Developing and Using the Interaction Measure from IMP databases

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<u>ABSTRACT</u>

The IMP school is growing in its importance as a prominent perspective in industrial and business marketing particularly in international contexts. The IMP databases provide a valuable resource to researchers in the Business and International Marketing field who wish to research various aspects of industrial and international marketing.

A key IMP construct is interaction. Surprisingly, there has been little attempt to clarify what interaction means, how it is to be measured and what may be done after measurement to test some of the theory that derives from the IMP school.

This paper examines the interaction construct in the context of innovation research and isolates items from the IMP2 (European) database and the IMP China database.

Suggestions for further research are offered.

Developing and Using the Interaction Measure from IMP databases

The importance of buyer-seller interactions in technical development and innovations in Buyer Seller Relationships has been emphasized in the literature for some time (Hakansson 1987 to Roy, Sivakumar and Wilkinson forthcoming). For example Hakansson noted:

"An important and fundamental precept in our work has been that we consider technological development as being the result of the interaction between different corporations, organisations and individuals instead of being the consequence of one individual actor's performance." Hakan Hakansson in the Preface (Page 1) to "Industrial Technological Development" (Hakansson 1987)

In addition the IMP group has been collecting the IMP data over the years from various locations and has led to significant publications including over 60 papers in the impgroup.org website that contain the word "interaction" in the abstract. Despite the importance of interaction in the IMP approach – researchers have not explicitly reported the nature of interaction in buyer –seller relationships in context of the IMP databases.

This working paper attempts to measure interaction in the context of innovation generation in buyer seller relationships and offers measurement guidelines and results from the IMP databases of Europe and China.

Selection of questionnaire items for each construct-Validity

To develop each of the measures an initial large pool of items were selected by the researchers based on their theoretical understanding. The choice of items was also guided by discussions that were held with a sample of business people in Singapore to gain their opinions on the relevance of different items and a panel of students in a university business course was asked to assess the relevance of different items.

Several items used are categorical that are treated as continuous variables in the context of the theory of the research and have been re-coded as necessary in the theoretical context. For e.g. the hierarchical level of a person is treated as a continuous variable and is reverse coded so that higher values represent the theory that higher hierarchy of the interacting person will mean greater interaction scope and more innovation generation. The re-coding of categorical items are mentioned on individual tables.

Interaction Quantity

Interaction quantity is the number of times meetings take place between buyer and seller directly or via the intermediary (distributor) of the seller. It includes communications by letter, phone, fax and email and is conceptualized as the number of contacts per time period where information is exchanged. The items in this construct are the meetings that take place between supplier and buyer, between supplier, buyer and intermediary, between intermediary and customer and between intermediary and supplier. It also

includes contacts by letter, phone and telex. The interaction quantity items and basic statistics in the European and Chinese databases are shown in the tables below.

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Insert Table 1, 2 and 3 about here

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Several alternative methods were attempted to reduce the number of items to facilitate later analysis. Several types of factor approaches were tried but in all cases .low variance was accounted for by the factors and they were non interpretable. Since Interaction quantity was central to the research question we decided to retain the individual items as measure of interaction quantity in both the databases.

Interaction Scope

Interaction scope is the quality and nature of interaction that facilitates innovation generation. It includes the impact of hierarchically senior level meetings and co-ordination between buyer and seller and technical meetings and co-ordination between buyer and seller. Two types of data was available in the IMP questionnaire, the first was the hierarchical level of person who handled the relationship from the customer and supplier organization. The second type of data was how strong was the involvement of the technical people on both sides, where the technical person worked and how unique were the skills of such a person. The interaction scope items and basic statistics in the European and Chinese databases are shown in the tables below.

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Insert Table 4, 5 and 6 about here

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Several alternative methods were attempted to reduce the number of items to facilitate later analysis. In all cases there was loss of information in terms of low factor extraction and unclear factors. Since Interaction scope was central to our research question we decided to retain the items as individual items as measure of interaction quantity in both the databases.

Future Research Directions

In our work with the IMP databases we were unable to aggregate a measure of Interaction Quantity or Scope as for example has been done for 'relationship understanding' (see Blankenburg –Holm et. al. 1996) where a summated scales were possible. Our next step is in trying to test a structural equation model for interaction using the same items as above. We believe that isolating interaction items in a SEM method will help in studying the impact of interaction on dependent variables of interest.

Table 1   Interaction Quantity Items

Section and No.	IMP Sup13 Database Code	Question	Scale
I.3-32		How frequently do personal meetings take place:	Number of times per year
32.1	MEET_ISC	between the intermediary (sales subsidiary etc) the customer and yourselves at the same time?	
32.3	MEET_IC	between the intermediary (sales subsidiary etc) the customer and yourselves at the same time?	
32.4	MEET_SI	between the intermediary (sales subsidiary etc) the customer and yourselves at the same time?	
I.3-33		How frequently are other personally addressed contacts (e.g. phone calls, personal letters, personal telex)	Number of times per year
33.1	CONTA_SC	between your company and customer?	
33.2	CONTA_IC	between the intermediary and customer?	

Table 2 Interaction Quantity Descriptive Statistics: Europe

IMP Database Code	Item	Min	Max	Mean	SD	Miss-ing	Skew-ness
MEET_ISC	Joint meetings between intermediary, supplier and customer	0	50	1.68	4.23	28	7.983
MEET_SC	Joint meetings between supplier and customer	0	245	7.75	26.25	1	7.106
MEET_IC	Joint meetings between intermediary and customer	0	200	8.80	26.72	25	5.900
MEET_SI	Joint meetings between intermediary, supplier and customer	0	360	5.54	27.09	26	11.568
CONTA_SC	Phone calls, letters, telex between supplier and customer	0	500	27.02	73.17	3	3.799
CONTA_IC	Phone calls, letters, telex between intermediary and customer	0	300	21.84	51.87	27	3.538

Table 3 Interaction Quantity Descriptive Statistics: China

IMP Database Code	Item	Min	Max	Mean	SD	Missing	Skewness
MEET_ISC	Joint meetings between intermediary, supplier and customer	0	65	4.70	10.45	44	4.207
MEET_SC	Joint meetings between supplier and customer	0	65	6.35	11.21	32	3.439
MEET_IC	Joint meetings between intermediary and customer	0	70	7.72	15.76	54	3.034
MEET_SI	Joint meetings between intermediary, supplier and customer	0	70	9.35	16.00	60	2.780
CONTA_SC	Phone Calls, letters, telex between supplier and customer	0	500	37.17	68.83	35	5.137
CONTA_IC	Phone Calls, letters, telex between intermediary and customer	0	500	27.56	95.66	73	4.991

Table 4 Interaction Scope Pool Items

Section and No.	IMP Sup13 Database Code	Question	Scale
I.3-34		How many people are directly involved in the relationship	number of people
34.1	PEOPLE_C	from the customer's firm?	
34.2	PEOPLE_I	from the intermediary ?	
34.3	PEOPLE_S	from your own firm excluding the intermediary?	
I.3-37		How strong is the involvement in the relationship of the most influential person in <u>your own</u> firm who supports it on the basis of:	1 = very weak 2 = weak 3 = medium 4 = strong 5 = very strong
37.1			
37.2	PROMO_SH PROMO_ST	his high hierarchical position? his special technical expertise?	
I.3-38	LEVEL-SH	What is the hierarchical level of the person referred to in Q 37.1?	1 = group level (Hi) 2 = company level 3 = regional level 4 = national level 5 = lower level (Lo)
I.3-39.1	AREA_ST	Where does the technical influencer referred to in Q37.2 work?	1 = basic research 2 = product design & development 3 = production engineering 4 = scheduling & control 5 = other function
I.3-39.2	UNIQU_ST	How unique or special is his technical competence?	1 = general to 5 = unique

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Section and No.	IMP Sup13 Database Code	Question	Scale
I.3-40		How strong is the involvement in the relationship of the most influential person in the customer's firm who supports it on the basis of :	1 = very weak 2 = weak 3 = medium 4 = strong 5 = very strong
40.2 40.3	PROMO_CH PROMO_CT	his high hierarchical position? his special technical expertise?	
I.3-42	LEVEL-CH	What is the hierarchical level person of the referred to in Q 40.2?	1 = group level (Hi) 2 = company level 3 = regional level 4 = national level 5 = lower level (Lo)
I.3-43.1	AREA-CT	Where does the technical influencer referred to in Q.40.3 work?	1 = basic research 2 = product design & development 3 = production engineering 4 = scheduling & control 5 = other function
I.3-43.2	UNIQU-CT	How unique or special is his technical competence?	1 = general to 5 = unique

Table 5 Interaction Scope Descriptive Statistics: Europe

IMP Database Code	Item	Min	Max	Mean	SD	Missing	Skewness
PEOPLE_C	Customer's people involved	0	100	5.37	10.21	2	7.433
PEOPLE_I	Intermediary's people involved	0	15	1.40	2.04	26	2.449
PEOPLE_S	Supplier's people involved	0	100	3.55	7.32	1	10.589
PROMO_SH	Supplier support with high hierarchical position	1	5	3.53	1.35	153	-.430
PROMO_ST	Supplier support with special technical expertise	1	5	3.51	1.30	144	-.537
LEVEL-SH*	Hierarchical level of supplier (reverse coded)	1	5	3.30	1.46	154	.082
AREA_ST**	Supplier technical area	1	5	3.49	1.06	149	-.298
UNIQU_ST	Supplier uniqueness of technical expertise	1	5	3.90	1.13	150	-.787
PROMO_CH	Customer support with high hierarchical position	1	5	3.60	1.33	147	-.683
PROMO_CT	Customer support with special technical expertise	1	5	3.82	1.14	152	-.388
LEVEL-CH*	Hierarchical level of customer (reverse coded)	1	5	3.32	1.11	148	-.540
AREA-CT**	Customer technical area	1.00	5.00	3.7105	1.0685	156	-.873
UNIQU-CT	Customer uniqueness of technical expertise	1.00	5.00	3.9268	.9658	154	-1.283

* Reverse coded to reflect theory that higher level will cause more interaction scope
** Higher code indicates more applied skills in functional area

Table 6 Interaction Scope Descriptive Statistics: China

IMP Database Code	Item	Min	Max	Mean	SD	Missing	Skewness
PEOPLE_C	Customer's people involved	0	20	3.96	3.74	22	2.335
PEOPLE_I	Intermediary's people involved	0	10	2.24	1.81	50	1.531
PEOPLE_S	Supplier's people involved	1	50	4.78	5.79	20	6.281
PROMO_SH	Supplier support with high hierarchical position	1	9	4.37	1.24	3	.152
PROMO_ST	Supplier support with special technical expertise	1	9	4.07	1.47	4	1.281
LEVEL-SH*	Hierarchical level of supplier (reverse coded)	2.00	5.00	4.1856	.5651	3	-.689
AREA_ST**	Supplier technical area	2	5	3.51	.90	10	-.644
UNIQU_ST	Supplier uniquiness of technical expertise	1	5	2.96	1.34	5	-.190
PROMO_CH	Customer support with high hierarchical position	1	9	5.18	2.29	6	.772
PROMO_CT	Customer support with special technical expertise	1	9	4.98	2.55	7	.708
LEVEL-CH*	Hierarchical level of customer (reverse coded)	1.00	5.00	4.0617	.7640	19	-1.830
AREA-CT**	Customer technical area	1	5	3.62	.87	21	-.866
UNIQU-CT	Customer uniquiness of technical expertise	1	5	2.96	1.33	24	-.274

* Reverse coded to reflect theory that higher level will cause more interaction scope
** Higher code indicates more applied skills in functional area

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