ONLINE SUPPLEMENTARY MATERIAL

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Table S1. Discriminant validity by Fornell-Lacker criterium

	ASCOS1_leadtime	**ASCOS4_Demand**	**Ad1**	**Ad2**	**Ad3**	**JIT1_suppliers**	**JIT2_Customers**	**JIT3_SetupTime**	**PDC1_CustInv**	**PDC2_MnfInv**	**PDC3_SupInv**	**PDC4_FrontEnd**	**Q1_FeedbackToEmployees**	**Q2_TopLeadership**	**Q3_ProcessControl**	**Q4_Training**
ASCOS1_leadtime	0.797															
ASCOS4_Demand	0.327	0.758														
Ad1	0.185	0.040														
Ad2	0.219	0.260	0.511													
Ad3	0.212	0.076	0.221	0.176												
JIT1_suppliers	0.287	0.342	0.264	0.264	0.115	0.779										
JIT2_Customers	0.255	0.485	0.125	0.207	0.125	0.358	0.776									
JIT3_SetupTime	0.179	0.356	0.455	0.457	0.229	0.417	0.394	0.785								
PDC1_CustInv	0.307	0.181	0.144	0.188	0.045	0.195	0.245	0.147	0.808							
PDC2_MnfInv	0.140	0.257	0.146	0.238	0.130	0.159	0.277	0.225	0.409	0.766						
PDC3_SupInv	0.195	0.322	0.198	0.245	0.136	0.280	0.298	0.241	0.392	0.534	0.826					
PDC4_FrontEnd	0.203	0.171	0.163	0.220	0.170	0.208	0.248	0.176	0.584	0.667	0.559	0.723				
Q1_FeedbackToEmployees	0.139	0.316	0.306	0.313	0.166	0.302	0.316	0.406	0.204	0.263	0.218	0.253	0.768			
Q2_TopLeadership	0.244	0.310	0.319	0.335	0.223	0.327	0.399	0.378	0.251	0.327	0.344	0.351	0.678	0.787		
Q3_ProcessControl	-0.092	-0.011	-0.062	-0.063	0.037	-0.081	-0.046	-0.034	-0.081	-0.130	-0.108	-0.028	-0.004	-0.150	0.914	
Q4_Training	0.102	0.322	0.277	0.307	0.110	0.281	0.310	0.360	0.196	0.328	0.285	0.334	0.777	0.698	-0.056	0.792

Table S2. VIF values

ITEMS	**VIF**
Adapt11	**1.115**
Adapt12	**1.115**
Adapt21	**1.289**
Adapt22	**1.289**
Adapt31	**1.268**
Adapt32	**1.268**
CINVLN01	**1.834**
CINVLN02	**1.535**
CINVLN03	**1.760**
CINVLN05	**1.936**
CNTRLN02	**1.828**
CNTRLN05	**1.828**

FBACKN01	1.834
FBACKN02	1.593
FBACKN03	1.653
FBACKN04	1.832
FBACKN05	1.708
FRONTN01	1.622
FRONTN02	1.855
FRONTN03	1.694
FRONTN04	1.602
FRONTN05	1.757
FRONTN06	1.825
FRONTN08	1.366
JITDELN01	1.611
JITDELN02	1.327
JITDELN03	1.546
LINKCN01	1.563
LINKCN03	1.282
LINKCN04	2.382
LINKCN05	2.809
MFDESN02	1.713
MFDESN04	1.935
MFDESN05	1.978
MFDESN06	1.472
MFDESN07	1.485
REPMASN01	1.441
REPMASN02	1.600
REPMASN03	1.144
SETUPN01	1.590
SETUPN02	1.261
SETUPN03	1.419
SINVLN01	2.352
SINVLN02	1.875
SINVLN03	1.899
SINVLN04	1.648
SPEEDN01	1.504
SPEEDN03	1.296
SPEEDN04	1.775
TPLEADN01	1.756
TPLEADN02	2.514
TPLEADN03	1.578
TPLEADN04	1.753
TPLEADN05	2.604
TPLEADN06	2.330
TRAINN01	1.589
TRAINN02	2.035
TRAINN03	1.652
TRAINN04	2.151

TRAINN05	**2.100**
CONSTRUCTS	**VIF**
Ad1	**1.386**
Ad2	**1.360**
Ad3	**1.057**
ASCOS1_leadtime	**1.000**
ASCOS4_Demand	**1.000**
JIT1_suppliers	**1.279**
JIT2_Customers	**1.251**
JIT3_SetupTime	**1.320**
PDC1_CustInv	**1.000**
PDC2_MnfInv	**1.000**
PDC3_SupInv	**1.000**
PDC4_FrontEnd	**1.000**
Q1_FeedbackToEmployees	**2.817**
Q2_TopLeadership	**2.220**
Q3_ProcessControl	**1.042**
Q4_Training	**2.927**

Table S3. Correlations between components of ASCOS or PDC, and SC-Ad

	ASCOS1_Lead time focus	**ASCOS2_JIT focus**	**ASCOS3_Quality focus**	**ASCOS4_Demand stability focus**	**PDC1**	**PDC2**	**PDC3**	**PDC4**	**SC-Ad**
ASCOS1_Lead time focus	1.000	0.207	0.224	0.327	0.307	0.140	0.195	0.203	0.271
ASCOS2_JIT focus	0.207	1.000	0.434	0.368	0.160	0.224	0.261	0.190	0.539
ASCOS3_Qualityfocus	0.224	0.434	1.000	0.337	0.254	0.327	0.321	0.338	0.419
ASCOS4_Demand stability focus	0.327	0.368	0.337	1.000	0.181	0.257	0.322	0.171	0.164
PDC1	0.307	0.160	0.254	0.181	1.000	0.409	0.392	0.584	0.178
PDC2	0.140	0.224	0.327	0.257	0.409	1.000	0.534	0.667	0.230
PDC3	0.195	0.261	0.321	0.322	0.392	0.534	1.000	0.559	0.264
PDC4	0.203	0.190	0.338	0.171	0.584	0.667	0.559	1.000	0.245
SC-Ad	0.271	0.539	0.419	0.164	0.178	0.230	0.264	0.245	1.000

Figure S1. 1st Lower-order Constructs' model

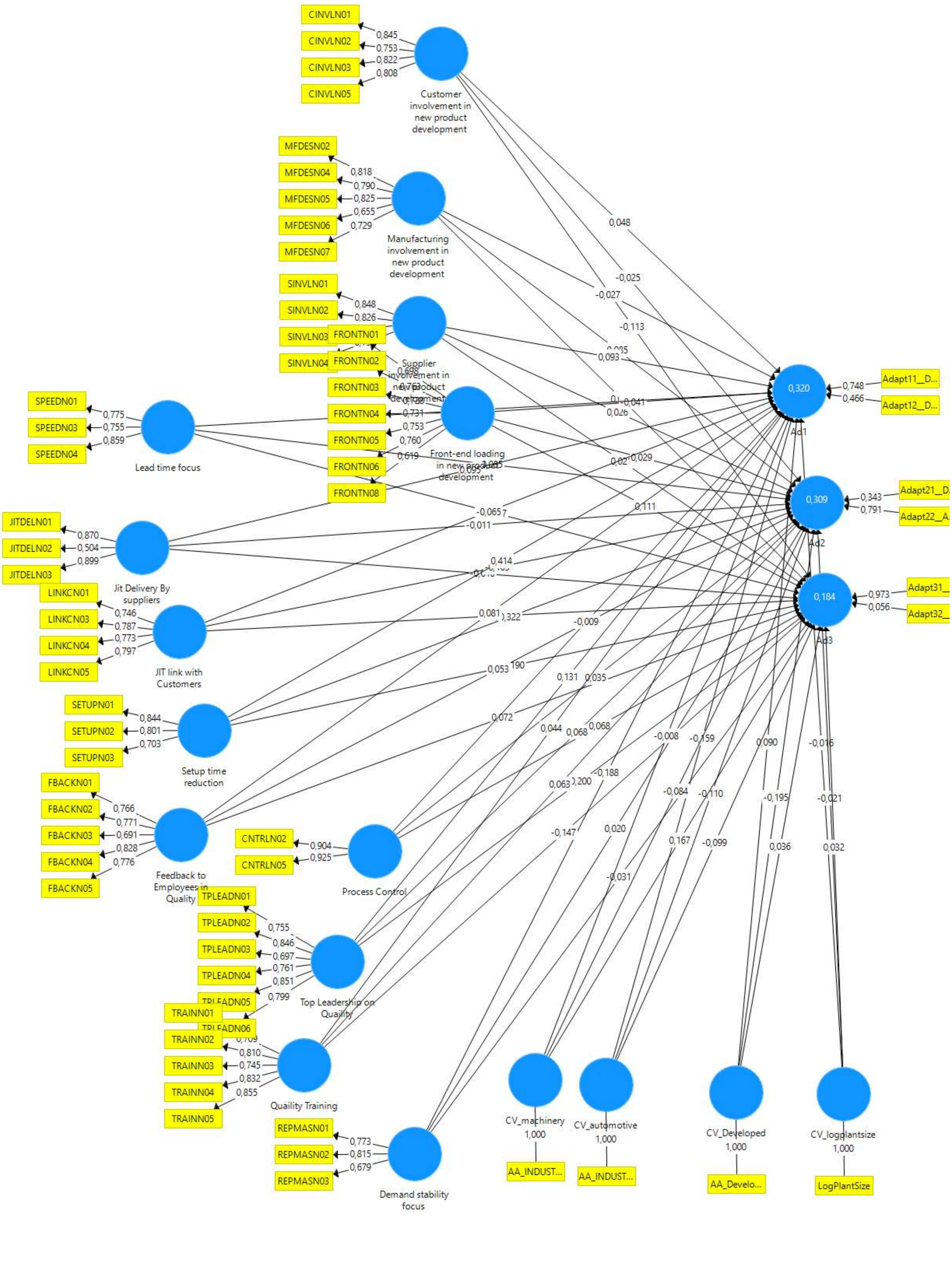


Figure S2. 2nd Higher-order Constructs' model

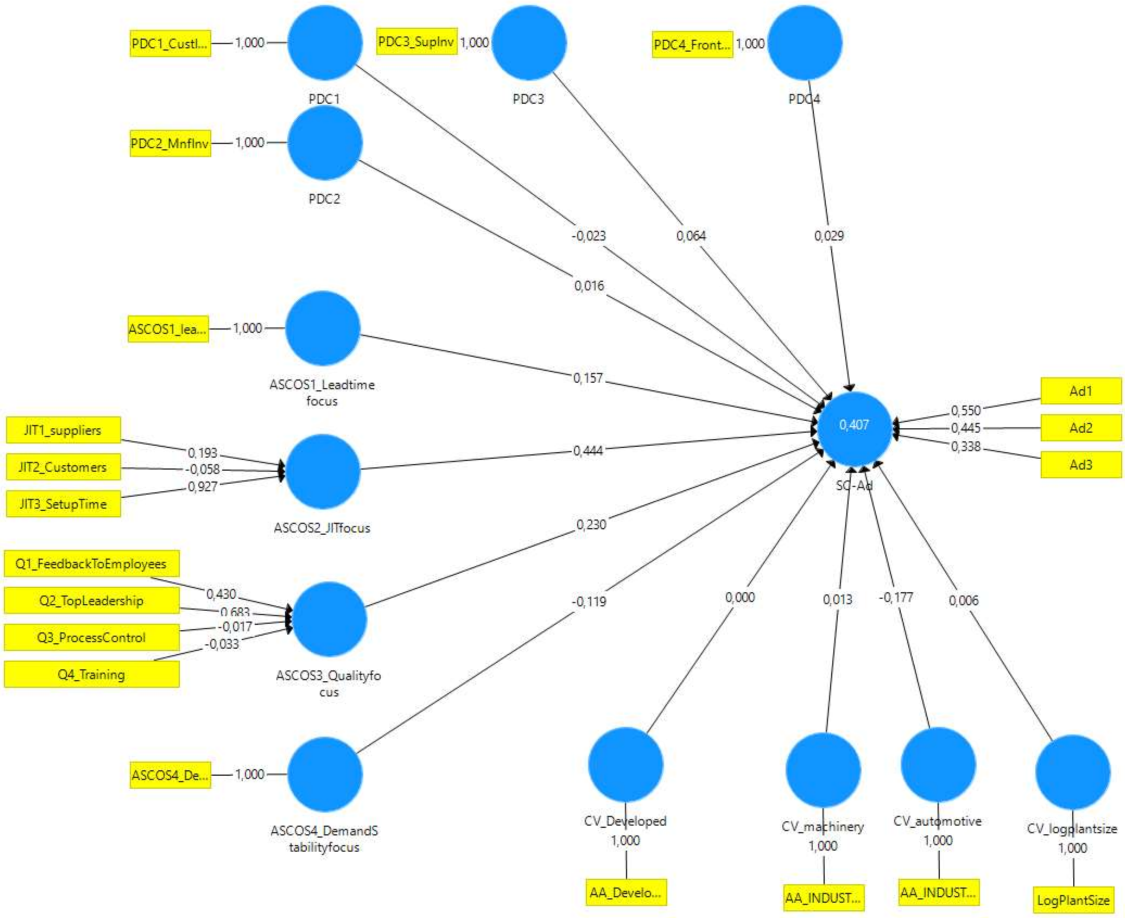
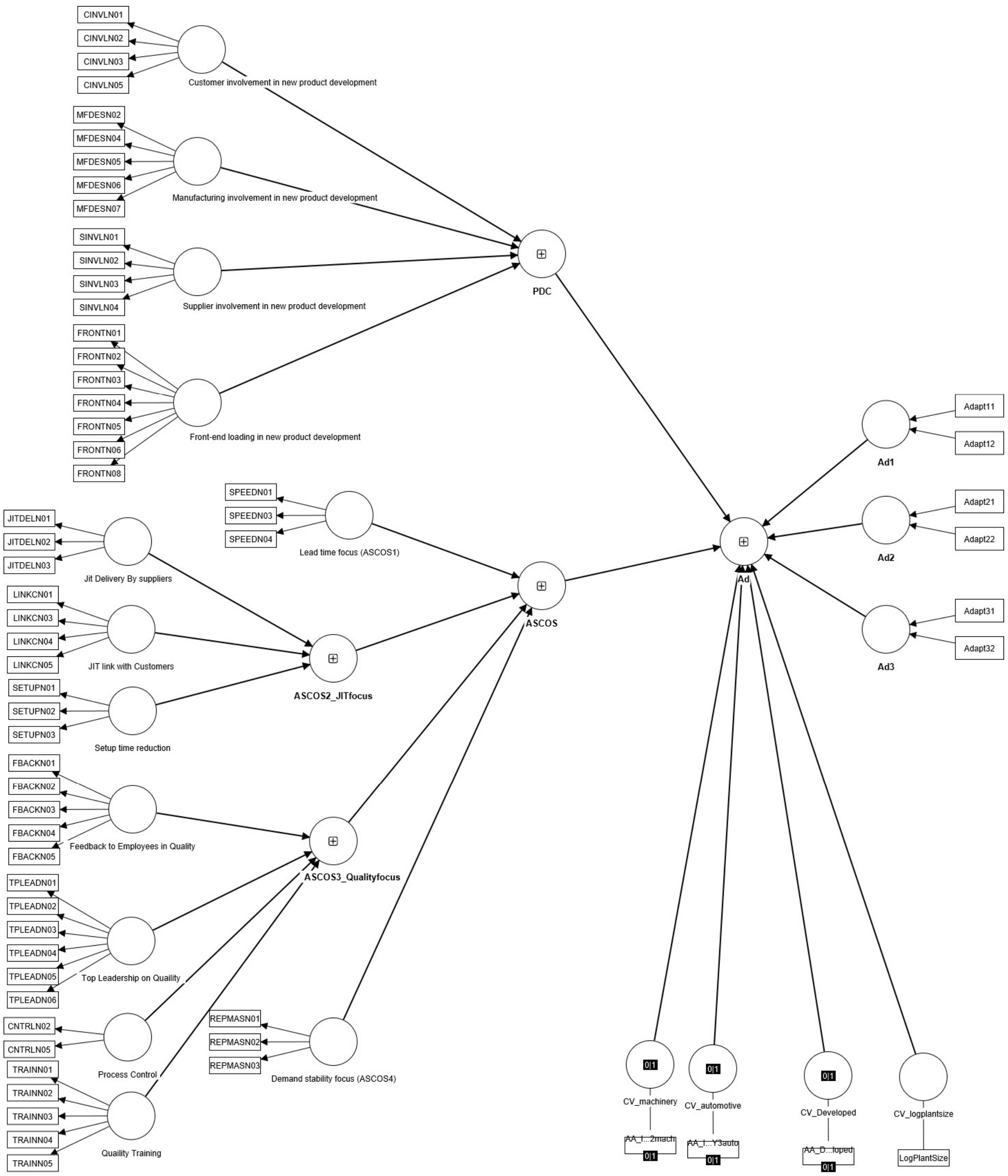


Figure S3. Conceptual model for the research (Circles with a "+" inside represent 2nd or 3rd higher order composites. Al other circles represent lower-order composites)



Two real examples about the importance of managerial leadership for Supply Chain Adaptability

When it comes to leadership related to this research, one of the authors of this study heard of two interesting new cases of initiative in Honda directly from the persons concerned. When visiting a Honda factory in 1991, an executive manager responsible for developing and installing a robot welding production line in the firm for the first time took the author involved on a tour of the production floor and showed him the robot welding production line. The manager and guide told him that Soichiro Honda (Honda's founder and president at the time) had presented him with the mission of developing the line, which he considered an enormously difficult task. After finishing the project, he was confident in his work and excitedly looked forward to receiving praise from Mr. Honda. However, Mr. Honda just said "Are you a fool? Why did you make a line with four stages? Do it again." The reason why the manager designed a four-stage line was that several welding rods easily got in a tangle during their fast, simultaneous operation. So, he decided to make a four-stage line to prevent this. However, a four-stage line requires four times more lead time and space than a one-stage line. Replacement alone was not enough. For Mr. Honda, creating otherwise impossible advantages was the reason for using new technologies. Fortunately, the manager eventually managed to make a line that satisfied Mr. Honda with digitization and robotics which led Honda to successful next-stage operation processes. This can be considered an example of successful ambidextrous management (AM); the right changes are made to current processes to address new competitive requirements.

The second case is a new product introduction in 1994 and corresponds to the worldwide trend toward high utility cars such as sport utility vehicles (hereafter, SUV), minivans, and multi-purpose vehicles (hereafter, MPV), which were missing from Honda's product line (Morita et al., 2001). Up to then, Honda's cars all had a common attribute, they were fun to drive, and one characteristic dimension was their low ride height. All production assembly lines were designed to produce cars this way. However, the newly designed roomy utility vehicle necessitated completely new assembly lines, and the required investments prevented Honda from competitively pricing the model in expanding and highly competitive markets. Therefore, the proposal was rejected and the inflexibility of production processes was the highest barrier. The model's chief designer could not abandon the idea as the concept of this new model was, he thought, perfectly designed. Project team staff traveled all around the world to interview users of existing potentially competitive vehicles about their convenience and usage problems in shopping mall parking lots and were extremely confident in their design concept. First, the design could provide the fun-to-drive feeling Honda's cars were supposed to have and also reduce the fatigue and boredom that vehicle user data they collected showed driving utility vehicles caused. Second, the design offered the competitive high utility with which most users would be satisfied. Although the proposal was turned down, the project was carried out "covertly" and was referred to as the "Zombie project". No managers, including those involved in financial matters, were heard to clearly state "Stop the project" due to reason that was, at once, both simple and complex: The president of Honda himself did not give a definite "No" to the project and remained silent at the executive meeting, even though other executives were against it. The chief designer told the author of this study that "most managers knew this and hesitated to terminate the project on their own." Therefore, the chief designer sent a new proposal to all plant managers together with the model's specifications, dimensions, and allowances, and a request for their collaboration on making the model. At that time, using a collaborative system was the way that Honda adopted proposals. One plant manager responded and they all collaborated on modifying the model's original specifications to within the permissible limits that the development team stipulated. They also had a close look at their assembly lines to determine how investments for the new model could be reduced. Finally, they devised a plan for making the model and estimated a feasible price that was accepted at the board meeting, despite numerous objections including assertions by reluctant sales and marketing people who remonstrated: "We need those high one-box cars that are selling well, not this new type." In the end, the new model was a breakthrough in Honda's product line and in the high utility vehicle market itself and allowed Honda to expand the feasibility of its product/market strategy. It may be a coincidence, or most likely a chance event, that the plant manager who supported the chief designer was the very same manager who had developed the above-described first robot welding machine in Honda. However, we think that his successful previous experience regarding advantages and the need to make necessary changes to current processes to contend with new competitive requirements opened up his mind to supporting this new opportunity.

These cases are real examples that show the importance of leadership for driving explorative initiatives -which would otherwise be difficult- by adapting exploitative initiatives. They also exemplify that the leadership approach has many facets including different leadership levels (e.g., individual, organizational) and the interactions between these (O'Reilly and Tushman, 2013), and organizational perceptions as to the company's situation. This opens the gateway to further research as our study seeks to emphasize the importance of finding sensible and universal ways as a prerequisite to achieve long-lasting supply chain adaptability (SC-Ad). Without this approach, a shift to an explorative initiative is likely to be a gamble. Thus, our next research agenda includes the design and configuration of reliable managerial platforms with top management leadership-driven SC-Ad.

References:

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