

# Diagnosing Organizational Integration of the Project Management

## An Instrument Based on Activities Integration Problems

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### **Abstract**

Firms wishing to benefit from the advantages of project management while preserving their traditional departments face the daunting challenge and complexity of managing organizational integration of the two structures (cross-functional structure). An important first step to aid managers, would be to realize diagnostic on the level of organizational integration of the project management in the firm.

The purpose of this study is to develop an instrument of measure to identify the activities integration problems, when managers of a firm must conjugate with activities of project and activities of departments involved in this project. This instrument of measure is composed of problematic situations, described by respondents who are confronted with activities integration problems, related to their own job. First results of exploratory factorial analysis and validity are presented.

### **Research Problem, Objective**

Firms wishing to benefit from the advantages of a project management structure while preserving their traditional departmental structure face the daunting challenge and complexity of managing the cohabitation of the two structures. This activities integration problem is not new to us. For over 35 years, numerous researchers have devoted their energies to describing the various components of this problem (e.g. Bartlett & Ghoshal, 1990; Cackowski, Najdawi & Chung, 2000; Carpenter-Anderson & Fleming, 1990; Davis & Lawrence, 1977, 1978; De Laat, 1994; Dunn, 2001; El-Najdawi & Liberatore, 1997; Goold & Campbell, 2003; Jones & Deckro, 1993; Kuprenas, 2003; Robins, 1993). Others have conducted a literature survey on advantages and disadvantages of cross-functional structure (see Ford & Randolph, 1992).

But, to my knowledge, there is no valid instrument to measure the activities integration problems in the area of cross-functional structure. The objective of this study is to develop, grounded in the data, an instrument of measure to diagnose the level of organizational integration of project management in the firm. This instrument of measure is composed of problematic situations, described by respondents who are confronted with activities integration problems in their own tasks.

## Activities Integration

In a study explicitly describing the activities integration problem within the product development context, Gélinas (2005) proposes a definition to this concept. The definition proposed for the concept of integration is the adaptation of one system components for insertion into another system, and vice versa. When product development activities have to be integrated with those of the firm's traditional departments, some of their components can be expected to blend into each other, while others will be enriched by the addition of new or complementary components or simply streamlined through elimination of obsolete elements. This definition of integration reflects all the dimensions of a firm that are likely to be affected, and implies a change in the way this firm is organized and managed.

## Method

The process to develop a scale of measure requires the realization of two major separate but interrelated stages, leading to validation and retention of this new measure. The first stage concerns the development of the dimensions and statements of the new measure and aims the validity of content. The second step concerns the development of the measuring scale and aims the evaluation of the psychometric properties of the scale (Hinkin, 1995). The following sections describe the research method used.

### Stage 1: Item Generation

In item generation, the primary concern is content validity, which may be viewed as the minimum psychometric requirement for measurement adequacy and is the first step in construct validation of a new measure (Schriesheim & al., 1993). In this study, item generation has necessitate three steps. These steps are: 1) Identification of integration problematic situations encountered by firms; 2) Comparison with integration problems reported in literature; 3) Identification of integration problem components.

#### *Step 1: Identification of Integration Problematic Situations encountered by firms*

In accordance with grounded theory, I selected firms and respondents in using theoretical sampling method (Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1990). The firms selected were those in which product development formed an integral part of their current activities and which manifested great interest in improving the methods involved in the process used by their managers. The activities involved in this process are carried out by a multidisciplinary team, whose members have to harmonize product development activities with those of their department of origin.

I began this step by carrying out an in-depth study of two companies working in automobile sector; both multinationals employed more than 500 employees. In one firm I met the R&D Vice-President and, in the other one, the manager of product development projects. Both companies had been implementing a formal process for project management, since in average, 8.5 years; this is the reason why I have them considered, as appropriate respondents.

The data were collected by means of non-structured face-to-face interviews addressing to the following management topics: product development projects, matrix structure, multidisciplinary teams, and theirs operations. The only one question was: Would you explain which problems you have to deal with, when you must manage the product development project activities? These interviews lasted approximately three hours on average, and were recorded and transcribed in their entirety. When the data were analyzed, the potential problems have been considered from the time they were mentioned

by the respondent. Both respondents, in this initial phase, were sure that the low success of their projects was due to those integration problems.

After codifying and classifying the data, the problematic situations were grouped under five headings of integration problem, namely 1) volume of tasks and responsibilities, 2) resource availability, 3) management support, 4) management of priorities and 5) management approach in matrix structure.

*Step 2: Comparison with Integration Problems Reported in Literature*

To my knowledge, Ford & Randolph (1992) conducted the more complete review of literature concerning the main disadvantages of the cross-functional structure. The authors report eight disadvantages of the cross-functional structure (see table 1).

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Insert Table 1 about here  
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*Step 3: Identification of Integration Problems Components*

After comparison with my data, I put aside the fourth disadvantage, because it underlie the integration of the specialists who have to work together, rather than the integration of the activities which those specialists have to deal with.

But, five disadvantages exposed by Ford and Randolph, clearly correspond to the five dimensions of activities integration problem, presented à step one (1, 2, 6, 7 and 8). Also, the third and fifth disadvantages presented in table 1, could be joint together and be labeled: power struggle between department manager and project manager. This sixth problem deserve to be considered and tested in the company survey. It includes issues related to power struggle, problem which haven't emerged during the exploration of problems, at the first step; probably due to the fact that the two respondents consulted hold similar positions within their respective companies (product development project). Indeed, I only became aware of the extent of the problem when I compared my results with those described in the literature. This is at this moment that I have decided to test for the importance of the power struggle in this new scale. The power struggle appears to involve primarily the project manager and the departmental managers, and is related to the sharing of authority over the team members (Ford & Randolph, 1992).

Finally, the six components representing activities integration problems are the overload of tasks and responsibilities, the lack of availability of human and informational resources, the lack of support from management for product development, the power struggle, the ineffectual management of priorities regarding the projects to be carried out, and the ineffectual management approach, prevailing in the cross-functional context. These six components underlie the 19 specific problematic situations identified in Table 2.

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Insert Table 2 about here  
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**Stage 2: Scale Development**

*Step 1: Design of the Developmental Study*

The population of this investigation is composed of companies, which consider new product

development projects as an important aspect of their everyday activities. They were all members of the Institut de Développement de Produits (IDP), whose mission is to accelerate the introduction of best practices concerning product development projects. It is a private institute that brings together an average of 50 manufacturing companies in province of Québec.

A questionnaire was drawn up, based on the problems identified in the firms and in literature. It is composed of 23 statements describing the problematic situations. Respondents were asked to answer the following question: To what extent do you experience this situation in your firm? A five-point Likert scale was used for each statement, ranging from (1) not at all to (5) tremendously.

This exploratory study was carried out from 138 respondents. All hierarchical levels were represented, with six vice-presidents, 57 functional managers (R&D, production, marketing and procurement), 53 project managers and 21 members of project team (response rate: 100%). They all knew that the questionnaire was experimental and that their responses would not be feedback to the manager being rated. The questionnaires were completed during work time and were us given personally back.

#### Step 2: *Scale Construction*

The exploratory factor analysis of the measure investigated is the first statistical test to do in the construction of a scale (Hinkin, 1995). The statistical tests needed consist in Bartlett's test of sphericity, Kaiser-Meyer-Olkin (KMO) measure and principal components analysis with Varimax rotation.

#### Step 3: *Reliability Assessment*

The assessment of reliability is important to the testing stage of the newly developed measure (Hinkin, 1995). Following Price & Mueller (1986), the most commonly accepted measure is the internal consistency reliability using Cronbach's Alpha.

### **First Results**

First, the results of KMO measure of sampling adequacy is 0.751, indicating that the exploratory factor analysis is appropriate. Bartlett's test of sphericity indicates a level of significance of 0.000. Following the exploratory factor analysis, after nine iterations, the eigenvalue of each factor revealed seven factors (one more than expected). These seven factors explained 61.5% of the variance (see Table 3). Cronbach coefficient alpha of the total measure is .84.

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Insert Table 3 about here  
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First, every items from the measure loaded significantly on, at least one factor (more than 0.4). Second, some of the items loaded on two distinct factors (Items 10, 4, 7).

The first factor is called, the Priority of the Project. This factor, with an eigenvalue of 5.47, is composed of four items, namely Items 9, 9a, 10a and 15, and accounted for 5.4% of the variance explained. The Cronbach coefficient alpha of this factor is .78.

The second factor is called, the Availability of the managers, and included four items: Items 11, 11a, 10 and 4. This factor, with an eigenvalue of 2.2, accounted for 9.6% of the variance explained. The Cronbach coefficient alpha of this factor is .67.

The third factor, call the Overload of tasks and responsibilities, is composed of three items: Items 1, 2 and 17. That factor, with an eigenvalue of 1.5, accounted for 6.6% of the variance

explained. The Cronbach coefficient alpha of this factor is .58.

The fourth factor, call Power Struggle, is composed of four items: Items 13, 12, 19 and 20. This factor, with an eigenvalue of 1.4, accounted for 6.2% of the variance explained. The Cronbach coefficient alpha of this factor is .63.

The fifth factor, call Direction of the project, is composed of four items: Items 18, 8, 6 and 16. This factor, with an eigenvalue of 1.3, accounted for 5.4% of the variance explained. The Cronbach coefficient alpha of this factor is .62.

The sixth factor, call Equal priority of department / project, is composed of three items: Items 14, 3 and 7. This factor, with an eigenvalue of 1.18, accounted for 5% of the variance explained. The Cronbach coefficient alpha of this factor is .56.

The seventh factor, call availability of human resources, is composed of one item: Item 5. This factor, with an eigenvalue of 1, accounted for 4.7% of the variance explained.

### **Discussion and Conclusion**

There is an important aspect that emerges from these results: this new instrument of measure concerning the level of activities integration of the project with those necessary for the traditional functions of the company, seems to be promising. Firstly, the results suggests that this diagnostic grid is likely to measure the concept of integration of activities in an appropriate manner. This is probably because the statements come from directly from the explanations given by those who live daily with this problem. As stipulated by the followers of grounded theory, these statements are ideal for the population concerned by the studied concept.

Nevertheless, certain realities observed in the results deserve to be studied. First, the validity of each factor is lower than the overall index of the instrument. This can indicates that this new measure gives the general level of integration of activities, rather than from its theoretical dimensions. More precisely, the label of each factor that emerged from the analysis is far to be satisfactory. The statements which load on more than one factor and the seventh factor which is added to the six already planned, deserve to be examined before being removed from the instrument, if necessary. Despite the encouraging results obtained following this first exploratory stage, it remains that statements of this instrument perhaps should be redesigned and, even increased in number.

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Table 1: Main Disadvantages of the Cross-Functional Structure

Disadvantages	Citations
1. Violates single line of authority and authority equal to responsibility principles of organization.	Barker, Tjosvold and Andrews (1988); Denis (1986a); Greiner and Schein (1981); Joyce (1986); Katz and Allen (1985).
2. Creates ambiguity over resources, technical issues, pay, and personnel assignments.	Davis and Lawrence (1977); Denis (1986a); Greiner and Schein (1981); Katz and Allen (1985); Larson and Gobeli (1987); Posner (1986).
3. Creates organizational conflict between functional and project managers.	Barker, Tjosvold and Andrews (1988); Denis (1986a); Katz and Allen (1985); Kerzner (1984); Wilemon and Thamhain (1983).
4. Creates conflict among individuals who must work together but have very different backgrounds and perspectives on work, time horizons, and goals.	Dill and Pearson (1984); Joyce (1986); Katz and Allen (1985); Meredith and Mantel (1989); Posner (1986); Smith (1978); Rucklenbruck (1982).
5. Creates insecurity for functional managers and erodes their autonomy.	Davis and Lawrence (1978); Wall (1984).
6. More costly for organization in terms of overhead and staff, more meetings, delayed decisions, and information processing.	Davis and Lawrence (1977); Denis (1986a); DiMarco, Goodson and Houser (1989); Jerkovsky (1983); Kerzner (1984); Larson and Gobeli (1987); Meredith and Mantel (1989); Pitts and Daniels (1984).
7. More costly for individuals in terms of role ambiguity, conflict and stress.	Denis (1986); Jerkovsky (1983); Struckenbruck (1982).
8. Slow response time to multinational issues.	Guterl (1989); Pitts and Daniels (1984).

Source : Ford et Randolph (1992, p.278)

Table 2 List of the Problematic Situations Underlying the Six Components of the Activity Integration Problem

Components	Problematic Situations
<p>1 Overload of tasks and responsibilities</p>	<p>a. Difficulty to conjugate with the overlap of tasks and responsibilities b. Difficulty to conjugate with the two authority's lines c. Struggle over the priorities to be placed on product development and the department</p>
<p>2 Lack of availability of human and informational resources</p>	<p>a. Difficulty to obtain the information requested at the requisite time b. Lack of the human resources needed to serve the two organizational structures c. Difficulty to obtain the presence of team members at product development meetings d. Difficulty to be assisted by the specialists needed to carry out the product development activities</p>
<p>3 Lack of support from management for product development</p>	<p>a. Lack of availability of the management to meet teams members b. Lack of credibility given by management to the manner in which product development activities are carried out c. Lack of management rigor in product development monitoring process</p>
<p>4 Power struggle</p>	<p>a. Poor willingness of department managers to share their power and control with project managers b. Lack of collaboration of department managers with project managers c. Difficulty for project manager to exert pressure on multidisciplinary team members when needed d. Difficulty for personnel to accept the fact that product development leadership lies in the hands of the R&amp;D department</p>
<p>5 Ineffectual management of priorities regarding the projects to be carried out</p>	<p>a. Difficulty for management to make choices regarding the projects to be carried out b. Difficulty in carrying out the steps of the product development process properly</p>
<p>6 Ineffectual management approach prevailing in the cross-functional context</p>	<p>a. Difficulty for team members to conjugate with the stress generated by the overload of tasks and responsibilities b. Difficulty to obtain team members' commitment to product development c. Heavy costs associated with lost time and money</p>

Table 3: Maximum Likelihood Factor Analysis of the Project Management Organization Integration Scale

Item	Factor						
	1	2	3	4	5	6	7
9a. Les directeurs de département ne sont pas convaincus que notre façon de développer nos produits est la meilleure (la plus efficace).	<b>.83</b>	.05	.05	-.02	.14	.01	.08
9. Les membres de la haute direction ne sont pas convaincus que notre façon de développer nos produits est la meilleure (la plus efficace).	<b>.75</b>	.03	-.08	.15	.25	.07	.01
10a. Durant le processus de développement de produit, les directeurs de département ne sont pas rigoureux dans le suivi des plans d'action.	<b>.69</b>	.35	.13	.18	-.10	.12	.17
15. La surcharge des membres de l'EDP pourrait être due au fait que la haute direction rencontre de la difficulté à gérer ses priorités en matière de projets.	<b>.57</b>	.24	.15	.30	.16	-.18	.20
11. Il est difficile de rencontrer les membres de la haute direction, lorsque le moment est venu d'approuver le travail réalisé; les rencontres sont relativement espacées.	.10	<b>.80</b>	-.12	.08	.17	.12	-.09
11a. Il est difficile de rencontrer les directeurs de département, lorsque le moment est venu d'approuver le travail réalisé; les rencontres sont relativement espacées.	.21	<b>.72</b>	-.07	-.06	.24	-.10	-.05
10. Durant le processus de développement de produit, les membres de la haute direction ne sont pas rigoureux dans le suivi des plans d'action.	.05	<b>.54</b>	.05	.18	-.12	.18	.14
4. Il manque souvent des membres de l'EDP lors des réunions organisées dans le cadre du projet de DNP.	.03	<b>.48</b>	.44	-.04	.05	.08	.11
1. Certains membres de l'EDP doivent rencontrer à la fois les objectifs de leur département respectif et ceux du projet de DNP.	.04	-.26	<b>.72</b>	-.03	.22	-.09	-.06
2. Certains membres de l'EDP doivent assumer les responsabilités que leur confient à la fois leur chef de département respectif et le responsable du projet DNP et, évidemment, leur rendre des comptes.	-.06	-.02	<b>.72</b>	.31	-.03	.04	.03
17. Certains membres de l'EDP ont de la difficulté à s'engager pleinement dans la réalisation du projet de DNP étant donné qu'ils n'y travaillent qu'à mi-temps.	.18	.23	<b>.54</b>	.14	.21	.09	.22
13. Les directeurs de département manifestent un certain malaise à partager leur autorité et leur contrôle avec les responsables de projet en matière de DNP.	.14	-.01	.23	<b>.79</b>	-.01	.04	.13
12. On sent bien une lutte de pouvoir entre le responsable du projet et les directeurs de département rattachés au projet de DNP; chacun semble vouloir réclamer ce qui lui est dû.	.22	-.03	.05	<b>.68</b>	.24	.16	.11
19. Le mode de direction actuel utilisé pour la réalisation du projet de DP affecte la qualité de vie au travail en raison, entre autres, du stress qu'il engendre chez les membres de l'EDP.	.23	.03	-.07	<b>.46</b>	.31	<b>.41</b>	-.10
20. Certains membres de l'EDP acceptent difficilement que l'entière responsabilité de la réalisation, donc du succès du projet de DNP revienne au département d'ingénierie et/ou de R&D.	-.05	.31	.21	<b>.45</b>	.06	.03	-.38

18. Le mode de direction actuel utilisé pour la réalisation du projet de DNP est lourd à gérer et entraîne des coûts de toutes sortes. Exemples : rencontres excessives, obligation de former le personnel, lenteur du processus de prise de décision, etc.	.05	.09	.19	.22	<b>.67</b>	.05	.08
8. Il est souvent difficile d'obtenir, en temps nécessaire, l'assistance de certains spécialistes lors de situations imprévues.	.10	.06	.06	.35	<b>.60</b>	-.02	.18
6. Il est souvent difficile (long) d'obtenir l'information secondaire nécessaire à la réalisation du projet de DNP. Exemples : coût des composantes - données statistiques sur les clients et les garanties sur les produits.	.11	.35	.06	-.16	<b>.55</b>	-.01	.19
16. Certaines étapes du processus de DNP sont parfois raccourcies, voire complètement éliminées afin d'accélérer la mise en production d'un nouveau produit.	.36	.14	.14	-.04	<b>.55</b>	.17	-.35
14. Le responsable du projet en DNP ne peut en aucun temps exercer une pression sur les membres de l'EDP afin de s'assurer qu'ils effectuent leurs tâches en matière de DP dans les délais prescrits.	-.04	.06	-.04	.14	-.04	<b>.82</b>	-.02
3. Certains membres de l'EDP accordent plus d'importance aux priorités de leur département respectif qu'à celles rattachées au projet de DNP.	.33	.03	<b>.49</b>	.15	.07	<b>.54</b>	-.08
7. Les besoins des départements en matière de ressources ont priorité sur ceux relatifs au projet de DNP.	.07	.11	.28	-.11	.29	<b>.51</b>	<b>.48</b>
5. Les ressources humaines de l'entreprise ne suffisent pas pour combler à la fois les besoins des départements et ceux relatifs aux projets de DNP.	.18	.01	.08	.20	.17	-.03	<b>.70</b>
Eigenvalue	5,47	2,2	1,52	1,43	1,25	1,18	1,08
Variance Explained by Each Factor	23,79	9,57	6,64	6,21	5,44	5,14	4,68
Cumulative Explained Variance	23,79	33,36	40,01	46,2	51,7	56,8	61,5

Note: This Questionnaire was addressed to French speaking respondents

Factors:

1: Priority of the project 2: Availability from the manager 3: Overload of tasks and responsibilities

4: Power struggle 5: Direction of the project 6: Equal priority of departments / project 7: Availability of Human Resources

EDP: Product Development Team

DP: Product Development

DNP: New Product Development