PAPER 3 OF 4

**Manufacturing systems and customer-responsiveness: reconfigurability beyond FMS**

MODELO CONCEPTUAL (FIT1)



MS: MANUFACTURING STRATEGY; RE: RECONFIGURABILITY; T: TECHNOLOGY; OR: OPERATIONAL RESPONSIVENESS; MR: MARKET RESPONSIVENESS

TQ, HR, JIT, T, MS, RE

FIT 2



ANALISIS DE 2 ORDEN

**REFLECTIVO**

**TQ**

Customer Satisfaction 127

Feedback 128

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**HR**

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**JIT**

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Equipment Layout 87

Setup Time Reduction 91

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|  |  |
| **T** | Modularization of Products |
|  | Proprietary equipment |
| Manufacturing Involvement in Product Design |
| Anticipation of New Technologies |
| Effective Process Implementation |
|  |  |
| **MS** | Manufacturing-business strategy linkage |
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|  |
| Formulation of Manufacturing Strategy |

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| **Title** | Modularization of Products |
| **Source** | Used in Round 3. Adapted from Forza & Salvador (2000). |
| **Rationale** |  |
| **Respondents** | New Product Development |
| MODLRN01  (TSMPN01) | Our products are modularly designed, so they can be rapidly built by assembling modules. |
| MODLRN02  (TSMPN02) | We have defined product platforms as a basis for future product variety and options. |
| MODLRN03  (TSMPN03) | Our products are designed to use many common modules. |
| MODLRN04  (TSMPN04) | When we make two products that differ by only a specific feature, they generally require only one different subassembly/component. |
| MODLRR05  (TSMPN05) | We do not use common assemblies and components in many of our products. |

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| **Title** | | Proprietary Equipment | |
| **Source** | | Used in Rounds 1, 2 and 3, plus four new items. | |
| **Rationale** | | Please note that the Cronbach’s alphas were only calculated using the Round 3 items. | |
| **Respondents** | | Process Engineering | |
| EQUIPN01  (SSPEN01) | We actively develop proprietary equipment. | |
| EQUIPN02  (SSPEN04) | We have equipment that is protected by our firm’s patents. | |
| EQUIPN03  (SSPEN05) | Proprietary equipment helps us gain a competitive advantage. | |
| EQUIPN04  (SSPEN07) | We frequently modify equipment to meet our specific needs. | |
| EQUIPR05 | We primarily rely on outside suppliers for equipment development. | |
| EQUIPN06 | We produce a substantial amount of our equipment in-house. | |
| EQUIPN07 | Developing our own equipment helps us to know more than our suppliers about everything that is critical to our business. | |
| EQUIPN08 | We develop some of our own equipment in-house, so that we are close to state-of-the-art for that equipment. | |

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| **Title** | Manufacturing Involvement in Product Design |
| **Source** | Used in Rounds 1, 2 and 3. |
| **Rationale** |  |
| **Respondents** | New Product Development |
| MFDESN01  (TSNPN03) | Direct labor employees are involved to a great extent before introducing new products or making product changes. |
| MFDESN02  (TSNPN04) | Manufacturing engineers are involved to a great extent before the introduction of new products. |
| MFDESR03  (TSNPR05) | There is little involvement of manufacturing people in the early design or products, before they reach the plant.  (Round 3: There is little involvement of manufacturing and quality people in the early design or products, before they reach the plant). |
| MFDESN04  (NSMIN01) | New product design teams have frequent interaction with the manufacturing function. |
| MFDESN05  (NSMIN02) | Manufacturing is involved at the early stages of new product development. |
| MFDESN06  (NSMIN03) | The manufacturing function is key in improving new product concepts. |
| MFDESN07  (NSMIN04) | Manufacturing is given challenging tasks in the development of new product concepts. |

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| **Title** | | Anticipation of New Technologies | |
| **Source** | | Used in Rounds 1, 2 and 3. | |
| **Rationale** | |  | |
| **Respondents** | | Process Engineering | |
| ANTICN01  (SSR4N04) | We pursue long-range programs, in order to acquire manufacturing capabilities in advance of our needs. | |
| ANTICN02  (SSR4N05) | We make an effort to anticipate the potential of new manufacturing practices and technologies. | |
| ANTICN03  (SSATN06) | Our plant stays on the leading edge of new technology in our industry. | |
| ANTICN04  (SSATN07) | We are constantly thinking of the next generation of manufacturing technology. | |

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| **Title** | | Effective Process Implementation |
| **Source** | | Used in Rounds 1, 2 and 3. |
| **Rationale** | |  |
| **Respondents** | | Process Engineering |
| PROCSR01  (TSEIR01) | We often fail to achieve the potential of new process technology. | |
| PROCSR02  (TSEIR02) | Once a new process is working, we leave it alone. | |
| PROCSN03  (TSEIN03) | We pay close attention to the organizational and skill changes needed for new processes. | |
| PROCSN04  (TSEIN04) | We search for continued learning and improvement, after the installation of new equipment. | |
| PROCSN05  (TSEIN05) | Our processes are effectively developed and implemented. | |

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| **Title** | Manufacturing-Business Strategy Linkage | |
| **Source** | Used in Round 3, including some items used in Rounds 1 and 2. | |
| **Rationale** |  | |
| **Respondents** | Plant Management | |
| LINKSN01  (SSR3N02) | We have a manufacturing strategy that is actively pursued. |
| LINKSN02  (SSR3N03) | Our business strategy is translated into manufacturing terms. |
| LINKSN03  (SSR3N04) | Potential manufacturing investments are screened for consistency with our business strategy. |
| LINKSN04  (SSR3N05) | At our plant, manufacturing is kept in step with our business strategy. |
| LINKSR05  (SSMBR06) | Manufacturing management is not aware of our business strategy. |
| LINKSR06  (SSMBR07) | Corporate decisions are often made without consideration of the manufacturing strategy. |

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| **Title** | | Formulation of Manufacturing Strategy | |
| **Source** | | Used in Rounds 1, 2 and 3. | |
| **Rationale** | | This was called Formal Strategic Planning in the previous rounds. | |
| **Respondents** | | Plant Management | |
| MFGSTRN01  (SSFPN01) | Our plant has a formal manufacturing strategy process, which results in a written mission, goals and strategies.  (Round 3: Our plant has a formal strategic planning process, which results in a written mission, long-range goals and strategies for implementation) | |
| MFGSTRN02  (SSFPN03) | This plant has a manufacturing strategy, which is put into writing.  (Round 3: This plant has a strategic plan, which is put in writing). | |
| MFGSTRN03  (SSFPN04) | Plant management routinely reviews and updates a long-range manufacturing strategy.  (Round 3: Plant management routinely reviews and updates a long-range strategic plan) | |
| MFGSTRR04  (SSFPR05) | The plant follows an informal manufacturing strategy ,with no written strategy document.  (Round 3: The plant has an informal strategy, which is not very well defined). | |

**OR**

*Reliability and validity of responsiveness*

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| --- | --- | --- |
| Priority | Dimension | Index |
| Responsiveness | Time | GLOBLX08 |
| GLOBLX09 |
|  |  |
| Dependability | GLOBLX11 On time new product launch |
| GLOBLX03 On time delivery performance |
|  |  |
| Flexibility | GLOBLX05 |
| GLOBLX06 |

FORMATIVE

**Reconfigurability**: RECNFGN01 hasta el 06 + MGOALX10 High degree of responsiveness

**MR**

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| --- | --- |
| SATISN02 | Our customers seem happy with our responsiveness to their problems. |

**PRUEBA PRELIMINAR**

**SI FMS O OTHERS TIENEN MEJORES VALORES?**

**FMS:**

RECNFGN19

RECNFGN20

RECNFGN21

RECNFGN22

RECNFGN23

RECNFGN24

**OTHER**

RECNFGN19

RECNFGN20

RECNFGN21

RECNFGN22

RECNFGN23

RECNFGN24

**CALCULOS**



Another approach views fit in terms of adherence to an ideal profile or pattern on a series of underlying dimensions [2]. The more an organization deviates from the ideal on any or all of the dimensions the lower the expected perfor-mance. Following Venkatraman and Prescott [26], the top 10% of the sampled firms in terms of performance were used as a calibration sample (*n* = 11); mean scores along the environment uncertainty, strategic orientation, structural complexity and strategic IT management dimensions were calculated to specify the “ideal” profile empirically (rather than theoretically). The bottom 10% were also removed so as not to skew the sample downwards (*n*=11, hold-out sam- ple). As shown in Fig. 10 and following Drazin and Van de Ven [2], fit (or more appropriately “misfit”) was measured for the 88 remaining firms (110 *−* 22) in the sample as the Euclidean distance from the individual pattern of scores to the ideal pattern along the four dimensions. This distance or profile deviation measure is thus hypothesized to be nega-

tively and significantly correlated to performance.