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Research Note—Some Characteristics of Human Resources in the Service Sector

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Research Note

Some Characteristics of Human Resources in the Service Sector

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As part of an ongoing study of the similarities and differences between the Goods and Services Sectors of the economy**,** a technique labelled "Data Surface Mining" (DSM) was used to analyze three independently generated and previously published data sets that focused on three different aspects of human resources. The three aspects are: in which economic sector to launch a career (young people), the relative presence of powerful women in the two sectors (women) and the relative presence of seniors in top positions in the two sectors (aging). Such matters are of major managerial significance in light of the fact that the Services Sector represents 80% (GDP and/or employment) of the United States economy and is of increasing importance in the global economy.

*Key words***:** human resources; services sector; goods sector
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1. Introduction

After an extended period of neglect because of its focus on the Goods Sector of the economy, the attention of the academic community is making a recognizable shift to analysis of the Services Sector, which has unique and definable characteristics. It is the largest segment of the United States economy, representing more than 80% of both the Gross Domestic Product (GDP) and employment. For other industrialized nations, the percentages are somewhat lower, but they are also approaching 80%. Service is also the fasting growing sector.

Tien and Berg (1995, 1997) have characterized, using a Bureau of Labour Statistics partitioning, the Services Sector as including Wholesale and Retail, Business and Professional, Education, Government, Finance, among others; the Goods Sector includes Manufacturing, Construction, Agriculture and Extraction. It is important to note that the Services Sector comprises more than eighty percent of domestic employment and the Goods Sector represents the remaining twenty percent, with manufacturing being the largest component of Goods at approximately thirteen percent of the total domestic employment. Tyson (2005) attributes the declining trend in Manufacturing to increases in worker productivity without a concomitant increase in demand. Altman (2006) points out that the decrease in Manufacturing is manifest in both durable and nondurable goods production accompanied by strong increases in professional and business services and in education and health care. Berg and Einspruch (2004, 2006) use these definitions and a simple analytical technique that they have labelled "Data Surface Mining" (DSM) in conducting their studies, which relate to identifying similarities and differences between the Goods Sector and the Services Sector.

2. Data Surface Mining Methodology and Applications

In applying Data Surface Mining (DSM), the authors undertake to locate data sets prepared and published by other researchers and to subject these data sets to observational considerations that lead to inferences and conclusions that go beyond the original intent of the researchers who generated the data set. The reference to “Surface” Mining comes about since “Deep” Data Mining does not have to be done in view of the fact that the relevant data have been already been gathered and are fully exposed for subsequent research. Since the subject data are already available non-exclusively, the costs associated with data collection are avoided. As such, DSM can lead to very cost-effective research. DSM has been used extensively by the authors in a variety of applications; see, for example, Berg and Einspruch (2008).

3. Analysis

Tien and Berg (2006) cite data on jobs taken by engineering graduates of Rensselaer Polytechnic Institute. In the class of 1985, 29% of the graduates went into Services and 71% went into Manufacturing; in the class of 2005, 69% went into Services and 29% went into Manufacturing, a very dramatic shift in only two decades. Gerdes (2008) reported the outcome of a BusinessWeek survey designed to determine “The Best Places to Launch a Career.” The reported results came from a weighted consolidation of three separate surveys. The first was one of career services directors at U. S. colleges to ascertain which employers are at the top of their list; these preferred employers were then surveyed on matters of pay, benefits and training programs, and the findings were compared with others in their industries. Finally, U. S. undergraduates were surveyed to identify their preferences in employers. The list of companies was then partitioned by the present authors as to whether they operate in the Goods or Services Sector. The results of this partitioning are presented in Table 1. Of course, the three tables represent snapshots in time; a current gathering of the data would certainly reflect changes brought about by the economic circumstances of 2008; for example, Merrill Lynch and Lehman Brothers would no longer appear in Table 1.

Table 1 The Best Places to Launch a Career
(BUSINESSWEEK – SEPTEMBER 15, 2008; Additional Classification by Authors)

Ranking	Employer	Industry	S	G
1	**Ernst & Young**	Accounting	X	
2	**Deloitte & Touche**	Accounting	X	
3	**PricewaterhouseCoopers**	Accounting	X	
4	**Goldman Sachs**	Investment Banking	X	
5	**KPMG**	Accounting	X	
6	**Marriott International**	Hospitality	X	
7	**Google**	Internet	X	
8	**Lockheed Martin**	Manufacturing		X
8	**IBM**	Technology	X	
10	**J.P. Morgan**	Investment Banking	X	
11	**Teach For America**	Nonprofit/Government	X	
12	**U.S. State Dept.**	Nonprofit/Government	X	
13	**Microsoft**	Technology	X	
14	**Target**	Retailing	X	
15	**Abbott Labs**	Pharmaceuticals		X
16	**NASA**	Nonprofit/Government	X	
17	**Boston Consulting**	Consulting	X	
18	**General Electric**	Manufacturing	X	

19	**Anheuser-Busch**	Consumer Goods		X
20	**Norfolk Southern**	Transportation	X	
21	**Merrill Lynch**	Investment Banking	X	
22	**Verizon Communications**	Telecommunications	X	
23	**Northrop Grumman**	Manufacturing		X
24	**General Mills**	Consumer Goods		X
25	**Boeing**	Manufacturing		X
26	**Enterprise Rent-A-Car**	Transportation	X	
27	**Walt Disney**	Media/Entertainment	X	
28	**New York Life**	Insurance	X	
29	**Lehman Brothers**	Investment Banking	X	
30	**Raytheon**	Manufacturing		X
31	**Cisco Systems**	Technology		X
32	**Philip Morris USA**	Consumer Goods		X
33	**Amazon.com**	Internet	X	
34	**Northwestern Mutual**	Insurance	X	
35	**Deutsche Bank**	Investment Banking	X	
36	**Intel**	Technology		X
37	**Central Intelligence Agency**	Nonprofit/Government	X	
38	**AT&T**	Telecommunications	X	
39	**Union Pacific**	Transportation	X	
40	**Siemens**	Technology		X
41	**Liberty Mutual**	Insurance	X	
42	**Wachovia**	Financial Services	X	
43	**Travelers**	Insurance	X	
44	**Citigroup**	Financial Services	X	
45	**Nestlé USA**	Consumer Goods		X
46	**Whirlpool**	Consumer Goods		X
47	**Accenture**	Consulting	X	
48	**Aetna**	Insurance	X	
49	**Kraft Foods**	Consumer Goods		X
50	**MetLife**	Insurance	X	
		TOTAL	**36**	**14**

Lowry (2008) presented a BusinessWeek survey of their network of correspondents to identify a list of people in the range of age 75 to 100 years who still run their companies or who continue to wield significant influence in business. The fifty seniors thus identified were tabulated in ranked order by age. The list was then partitioned as to whether the listed individuals operate in the Services Sector or the Goods Sector. The results are presented in Table 2.

Egan and Schoenberger (2008) reported on a Forbes survey that undertook to identify the world’s most powerful women. They “measure power as a composite of public profile-calculated using press mentions-and financial heft.” Their ranked list and a further partitioning into participation into the Services and Goods Sectors are given in Table 3.

Table 2 Extreme Experience
(BUSINESSWEEK – SEPTEMBER 8, 2008; Additional Classification by Authors)

Name	Position/Organization	Age	S	G
Run Run Shaw	Chairman, Television Broadcasts	100	X	
Jack LaLanne	Fitness expert and entrepreneur	93	X	
Kirk Kerkorian	President/CEO, Tracinda	91	X	
Wang, Yung-ching	Founder, Formosa Plastics	90		X
Harold Burson	Chairman, Burson-Marsteller	87	X	
Basant Kumar Birla	Chairman, Birla Group	87		X
Stanley Ho	Chairman, SJM Holdings	86		X
Summer Redstone	Chairman, CBS, Viacom	85	X	
Hans Riegel Jr.	Managing Director, Haribo	85		X
Robert Kuok	Founder, Kuok Group	84	X	
David Murdock	CEO, Castle & Cooke, Dole Food	84	X	
Keshub Mahindra	Chairman, Mahindra & Mahindra	84		X
C.P. Krishman Nair	Chairman, Hotel Leela Venture	84	X	
Hank Greenberg	Chairman & CEO, C.V. Starr	83	X	
Sam Farber	Design entrepreneur	83	X	
Hugh Hefner	Editor-in-Chief, Playboy Enterprises	82	X	
Ingvar Kamprad	Founder, IKEA	82	X	
Alfred E. Mann	Chairman and CEO, MannKind	82		X
Cheng Yu-Tung	Chairman, New World Development	82	X	
Albert Frere	Chairman and Managing Director, Groupe Bruxelles Lambert	82	X	
Richard Hu	Chairman, CapitaLand	81	X	
O. Bruton Smith	Chairman and CEO, Speedway Motorsports and Sonic Automotive	81	X	
Chuck Dolan	Chairman, Cablevision	81	X	
Leo Kirch	Founder, Kirch Group	81	X	
Paul Volcker	Former chairman, Federal Reserve	81	X	
S.I. Newhouse	Chairman, Advance Publications	80	X	
T. Boone Pickens	Founder, Mesa Power	80		X
Li Ka-shing	Chairman, Cheung Kong Holdings, Hutchison Whampoa	80	X	
Alan Greenspan	Former chairman, Federal Reserve	80	X	
Henry Kaufman	Founder, Kaufman & Co.	80	X	
Mike Ilitch	Owner, Detroit Red Wings, Detroit Tigers; Founder, Little Caesar's Pizza	79	X	
Al Davis	Principal owner, Oakland Raiders	79	X	
Donald Newhouse	President, Advance Publications	79	X	
Jack Bogle	Founder, Vanguard Group	79	X	
Osamu Suzuki	Chairman, Suzuki Motor	78		X
Edward C. Johnson III	CEO, FMR Corp	78	X	
Ross Perot	Founder, Perot Systems	78	X	
George Soros	Chairman, Soros Fund Management	78	X	
Warren Buffett	CEO, Berkshire Hathaway	78	X	
Rupert Murdoch	Chairman, News Corp	77	X	
Kushal Pal Singh	Chairman, DLF Group	77	X	
Gerard Roche	Senior Manager, Heidrick & Struggles International	77	X	
Robert Lutz	Vice Chairman, General Motors	76		X
Clive Davis	Chief Creative Officer of Sony BMG	76	X	

	Worldwide			
J.W. "Bill" Marriott, Jr.	Chairman, Marriott	76	X	
Tom Perkins	Founder, Kleiner Perkins Caulfield & Byers	76	X	
Muriel "Mickie" Siebert	Founder, Muriel Siebert	75	X	
Sheldon Adelson	Chairman, Las Vegas Sands	75	X	
Frank Bennack, Jr.	CEO, Hearst Corp	75	X	
Eli Broad	Founder of KB Home, Sun America	75		X
	TOTAL		**40**	**10**

Table 3 The 100 Most Powerful Women
(FORBES – SEPTEMBER 15, 2008; Additional Classification by Authors)

Rank	Name	Occupation	S	G
1	**Angela Merkel**	Chancellor, Germany	X	
2	**Sheila C. Bair**	Chairman, Federal Deposit Insurance Corp.	X	
3	**Indra K. Nooyi**	Chairman, Chief Executive, PepsiCo		X
4	**Angela Braly**	Chief Executive, President, WellPoint	X	
5	**Cynthia Carroll**	Chief executive, Anglo American		X
6	**Irene B. Rosenfeld**	Chairman, Chief Executive, Kraft Foods		X
7	**Condoleezza Rice**	Secretary of State, U.S.A.	X	
8	**Ho Ching**	Chief Executive, Temasek Holdings	X	
9	**Anne Lauvergeon**	Chief Executive, Areva	X	
10	**Anne Mulcahy**	Chairman, Chief Executive, Xerox Corp.		X
11	**Gail Kelly**	Chief Executive & Managing Director, Westpac Bank	X	
12	**Patricia A. Woertz**	Chairman, Chief Executive, Archer Daniels Midland		X
13	**Cristina Fernandez**	President, Argentina	X	
14	**Christine Lagarde**	Minister of Economy, Finance & Employment, France	X	
15	**Safra A. Catz**	President and Chief Financial Officer, Oracle	X	
16	**Carol B. Tome**	Executive Vice President and CFO, Home Depot	X	
17	**Yulia Tymoshenko**	Prime Minister, Ukraine	X	
18	**Mary Sammons**	Chairman, Chief Executive, President, Rite Aid	X	
19	**Andrea Jung**	Chairman, Chief Executive, Avon	X	
20	**Marjorie Scardino**	Chief Executive, Pearson PLC	X	
21	**Sonia Gandhi**	President, Indian National Congress Party	X	
22	**R. Lavizzo-Mourey**	CEO, The Robert Wood Johnson Foundation	X	
23	**Sri Mulyani Indrawati**	Coordinating Minister for Economic Affairs, Indonesia	X	
24	**Julie Gerberding**	Director, Centers for Disease Control and Prevention	X	
25	**Michelle Bachelet**	President, Chile	X	
26	**Ellen Alemany**	Chief Executive, Royal Bank of Scotland Americas	X	
27	**Carol Meyrowitz**	Chief Executive, President, The TJX Cos.	X	
28	**Hillary Rodham**	U.S. Senator, New York	X	
29	**Hynd Bouhia**	Director General, Casablanca Stock Exchange	X	
30	**Anne Sweeney**	President, Disney-ABC Television Group	X	
31	**V. Matviyenko**	Governor, St. Petersburg Region, Russia	X	
32	**Nancy Tellem**	President, CBS Paramount Television Entertainment	X	

33	**Ann Livermore**	Executive Vice President, Hewlett-Packard	X	
34	**Marina Berlusconi**	Chairman, Finivest Group and Mondadori Group	X	
35	**Nancy Pelosi**	Speaker, House of Representatives, U.S.A.	X	
36	**Oprah Winfrey**	Chairman, Harpo	X	
37	**Gulzhan**	Chief Executive, Basic Element		X
38	**Aung San Suu Kyi**	Deposed Prime Minister; Myanmar	X	
39	**Lynn Laverty**	Chief Executive and President, Sunoco		X
40	**Melinda Gates**	Co-founder, Bill & Melinda Gates Foundation	X	
41	**Gloria Arroyo**	President, Philippines	X	
42	**Jane Mendillo**	President and Chief Executive, Harvard Management Co.	X	
43	**Linda Z. Cook**	Executive Director, Gas and Power, Royal Dutch Shell		X
44	**Laura Bush**	First Lady, U.S.A.	X	
45	**Brenda Barnes**	Chief Executive, Sara Lee		X
46	**Christine Poon**	Vice Chairman, Johnson & Johnson		X
47	**Neelie Kroes**	Competition Commissioner, European Union	X	
48	**Amy Woods Brinkley**	Global Risk Executive, Bank of America	X	
49	**Susan E. Arnold**	President, Global Business Units, Procter & Gamble		X
50	**Susan Decker**	President, Yahoo!	X	
51	**Ana Patricia Botin**	Chairman, Banesto	X	
52	**Tzipora Livni**	Vice Prime Minister, Israel	X	
53	**D. Senequier**	Chief Executive Officer, AXA Private Equity	X	
54	**Amy Pascal**	Co-chairman, Sony Pictures Entertainment	X	
55	**Ursula Burns**	President, Xerox		X
56	**Helen Clark**	Prime Minister, New Zealand	X	
57	**Laura Desmond**	Chief Executive Officer, Starcom MediaVest Group	X	
58	**Queen Elizabeth II**	Queen, U. K.	X	
59	**Mayawati Kumari**	Chief Minister, Uttar Pradesh, India	X	
60	**Judy McGrath**	Chairman and CEO, MTV Networks	X	
61	**Meredith Vieira**	Co-anchor, Today show, NBC News	X	
62	**Katie Couric**	Anchor, CBS Evening News	X	
63	**Barbara Walters**	Correspondent, ABC News	X	
64	**Sallie Krawcheck**	Chairman, Global Wealth Management, Citigroup	X	
65	**Diane Sawyer**	Anchor, Good Morning America, ABC News	X	
66	**Ellen Johnson**	President, Liberia	X	
67	**Janice Fields**	Chief Operating Officer and EVP, McDonald's	X	
68	**Zhang Xin**	Chief Executive Officer, Co-founder, Soho		X
69	**Zaha Hadid**	Founder, Zaha Hadid Architects	X	
70	**Yang Mian Mian**	President, Haier		X
71	**Tarja Halonen**	President, Finland	X	
72	**Ruth B. Ginsburg**	Justice, Supreme Court, U.S.A.	X	
73	**Hyun Jeong-Eun**	Chairman, Hyundai Group		X
74	**Mary McAleese**	President, Ireland	X	
75	**Guler Sabanci**	Chairman, Sabanci Holding		X
76	**Drew Gilpin Faust**	President, Harvard University	X	

77	**Lisa M. Weber**	President, Individual Business, MetLife	X	
78	**Dora Bakoyannis**	Foreign Minister, Greece	X	
79	**Beth Brooke**	Global Vice Chairman, Ernst & Young	X	
80	**Lee Myung-Hee**	Chairman, Shinsegae Group	X	
81	**Susan M. Ivey**	Chief Executive, Reynolds American		X
82	**Nancy McKinstry**	CEO, Wolters Kluwer	X	
83	**Janet L. Robinson**	President and Chief Executive, The New York Times Co.	X	
84	**Margaret Chan**	Director-general, World Health Organization	X	
85	**Clara Furse**	Chief Executive, London Stock Exchange	X	
86	**Ellen J. Kullman**	Executive Vice President, DuPont		X
87	**Susan Desmond**	President, Product Development, Genentech		X
88	**Eva Cheng**	Chief Executive, China and Southeast Asia, Amway	X	
89	**Maha Al-Ghunaim**	Chairman, Global Investment House	X	
90	**Christina Gold**	Chief Executive, Western Union	X	
91	**C. Amanpour**	Chief International Correspondent, CNN	X	
92	**Pamela Nicholson**	President, Enterprise Rent-a-Car	X	
93	**Ann Moore**	Chairman, Chief Executive, Time Inc.	X	
94	**Sharon Allen**	Chair, Deloitte	X	
95	**Jing Ulrich**	Chairman and Managing Director, JPMorgan Chase	X	
96	**Queen Rania**	Queen, Jordan	X	
97	**Virginia Rometty**	Senior Vice President, IBM Global Business Services	X	
98	**Georgina Rinehart**	Owner, Chairman, Hancock Prospecting		X
99	**Kiran Mazumdar**	Chairman and Managing Director, Biocon		X
100	**Paula Rosput Reynolds**	Chief Executive, Safeco	X	
		TOTAL	**79**	**21**

4. Discussion and Findings

Examination of Table 1 indicates that 36 [72%] of the companies that are seen as preferred companies in which to start a career operate in the Services Sector. The remaining 14 [28%] companies operate in the Goods Sector. This observed partitioning is quite reflective of the 80%/20% split between the Services and Goods Sectors in the current economy. Without arguing about statistical validity, it is interesting to speculate as to why the 80%/20% split is not achieved, or even exceeded since the Services Sector is the most rapidly growing portion of the economy and recognizing that productivity growth is slower in that sector, thus providing greater opportunity for careers and concomitant career growth. One possible explanation is that contemporary engineering education continues to be oriented towards the Goods Sector, as it has traditionally and appropriately been for decades in the past. However, recognition of the realities of the trends in the economy calls for radical revisions in engineering education. Of the thirty-six companies, seventeen are in financial services fields such as accounting, finance, banking and insurance. Only six companies of the thirty-six are in technology based services, examples being IBM and Verizon.

Examination of Table 2 reveals that 40 [80%] of the sample of fifty executives greater in age than seventy-five operate in the Services Sector. The remaining 10 [20%] operate in the Goods Sector and are involved in Manufacturing, Construction and Extraction. Obviously, this distribution is precisely the 80/20 split mentioned earlier. Of these fifty older executives, only one, Muriel “Mickie” Siebert, is a woman, reflecting the proverbial “glass ceiling” perceived by women. The more recent greater success of the next generation of women in penetrating this barrier will be discussed below. Of the baker’s dozen who are 84 and older, six are Asians, reflecting the broadly culturally based respect given to the aged in those societies.

Examination of Table 3 reveals that 79 [79%] of the 100 most powerful women in the world operate in the Services Sector, and the remaining 21 [21%] operate in the Goods Sector. This distribution is remarkably close to the 80/20 split mentioned earlier. Of the 79, 29 - more that one-third - are involved in government or government-related service; of the top twenty in the Services Sector, ten - fully half - are in very significant government positions. This, of course, points to a career path for women that enables penetration of the proverbial glass ceiling. Longitudinal studies of these and other Human Resources topics would lead to quantification of trends in diversity, for example.

In all three of the analyses described above, the 80/20 Goods/Services split is achieved, closely in one case and almost identically in the other two. In view of the fact that domestic employment and domestic GNP are partitioned 80/20, perhaps one should not be surprised if this ratio is reflected in matters related to employment and careers. When there is a fundamental difference in the characteristics of the two sectors, e.g., the nature, value, protection and utilization of intellectual property, one can reasonably expect a deviation from the 80/20 ratio, as, indeed has previously been reported by Berg and Einspruch (2008) earlier in their course of their systematic study of the similarities and differences between the Goods and Services Sectors of the economy. The Services Sector addresses knowledge-based understanding of technology and how to use technology rather than how to generate it. For example, aircraft manufactured by Boeing, using proprietary technologies, are made available to all airlines on a non-exclusive basis; how the airline delivers its airline services, which are not protected by patents or trade secrets, is what differentiates the competitors in that industry. Eighty percent of patents are not held by services companies, and twenty percent of patents are not held by goods companies, as was pointed out in that paper. In conclusion, the DSM technique, which is applied in this paper to consideration of some aspects of human resources in the Services Sector, is useful in detecting areas in which the Goods/Services ratio deviates from the expected 80/20 rule, thereby enabling the researcher to focus on further exploration of the underlying cause of the deviation.

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