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**Built to Change Organizations:
Industry Influences and Performance
Implications**

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BUILT TO CHANGE ORGANIZATIONS: INDUSTRY INFLUENCES AND PERFORMANCE IMPLICATIONS

Organization design is a cornerstone of competitive advantage, performance, and organization effectiveness (Galbraith, 2001). Designing organizations that are efficient enough to drive current performance and flexible enough to adapt is a required capability in today's dynamic and global environment (Sull, 2009; Lawler and Worley, 2006; Volberda, 1999). Designing and implementing agile organizations is also therefore an important challenge for organization development.

We define organization agility as "an evolving change and design capability, a leadership challenge that is never finished, only approached over time, but which yields consistently high levels of sustainable effectiveness." This definition integrates principles of organization development and change management (Cummings and Worley, 2009; Burnes, 2004; Beckhard and Harris, 1977) with adaptation (Tushman and Romanelli, 1985). A variety of authors have proposed frameworks to assess agility (Lawler and Worley, 2006; Beer, 2009; Sull, 2009; Volberda, 1999; Haeckel, 1999; Brown and Eisenhardt, 1998) and there is an emerging case and anecdotal data base describing organizations or organizational systems that are held up as agile (e.g., Gerstner, 2003; Doz and Kosonen, 2008).

The purpose of this paper was to explore two aspects of agility using survey and performance data from a sample of organizations. First, we explored whether industry characteristics influenced an organization's agility characteristics. For example, are service organizations more agile, in general, than manufacturing organizations? Second, we explored whether consistently high performing firms have more agile features than inconsistent performers. The paper concludes with summary learnings and recommendations for organizations desiring to become more agile.

LITERATURE REVIEW

Building on traditional models of effectiveness (Yuchtman & Seashore, 1967; Campbell, 1977; Steers, 1975; Cameron, 1980; Quinn & Rohrbaugh, 1983), acknowledging the increased pace and complexity of change, and reconciling some of the conundrums and criticisms of the traditional stream (Miles, 1980), a different set of effectiveness models has emerged. Instead of trying to specify the criteria of effectiveness, agility models described the organization design features that are necessary to deliver on any of the various criteria proposed.

Organization agility occupies a middle ground between models of adaptability and planned change. It has been the subject of increasing research (Brown & Eisenhardt, 1998; Volberda, 1999; Haeckel, 1999; Doz & Kosonen, 2008; Beer, 2009; Lawler and Worley, 2006) and several calls for a better understanding of its genesis and consequences (e.g., Rudis, 2006). For example, adaptability refers to the organization's capability to respond to changes in environmental demands. Organization evolution (Tushman & Romanelli, 1985; De Geus, 2002), absorptive capacity (Zahra & George, 2002), and population

ecology (Aldrich, 1979; Hannan & Freeman, 1975) describe how organizations interpret and enact (Weick, 1969) environmental change and translate those beliefs into organization action and transformation.

Consistent with our definition of agility, stage models (e.g., Greiner, 1967) and punctuated equilibrium models (Tushman & Romanelli, 1985; Miller & Friesen, 1980) suggest that long-term organization effectiveness and agility is a function of the ability to converge on a given strategic orientation (stability and efficiency) and the ability to execute reorientations when significant internal or external events warrant such “transformations” (flexibility and innovation). Miller and Friesen (1980) operationalized stability as “continuity in the direction of change and transformation as reversals in the direction of change across a wide variety of organizational features.” Data from Romanelli & Tushman (1994), Lant, Milliken, and Batra (1992), and Miller and Friesen (1980) empirically supported this pattern of organization change. Organization performance depended on relatively long periods of stability where the organization could learn how best to operate a particular design. Occasionally, the interplay of various internal and external forces resulted in a violent transformation.

Organization development (Cummings and Worley, 2009), planned change (Beckhard & Harris, 1977), and change management (Hayes, 2002; Burnes, 2004) all address the activities involved in intentionally moving an organization or subsystem from one state to another. Beckhard and Harris (1977), for example, describe the activities associated with defining the current state, the future state, and the action planning and intervention processes associated with the transition. Models of planned change do not specify effectiveness criteria per se. Instead, they argue that in the face of complex and uncertain environmental changes, effective organizations are able to make the transition from one relatively stable state to another because they can plan and execute change as well as sense and respond to it.

While researchers have studied the various pieces of organizational agility, there has not been a cohesive and integrated statement of agile organization design principles. For example, Doz and Kosenen (2008) examined the issues of flexible and dynamic strategy, Hatch and Schultz (2002) explored how organization identities can facilitate or hinder organization change, and Galbraith (2001) and O’Reilly, Harreld, and Tushman (2009) described how reconfigurable and ambidextrous structures can operate. Drawing on these various threads of research and practice, Lawler and Worley (2006) presented an integrated and comprehensive view of organization agility, and they described the development and application of an assessment instrument using this model (Worley and Lawler, 2010).

Based on this research, we developed two propositions for testing. First, our definition of agility as a change capability and leadership challenge implies that any organization can be agile. Moreover, research in organization development has claimed success in a variety of industries and organizations. That said, large, vertically-integrated, and asset intense firms have had difficulty implementing strategic change (Rumelt, 1974) and Lant, Milliken, and Batra (1992) found that firms in the volatile software development industry were more likely to reorient, and did so more quickly, than firms in the more stable furniture industry. We wanted to determine if organization members from manufacturing

or asset-intense firms rated their firms lower in agility characteristics than service or asset-light firms. Toward that end, we propose:

Proposition 1: Manufacturing firms (or firms with higher fixed assets) will score lower on agility design measures than service firms

Second, the literature on organization development and organization evolution point to a positive relationship between change and performance (Golembiewski, 1998; Nicholas, 1982; Miller and Friesen, 1980; Romanelli and Tushman, 1994). Our definition of agility, however, describes a longitudinal and dynamic view of organization and performance. We believe agile organizations – organizations with the ability to adjust to changing conditions – should manifest consistently above average performance patterns. We therefore propose:

Proposition 2: Consistently above average performers will score higher on measures of agility than inconsistent performers.

RESEARCH METHODS

The survey research reported here is based on a convenience sample of more than 40 firms between early 2007 and early 2010, a period where the US and global economy was both growing and in recession. The firms represent a broad range of industries, including health care, aerospace and defense, professional services, manufacturing, software development, energy, and retail.

Sampling

The sample organizations represent either whole enterprises or major business units within large corporations. The data can come from all members of the top management team, a sample of top managers and director-level middle managers, or from particular functional groups. In each case, the sampling scheme was based on the definition of a specific organization unit and a census or sampling procedure to represent the perspectives of that unit. In all cases, respondents were asked to think about and report on their attitudes about the whole enterprise or business unit. In particular, respondents were asked to think about how the particular system traditionally operated. That is, we asked respondents to report on the organization practices and activities that tended to characterize the typical way the organization operates. The average sample size for each firm was 74.8 and ranged between 6 and 1098. The smallest samples of 6-8 people were from the senior teams in three functional organizations (human resources, sales, and engineering). Since many organization-level studies (e.g., Zajac and Shortell, 1989) have used one survey from a senior person to reflect the characteristics of a whole organization, taking multiple surveys from a part of an organization and asking them to represent the whole seems reasonable.

Variables

This study utilizes three sets of variables – industry, agility, and performance. The industry variable was defined in two ways. First, we categorized firms in the sample as manufacturing or service. The firm's

description in the Hoover's database drove the categorization. If the overview described the firm as being involved in providing solutions, services, or other process-oriented offerings, they were classified as a service firm. If the overview described the physical products offered, they were classified as a manufacturing firm. Second, a net asset intensity variable was constructed by dividing the 2008 value for net property, plant, and equipment by total assets. The "net PPE" value may underestimate the intensity slightly if 2008 represented the end of a depreciation cycle. The two measures were independent of each other ($r=-0.26$; $df = 34$; $p=.14$) and thus represent two different views of this variable.

The agility variables were measured using a survey of 51 items that were pre-tested and piloted on a variety of groups, including three organizations, two classes from a master's degree program in organization development, and three professional association groups. The survey items were factor analyzed into fourteen scales representing four broad dimensions of agility, including strategizing (strong future focus, robust strategies, change-friendly identity, and shared purpose), designing (flexible structure, flexible resource allocation systems, flexible reward systems, HR development orientation, information transparency), leadership and culture (shared leadership, power sharing), and capabilities (change capability, innovation, learning). The scales and their respective reliability scores are shown in Table 1. The only scale with an inadequate reliability is structural surface area ($\alpha = 0.46$).

The performance variable – Performance Consistency – represents the extent to which a firm has maintained above industry average performance results over a long period. We calculated the variable as follows. First, we chose ROA, annual net income divided by total assets for the same year, as the measure of performance. To maintain consistency in the calculation of the performance data, Compustat's Annual Fundamentals database was used. When the "firm" was a large business unit within a corporation, Compustat's Annual Segment database was used.

The use of any single measure of performance will always include some bias. In this case, firms can adopt a more or less capital intense profile and those opting for a less intense fixed asset footprint can lower the denominator in the ROA calculation for any given level of revenue. Financial services firms, in particular, might not be comparable, and to that point, there are no firms from the financial services industry in this sample. We chose ROA over other measures, such as stock price or market capitalization, because it reflects an operational measure of profitability or the organization's effectiveness in leveraging its assets.

Second, we chose the industry's median ROA as the measure of "average performance." We believe the median or half way value in the performance distribution was a better measure than the mean because nearly all of the performance distributions were skewed and the mean is sensitive to extreme values. The calculation of the industry median ROA also involved some judgment. For any given industry (defined by its 4 – 6 digit North American Industry Classification System (NAICS) code), the Compustat database can contain hundreds of firms. Our long-standing interest has been with large, publicly traded firms and so for any particular industry our choice of which firms constituted the "industry" was guided by the firms listed in Standard and Poor's Industry Surveys containing the subject firm. For example, if HP were in our

dataset (which it isn't), we would look to the Computer Hardware industry for a list of competitors.

Third, we chose the period 1980 to 2008 as a "long period." Although the Compustat data contains data prior to 1980, the entries for many firms become consistent around this year. Thus, the maximum number of years data was available was 29 (1980-2008). The mean number of years available for a sample firm was 22.5 years with a range between 7 and 29 years; the modal number of years was 29.

Performance consistency was calculated as the percentage of years (up to 29) for which the firm's ROA exceeded the industry's median ROA.

Table 1 – Descriptive Statistics for the Agility Sample

Variable	N	Mean	S.D.	Reliability
Asset intensity	35	.23	.18	NA
Manufacturing vs. Service	38	1.50	.51	NA
Performance Consistency	30	.48	.26	NA
Strong shared purpose	16	4.09	.31	.91
Develops robust strategies	41	3.47	.43	.76
Strong future focus	41	3.51	.43	.72
Change-friendly identity	42	3.19	.57	.90
Structural surface area	41	3.35	.55	.46
Information is Transparent	42	3.67	.45	.77
Flexible resources	42	3.02	.36	.89
Development orientation	42	3.79	.36	.81
Flexible rewards	42	3.35	.41	.69
Shares power	16	3.46	.34	.81
Shared leadership	42	3.48	.42	.85
Innovation	42	3.49	.42	.73
Change capability	41	3.05	.40	.94
Learning capability	41	3.16	.41	.89

* The N's for Shared purpose and Shared power are smaller because these two scales were added later in the project.

Our cutoff point for "consistently" above average was driven by two concerns. First, we wanted a number (percentage of years) that had an obvious and qualitative ring to it. Being above average 50% of the time does not sound too challenging or impressive, but setting the bar too high (e.g., 100% of the time) might restrict the number of firms to analyze and fails to recognize that even great firms can have a bad year. Initially, we thought 75% was a reasonable number. That is, any firm had to exceed the industry average in three out of every four years running. Second, we wanted the data to do a little bit of the talking. Was there any natural break point that seemed to separate consistently

high performers. The frequency distribution of Performance Consistency (e.g., the percent of years the firm was above average) is shown in Table 2. In this case, there was a natural break; no firm was above the median between 71 and 80% of the time. For the purpose of this analysis, then, a consistently high performer was defined as any firm that posted a Performance Consistency score figure greater than 80% of the years for which data were available.

Table 2: Frequency Distribution of ROA Deviation

Value	Frequency
.00 - .10	2
.11 - .20	3
.21 - .30	1
.31 - .40	7
.41 - .50	5
.51 - .60	3
.61 - .70	5
.71 - .80	0
.81 - 90	3
.91 - 1.00	2
Total	31

Analysis

We used independent sample t-tests to test the propositions. In the first proposition, the sample was divided into service vs. manufacturing or high fixed asset vs. low fixed asset groups. In the second proposition, the two groups were labeled “consistent performers” representing any firm with a Performance Consistency score of greater than .80, and “inconsistent performers” with Performance Consistency scores of less than .80. The “inconsistent performers” were firms whose ROA performance cycled above and below the industry median or remained below the industry median over the years measured.

RESULTS

The descriptive statistics for the variables used in this study are shown in Table 1. The average net asset intensity was .23 and about half the firms were categorized as service firms. The mean percentage of years a firm’s ROA was above the industry median was 48% (this was also the median value). The agility dimensions, scored on a scale from 1 = not at all to 5= to a great extent, ranged from a low of 3.02 for flexible resources and 3.05 for change capability to a high of 4.09 for shared purpose. For most of the agility dimensions, organizations reflected these dimensions “to some extent,” and the relatively small standard

deviations do not suggest wide variation in the scores for this sample of 40+ firms.

The first proposition suggested that agility dimensions might differ according to industry classification. Using two different industry variables, the results are shown in Tables 3 and 4. When the industry variable is a classification into service or manufacturing (Table 3), five out of 14 agility dimensions are significantly different. Service firms scored higher than manufacturing firms on the learning and change capabilities as well as the future focus, identity, and structural surface area dimensions. When the industry variable was net asset intensity (Table 4), only the shared leadership and development orientation dimensions were different, with high intensity less associated with agility. There is limited support for this proposition.

In the second proposition, consistently high performers were expected to have higher scores on the agility dimensions than inconsistent or low performers. Table 5 displays the results of the t-tests. Out of the 14 dimensions of agility, consistently high performers scored significantly higher on ten dimensions (at the $p < .05$ level) and on 11 of the 14 dimensions (at the $p < .10$ level).

As a check on this result, we ran an additional set of t-tests. The proposition states that consistently high performers will score higher on agility, and if true, then lowering the criteria for “consistently high” should produce non-significant t-tests. When the sample was split in half on the Consistent Performance variable (a median split), there were no significant differences at the $p < .05$ level and only one difference at $p < .10$ level (Robust strategy: $t = 1.94$, $df = 27$, $p = .06$). There is strong support for this proposition.

DISCUSSION

The objective of this research was to test whether industry structure affected agility characteristics and if agility was associated with consistently above average performance.

The results with respect to industry differences are equivocal. Using two very different and uncorrelated measures, less than half of the agility dimensions showed up as significantly different and no two dimensions were significantly different in both situations. The most differences were found when the sample was split according to a simple manufacturing vs. service classification. Service firms had a stronger future focus, more change-friendly identities, more contact with the external environment (maximum surface area), and better change and learning capabilities. Those differences did not hold up when the industry’s structure was measured by net asset intensity.

Table 3 – Comparison of Agility Dimensions by Service/Manufacturing Classification

Agility Dimension	Industry	N	Mean	S.D.	t	df	p
Strong shared purpose	Manufacturing	7	4.01	0.25	-1.27	13	0.23
	Service	8	4.21	0.33			
Develops robust strategies	Manufacturing	18	3.36	0.40	-1.67	35	0.10
	Service	19	3.60	0.46			
Strong future focus	Manufacturing	18	3.38	0.41	-1.83	35	0.08
	Service	19	3.64	0.45			
Change-friendly identity	Manufacturing	19	3.02	0.48	-2.15	36	0.04
	Service	19	3.41	0.64			
Structural surface area	Manufacturing	18	2.91	0.43	-6.75	35	0.00
	Service	19	3.77	0.34			
Information is transparent	Manufacturing	19	3.76	0.35	0.93	36	0.36
	Service	19	3.63	0.55			
Flexible resources	Manufacturing	19	2.94	0.35	-1.51	36	0.14
	Service	19	3.13	0.40			
Development orientation	Manufacturing	19	3.80	0.33	0.01	36	0.99
	Service	19	3.80	0.42			
Flexible rewards	Manufacturing	19	3.33	0.43	-0.75	36	0.46
	Service	19	3.43	0.40			
Shares power	Manufacturing	7	3.52	0.38	0.55	13	0.59
	Service	8	3.42	0.33			
Shared leadership	Manufacturing	19	3.48	0.39	-0.62	36	0.54
	Service	19	3.56	0.45			
Encourages innovation	Manufacturing	19	3.48	0.37	-0.43	36	0.67
	Service	19	3.54	0.51			
Change capability*	Manufacturing	18	2.92	0.36	-1.89	29.6	0.07
	Service	19	3.22	0.60			
Learning capability	Manufacturing	18	3.00	0.33	-2.30	35	0.03
	Service	19	3.31	0.46			

* df based on unequal variances in the two groups.

** The N's and df's for shared purpose and shared power are lower because these two scales were added to the survey.

Table 4: Comparison of Agility Dimensions by Net Asset Intensity

Dimension	Asset intensity	N**	Mean	S.D.	t	df**	p
Strong shared purpose	High	7	4.02	0.26	-1.68	12	0.119
	Low	7	4.27	0.29			
Develops robust strategies	High	15	3.36	0.49	-1.66	32	0.106
	Low	19	3.61	0.39			
Strong future focus	High	15	3.39	0.46	-1.65	32	0.108
	Low	19	3.64	0.41			
Change-friendly identity	High	16	3.16	0.61	-0.64	33	0.530
	Low	19	3.29	0.62			
Structural surface area	High	15	3.27	0.49	-0.41	32	0.687
	Low	19	3.35	0.65			
Information is transparent	High	16	3.75	0.38	0.21	33	0.833
	Low	19	3.72	0.43			
Flexible resources	High	16	3.01	0.39	-0.55	33	0.586
	Low	19	3.08	0.40			
Development orientation	High	16	3.67	0.37	-2.88	33	0.007
	Low	19	3.98	0.28			
Flexible rewards	High	16	3.36	0.43	-0.62	33	0.537
	Low	19	3.45	0.38			
Shares power	High	7	3.38	0.39	-1.21	12	0.250
	Low	7	3.60	0.29			
Shared leadership	High	16	3.40	0.45	-2.22	33	0.034
	Low	19	3.69	0.33			
Encourages innovation	High	16	3.40	0.42	-1.47	33	0.151
	Low	19	3.62	0.46			
Change capability	High	15	2.95	0.49	-1.54	32	0.134
	Low	19	3.22	0.52			
Learning capability	High	15	3.09	0.33	-0.99	32	0.330
	Low	19	3.24	0.51			

** The N's and df's for shared purpose and shared power are lower because these two scales were added to the survey.

Table 5: Comparison of Performance Patterns According to Agility Dimensions

Agile Dimension	Performance	N**	Mean	S.D.	t	df**	p
Strong shared purpose	Consistent	3	4.47	0.37	2.71	12	0.02
	Inconsistent	11	4.02	0.23			
Develops robust strategies	Consistent	5	3.96	0.32	2.70	28	0.01
	Inconsistent	25	3.44	0.41			
Strong future focus	Consistent	5	3.81	0.52	1.23	28	0.23
	Inconsistent	25	3.54	0.44			
Change-friendly identity	Consistent	5	3.80	0.62	2.30	29	0.03
	Inconsistent	26	3.16	0.56			
Structural surface area	Consistent	5	3.88	0.38	3.12	28	0.00
	Inconsistent	25	3.11	0.52			
Information is transparent	Consistent	5	3.96	0.16	1.08	29	0.29
	Inconsistent	26	3.79	0.35			
Flexible resources	Consistent	5	3.36	0.33	2.05	29	0.05
	Inconsistent	26	3.00	0.36			
Development orientation	Consistent	5	4.13	0.34	2.30	29	0.03
	Inconsistent	26	3.78	0.31			
Flexible rewards	Consistent	5	3.74	0.21	2.11	29	0.04
	Inconsistent	26	3.35	0.40			
Shares power	Consistent	3	3.54	0.34	0.36	12	0.73
	Inconsistent	11	3.45	0.38			
Shared leadership	Consistent	5	3.97	0.35	2.68	29	0.01
	Inconsistent	26	3.51	0.35			
Encourages innovation	Consistent	5	3.86	0.43	1.85	29	0.07
	Inconsistent	26	3.53	0.36			
Change capability	Consistent	5	3.62	0.44	2.61	28	0.01
	Inconsistent	25	3.04	0.45			
Learning capability	Consistent	5	3.61	0.58	2.57	28	0.02
	Inconsistent	25	3.09	0.38			

* Consistent performance is defined as above industry median ROA for at least 80% of the years for which data were available.

** The N's and df's for shared purpose and shared power are lower because these two scales were added to the survey.

If we fail to support this proposition – if we are just as likely to find agile firms in manufacturing or service or in high asset vs. low asset intensity industries – it suggests, in line with our definition, that any organization can be agile. Since this data is based on survey responses, such a result suggests that when people are answering survey items, they are not thinking, “I’m in a high fixed asset industry and therefore my structure probably isn’t as flexible as a service firm.” Rather, people judge flexibility based on their perceptions of what is and is not flexible compared to what they could be. It is more likely that a respondent is thinking, “We are generally flexible in this regard given all that we have to deal with.” This is an interpretation, of course, because an oil and gas company may be less agile than a retail firm in absolute terms.

If the proposition is supported, and taking the service vs. manufacturing results at face value, then achieving agility will be a much more challenging task in service firms. In particular, getting the future focus, flexible structure, and change/learning capabilities right is particularly important and problematic.

The second proposition, following from our definition of agility, suggested that consistently high performing firms would be associated with stronger agility dimensions. When annual firm performance was above average more than 80% of the time over a 29-year period, their agility scores were significantly higher and support the proposition. This result was supported by an analysis where the sample was split in half along the performance dimension. Under these conditions, there were no significant differences in the agility dimensions; only consistently high performance was associated with significantly higher agility scores.

If this result holds up – and it is important to note that we are continuing to collect data, that there are other performance measures to use, and the assumption that a restricted sampling process can accurately reflect an entire system can be challenged – there is a compelling case for agility. Organizations that are “built to change” and have the ability to adjust the organization’s strategy, structure, and processes over time not only survive but also thrive.

These results contribute to the literature on the performance correlates of organization development, adaptation, and transformation (Beer, 2009; Romanelli and Tushman, 1994; Lant, Milliken and Batra, 1992; Miller and Friesen, 1980). Organizations with flexible strategies, structures, and processes, and organizations with strong change, learning, and innovation capabilities outperformed organizations with more traditional designs. Organization development, in particular, is about managing change in such a way that knowledge and skill are transferred to a system, and the system is better able to implement change in the future (Cummings and Worley, 2009). The current study supports the relevancy of such activities and argues that OD practitioners who spend less time refining interventions and more time helping the organization implement the designs (strategies, structures, systems, and processes) that will make them more agile can generate important benefits for the organization.

Finally, we should raise one additional limitation concerning the causal direction of these findings. Our argument is that agility produces consistently high levels of performance. The alternative argument is that consistently high performance results in agile characteristics. That alternative is somewhat mitigated by our sampling process and performance measure. From a sampling

perspective, the survey was taken by some firms during a period of economic boom (early 2007) and by others during a period of economic crisis (2009 and 2010). There was no difference in agility scores based on when they took the survey and our administration process asked people to think about the way the firm “traditionally” operated. Second, consistently high performance does not mean performance was always good. Nearly all of the firms that took the sample in 2009 said their performance was awful even though their ROA for that year was above average. Thus, while we cannot be definitive about the direction of causality, our design does mitigate for some of these issues.

CONCLUSION

Based on a multi-industry survey sample of firms, this study found strong support for the proposition that consistently above average performance was associated with agile organization features. Firms whose ROAs were above average at least 80% of the time over a 29 year period had significantly higher agility scores than firms whose performance cycled above and below industry average or remained consistently below average. In addition, there was weak support for the proposition that broad industry features affected agility dimensions.

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