research process (see Figure 4) is very consistent with the definition of marketing research presented earlier (see Figure 2).

The Internet is very useful for project management. Researchers and clients use e-mail combined with software such as Lotus Notes to communicate with each other and to coordinate the six steps of the marketing research process. The Internet also is being used to disseminate mar-

Social Media

Be a DM!

As the marketing chief for Fossil, you are considering the introduction of a fashionable wristwatch for men and women priced at \$99. What kind of information do you need to help you make this decision?

Be an MR!

You've been hired to help Fossil to determine whether to introduce its new wristwatch. Visit www.fossil.com and search the Internet—including social media—as well as your library's online databases to obtain information on consumers' preferences for wristwatches. Describe the six steps of the marketing research process that should be followed.

Fossil Goes Fashionable!

The Role of Marketing Research in Marketing Decision Making

The Reebok vignette illustrates only a few applications of marketing research and its role in the marketing decision-making process. Marketing research, indeed, has a broad range of applications and plays a crucial role in the marketing decision-making process. One way to describe the role of marketing research is in light of the basic marketing paradigm given in Figure 5.

A major goal of marketing is to identify and then satisfy needs of various customer groups (e.g., consumers, employees, channel members, suppliers). To do this, marketing managers need information about the various customer groups, competitors, and other forces, such as environmental trends in the marketplace. In recent years, timely market information has become even more valuable. For example, the speed of new products entering the marketplace, domestic and international competition, and the increase in demanding and well-informed consumers all contribute to the importance of this type of market data.

The task of marketing research is to assess the information needs and provide management with relevant, accurate, reliable, valid, and current information to aid marketing decision making (see Figure 5). Companies use marketing research to stay competitive and to avoid high costs associated with making poor decisions based on unsound information. Sound decisions are not based on gut feeling, intuition, or even pure judgment; they are based on sound information. Without sound information, management cannot make sound decisions. Reebok's successful introduction of the home-step aerobics line was guided by systematic marketing research.

The following example illustrates how Sony improves its products through the use of marketing research. Sony reinforces the fact that management cannot make sound decisions without reliable information provided by marketing research.

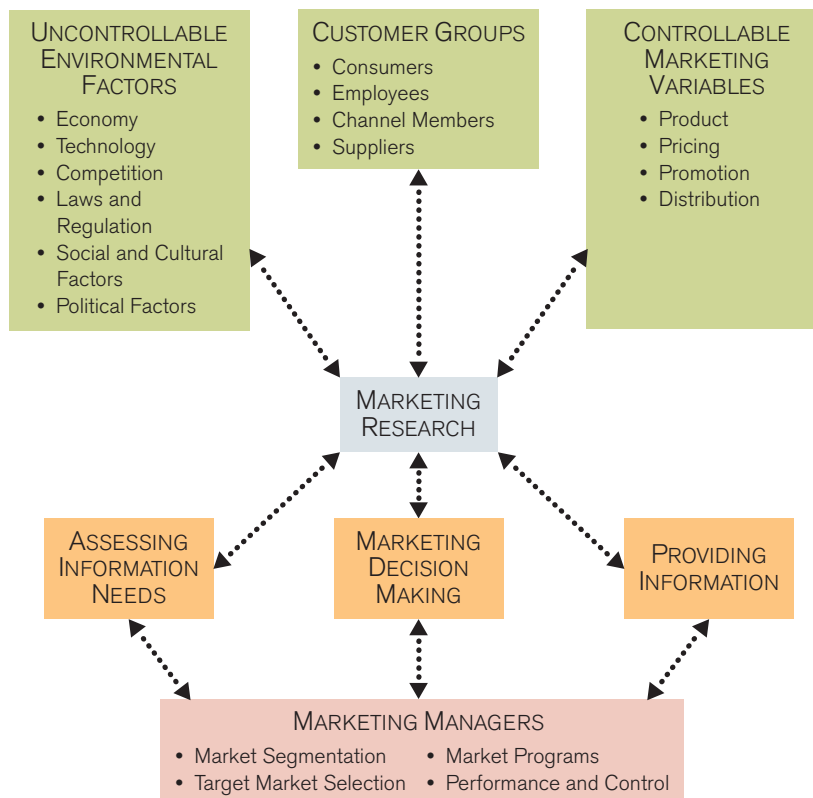


FIGURE 5
The Role of Marketing Research in Marketing Decision Making

Research in Action

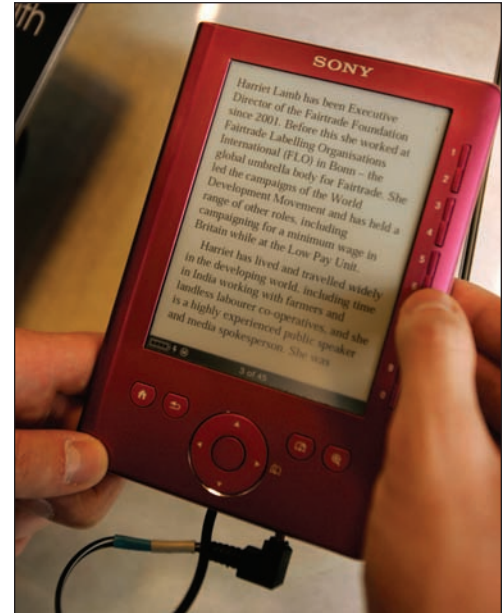
Sony Gives Santa a Few Tips

The Christmas holiday season is one of the most intensely competitive in terms of gift-giving products. This is true for Sony (www.sony.com) just as much as any other company. However, Sony gains a leg up on its competition by using marketing research to refine its gift products just in time for Christmas.

Sony asks consumers what they would like from Sony's products. It uses descriptive studies of consumer behavior, with actual product-usage information, to refine its offerings. Surveys, focus groups, analysis of social media, interviews, tracking devices, and even syndicated data are all used to gain more knowledge on consumers' perception of Sony products. For example, Sony uses focus groups in which participants get to sample and use a product that might be released for the Christmas season. The participants let Sony know if they like the product, how much they like it, what they would change about it, and whether they would buy it. Sony also uses surveys to determine if there is a current need that could be satisfied by a product that is under development. Tracking devices are used to find out how often and when potential products are put into use by participating "test" consumers.

For instance, focus groups in the United States evaluating a preliminary design for the Sony Reader gave Sony feedback that its electronic book reader had too many buttons and its alkaline battery design was clunky and awkward. Sony engineers modified the design based on the consumers' feedback, including replacing

alkaline batteries with rechargeable ones and reducing the number of buttons to ease navigation. The Sony Reader enjoyed high demand throughout the holiday season and beyond.⁴



Source: news.com/s44ZUMA Press/Newscom.

The Sony example illustrates the numerous strategic and tactical decisions marketing managers face and how marketing research can be helpful in improving the decision-making process. Identifying and finding solutions to customer needs (a primary goal of marketing) requires the integration of a wide range of factors, not just intuition. Figure 5 illustrates this range, which includes decisions about potential opportunities, target market selection, market segmentation, planning and implementing marketing programs, marketing performance, and control. These decisions often result in actions related to product, pricing, promotion, and distribution.

To make the decision process even more complicated, a manager must also consider uncontrollable external factors that influence the marketing process. These include general economic conditions (e.g., an economic slowdown or recession), technology (e.g., the impact of new technology, such as the Internet including social media), public policies and laws (e.g., those related to environmental pollution affect automobile companies), the political environment (e.g., Republicans are considered to be pro-business), competition (e.g., many dot.coms have not been able to survive because of competition), and social and cultural changes (e.g., changes in traditional marital roles). Another factor in this mix is the complexity of the various customer groups: consumers, employees, channel members, and suppliers. The marketing manager must attempt to monitor and incorporate all these factors. Marketing research removes some of the uncertainty and improves the quality of decision making in this highly complex environment.

The Internet can be useful to marketing researchers in many ways. Marketing research information related to the client company, its competitors, and the industry, as well as relevant marketing, economic, governmental, and environmental information, can be obtained by conducting a search using any of the popular search engines. Of particular interest is KnowThis (www.knowthis.com), a specialty search engine for a virtual marketing library.

Other important sources of marketing research information on the Internet include bulletin boards, newsgroups, and social media. A *newsgroup* is an Internet site (e.g., groups.google.com)

where people can read and post messages pertaining to a particular topic. *Blogs*, or *Web logs*, can be used to obtain information on a variety of topics and to recruit survey respondents. Although blogs can be located via most search engines, special search engines, such as Blog Search Engine (www.blogsearchengine.com), have been designed for blog searches. The use of social media is discussed in more detail later in the chapter.

Traditionally, a clear distinction existed between the responsibilities of the marketing researchers and those of the marketing manager. However, these roles are beginning to merge as marketing researchers become more involved in decision making and marketing managers become more involved with research. This trend can be attributed to better training of marketing managers, the Internet, advances in technology, and the use of research as an ongoing aspect of the marketing function.

In essence, marketing research must add value to marketing decision making, indeed, to the entire organization.⁵ Note that marketing managers do not work in isolation from other functions in the organization. Rather, the marketing orientation embodies a cross-functional perspective to meet consumer needs and attain long-term profitability. Therefore, marketing research should interface with the other functions in the organization, such as manufacturing, research and development, finance, accounting, and other functional areas, as may be relevant in a given project.

Marketing Research and Competitive Intelligence

Competitive intelligence (CI) may be defined as the process of enhancing marketplace competitiveness through a greater understanding of a firm's competitors and the competitive environment. This process is unequivocally ethical. It involves the legal collection and analysis of information regarding the capabilities, vulnerabilities, and intentions of business competitors, conducted by using information databases and other "open sources" and through ethical marketing research inquiry. A heads-up on a new product, information on a rival's costs and prices, and a read on an ally's changing distribution strategy are a few examples of CI.

Competitive intelligence is a crucial part of the emerging knowledge economy. CI enables senior managers in companies of all sizes to make informed decisions about everything from marketing, research and development (R&D), and investing tactics to long-term business strategies. By analyzing rivals' moves, CI allows companies to anticipate market developments rather than merely react to them. Although a variety of methods are used, the Internet, particularly social media, can be mined as a source of CI. Companies are leaking more information than ever into social media channels; one powerful way is through the use of RSS feeds that allow a firm to subscribe anonymously to a competitor's newsletter, Web site, or any other features that are constantly updated (for example, by setting up special Twitter and Facebook accounts). More importantly, the use of social media is a perfectly legal and ethical way because access is public.

Although marketing research plays a central role in the collection, analysis, and dissemination of CI information, CI has evolved into a discipline of its own. The Strategic and Competitive Intelligence Professionals (SCIP) consists of members conducting CI for large and small companies, providing management with early warning of changes in the competitive landscape. For more information on competitive intelligence, go to SCIP's Web page at www.scip.org.

competitive intelligence

The process of enhancing marketplace competitiveness through a greater understanding of a firm's competitors and the competitive environment.

**Social
Media**

The Decision to Conduct Marketing Research

Although marketing research can be beneficial in a variety of situations, the decision to conduct research is not automatic. Rather, this decision should be guided by a number of considerations including management's attitude toward research, the resources available to conduct the research and to implement the findings, the need for additional information, the importance of the decision, and the costs versus the benefits of conducting the research (see Figure 6).

If management does not have a positive attitude toward research, then it is likely that the project report will gather dust if the research is conducted. However, sometimes there are

FIGURE 6
The Decision to Conduct
Marketing Research



exceptions to this guideline. For example, we conducted a project for a retail chain where the chain management was hostile toward the project, but the research was commissioned and funded by the parent organization. Although the store management was opposed to the findings that reflected negatively on the store chain, the parent company did implement our recommendations.

Resources, especially time and money, are always limited. If either time or money is not available in adequate amounts to conduct a quality project, then that project probably should not be undertaken. It is better to forego a formal project than to undertake one in which the integrity of the research is compromised because of lack of resources. In one instance, we advised Fisher Price not to undertake a formal research project because a go/no-go decision regarding the introduction of a new toy had to be made in just a few days and time was too limited to conduct quality research. Likewise, a firm might lack the resources to implement the recommendations arising from the findings of marketing research. In that case, spending the resources to conduct the research might not be warranted.

Other circumstances also might indicate that a particular marketing research project should not be undertaken. If the required information is already available within the organization, the decision for which the research is to be conducted has already been made, or if the research is going to be used for political ends, then the value of the information generated is greatly reduced and the project is generally not warranted.

If the decision to be made is not of strategic or tactical importance, marketing research may not be warranted. In general, marketing research should be undertaken when the expected value of information it generates exceeds the costs of conducting the marketing research project. The more important the decision confronting management and the greater the uncertainty or risk facing them, the greater the value of information obtained. Formal procedures are available for quantifying the expected value as well as the costs of a marketing research project. Although in most instances the value of information exceeds the costs, in some instances the reverse might be true. For example, a pie manufacturer wanted to understand the purchase of pies in convenience stores. We advised against a major marketing research project when we discovered that less than 1 percent of the sales were coming from convenience stores and that this situation was unlikely to change in the next 5 years. However, in many cases, the answer to all the questions of Figure 6 is “yes” and marketing research should be conducted.

Be a DM!**Be an MR!****Solving Estee Lauder's Problem**

As the marketing director of Estee Lauder, would you conduct a formal marketing research project to determine consumer response to a proposed new line of cosmetics? Why or why not?

Visit www.esteelauder.com and search the Internet—including social media—as well as your library's online databases to find information on Estee Lauder's marketing strategy. What type of problem-solving research would you conduct?

**Social
Media**

An Overview of the Marketing Research Industry

The **marketing research industry** consists of suppliers who provide marketing research services. Figure 7 broadly categorizes research suppliers as either internal or external. An **internal supplier** is a marketing research department within the firm. Internal research departments can be found in large organizations across a wide range of industries, including automobile companies (e.g., GM and Ford), consumer products firms (e.g., P&G, Colgate Palmolive, Coca-Cola, and Reebok), and banks (e.g., Citigroup and JP Morgan Chase). For these larger companies, the research function often is located at the corporate headquarters, and this one corporate marketing research department caters to all of the firm's research needs. For smaller or decentralized firms that operate independent divisions, the market research function is distributed among the separate divisions. In decentralized organizations, divisions can be structured around products, customers, or geographical regions, with marketing research personnel assigned across the country. Each division (or group based on product line or geographical region) will have its own marketing research operation. Although companies can be found operating under a number of organizational structures, the recent trend has been toward centralization and a trimming of internal marketing research staff.

marketing research industry

The marketing research industry consists of suppliers who provide marketing research services.

internal supplier

Marketing research departments located within a firm.

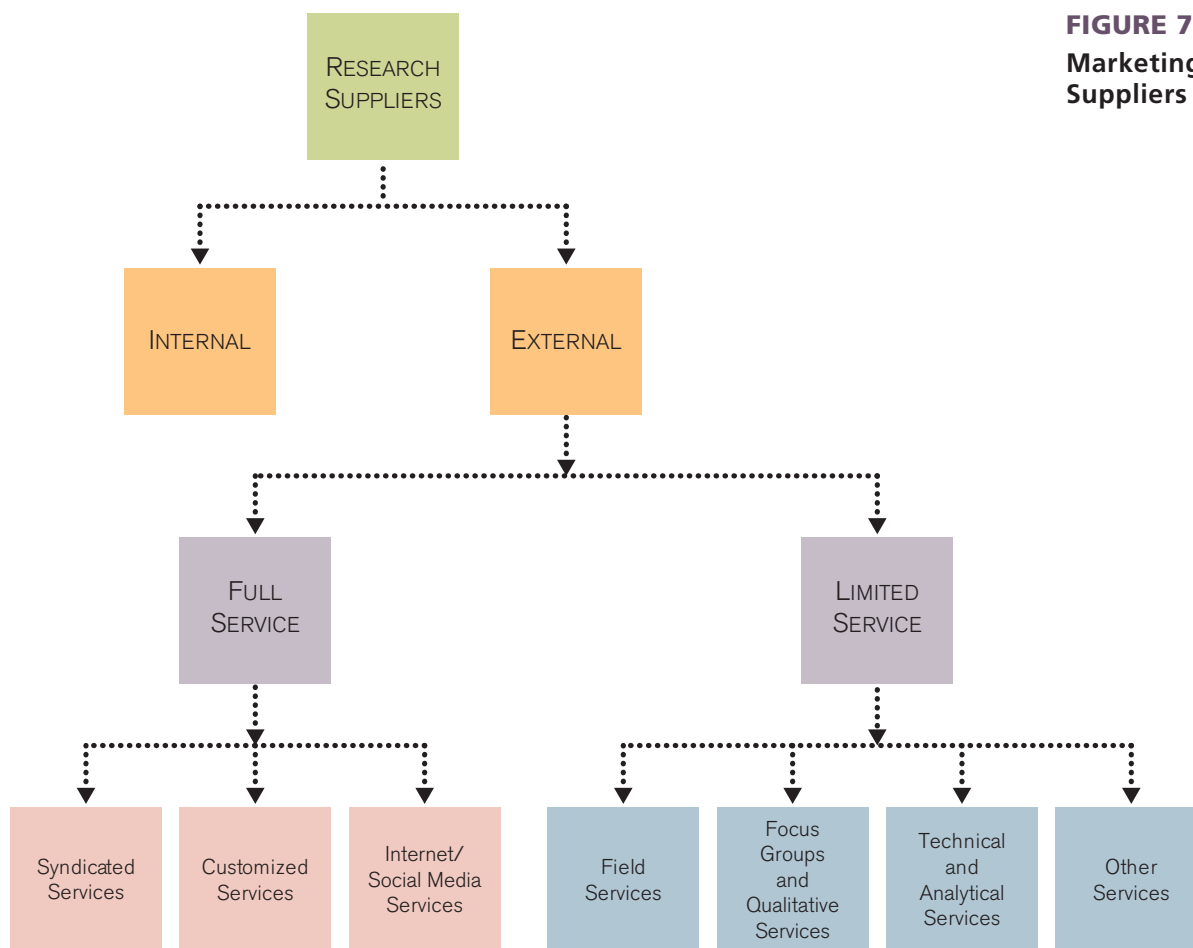


FIGURE 7

Marketing Research Suppliers and Services

TABLE 1 Top 10 Global Research Organizations

Rank 2009	Rank 2008	Organization	Headquarters	Parent Country	Web Site (www.)	Number of Countries with Subsidiaries/ Branch Offices	Global Research Revenue (US\$, in millions)	Percent of Global Revenue from Outside Home Country
1	1	Nielsen	New York	U.S.	nielsen.com	100	4,628.0	50.3
2	2	Kantar	London & Fairfield, Conn.	U.K.	kantar.com	80	2,823.2	75.0
3	3	IMS Health Inc.	Norwalk, Conn.	U.S.	imshealth.com	75	2,189.7	63.4
4	4	GfK SE	Nuremberg	Germany	gfk.com	59	1,622.8	74.1
5	5	Ipsos Group SA	Paris	France	ipsos.com	64	1,315.0	89.8
6	6	Synovate	London	U.K.	synovate.com	62	816.4	85.0
7	7	SymphonyIRI	Chicago	U.S.	symphonyiri.com	8	706.3	37.5
8	8	Westat Inc.	Rockville, Md.	U.S.	westat.com	1	502.4	—
9	9	Arbitron Inc.	Columbia, Md.	U.S.	arbitron.com	2	385.0	1.5
10	10	INTAGE Inc.	Tokyo	Japan	intage.co.jp	3	368.6	1.7

Source: Reprinted with permission from *Marketing News*, published by the American Marketing Association, Jack Honomichl, "Top 25 Global Research Organizations," (August 30, 2010): 16.

external suppliers

Outside marketing research companies hired to conduct a complete marketing research project or a component of it.

External suppliers are outside firms hired to supply marketing research services. Even firms such as HP and Reebok (see opening vignette) with in-house marketing research departments make at least some use of external suppliers. External suppliers range in size from one- or two-person shops to multinational corporations. Most of the research suppliers are small operations. Table 1 lists the top 10 global marketing research suppliers.⁶ Many external suppliers form strategic alliances with other firms in the marketing research industry. These alliances enable participating firms to access each other's expertise and resources. Such alliances are formed through mergers, acquisitions, or contractual agreements. For example, Burke, Inc., has partnerships with several marketing research firms in other countries. These partnerships and alliances give Burke, Inc., access to international markets.

full-service suppliers

Companies that offer the full range of marketing research activities.

External suppliers can provide either full or limited service. **Full-service suppliers** offer the entire range of marketing research services, from problem definition, approach development, questionnaire design, sampling, data collection, data analysis, and interpretation to report preparation and presentation. The services of these suppliers can be further broken down into syndicated services, customized services, and Internet/social media services (see Figure 7).

syndicated services

Companies that collect and sell common pools of data designed to serve the information needs of multiple clients.

Syndicated services are companies that collect and sell common pools of data designed to serve information needs that are shared by a number of clients. These data are collected primarily through surveys, purchase and media panels, scanners, and audits. For example, Nielsen's national television ratings in the U.S. provides information on audience size and demographic characteristics of households watching specific television programs (www.nielsen.com). The Nielsen Company also provides scanner tracking data, such as that generated by electronic scanners at checkout counters in supermarkets. The NPD Group (www.npd.com), another example of a syndicated service, maintains one of the largest consumer panels in the United States.

customized services

Companies that tailor research procedures to best meet the needs of each client.

Customized services offer a wide variety of marketing research services customized to suit a client's specific needs. Each marketing research project is designed to meet the client's unique needs. Some of the marketing research firms that offer these services are Synovate, Westat, and Burke, Inc.

Internet services

Companies that specialize in conducting research on the Internet.

Several marketing research firms, including some that have specialized in conducting marketing research on the Internet, offer **Internet services** including social media research. For example, the Toluna Group (www.toluna-group.com), which acquired Greenfield Online and Ciao Surveys in 2009, offers a broad range of customized qualitative and quantitative online marketing research for consumer, business-to-business, and professional markets. Using large,



Source: The Nielsen Company.

The Nielsen Company is the largest marketing research firm in the world with over half its revenue coming from outside the United States.

proprietary databases, studies are conducted within the company's secure Web site. Forrester Research (www.forrester.com), which acquired JupiterResearch in 2008, offers research and consulting services that focus on consumer online behavior and interactive technologies. A special class of Internet services focuses on social media research, and these companies are discussed later in the chapter.

Limited-service suppliers specialize in one or a few steps of the marketing research process. Limited-service suppliers specialize in field services, focus groups and qualitative research, technical and analytical services, and other services. **Field services** collect data. They might use the full range of data collection methods (i.e., mail, personal, telephone, and electronic interviewing), or they might specialize in only one method. Some field service organizations maintain extensive interviewing facilities across the country for interviewing shoppers in malls. Many offer qualitative data collection services, such as focus-group interviewing. Firms that offer field services include Field Work, Inc. (www.fieldwork.com), Booth Research Services (www.boothresearch.com), and WorldOne (www.worldone.com).

Focus groups and qualitative services provide facilities and recruit respondents for focus groups and other forms of qualitative research, such as one-on-one depth interviews. Some firms might provide additional services, such as moderators, and prepare focus group reports. Examples of such firms include Jackson Associates (www.jacksonassociates.com) and 20|20 Research, Inc. (www.2020research.com).

Technical and analytical services are offered by firms that specialize in design issues and computer analysis of quantitative data, such as those obtained in large surveys. Firms such as SDR of Atlanta (www.sdr-consulting.com) offer sophisticated data analysis using advanced statistical techniques. Sawtooth Technologies (www.sawtooth.com) provides software for research data collection and analysis. Microcomputers and statistical software packages enable firms to perform data analysis in-house. However, the specialized data-analysis expertise of outside suppliers is still in demand. Other services include branded marketing research products and services developed to address specific types of marketing research problems. For example, Survey Sampling International (www.surveysampling.com) specializes in sampling design and distribution. Some firms focus on specialized services, such as research in ethnic markets (i.e., Hispanic, African, multicultural). Two firms that focus on research in ethnic markets are Latin Facts Research, a subsidiary of Facts 'n Figures, Inc. (www.factsnfiguresinc.com) and Multicultural Insights (www.multicultural-insights.com).

A firm without an internal marketing research department or specialists will be forced to rely on external, full-service suppliers. A firm with an internal marketing research staff will make use of both full- and limited-service suppliers. The need for external suppliers arises when the firm does not have the resources or the technical expertise to undertake certain phases of a

Social Media

limited-service suppliers

Companies that specialize in one or a few steps of the marketing research process.

field services

Companies whose primary service offering is their expertise in collecting data for research projects.

focus groups and qualitative services

Services related to facilities, recruitment, and other services for focus groups and other forms of qualitative research, such as one-on-one depth interviews.

technical and analytical services

Services related to design issues and computer analysis of quantitative data, such as those obtained in large surveys.

particular project. Also, conflict-of-interest issues might necessitate that a project be conducted by an outside supplier, as in the case of Reebok in the opening vignette. At Reebok, data collection and data analysis frequently are contracted to external suppliers. Sometimes Reebok uses full-service suppliers to conduct the entire marketing research project.

Selecting a Research Supplier

When initiating a marketing research study, a firm often will need to hire external suppliers for all or part of the project. The process of selecting an outside supplier can be informal, relying primarily on word-of-mouth endorsements, or it can be very formal, involving a “request for proposal.” In the latter case, research suppliers are asked to submit formal proposals for evaluation by the hiring firm. The first step involves compiling a list of prospective suppliers from trade publications, professional directories, Internet sources, and personal contacts. For example, www.greenbook.org can be used to locate marketing research suppliers by region, specialty, and other criteria.

Regardless of the formality of the process, the hiring firm must develop a checklist detailing its selection criteria for outside suppliers. That checklist should go beyond technical requirements, covering the following areas:

- What is the supplier’s reputation?
- Does the firm complete projects on schedule? Is it flexible?
- Is it known for maintaining ethical standards?
- Are its research projects of high quality?
- What kind and how much experience does the supplier have?
- Has the firm had experience with projects similar to this one?
- Do the supplier’s personnel have both technical and nontechnical expertise? Do they have Professional Researcher Certification offered by the Marketing Research Association (www.mra-net.org)?
- Has the firm formed any strategic alliances? What resources does it have access to?

Reebok International, which subcontracts a great deal of its research to external suppliers, uses a similar checklist. You can also find checklists for qualifying marketing research suppliers at the Web sites of prominent marketing research associations (e.g., www.esomar.org). A checklist helps managers examine the working relationships as well as the project requirements. Because of the importance of most research efforts, compatible working relationships and good communication skills can become primary considerations when hiring an outside firm.

A competitive bidding process usually is used in selecting external suppliers, particularly for large jobs. Often the organization commissioning the research will issue a request for proposal (RFP), a request for information (RFI), a request for application (RFA), an invitation to bid (ITB), or a similar call, inviting suppliers to submit bids. You can locate actual RFPs on the Internet by doing a Google advanced search using “RFP” and “Marketing Research.” Some marketing research firms, such as Marketing Research Services, Inc. (www.mrsi.com), will post a RFP form on its Web site that prospective clients can use to issue RFPs. Note that awarding projects based on the lowest price is not a good rule of thumb. The completeness of the research proposal and the selection criteria must all be factored into the hiring decision. Moreover, long-term contracts with research suppliers are preferable to selection on a project-by-project basis.

Be an MR!	Be a DM!
Redesigning Yahoo!	
<p>As the research director for Yahoo!, you are to select a marketing research firm that specializes in researching consumers who shop on the Internet. Visit www.greenbook.org and identify the marketing research firms in your area that conduct Internet-based surveys. Make a list of five such firms. Which firm will you select and why?</p>	<p>As the director of marketing at Yahoo!, how would you use information on consumer shopping on the Internet in redesigning the Yahoo! Web site?</p>

Careers in Marketing Research

Promising career opportunities are available with marketing research firms (e.g., Nielsen, Kantar, Burke, Inc., M/A/R/C). Equally appealing are careers in business and nonbusiness firms and agencies with in-house marketing research departments (e.g., P&G, Coca-Cola, Reebok, the Federal Trade Commission, and the U.S. Census Bureau). Advertising agencies (e.g., BBDO International, McCann Erickson, Ogilvy & Mather, J. Walter Thompson, and Young & Rubicam) also conduct substantial marketing research and employ professionals in this field.

A career in research often begins with a supervisory position in fieldwork or data analysis. With experience, the researcher moves up to project management positions, resulting in director and, eventually, in a vice-president-level position. The most common entry-level position in the marketing research industry for people with bachelor's degrees (e.g., a BBA) is operational supervisor. An operational supervisor is responsible for supervising the day-to-day operations of specific aspects of the marketing research process, ranging from fieldwork to data editing to coding for programming and data analysis. Rather than entering the discipline from the operations side, BBAs with strong organizational skills might start as assistant project managers. An assistant project manager assists in questionnaire design, reviews field instructions, and monitors timing and costs of studies. As research techniques become more sophisticated, there is a growing preference for people with master's degrees. Those with MBA or equivalent degrees are likely to be employed as project managers. In marketing research firms, such as Burke, Inc., the project manager works with the account director in managing the day-to-day operations of a marketing research project.

A researcher entering the profession on the client side would typically begin as a junior research analyst (for BBAs) or research analyst (for MBAs). The junior analyst and the research analyst learn about the particular industry and receive training from a senior staff member, usually the marketing research manager. The junior analyst position includes a training program to prepare individuals for the responsibilities of a research analyst, including coordinating with the marketing department and sales force to develop goals for product exposure. Research analyst responsibilities include checking data for accuracy, comparing and contrasting new research with established norms, and analyzing data for the purpose of market forecasting. As these job titles indicate, careers in marketing research can be highly technical, specializing in the design and the statistical side of the industry, or they can be of a general management nature, with emphasis on client relationships. For descriptions of other marketing research positions and current salaries, visit www.marketresearchcareers.com.

To prepare for a career in marketing research, you should:

- Take all the marketing courses you can.
- Take courses in statistics and quantitative methods.
- Acquire computer and Internet skills.
- Take courses in psychology and consumer behavior.
- Acquire effective written and verbal communication skills.
- Think creatively. Creativity and common sense command a premium in marketing research.

It is important for marketing researchers to be liberally educated in order to better understand the problems managers face and then be able to address them from a broad perspective.⁷ A career in marketing research will involve working with other bright, energetic people in a fast-paced, dynamic environment. You will get to work on diverse qualitative and quantitative projects with clients in a variety of industries, including e-commerce, travel, telecommunications, pharmaceuticals, government, and nonprofit. The benefits include ongoing training and career development, a competitive salary, comprehensive health and dental plans, a 401K, the option to wear business casual attire, and excellent advancement opportunities. We present the profile of Merrill Dubrow to showcase a successful career in marketing research.

Social
Media

Research in Action

Profile of a Marketing Research Blogger

Merrill Dubrow is president and chief executive officer of M/A/R/C Research (www.marcresearch.com), a 100-person marketing research firm located in Irving, Texas. Prior to taking the leadership role at M/A/R/C, Merrill served as senior vice president of client development at Harris Interactive's Service Bureau. He has also held positions with Elrick & Lavidge, Phone Lab Research, CRC Information, Quick Test, and BizRate.com throughout his more than 25 years in the marketing research industry.

Merrill received a Bachelor of Arts degree from Hofstra University in Long Island, New York, where he took a broad array of courses to prepare him for a career in marketing research.

Merrill also authors The Merrill Dubrow Blog, which he started in August 2006. His topics include the best movies of all time, his painful experience of taking a Bikram Yoga class, and his favorite board games. However, it is not all fun and games; Dubrow's blog also contains discussion of new trends in marketing research, profiles of marketing research industry colleagues, and interesting findings from M/A/R/C's own research.

The power of the blog never ceases to amaze Merrill Dubrow. It hits him every time conference attendees tell him they came to his session because they had read his blog and felt compelled to meet him.⁸

College graduates' lack of awareness of marketing research as a career and a growing demand for marketing researchers in the fields of information technology, pharmaceuticals, financial services, and other booming industries have created a shortage of professionals in the field. Marketing research organizations would like to have more incoming talent in order to have a greater presence in senior management in the future. The need for marketing researchers could not be greater. According to the United States Bureau of Labor and Statistics (www.bls.gov), employment opportunities are expected to grow faster than average for all market research positions through 2015. Job growth will be driven, in part, by retiring workers, shifting of job skills toward computers and quantitative methods, a growing economy, and the need for companies to operate in an increasingly competitive global marketplace. This makes it a career worth pursuing for both the short and the long term. For more information on jobs in marketing research, check out the American Marketing Association's career center at www.marketingpower.com or visit www.marketresearchcareers.com.

Experiential Learning

The World of Marketing Research on the Internet

MarketResearchCareers.com (www.marketresearchcareers.com) offers up-to-date news and information on the market research industry. Here's how to find what you're looking for and get the most out of your visit.

If you're job hunting or hiring, the classifieds section lists jobs in research, marketing, advertising, public relations, and allied

professions. The site lists current job openings. Resumes and job listing can be submitted to the site.

The Market Research News section provides company, conference, and product news from the world of market research.

There are many other ways the MarketResearchCareers.com Web site brings the world of marketing research to you. Explore it!

The Role of Marketing Research in MIS and DSS

Earlier, we defined *marketing research* as the systematic and objective identification, collection, analysis, dissemination, and use of information as input in marketing decision making. Combining external market information with internal billing, production, and other records results in a powerful marketing information system (MIS) (see Figure 8).

A **marketing information system (MIS)** is a formalized set of procedures for generating, analyzing, storing, and distributing information to marketing decision makers on an ongoing basis. Such systems are differentiated from marketing research in that they are continuously available. Marketing information systems are designed to complement the decision maker's responsibilities, style, and information needs. The power of a MIS is in the access it gives managers to vast amounts of information, combining production, invoice, and billing information

marketing information
system (MIS)

A formalized set of procedures for generating, analyzing, storing, and distributing pertinent information to marketing decision makers on an ongoing basis.

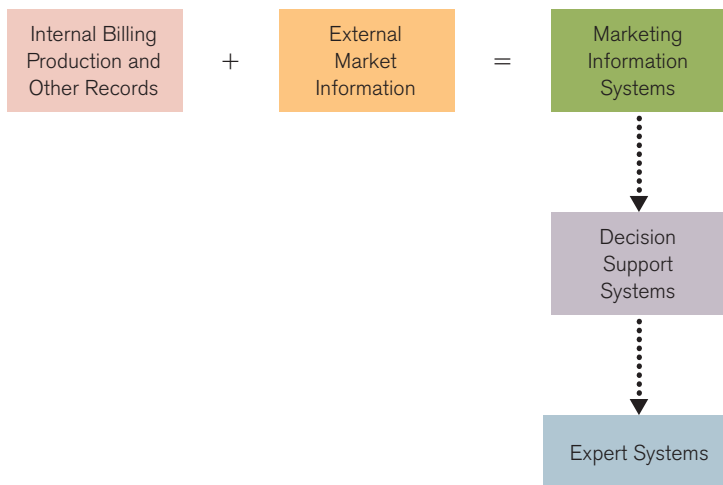


FIGURE 8
**The Development
of MIS and DSS**

with marketing intelligence, including marketing research, into a centralized data warehouse. MIS offer the potential of much more information than can be obtained from ad hoc marketing research projects. However, that potential often is not achieved when the information is structured so rigidly that it cannot be easily manipulated.

Developed to overcome the limitations of MIS, **decision support systems (DSS)** have built-in flexibility that allows decision makers to interact directly with databases and analysis models. A DSS is an integrated system that includes hardware, a communications network, a database, a model base, a software base, and the DSS user (decision maker) who collects and interprets information for decision making. Information collected by marketing research becomes a part of the DSS, as in the case of Reebok in the opening vignette. Specifically, marketing research contributes research data to the database, marketing models and analytical techniques to the model base, and specialized programs for analyzing marketing data to the software base. Many firms are building huge internal databases as part of the DSS. Decision support systems differ from MIS in that they combine the models and analytic techniques of traditional marketing research with the easy access and retrieval of MIS (Figure 9). Well-designed DSS adapt to the decision-making needs of the user with easy interactive processes. In addition to providing easy access to data, DSS can also enhance decision-making effectiveness by using “what-if” analysis. Reebok International makes use of a sophisticated DSS that enables it to assess the impact of introducing new footwear, making a promotional offer, or opening a new facility at a specific location when these projects are still in the planning stage.

MIS and DSS can greatly improve decision making by enabling management to access a wide range of information. An advanced form of DSS, called *expert systems*, uses artificial intelligence procedures to incorporate expert judgment. In addition to crunching numbers and storing and retrieving information, these systems are programmed to reason and make inferences. Thus, the expert systems can actually lead to decisions recommending certain courses of action to the management. All of these systems can greatly enhance the effectiveness of marketing.

decision support system (DSS)

An information system that enables decision makers to interact directly with both databases and analysis models. The important components of a DSS include hardware and a communication network, database, model base, software base, and the DSS user (decision maker).

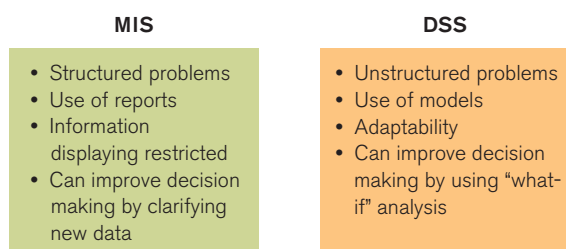


FIGURE 9
**Marketing Information
Systems (MIS) Versus
Decision Support
Systems (DSS)**

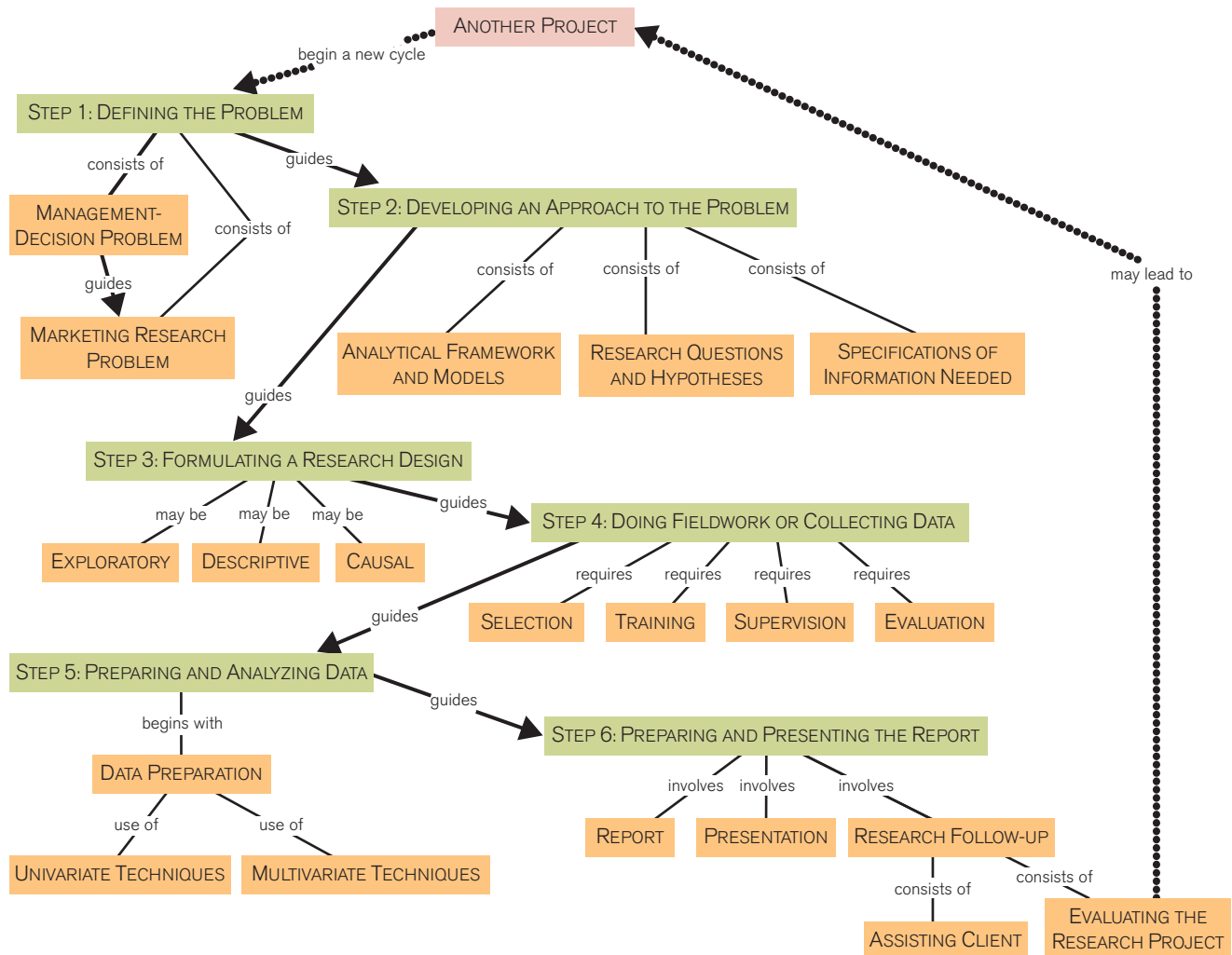
Summary Illustration Using the Opening Vignette

To summarize and illustrate the concepts in this chapter, let's return to the opening vignette. Marketing research involves the identification, collection, analysis, dissemination, and use of information about consumers, channel members, competitors, and changes and trends in the marketplace and other aspects of the firm's environment. In the opening vignette, Reebok used "time-use" research in an attempt to discover what consumers do with their spare time. Marketing research can be classified as problem-identification research or problem-solving research. Reebok used problem-identification research involving secondary data analysis, focus groups, and a market potential survey to discover that adults were spending less time in health clubs and more time exercising at home. Problem-solving research, in the form of product research, then led to the development of the successful home-step aerobics line.

The marketing research process consists of six steps, which must be followed systematically. Figure 10 provides a concept map for the marketing research process. In this figure, the six steps of the marketing research process are connected, in order, by bold arrows. Each step is described by concepts that are connected to that step by lines with descriptors. Concepts are also linked to other concepts by lines or arrows. Thus, step 1 is defining the problem, which consists of the management decision problem and the marketing research problem. The management decision problem guides the marketing research problem. Reebok follows a very similar marketing research process, and some of these steps were illustrated in the opening vignette.

Marketing research can be conducted internally or purchased from external suppliers. In the case of Reebok, in-house marketing research specialists are actively involved in defining and designing the marketing research project. The in-house specialists also have the primary

FIGURE 10
A Concept Map for the Marketing Research Process



responsibility for presenting the results to management and providing assistance in implementation. Reebok also makes use of full-service suppliers who provide assistance in all the steps of the marketing research process as well as limited-service suppliers who may handle only data collection and analysis and assist in report writing.

The marketing research industry offers a wide range of careers in both corporate (e.g., Reebok) and marketing research organizations. Information obtained using marketing research can stand alone or be integrated into an MIS and DSS, as in the case of Reebok.

Application to Contemporary Issues

Although several contemporary issues are discussed throughout the chapter, we focus special attention on international marketing research, marketing research and social media, and ethics in marketing research. We show how marketing research principles can be applied when conducting research in an international setting. Because we live in an age of social media, the use of social media as an application and as a domain to conduct marketing research also is discussed. Ethical issues in marketing research are described.

International Marketing Research

The United States accounts for about 40 percent of worldwide marketing research expenditures; another 40 percent is attributable to Western Europe and about 10 percent to Japan. Most of the research in Europe is done in the United Kingdom, Germany, France, Italy, and Spain. Japan is the clear leader in the Asia-Pacific region, followed by Australia, China, South Korea, and Taiwan. Brazil and Mexico lead the Central and South American markets in terms of marketing research expenditures.⁹

With the globalization of markets, marketing research has assumed a truly international character, a trend that is likely to continue. Several U.S.-based market research firms are equipped to conduct international marketing research. They include Nielsen, IMS Health, and SymphonyIRI (see Table 1). Foreign-based firms include Kantar (United Kingdom) and GfK (Germany).

International marketing research is much more complex than domestic marketing research. Research of this type should be sensitive to differences in customs, communication, and culture. The environment in the countries or international markets that are being researched influences the way the six steps of the marketing research process should be performed. These environmental factors include marketing, government, legal, economic, structural, informational and technological, and sociocultural factors. When conducted properly, international marketing research can yield high dividends, as demonstrated by the success of Procter & Gamble in China.

Research in Action

Head & Shoulders Stands Head and Shoulders Above Competition in China

As of 2011, Procter & Gamble (P&G) (www.pg.com) markets about 300 products to more than 4 billion consumers in 180 countries. P&G products are the largest daily-use consumer products in China. The company has achieved this status by ignoring popular maxims, instead relying on marketing research.

P&G succeeded because it ignored the standard practices used in marketing to the Chinese consumers. It did not cater to a wealthy audience, although it was told that none other could afford its expensive products. By relying on marketing research, such popular maxims were seen for what they were—misunderstandings. Additionally, by conducting proper cross-cultural research P&G was able to overcome Western biases based on erroneous



Source: AP Wide World Photos/Feng lei
SH-Imaginechina/Associated Press.

(continued)

beliefs about China, such as that middle-class Chinese could not afford expensive Western products.

Marketing research revealed that dandruff was a major concern, because the Chinese have dark hair, causing dandruff to readily stand out. Furthermore, Chinese shampoos were ineffective in fighting this malady. Research revealed that most Chinese were willing to pay a premium for a shampoo that addressed this problem.

P&G decided to establish its foothold in China by fighting dandruff. P&G targeted a broad segment, rather than just the

wealthy. P&G introduced Head & Shoulders as a premium brand, and within 3 years it was China's leading shampoo. P&G then introduced antidandruff versions of Pert and Pantene. Using careful targeting, both brands performed extremely well. Overall, P&G commands a leading share of the shampoo market in China, even though its products are priced more than 300 percent higher than local brands. This example shows that those who overcome their biases and conduct proper research can stand head and shoulders above the competition.¹⁰

Be an MR!

Be a DM!

Jeans, a Universal Product?

Social Media

Visit www.levi.com and search the Internet—including social media—as well as your library's online databases to find information on consumer preferences for jeans. Levi's would like to conduct marketing research to increase its share of the jeans market in the United States and India. How would you conduct marketing research in the two countries?

As Levi's marketing chief, what information would you need to formulate strategies aimed at increasing marketing share?

Social Media

Marketing Research and Social Media

Social media embody social computing tools commonly referred to as *Web 2.0*. These are Web applications that facilitate interactive information sharing, user-centered design, and collaboration on the World Wide Web. Examples of social media include social-networking sites (e.g., Facebook), video sharing (e.g., YouTube), photo sharing (e.g., Flickr), music sharing (e.g., Last FM), bookmarking (e.g., Delicious), voice networking (e.g., Skype), wikis (e.g., Wikipedia), product and service reviews (e.g., TripAdvisor), virtual worlds (e.g., Second Life), multiplayer games (e.g., Farmville), Web-based communities (e.g., ivillage), blogs (e.g., Direct2Dell), and microblogs (e.g., Twitter). A Web 2.0 site allows its users to interact with other users or to change Web site content, in contrast to noninteractive Web sites where users are limited to the passive viewing of information that is provided to them. Good social media networks use all the tools available to them: discussion, chat, webcast, photo, video, podcasts, animation, surveys, games, and virtual worlds. People interact in different ways, and so it is desirable to give them as many tools as feasible. Moreover, the cost of providing all these tools has become reasonable.

All social media share certain common characteristics that make them very relevant as a domain for conducting marketing research. Social media are marked by user-generated content that is blurring the distinction between professional and amateur content. Key social interactions develop around the user-generated content. Users are able to rate, rank, comment on, review, and respond to the new world of media, a factor that is driving the success of social media. People form online communities by combining one-to-one (e.g., e-mail and instant messaging), one-to-many (Web pages and blogs), and many-to-many (wikis) communication modes.

Marketing researchers can make use of these new social networks, and the open-source social computing tools from which they are built, to extend the boundaries of our research offerings. These social communities open new avenues for understanding, explaining, influencing, and predicting the behaviors of consumers in the marketplace. Thus, they can be used in a variety of marketing research applications including segmentation, idea generation, concept testing, product development, brand launches, pricing, and integrated marketing communications.

Social media are not without limitations. Although the standard for objectivity is high for journalists, expectations about objectivity among bloggers and other social media users are lower. Social media users may not be representative of the target population in many marketing research applications. Social media as a source of samples suffers from at least two biases: first from self-selection in that the respondents can self-select themselves into the sample, and second from

advocacy. Yet, as long as these limitations are understood, insights from social media analysis can uncover useful information that can inform marketing decisions. We advocate the use of social media as an additional domain in which to conduct marketing research to supplement and complement, but not to replace, the traditional ways in which research is conducted. We also discuss social media as an application of marketing research in that we show how the traditional marketing research procedures can be implemented in social media.

A handful of marketing research firms have emerged that specialize in social media conversation mining services. They listen in on online conversations, report on activity, and assess influence. These services charge from a few hundred to a few thousand dollars per month and differ in the features they offer. Nielsen (www.nielsen.com) derives data-driven insights from nearly 100 million blogs, social networks, groups, boards, and other consumer-generated media platforms. The company offers real-time measurement and analysis, balancing investment in text-mining, analytical technologies, and expert analysis. Cymfony (www.cymfony.com), a Kantar Media company, provides market influence analytics by scanning and interpreting voices at the intersection of social and traditional media. The company's Maestro platform identifies the people, issues, and trends impacting businesses. Cymfony offers a range of packaged and custom services to address specific intelligence requirements, such as social media strategy, consumer opinions and trends, customer satisfaction, and reputation management. Attensity's Attensity360 (www.attensity.com) service continuously monitors and analyzes social media conversations and their impact on businesses. It offers real-time analysis and drill-down capabilities to analyze the data in different ways. Client firms can track and analyze the ongoing relevant conversations affecting their businesses, influential opinion leaders and sources, the impact of conversation topics, and topic trends. BrandsEye (www.brandseye.com), developed by Quirk eMarketing, searches the Internet for every mention of a brand and calculates a weighted Reputation Score that companies can use to compare their brands to their competitors. The services of other social media research firms are discussed throughout the book. Here, we illustrate how one firm, namely Starbucks, is using social media to obtain information and connect with consumers in the target market.

Research in Action

Starbucks: The Star of Social Media

Starbucks has a blog, My Starbucks Idea (MSI) (mystarbucks-idea.force.com), where it not only connects with customers but also co-creates the company's future with them. Customers can share ideas, vote on ideas others have suggested, discuss ideas with other customers, and view the ideas Starbucks has announced. Starbucks's Idea Partners from different departments within the company take part in answering queries and providing insights to discussions. Starbucks can then get ideas and feedback on how to improve their products to satisfy the needs of customers. Furthermore, the brand takes suggestions posted on the site seriously and publishes implemented suggestions for all to see. It further encourages feedback from customers by providing online incentives in the form of virtual vouchers or purchase points. This enables the brand to interact with its loyal customers. Additionally, Starbucks includes qualitative and quantitative types of survey questions in the form of polls along the sidelines of the blog in a bid to further solicit marketing research data. My Starbucks Idea has a significant impact as, on average, one in three suggestions are implemented. All suggestions are acknowledged and commented on within an hour of uploading; an average of four suggestions are made every hour.

Starbucks has a Facebook page (www.facebook.com/starbucks) that has a total of more than 21 million, and still growing, fans. It uses this site to promote new products and gain the feedback of customers. It also organizes events and uses Facebook's technology to invite customers to attend its events. It

has a collection of photos from its products and events, among many others uploaded by fans. Starbucks updates its Facebook page approximately once every 2 days, and every update sees thousands of users responding to it. The company actively comments or replies to its followers' posts or photo tags of them, increasing its presence on social media. Starbucks also uses its Facebook page to develop a target market's profile through descriptive research.

Starbucks also make use of Twitter (www.twitter.com/starbucks) to promote products and connect with customers. The firm uses Twitter to update customers about new products and services with short messages. Tools like retweets allow users to spread messages originally tweeted by Starbucks to others. Starbucks's Twitter account often directs followers to MSI for polls, surveys, or opinions-casting.

Starbucks uses YouTube (www.youtube.com/starbucks) to share videos of its events and special music performances. It is also a way for the company to obtain feedback through the number of views, comments or subscribers, and ratings.

Starbucks is on Flickr (www.flickr.com/starbucks), an image and video-hosting Web site, and has a group (www.flickr.com/groups/starbuckscoffeecompany) where it allows customers to post photos of their experience at the store and have discussions among themselves.

In addition to the official Starbucks blog and social media sites, there are many unofficial Starbucks sites maintained by fans and other

(continued)

individuals. An example of one such site, www.starbucks melody.com, is shown here:



Source: Courtesy of Melody Overton, StarbucksMelody.com.

Being present on many other forms of social media, Starbucks is not absent from MySpace, where it has audio clips uploaded and people discussing issues with one another. It also has a page on Wikipedia, the most popular wiki provider. In addition, Starbucks also makes use of LinkedIn (www.linkedin.com/companies/2271) to present the company profile to others.

An example of how social media have helped Starbucks improve its service is the recurring requests for free wireless and the final move made by Starbucks to officially offer free unlimited wireless to all its customers. Likewise, several members of the MSI community posted ideas requesting fresh fruits to be served at Starbucks. In response, Starbucks began producing a new drink with a fruity touch, alongside its new iced coffee beverage, to help beat the summer heat. From the tropics of the Bahamas to the Forbidden City in Beijing, social media have helped Starbucks to serve its corporate logo alongside freshly brewed coffees in meeting the needs of customers. As of 2011, the brand is represented in more than 55 countries and continues to grow.¹¹

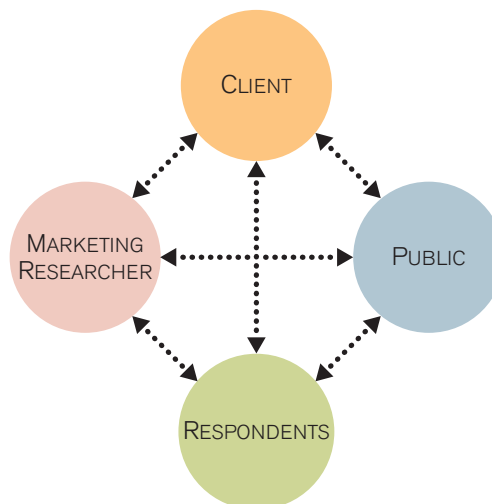
Ethics in Marketing Research

Business activities often are discussed from the perspectives of different stakeholders, those individuals or groups who have an interest in or are directly involved in activities related to business. Marketing research activities affect four stakeholders: (1) the marketing researcher, (2) the client, (3) the respondent, and (4) the public. Ethical questions arise when conflict occurs between these stakeholders (Figure 11).

In the face of conflict, the behavior of the stakeholders should be guided by codes of conduct. Several organizations, including the Marketing Research Association (MRA) and the American Marketing Association (AMA), provide codes in the area of ethical research behavior. For example, see the respondent bill of rights on the Web site of the Marketing Research Association (www.mra-net.org). Each stakeholder has responsibilities. Neglect of these responsibilities might result in harm to another stakeholder or to the research project. It will always damage the research process and the integrity of the profession.¹²

Ethical issues can arise at each step of the marketing research process. Here we give the code of ethics of the Marketing Research Association (MRA). This code is consistent with the ethical guidelines issued by many marketing research and related associations.

FIGURE 11
Stakeholders in
Marketing Research: An
Ethical Perspective



Research in Action

MRA's Ethical Guidelines on the Use of the Internet for Conducting Marketing Research

These *Ethical Guidelines* include:

- Respondent Cooperation Should Be Voluntary
- Researcher's Identity Should Be Disclosed to Respondents
- Respondents' Rights to Anonymity Should Be Safeguarded
- Privacy Policy Statements Should Be Posted Online
- Data Security Should Be Maintained
- Reliability and Validity of Findings Should Be Disclosed to the Public

- Researchers Interviewing Minors Should Adhere to the Children's Online Privacy Protection Act
- Unsolicited E-mail Should Not Be Sent to Those Requesting Not to Receive Any Further E-mail

Source: Code of Ethics of Marketing Research Association (www.mra-net.org). Used with permission.

Experiential Learning

Ethical Guidelines

Compare the ethical guidelines for conducting marketing research posted at the following Web sites:

- CASRO: The Council of American Survey Research Organizations (www.casro.org)
- MRA: Marketing Research Association (www.mra-net.org)
- ESOMAR: European Society for Opinion and Marketing Research (www.esomar.org)

Which organization has the most stringent set of guidelines?
Which organization's ethical guidelines are the most complete?

What is missing from the guidelines of all three of the organizations?

WHAT WOULD YOU DO?

Samsonite. Life's a Journey

The Situation

Samsonite is one of the world's largest designers, manufacturers, and distributors of luggage. It sells its products using a number of quality brand names, including Samsonite® and American Tourister®. Samsonite's tagline—"Life's a Journey"—embodies the brand, signifying the role Samsonite continues to play in the multifaceted lives of the global traveler. With net sales of \$1.1 billion for its fiscal year ending January 31, 2010, it is a leader in the highly fragmented global luggage industry. Through aggressive product development and marketing, president and chief executive officer Marcello Bottoli hoped to increase the company's market share. Bottoli recognizes the importance of new product development and acknowledges that Samsonite must continually introduce successful new products in the marketplace.

The Marketing Research Decision

1. What type of marketing research should Samsonite undertake? (Check as many as are applicable.)
 - a. Product research
 - b. Pricing research
 - c. Promotion research
 - d. Distribution research
 - e. All of the above
2. Discuss the role of the type of research you recommend in enabling Marcello Bottoli to increase the market share of Samsonite.



Source: Ross Hailey/MCT/Newscom.

The Marketing Management Decision

1. Marcello Bottoli's aggressive marketing strategy should be built around (check as many as are applicable):
 - a. New product development
 - b. Price discounts

(continued)

- c. International marketing
 - d. Distribution through flagship stores
 - e. All of the above
2. Discuss how the marketing management decision action that you recommend to Marcello Bottoli is influenced by the research that you suggested earlier and by the findings of that research.

What Marcello Bottoli Did

Marcello Bottoli unveiled a directional luggage collection by world-renowned designer Alexander McQueen. The collaboration brought together inspiration and

ideas from McQueen's own life experience and travels. The design ethos contrasts fragility and strength, tradition and modernity, resulting in a collection of key travel pieces to appeal to the world's most discerning globe trotters. Underpinning the design features are Samsonite Black Label's contemporary style and luxury, and its values of ultimate performance, function, and durability.

The world of travel is constantly changing, and so is Samsonite. As the brand is taken beyond luggage, Samsonite is constantly seeking opportunities to expand internationally and become present in new distribution channels, leading to the opening of flagship Samsonite Black Label stores in high-end locations in New York, London, Moscow, Berlin, Seoul, Tokyo, Hong Kong, Singapore, Taipei, and Shanghai.¹³



SPSS Windows and Excel

We feature SPSS programs, not merely as a statistical package, but as an integrative package that can be used in the various stages of the marketing research process. We illustrate the use of SPSS for defining the problem, developing an approach, formulating the research design, data collection, data preparation and analysis, and report preparation and presentation. In addition to the BASE module, we also feature other SPSS programs, such as Decision Time, What If?, Maps, Data Entry, SamplePower Missing Values, TextSmart, and SmartViewer.

The data analyses also are illustrated with three other software packages: Excel, SAS, and Minitab. Detailed, step-by-step instructions are provided for both SPSS Windows and Excel. All the data files are available for both SPSS and Excel. The computerized demonstration movies and screen captures for implementing each and every statistical procedure using SPSS or Excel can be downloaded from the Web site for this book.



Summary

Marketing research assesses information needs and provides relevant information in order to improve the marketing decision-making process. It is a systematic and objective process designed to identify and solve marketing problems. Thus, marketing research can be classified as problem-identification research and problem-solving research. The marketing research process consists of six steps that must be followed systematically. Marketing research provides information about consumers, channel members, competitors, changes and trends in the marketplace, and other aspects of the firm's environment including competitive intelligence. The decision to conduct marketing research should be guided by a number of considerations, including the costs versus the benefits, the resources available to conduct the research, the resources available to implement the research findings, and management's attitude toward research.

A firm can conduct its own marketing research or purchase it from external suppliers. External suppliers might provide full service or specialize in one or more aspects of the process. Full-service suppliers provide the entire range of marketing research services, from problem definition to report preparation and presentation. The services provided by these suppliers can be classified as syndicated services, customized services, or Internet services including social media. Limited-service suppliers specialize in one or a few steps of the marketing research process. These suppliers might offer field services, focus groups and qualitative services, technical and analytical services, and other services such as branded products and services.

The marketing research industry offers a wide range of careers in both corporate and marketing research organizations. Marketing research firms, business and nonbusiness firms, and advertising agencies all employ research professionals. Information obtained using marketing research can stand alone or be integrated into an MIS or DSS. Marketing research

contributes to the DSS by providing research data to the database, marketing models and analytical techniques to the model base, and specialized marketing research programs to the software base.

International marketing research is much more complex than domestic research because researchers must consider the environment in the international markets they are researching. Social media are emerging as an important domain in which to conduct marketing research. The ethical issues in marketing research involve four stakeholders: (1) the marketing researcher, (2) the client, (3) the respondent, and (4) the public.

Key Terms and Concepts

Marketing research	Internal supplier	Limited-service suppliers
Problem-identification research	External suppliers	Field services
Problem-solving research	Full-service suppliers	Focus groups and qualitative services
Marketing research process	Syndicated services	Technical and analytical services
Competitive intelligence	Customized services	Marketing information system (MIS)
Marketing research industry	Internet services	Decision support system (DSS)

Suggested Cases and Video Cases

Case with Real Data

Hewlett-Packard

Critical Thinking Cases

American Idol

Baskin-Robbins

Akron Children's Hospital

Cases with Real Data

Bank of America

McDonald's

Boeing

Comprehensive Brief Harvard Business School Cases

TruEarth Healthy Foods: Market Research for a New Product Introduction (4065)

The Springfield Nor'easters: Maximizing Revenues in the Minor Leagues (2510)

Metabical: Positioning and Communications Strategy for a New Weight-Loss Drug (4240)

Saxonville Sausage Company (2085)

Online Video Cases

Burke

Accenture

NFL

P&G

Dunkin' Donuts

Motorola

Subaru

Intel

Marriott

Live Research: Conducting a Marketing Research Project


1. Give a background of the client organization.
2. Discuss the client's marketing organization and operations.
3. Explain how the project's result will help the client make specific marketing decisions.
4. Organize the class. This might require the formation of project teams. The entire class could be working on the same project with each team working on all aspects of the project or each team could be assigned a specific responsibility (e.g., a specific component of the problem or a specific aspect of the project, such as collection and analysis of secondary data). Each student should participate in primary data collection. Alternatively, the class could be working on multiple projects with specific teams assigned to a specific project. The approach is flexible and can handle a variety of organizations and formats.
5. Develop a project schedule clearly specifying the deadlines for the different steps.
6. Explain how the teams will be evaluated.
7. One or a few students should be selected as project coordinators.

Acronym

The role and salient characteristics of marketing research can be described by the acronym RESEARCH:

- R ecognition of information needs
- E ffective decision making
- S ystematic and objective
- E xodus/dissemination of information
- A nalysis of information
- R ecommendations for action
- C ollection of information
- H elpful to managers

Review Questions

1. Define *marketing research*. What are some of the noteworthy aspects of this definition?
2. Describe a classification of marketing research and give examples.
3. Describe the steps in the marketing research process.
4. Describe the task of marketing research and illustrate with an example.
5. What decisions do marketing managers make? How does marketing research help them to make these decisions?
6. Discuss the role of marketing research in gathering competitive intelligence.
7. How would you classify marketing research suppliers?
8. What are syndicated services, and how do they help a firm conduct marketing research?
9. What is the main difference between a full-service and a limited-service supplier?
10. List five guidelines for selecting an external marketing research supplier.
11. What career opportunities are available in marketing research? Are you interested in pursuing such a career? Why or why not?
12. What is a marketing information system (MIS)?
13. How is DSS different from MIS?
14.  Discuss the role of social media in conducting marketing research.
15. Who are the stakeholders in marketing research?

Applied Problems

1. Visit the Web site of one of the marketing research firms listed in Table 1. Write a report on the types of marketing research conducted by this firm. Classify this firm based on the scheme presented in Figure 7.
2. Search the Internet to identify five examples of problem-identification research and five examples of problem-solving research.
3. Describe one marketing research project that would be useful to each of the following organizations:
 - a. Your campus bookstore
 - b. The public transportation authority in your city
 - c. A major department store in your area
 - d. A restaurant located near your campus
 - e. A zoo in a major city
4. Search the Internet and your library's online databases to identify an innovative new product introduced in the past 12 months and research it. Write a report about the marketing research undertaken to develop this product.
5. Visit the Web sites of the following organizations: MRA (www.mra-net.org), ESOMAR (www.esomar.org), and AMSRS (www.amsrs.com.au). Compare and contrast the information available at these sites. Of the three marketing research associations, which has the most useful Web site? Explain.
6. Visit the U.S. Bureau of Labor Statistics Web site at www.bls.gov and search the Internet to obtain information on the employment potential for marketing researchers.


Group Discussion

As a small group of four or five, discuss the following issues.

1. What type of institutional structure is best for a marketing research department in a large business firm?
2. What is the ideal educational background for someone seeking a career in marketing research?
3. Can ethical standards be enforced in marketing research? If so, how?

Hewlett-Packard Case

Review the Hewlett-Packard (HP) case and questionnaire. Answer the following questions.

1. Discuss the role that marketing research can play in helping HP maintain and build on its leadership position in the personal computers market.
2. What problem-identification research should HP undertake?
3. What problem-solving research should HP undertake?
4. Would you like to pursue a marketing research career with HP? Explain.
5.  How can HP make use of social media to obtain marketing research information?

ONLINE VIDEO CASE

BURKE: Learning and Growing Through Marketing Research

Visit www.pearsonhighered.com/malhotra to read the video case and view the accompanying video. Burke: Learning and Growing Through Marketing Research traces the evolution of marketing research and how Burke implements the various steps of the marketing research process. Burke's approach to all the six steps of the marketing research process is highlighted: defining the marketing research problem, developing an approach to the problem, formulating a research design, collecting data, analyzing the data, and preparing and presenting the report. This case can be used to discuss the role of marketing research in marketing decision making and the steps of the marketing research process. Specific marketing research questions are posed in the video case.

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Defining the Marketing Research Problem and Developing an Approach

Defining the Marketing Research Problem and Developing an Approach




Source: AP Wide World Photos/PRNewPhoto/Subaru of America, Inc./Associated Press.

LEARNING OBJECTIVES

After reading this chapter, the student should be able to:

1. Understand the importance of and the process used for defining the marketing research problem.
2. Describe the tasks involved in problem definition, including discussions with decision makers, interviews with industry experts, secondary data analysis, and qualitative research.
3. Discuss the environmental factors affecting the definition of the research problem: past information and forecasts, resources and constraints, objectives of the decision maker, buyer behavior, legal environment, economic environment, and marketing and technological skills of the firm.
4. Clarify the distinction between the management-decision problem and the marketing research problem.
5. Explain the structure of a well-defined marketing research problem, including the broad statement and the specific components.

6. Discuss in detail the various components of the approach: analytical framework and models, research questions and hypotheses, and specification of information needed.
7. Acquire an appreciation of the complexity involved in defining the problem and developing an approach in international marketing research.

8.  Describe how social media can be used to identify and define the marketing research problem and aid in developing an approach.
9. Understand the ethical issues and conflicts that arise in defining the problem and developing the approach.

“The most challenging part of any research project is defining the problem in the terms management understands and in a way that ensures the desired information is obtained.”

Chet Zalesky
President, CMI, Atlanta, Georgia

The World's First Sport Utility Wagon

The 2012 Outback Wagon was marketed as having a five-star government crash test rating and received rave reviews from automotive magazines. How was the Outback born?

In the early 1990s, Subaru of America was searching for new ways to penetrate the U.S. automobile market. The marketing research firm hired by the company undertook a comprehensive examination of the marketing situation (a problem audit). The audit enabled the research firm to identify the real problem confronting management (the management-decision problem) as “What can Subaru do to expand its share of the automobile market?” The marketing research problem was defined broadly as determining the various needs of automobile users and the extent to which current product offerings were satisfying those needs. However, for marketing research to be conducted effectively and efficiently, the problem had to be defined more precisely. Subaru's management and the research firm agreed on the following specific problem components:

1. What needs do buyers of passenger cars, station wagons, and sport utility vehicles (SUVs) seek to satisfy?
2. How well do existing automobile product offerings meet these needs?
3. Is there a segment of the automobile market whose needs are not being adequately met?
4. What automobile features does the identified segment desire?
5. What is the demographic and psychographic profile of the identified segment?

The approach to the marketing research problem was developed based on the postulate, or framework, that buyers first decide on the type of car (e.g., station wagon, SUV, passenger car) they want and then select a particular brand. The research firm formulated specific research questions and possible answers (hypotheses) to be tested by collecting survey data.

The research indicated a strong market potential for a vehicle that combined the features of a station wagon and a compact SUV. The needs of a sizable male-dominated segment were not being met by either the station wagon or the SUV, and this segment wanted a hybrid product.

Based on these findings, Subaru of America introduced the 1996 Outback as “the world's first sport utility wagon.” Subaru said in a press release that the Outback filled the niche between the SUV and the passenger car. The Outback has several important features that are missing from most SUVs, including an all-wheel-drive system that operates under all road conditions and vehicle speeds, four-wheel independent suspension, antilock brakes, dual air bags, and a side-intrusion protection system. It also has a low door threshold for easy passenger entry and exit and a lower center of gravity for road handling and ride comfort. Inside amenities were also upgraded, and several other features were added.

A TV campaign for Outback featured *Crocodile Dundee*'s Paul Hogan. Viewers liked the ads and, of course, the product. Those taking a test drive were very impressed with the vehicle's capabilities. The result? Sales were triple what Subaru originally expected. Sales of the Outback continued to be strong through the 2012 model year.¹

Overview

This chapter examines the first two steps of the six steps of the marketing research process: defining the marketing research problem and developing an approach to the problem. Figure 1 briefly explains the focus of the chapter and on which steps of the marketing research process this chapter concentrates.

In the opening vignette, Subaru's introduction of the Outback to exploit a new market segment demonstrates the crucial importance of correctly defining the marketing research problem. Subaru correctly defined the marketing research problem as determining the various needs of automobile users and the extent to which current product offerings were satisfying those needs. Defining the research problem is the most important aspect of the research process. Only when a problem has been clearly and accurately identified can a research project be conducted properly. This is because problem definition sets the course for the entire project. In this chapter, we will identify the tasks involved and the factors to be considered at this stage and provide guidelines to help the researcher avoid common errors.

The chapter also discusses how to develop an approach to the research problem once it has been identified. The approach lays the foundation for how to conduct the research by specifying the relevant theory and models. It further refines the specific components of the problem by asking more specific questions and formulating the hypotheses that will be tested. The approach also specifies all the information that would need to be collected in the marketing research project. The special considerations involved in defining the problem and developing an approach in international marketing research are discussed. The impact of social media and several ethical issues that arise at this stage of the marketing research process also are considered. Figure 2 provides an overview of the topics discussed in this chapter and how they flow from one to the next.

The Importance of Defining the Problem

Although every step in a marketing research project is important, problem definition is the most important step. Marketing researchers consider problems and opportunities confronting management to be interchangeable, because the investigation of each follows the same

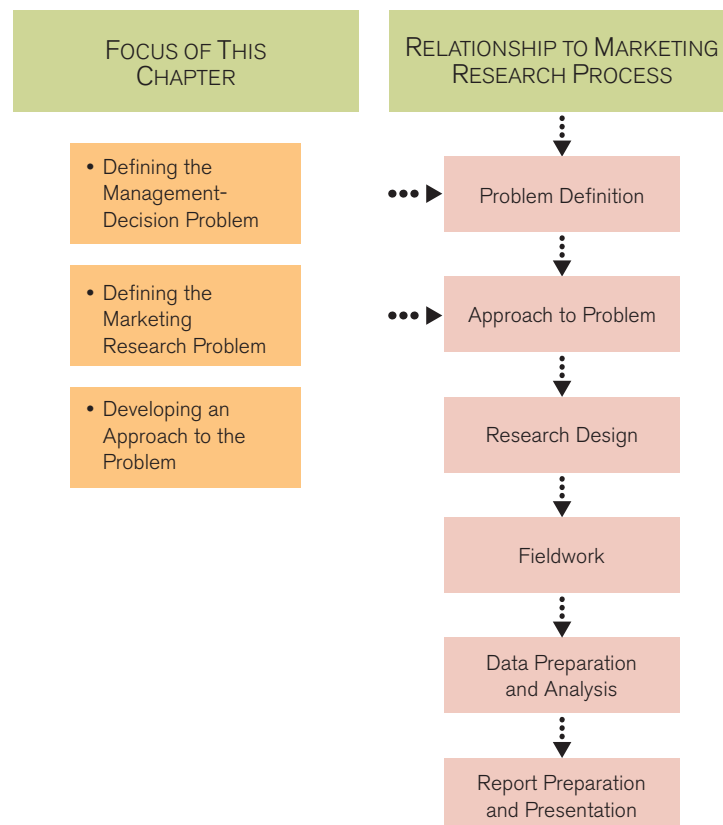


FIGURE 1
Relationship of
Problem Definition
and Approach to the
Marketing Research
Process

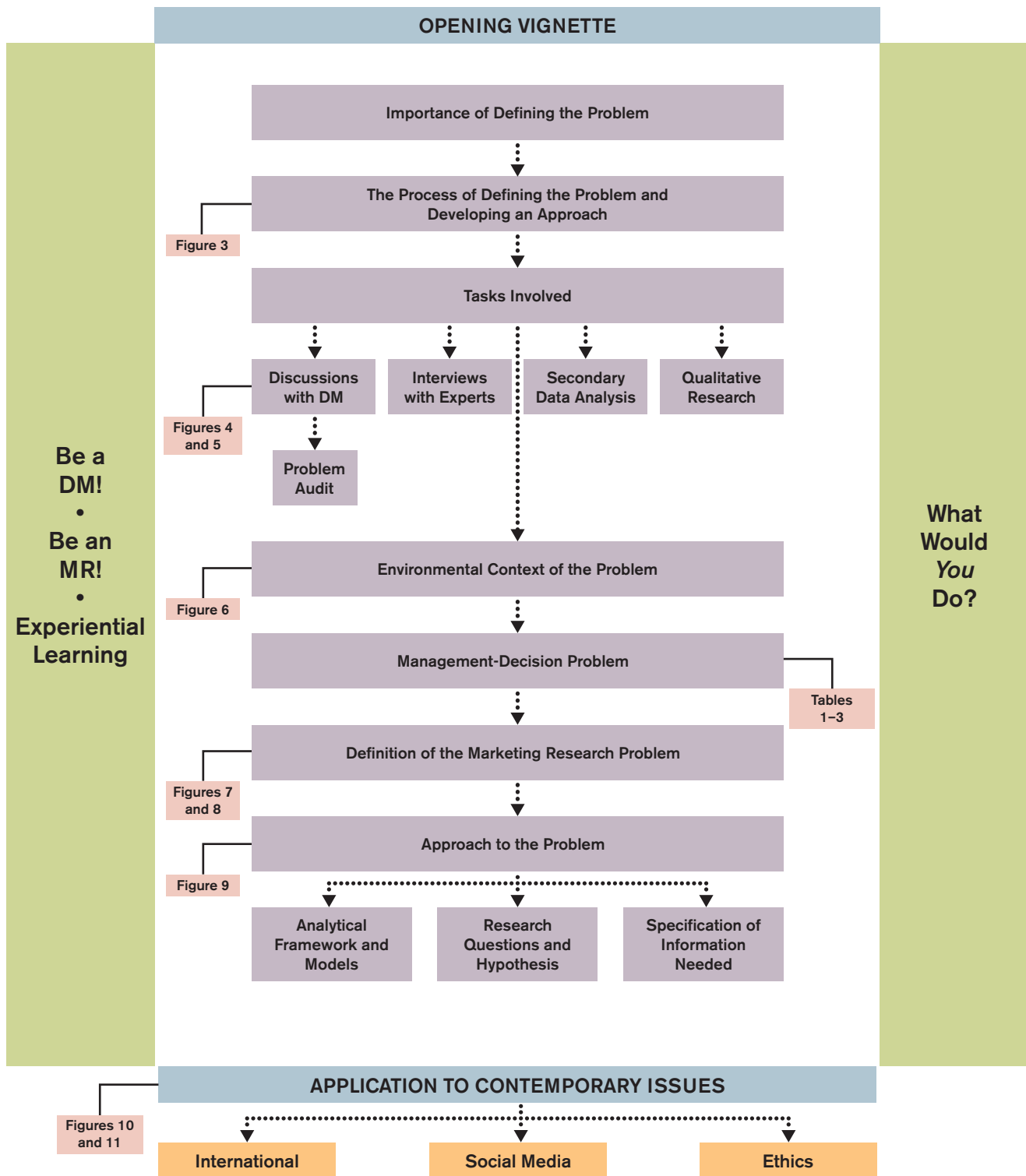


FIGURE 2
 Defining the Marketing Research Process and Developing an Approach: An Overview

research process. **Problem definition** involves stating the general problem and identifying the specific components of the marketing research problem, as illustrated in the opening vignette.

The opening vignette provided a broad statement of the problem confronting Subaru and identified its five specific components. The researcher and the key decision makers on the client side should agree on the definition of the problem. The *client* is the individual or organization commissioning the research. The client might be an internal person, as in the case of a research director dealing with a decision maker in her or his own organization. Alternatively, the client might be an external entity if the research is being conducted by a marketing research firm.

problem definition

A broad statement of the general problem and identification of the specific components of the marketing research problem.

Only when both parties have clearly defined and agreed on the marketing research problem can research be designed and conducted properly. Mistakes made at this stage of the process can only mushroom into larger mistakes as the project progresses. As stated by the well-known management expert Peter Drucker, the truly serious mistakes are made not as a result of wrong answers, but rather from asking the wrong questions. Of all the steps in the marketing research process, none is more vital to the ultimate fulfillment of a client's needs than an accurate and adequate definition of the research problem. All the effort, time, and money spent from this point on will be wasted if the problem is not defined properly.

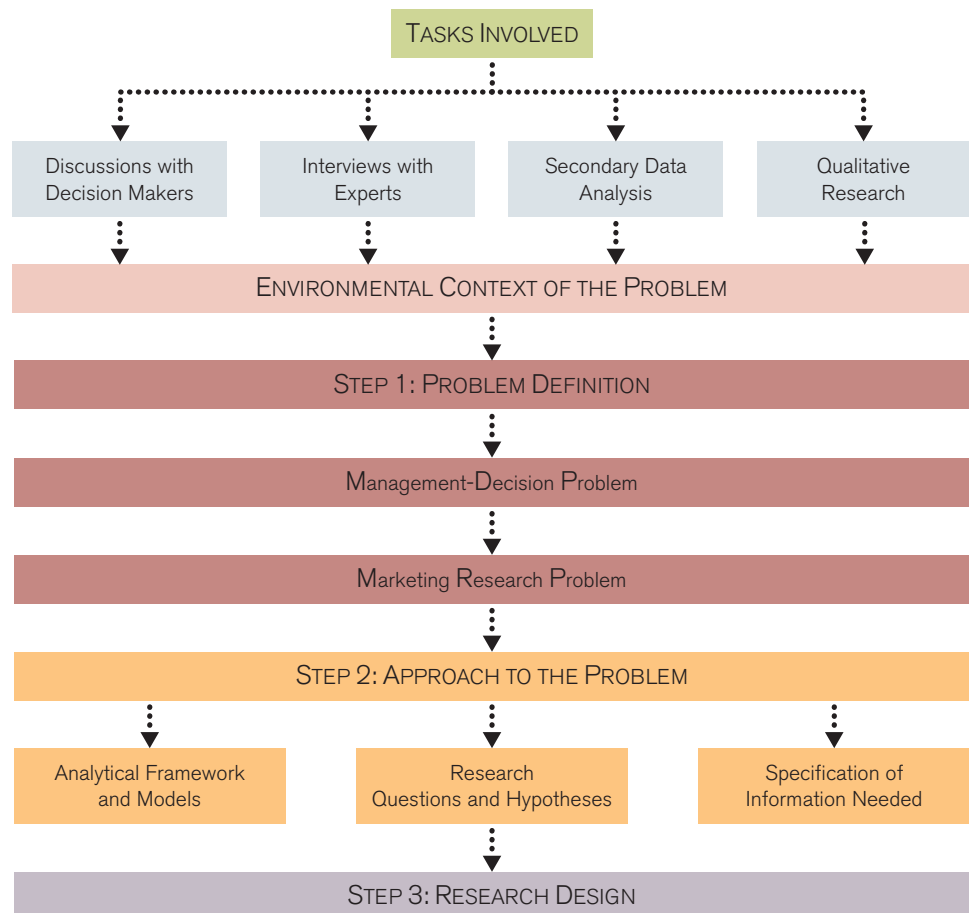
This point is worth remembering. Inappropriate problem definition is one of the major sources of failure in marketing research. The basic message here is that clear identification and definition of the marketing research problem are critical. This was illustrated in the opening vignette. Subaru defined the problem correctly by determining the various needs of automobile users and the extent to which those needs were being satisfied by the current product offerings. The research resulted in an important finding that a substantial segment of the marketplace desired the features of both a station wagon and an SUV, leading to the introduction of a very successful product. Suppose Subaru had incorrectly defined the problem as determining the preferences of the red-hot SUV owners. In such a scenario, it is highly unlikely that the Outback would have been developed.

The problem-definition process provides guidelines on how to correctly define the marketing research problem.

The Process of Defining the Problem and Developing an Approach

The problem-definition and approach development process is illustrated in Figure 3. To define a research problem correctly, the researcher must perform a number of tasks.

FIGURE 3
The Problem-Definition and Approach Development Process



The researcher must discuss the problem with the decision makers in the client organization, interview industry experts and other knowledgeable individuals, analyze secondary data, and sometimes conduct qualitative research. This informal data collection helps the researcher understand the context or environment within which the problem has arisen. A clear understanding of the marketing environment also provides a framework for identifying the management-decision problem: What should the management do? The management-decision problem is then translated into a marketing research problem, the problem that the researcher must investigate. Based on the definition of the marketing research problem, the researcher develops an appropriate approach. Further explanation of the **problem-definition process** follows, with a discussion of the tasks involved.

problem-definition process

The process of defining the management-decision problem and the marketing research problem.

Tasks Involved in Problem Definition

As mentioned earlier, the tasks involved in problem definition include discussions with the decision makers, interviews with industry experts, analysis of secondary data, and qualitative research. The purpose of performing these tasks is to obtain information on the environmental factors that are relevant to the problem and to help define the management-decision problem and the corresponding marketing research problem, as well as to develop an approach. We will discuss and illustrate each of these tasks.

Discussions with Decision Makers

It is essential that the researcher understand the nature of the decision faced by the firm's managers—the management-decision problem—as well as management's expectations of the research. This discussion gives the researcher an opportunity to establish achievable expectations. The decision maker needs to understand the capabilities, as well as the limitations, of the research. Research does not provide automatic solutions to problems; rather, it serves as an additional source of information that the manager should consider in the decision-making process.

To identify the management problem, the researcher must possess considerable skill in interacting with the decision maker and maneuvering through the organization. When the ultimate decision maker is a senior executive, the researcher might have difficulty gaining access to that individual. To complicate the situation even further, several individuals might be involved in the final decision. All individuals responsible for resolving the marketing problem should be consulted in this early phase of the project. The quality of the project will be dramatically improved when the researcher is given the opportunity to interact directly with the key decision makers.

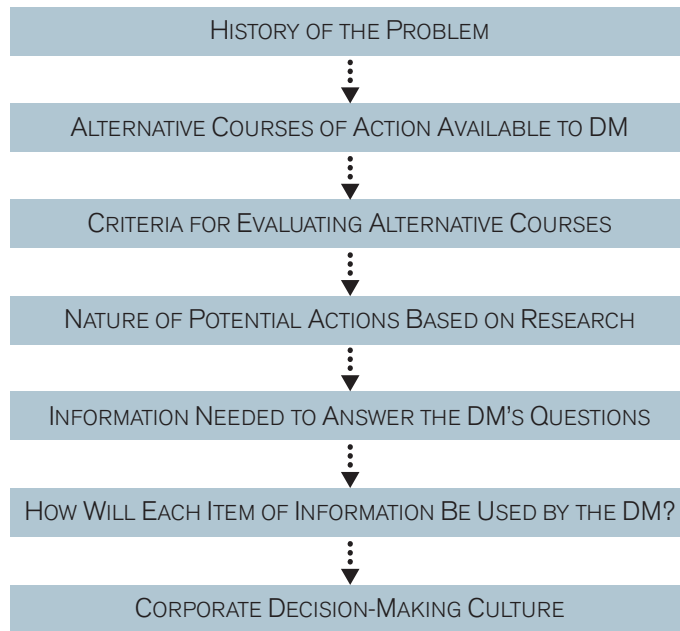
Discussions with the decision maker can be structured around the **problem audit**, which helps to identify the underlying causes of the problem. The problem audit, like any other type of audit, is a comprehensive examination of a marketing problem with the purpose of understanding its origin and nature (see Figure 4). The problem audit involves discussions with the decision maker on the following issues, which are illustrated with a problem facing Mars, Inc. (www.mars.com).

problem audit

A comprehensive examination of a marketing problem to understand its origin and nature.

1. **The history of the problem.** This includes an analysis of the events that have led to the decision to act. Mars, the second-leading manufacturer of candies in the United States, with a market share of 25 percent, would like to maintain and increase its share of the market. This problem has come into focus due to recent introductions by Hershey's, the category leader with 42 percent share as of January 1, 2010. Hershey's recent product spin-offs, including Hershey's Goodness and York Pink Patties, are threatening Mars' market share.
2. **The alternative courses of action available to the decision maker.** The set of alternatives might be incomplete at this stage, and qualitative research might be needed to identify the more innovative courses of action. The alternatives available to the management of Mars include introducing new brands of chocolates, reducing the prices of existing brands, expanding channels of distribution, and increasing advertising expenditures.
3. **The criteria that will be used to evaluate the alternative courses of action.** For example, new product offerings might be evaluated on the basis of sales, market share, profitability, return on investment, and so forth. Mars will evaluate the alternatives based on contributions to market share and profits.

FIGURE 4
Conducting a Problem Audit



4. *The nature of potential actions that are likely to be suggested based on the research findings.* The research findings will likely call for a strategic marketing response by Mars.
5. *The information that is needed to answer the decision maker's questions.* The information needed includes a comparison of Hershey's and Mars on all the elements of the marketing mix (product, pricing, promotion, and distribution) in order to determine relative strengths and weaknesses.
6. *The manner in which the decision maker will use each item of information in making the decision.* The key decision makers will devise a strategy for Mars based on the research findings and their intuition and judgment.
7. *The corporate culture as it relates to decision making.* In some firms, the decision-making process is dominant; in others, the personality of the decision maker is more important. A sensitivity to corporate culture in order to identify the individuals who are either responsible for the decision or who have a significant influence over the decision process is essential. In this case, the corporate culture at Mars calls for a committee approach in which key decision makers make the critical decisions.

Conducting a problem audit is essential in order to clarify the problem for the researcher. Not surprisingly, it may serve the same function for the decision maker. Often, the decision maker has only a vague idea of the real problem. For example, the decision maker might know that the firm is losing market share but might not know why. This is because most decision makers focus on the symptoms of a problem rather than its causes. An inability to meet sales forecasts, loss of market share, and a decline in profits are all symptoms. Research that adds value goes beyond the symptoms to address the underlying causes. For example, loss of market share might be caused by a superior promotion by the competition, inadequate distribution of the company's products, lower product quality, price undercutting by a major competitor, or any number of factors (see Figure 5).

FIGURE 5
Discussion Between the Researcher and the DM

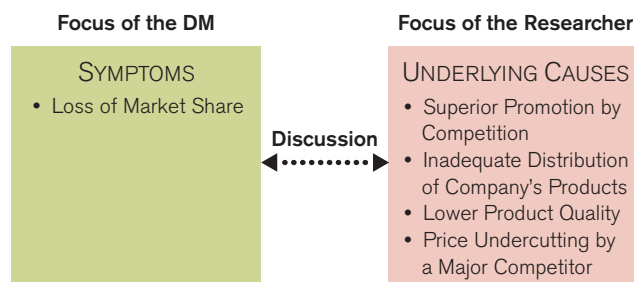


TABLE 1 Problem Definition Based on Symptoms Can Be Misleading

Firm	Symptoms	Problem Definition	
		Based on Symptoms	Based on Underlying Causes
Manufacturer of orange soft drinks	Consumers say the sugar content is too high	Determine consumer preferences for alternative levels of sugar content	Color. The color of the drink is a dark shade of orange giving the perception that the product is too “sugary.”
Manufacturer of machine tools	Customers complain prices are too high	Determine the price elasticity of demand	Channel management. Distributors do not have adequate product knowledge to communicate product benefits to customers.

As shown in Table 1, a definition of the problem based on symptoms can be misleading. Only when the underlying causes are identified can the problem be successfully addressed, as exemplified by the effort of Nike to stop the loss of market share.

Research in Action

Increased Advertising in the Video Game Industry Puts Nike Back in the Game

Nike (www.nike.com) reported revenues of \$19.39 billion for the fiscal year ending May 31, 2010. Although the company was the global and U.S. leader in athletic footwear, it was losing market share. Clearly there was a problem. However, loss of market share was a symptom, and the underlying causes of the problem had to be identified. A problem audit revealed that a major underlying cause of the problem was the amount Nike was spending on advertising, specifically on advertising in the video game industry. Competitor Adidas had increased its advertising in the video game industry and was one of the top brands recalled by gamers in a study conducted by Phoenix Marketing International. Therefore, the problem was defined as whether Nike should increase its advertising budget in the video game industry.

In an effort to answer this problem, an online survey of 540 video gamers was conducted. The results showed that although Nike was popular with gamers age 8 to 17 years, it lagged behind in the 25- to 35-year segment, a segment that was growing in video game use and that also was a massive contributor to sales of athletic shoes.

Based on these findings, Nike decided to increase its advertising budget devoted to the video game industry. This effort yielded good results, and revenues and market share improved. Nike has continued its emphasis on advertising in the video game industry and has maintained its leadership in the U.S. and global athletic

footwear markets. Correctly identifying the underlying cause of the problem was a key in this turnaround.²



Source: Bloomberg/Getty Images.

The Internet provides several mechanisms that can help the researcher communicate with decision makers. The first and most obvious is e-mail. Researchers can use e-mail to reach decision makers at any place or time. Chat rooms also are good forums for discussion with decision makers. For instance, a chat room discussion with multiple decision makers could be developed around a problem audit. The researcher could introduce the audit issues in the chat, and then the decision makers could respond to the issues and to the each other's responses. Chat rooms can be secured with a password if there is a need to protect the discussion's contents. The use of social media for defining the problem is discussed later in the chapter.

	Be a DM!	Be an MR!
	Sprite: The Number-Three Soft-Drink Brand	
Social Media	As the brand manager for Sprite, the third-largest soft-drink brand in the United States, you are concerned about improving the brand's performance. Identify possible symptoms that indicate that Sprite's performance is below expectations.	You are conducting marketing research for Sprite to help improve the brand's performance. Identify possible underlying causes that might be contributing to the brand's lack of performance. Visit www.coca-cola.com and www.sprite.com and search the Internet—including social media—to obtain as much information about Sprite's marketing program as you can.

Interviews with Industry Experts

In addition to discussions with decision makers, interviews with industry experts—individuals knowledgeable about the firm and the industry—can help researchers formulate the marketing research problem. Experts can be found both inside and outside the firm. If the notion of experts is broadened to include people knowledgeable about the general topic being investigated, then the interview also is referred to as an **experience survey** or as the **key-informant technique**. Another variation of this in a technological context is the **lead-user survey**, which involves obtaining information from the lead users of the technology.

Although formal questionnaires normally are not used, a prepared list of topics to be covered during the interview can be often helpful. The order in which these topics are covered and the questions to ask should not be predetermined, but rather decided as the interview progresses. This allows greater flexibility in capturing the experts' insights. The purpose of interviews with experts is to help define the marketing research problem rather than to develop a conclusive solution.

Expert interviews are more commonly used in industrial rather than consumer-research applications. In industrial or highly technical environments, the experts often are more easily identified than in consumer-research settings. This is because consumer settings are more broad and diffused than industrial or technical environments. Expert interviews also are helpful in situations where little information is available from other sources, as in the case of radically new products.

Experts can provide valuable insights in modifying or repositioning existing products, as illustrated by the repositioning of Sears. Once America's number-one retailer, for years, sales at this giant retailer floundered. In 2009, Sears Domestic stores generated \$23.7 billion in net sales, down 7.7 percent from the \$25.3 billion in sales in 2008, due to an 8.7 percent decrease in comparable store sales. When industry experts were consulted, researchers were able to identify the real problem: lack of image. Traditionally a discount store, Sears had unsuccessfully tried to upgrade its image to a prestigious department store, thereby alienating its loyal customers. Sears finally gave up its attempt to upgrade and re-embraced the image of a discount chain store. Since then, sales and profitability have improved.

Researchers can use the Internet to enhance their ability to obtain information from experts in a specific industry. One approach to finding experts is to use newsgroups. Due to the large amount of information available, searching through the newsgroups for specific information can

experience survey

Interviews with people knowledgeable about the general topic being investigated.

key-informant technique

Interviews with people knowledgeable about the general topic being investigated.

lead-user survey

Surveys that involve obtaining information from the lead users of the technology.

	Be an MR!	Be a DM!
	Walmart: The Largest Retailer in the World!	
Social Media	Visit www.walmart.com and search the Internet—including social media—as well as your library's online databases to identify the challenges and opportunities facing Walmart, the largest retailer in the world. Visit groups.google.com and browse retailing newsgroups to identify an expert in online retailing. Interview this expert (via telephone or online) to identify the challenges and opportunities facing Walmart. Alternatively, you can search for and analyze this expert's comments by searching the Internet.	As the CEO of Walmart, what marketing strategies would you formulate to overcome the challenges and capitalize on the opportunities identified by the marketing researcher?

be an arduous task. A good place to start is groups.google.com, which provides categorized lists of newsgroups. Also, you may have access to newsgroups through your ISP (Internet service provider). After finding a relevant newsgroup, access the newsgroup and search for postings about the topic of interest. Surveying postings in a newsgroup is a good starting point for making contacts with the experts in a particular industry.

Secondary Data Analysis

The information that researchers obtain from decision makers and industry experts should be supplemented with available secondary data. **Secondary data** are data collected for some purpose other than the problem at hand, such as data available from trade organizations, the Bureau of Census (www.census.gov), and the Internet. In contrast, **primary data** are originated by the researcher for the specific problem under study, such as survey data. Secondary data include information made available by business and government sources, commercial marketing research firms, and computerized databases. Secondary data are an economical and quick source of background information.

Analyzing available secondary data is an essential step in the problem-definition process and should always precede primary data collection. Secondary data can provide valuable insights into the problem situation and lead to the identification of innovative courses of action. For example, the U.S. Department of Labor says that the median age of the American labor force will increase; by 2030, 23 percent of the U.S. labor force is projected to be age 55 and older, compared with 16 percent in 2005. This is, in part, the result of the maturation of the “baby bust” generation (those born between 1965 and 1976), which will cause a decline in the number of young (age 16 to 24) workers available to fill entry-level positions, with that percentage decreasing from 15 in 2005 to 13 in 2030. This potential shortage of young workers has caused many marketers, particularly those in the service industries, to investigate the problem of consumer response to self-service. Some companies, such as Arby’s, have switched from a “high-touch” to a “high-tech” service orientation. By using high-tech equipment, consumers now perform many of the services formerly done by workers, such as placing their own orders by entering them directly into the electronic terminal.

secondary data

Data collected for some purpose other than the problem at hand.

primary data

Data originated by the researcher to address the research problem.

Be a DM!	Be an MR!
Wendy's Battling for Market Share	
As the marketing director for Wendy's, what significance do you attach to secondary data showing the aging of the U.S. population? What are the implications of these data for increasing Wendy's market share?	Identify the sources of secondary data including social media that would be helpful in defining the problem of Wendy's increasing its share of the fast-food market. Visit www.wendys.com and search the Internet—as well as your library's online databases—to determine Wendy's market share for the past 3 years.

Social Media

Qualitative and Exploratory Research

Information obtained from decision makers, industry experts, and secondary data might not be sufficient to define the research problem. Sometimes qualitative research must be undertaken to gain a clear understanding of the factors underlying a research problem. **Qualitative research** is unstructured in that the questions asked are formulated as the research proceeds. It is exploratory in nature and based on small samples. It might involve popular qualitative techniques such as focus groups (group interviews) or in-depth interviews (one-on-one interviews that probe the respondents' thoughts in detail). Other exploratory research techniques, such as pilot surveys and case studies, can also be undertaken to gain insights into the phenomenon of interest. **Pilot surveys** tend to be less structured than large-scale surveys in that they generally contain more open-ended questions and the sample size is much smaller. **Case studies** involve an intensive examination of a few selected cases of the phenomenon of interest. The cases could be consumers, stores, firms, or a variety of other units, such as markets, Web sites, and so forth.

qualitative research

An unstructured, exploratory research methodology based on small samples intended to provide insight and understanding of the problem setting.

pilot surveys

Surveys that tend to be less structured than large-scale surveys in that they generally contain more open-ended questions and the sample size is much smaller.

case studies

Involve an intensive examination of a few selected cases of the phenomenon of interest. Cases could be customers, stores, or other units.

The data are obtained from the company, external secondary sources, and by conducting lengthy unstructured interviews with people knowledgeable about the phenomenon of interest. In a project we conducted for a major department chain store, valuable insights into factors affecting store patronage were obtained in a case study comparing the five best stores with the five worst stores of that chain. The role of qualitative research in defining the marketing research problem is further illustrated by Norwegian Cruise Lines.

Once the leader in the Caribbean cruise market, Norwegian Cruise Lines (www2.ncl.com), based in Coral Gables, Florida, had slipped to fourth position. To identify the underlying causes and define the problem, focus groups and pilot (small-scale) surveys were conducted. This qualitative research revealed that one worry that kept people from cruising was the fear of being confined to a boat for a week or more with little to do. This concern was particularly acute among young people. This concern became a major component of the problem, and a large survey was conducted to address it. The survey verified the qualitative research findings.

In response to this information, Norwegian Cruise Lines developed advertising that fought this myth, emphasizing that passengers have the flexibility to make their cruise vacation whatever they want it to be. Its provocative, award-winning print and TV campaigns featured close-ups of young people, often on land, having lots of fun. The campaign helped Norwegian attract new and younger customers and improve its market share and penetration. This success was achieved despite the fact that Norwegian was outspent in advertising two to one by Carnival Cruise Lines and one and one-half to one by Royal Caribbean Cruises.

Although research undertaken at this stage might not be conducted in a formal way, it can provide valuable insights. These insights, together with information obtained from discussions with the decision makers, industry experts, and analysis of secondary data, guide the researcher to an appropriate definition of the problem, as illustrated by P&G for CoverGirl.

Research in Action

P&G's Peep into Privacy Identifies Underlying Causes

P&G decision makers were faced with the problem of increasing the sales and market share of its CoverGirl cosmetics lines. Analysis of internal secondary data showed that the sales to working mothers were stagnating despite the fact that external secondary data revealed that the number of mothers in the workforce was increasing. Past research conducted by P&G as well as interviews with cosmetic experts revealed that the image of CoverGirl was not the problem, as the line was well-thought-of by both the experts and ordinary users.

In an effort to identify the underlying causes, P&G turned to qualitative research. In addition to focus groups, it sent video crews and cameras into households with working mothers, hoping to capture, on tape, life's daily routines and procedures in all their boring glory. A small London research firm, Everyday Lives Ltd. (www.everydaylives.com) ran the program for P&G.

This research revealed that one of the biggest challenges faced by working mothers is their hectic mornings. Between getting the kids off to school and juggling a host of other duties, they still want to make sure they leave the house looking their best. So P&G defined the marketing research problem as determining the potential for multipurpose products that could help this segment of customers by making their makeup routine easier. Subsequent research led to the launch of multipurpose products such as a CoverGirl cosmetic that is a moisturizer, foundation, and sunscreen all rolled into one. This was followed by the introduction in 2010 of "the 3-Minute Facelift Effect," involving CoverGirl & Olay Simply Ageless Serum Primer and Foundation. Working moms were to "first, smooth on the Serum Primer to prep your skin; it hydrates to

help firm skin's appearance. Next, apply the foundation to cover fine lines and wrinkles flawlessly. The results are so amazing everyone will wonder what you did." These products were successful because they met an underlying need of the target segment.⁴



Source: Splash News/CoverGirl/News.com.

Environmental Context of the Problem

The insights gained from qualitative research, along with discussions with decision makers, interviews with industry experts, and analysis of secondary data, help the researcher understand the environmental context of the problem. The researcher must have a full understanding of the client's firm and industry. Several factors that comprise the **environmental context of the problem** can play an important role in defining the marketing research problem. These factors consist of past information and forecasts pertaining to the industry and the firm, the firm's resources and constraints, decision makers' objectives, buyer behavior, the legal environment, the economic environment, and the firm's marketing and technological skills (see Figure 6). Each of these factors is discussed briefly.

Past Information and Forecasts

Past information and forecasts of trends with respect to sales, market share, profitability, technology, population, demographics, and lifestyle are combined to provide the researcher with a fuller picture of the underlying marketing research problem. Not only should the firm's performance and projections be analyzed, but the firm's performance relative to the overall industry should be examined as well. For example, if a firm's sales have decreased but industry sales have increased, the problems will be very different than if industry sales have also decreased. In the former case, the problems are likely to be specific to the firm.

Past information, forecasts, and trends can be valuable in uncovering potential opportunities and problems. For example, pizza restaurants have sought to exploit potential opportunities in the recent trend toward takeout food and home delivery. Pizza Hut has successfully capitalized on this trend by emphasizing takeout and home-delivery services. It opened several takeout-only (with no dine-in service) outlets to better serve this market. As another illustration, in the Subaru vignette, forecasts of future sales of station wagons and SUVs indicated to management that both types of automobiles were not tapping the full market potential.

Past information and forecasts can be especially valuable if resources are limited and there are other constraints on the organization.

Resource Constraints and Objectives

To formulate a marketing research problem of appropriate scope, it is necessary to take into account the resources available, such as money, research skills, and operational capabilities, as well as operational and time constraints. Although adjustments in proposed research expenditure levels are common, proposing a large-scale \$100,000 project when only \$40,000 has been

environmental context of the problem

Factors that have an impact on the definition of the marketing research problem, including past information and forecasts, resources and constraints of the firm, objectives of the decision maker, buyer behavior, legal environment, economic environment, and marketing and technological skills of the firm.

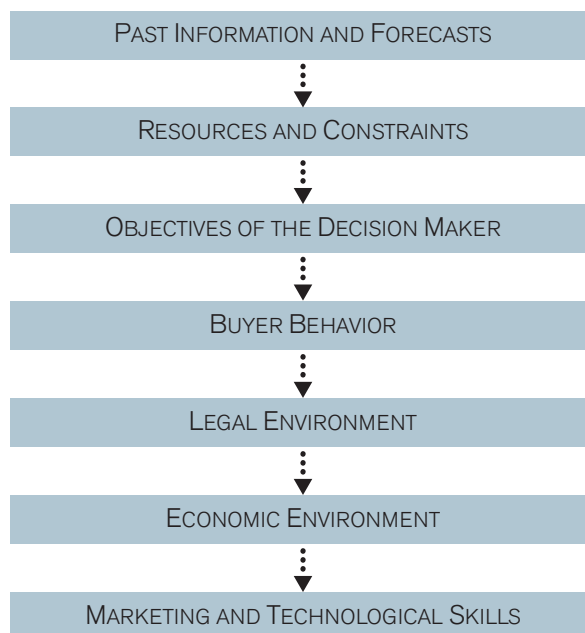


FIGURE 6
Factors to Be Considered
in the Environmental
Context of the Problem

budgeted will put the research firm at a serious competitive disadvantage. Time constraints also are an important factor in many research projects. A project for Fisher-Price, a major toy manufacturer, involving mall-intercept interviews (conducted with shoppers in malls) in six major cities (Chicago, Fresno, Kansas City, New York, Philadelphia, and San Diego) had to be completed in 4 weeks. Why the rush? The results had to be presented at an upcoming board meeting where a major (go/no-go) decision was to be made about a new product introduction. The time constraint was a major factor that guided the problem definition and the approach adopted.

objectives

Goals of the organization and of the decision maker that must be considered in order to conduct successful marketing research.

In formulating the management-decision problem, the researcher must also have a clear understanding of two types of **objectives**: (1) the organizational objectives (the goals of the organization) and (2) the personal objectives of the decision makers. For the project to be successful, it must serve the objectives of the organization and of the decision makers. This may become a challenge when the two are not complementary. For example, a decision maker might wish to undertake research to postpone an awkward decision, to lend credibility to a decision that has already been made, or to get promoted.

It might take skill to get the decision maker to think in terms of objectives that management can act upon (actionable objectives). One effective technique is to confront the decision maker with a number of possible solutions to a problem and ask whether he or she would follow a particular course of action. If the answer is no, further probing might be needed to uncover deeper reasons as to why a particular solution is unsatisfactory.

Buyer Behavior

buyer behavior

A body of knowledge that tries to understand and predict consumers' reactions based on an individual's specific characteristics.

Buyer behavior is a central component of the environment. It includes the underlying motives, perceptions, attitudes, buying habits, and demographic and psychographic (psychological and lifestyle) profiles of buyers and potential buyers. Most marketing decisions involve a prediction of the buyers' response to a particular marketing action. An understanding of the underlying buyer behavior can provide valuable insights into the problem. Note that in the Subaru vignette, information on the demographic and psychographic characteristics of the automobile segment whose needs were not being met was an important component of the marketing research problem.

Be a DM!	Be an MR!
Timberland Marketing Outdoor Shoes	
As the marketing manager for Timberland, how would your understanding of the consumers' decision-making process affect your decision to sell outdoor shoes on the Internet?	Timberland is a major manufacturer of outdoor footwear. Visit www.timberland.com and search the Internet—including social media—as well as your library's online databases to obtain information on Timberland's marketing program for outdoor shoes. What decision-making process do consumers follow when purchasing outdoor shoes?

Social
Media

In another case, buyer behavior research told ConAgra Frozen Foods that more than 55 percent of Americans pack a lunch and that more and more meals are eaten on the run. However, although consumers increasingly want their food to be portable, they still demand high flavor and good nutrition. Wanting to capitalize on this aspect of buyer behavior, ConAgra further investigated the marketing research problem of consumer preferences for healthy, delicious, and portable food.

The company's answer, based on the findings of this research, was a new entry into the premium-meals category, Healthy Choice Hearty Handfuls frozen sandwiches. As an alternative to many frozen convenience foods, the product targeted an adult taste profile with bakery-style breads, lean meats, and crisp vegetables. True to the name, the sandwiches are both healthy (low in fat and calories) and hearty (at 6 ounces, they are an estimated 35 percent larger than most frozen sandwiches). According to ConAgra, the Hearty Handfuls line exceeded sales expectations, becoming the number-three frozen sandwich brand in its first 6 months.

The increased preference for portable, healthy, and hearty food could be attributed to changes in the sociocultural environment, which includes demographic trends and consumer tastes. The legal, economic, and marketing environment also has a significant impact in some industries.

Legal, Economic, Marketing, and Technological Environments

The **legal environment** includes public policies, laws, government agencies, and pressure groups that influence and regulate various organizations and individuals in society. Important areas of law include patents, trademarks, royalties, trade agreements, taxes, and tariffs. Federal regulation and deregulation has had a huge impact on the marketing process in many industries, such as the airline, banking, and telecommunication industries. The legal and regulatory considerations relevant to a business must be taken into account by the researcher.

Another important component of the environmental context is the **economic environment**, which is composed of purchasing power, gross income, disposable income, discretionary income, prices, savings, credit availability, and general economic conditions. The general state of the economy (rapid growth, slow growth, recession, or stagflation) influences the willingness of consumers and businesses to take on credit and spend on big-ticket items. Thus, the economic environment can have important implications for marketing research problems.

J.C. Penney is one of the largest and most well-known department stores in the United States. In the 1980s, J.C. Penney suffered due to inconsistent sales growth and a drop in the company's image. In the early 2000s, J.C. Penney began a massive overhaul toward a higher-quality image to counter these problems. The company courted famous name brands such as Oshkosh B'Gosh, Levis, and Charles of the Ritz. Unfortunately, J.C. Penney decided to raise prices and go for high-end fashions at a bad time. Price increases coincided with the recession and the economic downturn of 2001 and 2002, and consumers did not have sufficient money to spend. Its most recent attempt in 2011 to recover its image has been to stick with good brand names, to control prices, and to market itself as the store for "middle America." J.C. Penney's lost image has been found by keeping prices competitive and carrying good brand names.

A firm's marketing and technological skills greatly influence which marketing programs and strategies can be implemented. A company's expertise with each element of the marketing mix, as well as its general levels of marketing and production skills, affect the nature and scope of the marketing research project. For example, the introduction of a new product that requires retooling of a manufacturing process or that presumes sophisticated marketing skills might not be a viable alternative if the firm lacks the skills to manufacture or market such a product. However, if the company is able to capitalize on its marketing and technological skills, its products and new introductions are more likely to succeed, as illustrated in the Subaru vignette.

A good understanding of the environmental context of the problem enables the researcher to appropriately define the problem, as illustrated by Gillette.

legal environment

Regulatory policies and norms within which organizations must operate.

economic environment

The economic environment is composed of purchasing power, gross income, disposable income, discretionary income, prices, savings, credit availability, and general economic conditions.

Research in Action

Satin Care for Women Provides a Satin Touch for Gillette

Analysis of past information indicated that most women pamper themselves with products for their beauty regimen and that this trend was likely to continue. Gillette was willing to devote its tremendous financial resources and marketing expertise to capturing a larger share of the women's shaving-products market.

An examination of underlying buyer behavior revealed that women had a strong preference for personal-care products that were rich in moisturizers. Economic and marketing analysis indicated that a substantial segment of this market was not price sensitive and was willing to pay a premium for such products. Accordingly, the marketing research problem was formulated as the investigation of women's preferences and purchase intentions for a shaving preparation rich in moisturizers.

The research showed that women were willing to spend more on shaving products that contained moisturizers. To capitalize on those findings, Gillette introduced Satin Care for Women (www.satincare.com). The product was an innovation in the shaving-products category, because it was the first nonsoap-based shaving preparation and it was infused with seven moisturizers. The product introduction was so successful that Satin Care



Source: HANDOUT/KRT/Newscom.

(continued)

for Women exceeded all expectations in the launch markets of the United States, Canada, and northern Europe. This success reinforced Gillette's understanding of the environmental factors in the shaving-products market. Gillette continued to build on the success of Satin Care for Women by extending the line. As of

2011, the Satin Care line was marketed with the tagline: "Smooth. Sexy. Satin" and included in-shower moisturizers (Dry Skin and Sensitive Skin), shave gel fragrances (Alluring Avocado, Lavender Kiss, Floral Passion, and Radiant Apricot), and shave gel skin formulations (Dry Skin, Sensitive Skin, and Cooling Sensation).⁵

Many of the factors to be considered in determining the environmental context of the problem can be researched via the Internet. Past information and trend forecasts can be found by searching for the appropriate information with the search engines. For company-specific information pertaining to the client or a competitor, the researcher can go to the company's home page.

Gaining an adequate understanding of the environmental context of the problem allows the researcher to define both the management-decision problem and the marketing research problem.

Management-Decision Problem and Marketing Research Problem

management-decision problem

The problem confronting the decision maker. It asks what the decision maker needs to do.

marketing research problem

The marketing research problem asks what information is needed and how it can best be obtained.

The **management-decision problem** asks what the decision maker needs to do, whereas the **marketing research problem** asks what information is needed and how it can best be obtained (see Table 2). Research is directed at providing the information necessary to make a sound decision. The management-decision problem is action oriented, framed from the perspective of what should be done. How should the loss of market share be arrested? Should the market be segmented differently? Should a new product be introduced? Should the promotional budget be increased?

In contrast, the marketing research problem is information oriented. Research is directed at providing the information necessary to make a sound decision. The management-decision problem focuses on the symptoms, whereas the marketing research problem is concerned with the underlying causes (see Table 2).

In the opening vignette, the management-decision problem was "What can Subaru do to expand its share of the automobile market?" The marketing research problem focused on information about the needs of the buyers of passenger cars, station wagons, and SUVs and on identifying a segment whose needs were not being met. Also, information was to be obtained on the automobile features desired by the identified segment and on the demographic and psychographic characteristics of this segment.

To further illustrate the distinction between the two orientations, consider an illustrative problem: the loss of market share for Unilever's (www.unilever.com) Axe male grooming product line in United States. The decision maker is faced with the problem of how to recover this loss (the management-decision problem). Possible responses include modifying existing products, introducing new products, reducing prices, changing other elements in the marketing mix, and segmenting the market. Suppose the decision maker and the researcher believe that the problem can be traced to market segmentation, in that Axe should be targeted at a specific segment. They decide to conduct research to explore that issue. The marketing research problem would then become the identification and evaluation of different ways to segment or group the market. As the research process progresses, problem definition can be modified to reflect emerging information. Table 3 provides additional examples, including that of Subaru from the opening vignette, that further clarify the distinction between the management-decision problem and the marketing research problem.

TABLE 2 Management-Decision Problem Versus the Marketing Research Problem

Management-Decision Problem	Marketing Research Problem
Asks what the decision maker needs to do	Asks what information is needed and how it should be obtained
Action oriented	Information oriented
Focuses on symptoms	Focuses on the underlying causes

TABLE 3 Management-Decision Problem and the Corresponding Marketing Research Problem

Management-Decision Problem	Marketing Research Problem
Should the advertising campaign be changed?	To determine the effectiveness of the current advertising campaign.
Should the price of the product be changed?	To determine the impact on sales and profits of various levels of price changes.
What can Subaru do to expand its automobile market?	To determine the various needs of the automobile users and the extent to which those needs were being satisfied by the current product offerings.

A good way to link the broad statement of the marketing research problem with the management-decision problem is through the use of a conceptual map.⁶ A **conceptual map** involves the following three components:

Management wants to (*take an action*).

Therefore, we should study (*topic*).

So that we can explain (*question*).

The first line states the rationale for the question and the project. This is the management-decision problem. The second line of the conceptual map declares what broader topic is being investigated. The third line implies the question being investigated—the who/how/why that needs to be explained. Thus, the second and third lines define the broad marketing research problem. An example of the conceptual map for AT&T follows:

Management wants to (develop retention programs that will retain 90 percent of heavy users of wireless services and lead to 10 percent higher sales over the next 2 years).

Therefore, we should study (heavy-user loyalty).

So that we can explain (what will be the most important variables in retaining these customers over the next 2 years).

As can be seen, the preceding example provides valuable definitions of the management-decision problem and the broad marketing research problems that are closely linked. The problem is now focused on a segment of customers (heavy users) and one behavior of these customers (staying with the company over the next 2 years). Measurable results, such as “90 percent retention of heavy users,” are included, as well as a company goal (10 percent increase in sales over the next 2 years).

Experiential Learning

Kimberly-Clark's Conceptual Map

In an attempt to take market share away from archrival P&G's Pampers, Kimberly-Clark's baby-care division has developed a diaper that remains wet for 2 minutes prior to drying. Called “Wet 'n Act Advanced Trainers,” these diapers prompt toddlers to try tinkling in the toilet once they partially wet the diaper. The Huggies team has a keen interest in the primary customer segment it calls “30 & Smart.” This segment currently accounts for 15 percent of Pampers and 20 percent of Huggies sales. Members of this segment live primarily in metropolitan areas, are between 30 and 39 years of age, and are well educated.⁷

Visit www.kimberly-clark.com and search the Internet—including social media—as well as your library's electronic databases to obtain information on Kimberly-Clark's and competing diaper brands. Develop a three-level conceptual map from the following elements:

- Management wants to beat Pampers in the diaper wars.
- Management wants to successfully introduce a new diaper that will capture an 80 percent market share in the 30 & Smart segment within 12 months after introduction.
- Therefore, we are studying what will make the best diaper.
- Therefore, we are studying 30 & Smart evaluations of “Wet 'n Act” in a test market.
- So that we can explain preferences for competing brands of diapers.
- So that we can explain the probability of switching to the “Wet 'n Act” diapers within this segment.

conceptual map

A way to link the broad statement of the marketing research problem with the management-decision problem.