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Firm responses to disruptive innovations

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Appendix A: Survey

Survey questions included in the PROCESS regression analysis. Several loops were created to direct respondents through the survey questions. This way, respondents only had to answer questions that specifically addressed their situation. When filling in the survey, respondents were asked to place their response within a specific time period. The survey was constructed to collect data across two time periods: The Downloading period (2006-2010) and The Streaming period (2010-2015). To account for any recency effects, reference points and examples, identified during the pre-survey fieldwork, were given to guide respondents in their recall of the specific time period (Miles & Huberman, 1994). The interviews with industry experts and record companies confirmed that respondents would be able to recall the general sentiment of the two time periods and could clearly identify specific reference points or critical events (Van de Ven & Poole, 1995) that distinguish the two time periods.

Control variables

Firm age: In which year has your company been founded?

Firm size: How many employees (in FTEs) does your company currently employ?

Prior experience with technological change:

Does your company have experience with technological change in the music industry?

- Yes, my company has experience with digital technological change in the music industry
- Yes, my company has experience with technological change in the music industry
- No, my company has no experience with technological change in the music industry, but does have experience with technological change in another industry
- No, my company has no experience with technological change in the music industry, also not in another industry

Given constraints

Since the disruption, to what extent did the following factors constrain your business to deal with the disruption? (1, “not at all”; 5, “to a very large extent”)

CONSTRAIN 1	Existing value network
CONSTRAIN 2	Firm routines
CONSTRAIN 3	Difficult to re-allocate resources
CONSTRAIN 4	Insufficient resources

Time taken to respond:

In which year did your company become aware of the effects of disruption ?
In which year did your company decide to respond to the disruption?*

* Loop to question corresponding to a specific disruption phase

Organizational Response

Defensive Response (per time period)

Since the disruption, to what extent has your business pursued the following activities?
(1, “not at all”; 5, “to a very large extent”)

DEFENSIVE 1 Sustain old value network

DEFENSIVE 2 Gain information about new possibilities

DEFENSIVE 3 Spread risks by contacting multiple potential partners

DEFENSIVE 4 Install protective measures against digital exploitation

DEFENSIVE 5 Reduce overhead costs

DEFENSIVE 6 Develop alternative sources of income in traditional physical business model

DEFENSIVE 7 Improve quality physical product

DEFENSIVE 8 Sustain focus on old business

Offensive Response (per time period)

Since the disruption, to what extent has your business pursued the following activities?
(1, “not at all”; 5, “to a very large extent”)

OFFENSIVE 1 Invest resources to make digital core-business of the firm

OFFENSIVE 2 Invest in joint projects on new business

OFFENSIVE 3 Invest in collaborations on new business

OFFENSIVE 4 Invest to establish new value network

OFFENSIVE 5 Search for knowledgeable potential partners

OFFENSIVE 6 Reallocate resources to embrace digital business

OFFENSIVE 7 Initiate new activities independently

OFFENSIVE 8 Allocate resources for new skills in-house

OFFENSIVE 9 Reorganization of the firm

Impact of the disruption

Disruption impact (per time period). How did the disruption negatively affect (directly or indirectly) your firm on the following dimensions? (1, “not at all”; 10, “to a very large extent”)

IMPACT 1 Production

IMPACT 2 Distribution

IMPACT 3 Promotion

IMPACT 4 Sales

Motivation to respond

Motivation to respond (per time period)

Thinking about time period X, to what extent do you agree with the following statements? (1, “not at all”; 5, “to a very large extent”)

MOTIVATION 1 Disruption improves the value of my products

MOTIVATION 2 Disruption is developing at an increasingly high speed

MOTIVATION 3 Disruption improves my market share

MOTIVATION 4 Disruption creates potential for growth for my company

Capability to respond

Capability to respond (per time period)

Thinking about time period X, to what extent do you agree with the following statements? (1, “not at all”; 5, “to a very large extent”)

CAPABILITY 1 My company is alert (scanning capacity)

CAPABILITY 2 My company has the required skills

CAPABILITY 3 My company has the required competences

CAPABILITY 4 My company is informed about the disruption (knowledge)

CAPABILITY 5 My company sees profit opportunities (opportunity recognition)

CAPABILITY 6 My company experiences a positive influence of the disruption on work processes

CAPABILITY 7 My company does not experience any organizational dependencies (resource dependencies)

Appendix B: Using PLS to assess common method variance (CMV)

PLS has been used to assess common method variance by controlling for the effects of a single unmeasured latent factor (Liang et al., 2007). Three steps are involved. First, to overcome identification problems, each reflective indicator is transformed into a single-indicator latent construct. Second, the original constructs are linked to the new single-indicator constructs. Third, a common methods variance (CMV) factor is linked with all single-indicator constructs. The explained variance (i.e., squared loadings) by substantive constructs is compared with those of the common method. The average explained variance of CMV is .06, whereas that of the substantive constructs is .69. Additionally, only three of the forty-one paths between CMV and indicators are significant, which means that common method bias is important to consider, but does not present a serious concern.

Table B. I: Common Method Variance using PLS Bootstrapping Method

Path	Coefficient	t-statistic	f ²	Path	Coefficient	t-statistic	f ²
CMV → IMP1	0.07	1.38	0.02	IMP → IMP1	0.79	21.45	1.00
CMV → IMP2	0.01	0.09	0.01	IMP → IMP2	0.91	62.32	1.00
CMV → IMP3	0.04	0.72	0.01	IMP → IMP3	0.78	18.12	1.00
CMV → IMP4	-0.11	1.87	0.05	IMP → IMP4	0.84	21.56	1.00
CMV → ABI1	-0.09	0.57	0.02	ABI → ABI1	0.79	4.76	0.77
CMV → ABI2	0.05	0.18	0.02	ABI → ABI2	0.73	3.89	0.36
CMV → ABI3	-0.11	0.87	0.02	ABI → ABI3	0.89	7.32	0.57
CMV → ABI4	-0.00	0.16	0.02	ABI → ABI4	0.77	5.19	0.43
CMV → MOT1	0.11	0.62	0.03	ABI → MOT1	0.64	4.70	0.26
CMV → MOT2	-0.19	1.00	0.03	ABI → MOT2	0.59	3.01	0.14
CMV → MOT3	-0.21	1.00	0.05	ABI → MOT3	0.53	2.62	0.19
CMV → MOT4	0.14	1.37	0.04	MOT → MOT4	0.77	8.74	0.90
CMV → MOT5	-0.55	4.17	0.19	MOT → MOT5	1.00	9.98	0.77
CMV → MOT6	0.15	1.50	0.04	MOT → MOT6	0.69	6.91	0.50
CMV → MOT7	0.12	1.23	0.03	MOT → MOT7	0.75	9.48	0.65
CMV → DEF1	0.03	0.28	0.01	DEF → DEF1	0.67	7.50	0.55
CMV → DEF2	0.22	3.196	0.10	DEF → DEF2	0.92	18.82	1.00
CMV → DEF3	-0.47	6.060	0.37	DEF → DEF3	0.40	4.79	0.29
CMV → DEF4	0.34	2.488	0.13	DEF → DEF4	0.67	6.03	0.46
CMV → DEF5	-0.42	5.48	0.46	DEF → DEF5	0.53	7.90	0.70
CMV → DEF6	0.11	0.99	0.03	DEF → DEF6	0.72	7.27	0.66
CMV → DEF7	0.23	2.29	0.09	DEF → DEF7	0.83	10.68	0.99
CMV → DEF8	0.07	0.98	0.02	DEF → DEF8	0.83	12.88	1.00

CMV → OFF1	0.19	2.08	0.05	OFF → OFF1	0.68	8.37	0.60
CMV → OFF2	-0.11	1.21	0.02	OFF → OFF2	0.89	11.56	0.85
CMV → OFF3	0.14	1.76	0.03	OFF → OFF3	0.68	9.31	0.51
CMV → OFF4	-0.13	1.46	0.03	OFF → OFF4	0.91	12.47	0.94
CMV → OFF5	0.04	0.32	0.01	OFF → OFF5	0.62	4.46	0.28
CMV → OFF6	-0.25	1.55	0.05	OFF → OFF6	0.75	4.79	0.33
CMV → OFF7	0.02	0.16	0.01	OFF → OFF7	0.71	8.79	0.44
CMV → OFF2	0.16	1.86	0.05	OFF → OFF8	0.72	9.38	0.72
CMV → OFF4	-0.21	1.86	0.03	OFF → OFF9	0.75	6.82	0.34
CMV → PERF1	0.16	1.87	0.06	PERF → PERF1	0.68	6.99	1.00
CMV → PERF2	0.11	1.17	0.03	PERF → PERF2	0.64	7.53	0.71
CMV → PERF3	-0.07	1.50	0.03	PERF → PERF3	0.91	32.98	1.00
CMV → PERF4	-0.06	1.28	0.02	PERF → PERF4	0.92	37.69	1.00
CMV → PERF5	-0.08	1.96	0.04	PERF → PERF5	0.93	35.38	1.00
CMV → CON1	-0.03	0.24	0.02	CON → CON1	0.77	8.13	0.69
CMV → CON2	-0.03	0.35	0.02	CON → CON2	0.85	12.18	1.00
CMV → CON3	0.09	0.65	0.02	CON → CON3	0.84	8.39	0.77
CMV → CON4	-0.02	0.19	0.01	CON → CON4	0.85	12.67	1.00

Appendix C: Cases & data sources included in multiple case study

Table C. I: Cases & Data sources included in the analysis

Firm Genre SIC code	Year of establishment	No. of employees	No. of interviews Duration	Interviewee ²	Secondary Sources
Pink Floyd World 5920. ³	1976	1 (formerly 5)	2 60 minutes each	Mr. K (CEO)	Location & Respondent observations News articles Telephone contact during interpretation (N=2)
Oasis World/Jazz 5920	2007	1.5	2 60 minutes each	Mr. O (CEO)	Location & Respondent observations News articles Industry meetings (N=1) Telephone contact during interpretation (N=2)
AC/DC BV World/Theater 90012. ⁴ 46435. ⁵	1996	5 (formerly 8)	1 50 minutes	Mr. K (GM)	Respondent observations News articles Telephone contact during interpretation (N=1)
The Who Dutch 5920 6311. ⁶	2004	1	2 45 minutes each	Mr. K (CEO)	Respondent observations News articles Orbis Telephone contact during interpretation (N=2)
Van Halen Dutch 5920	2013	4	1 45 minutes	Mw. W (CEO)	Location & Respondent observations News articles Industry meeting (N=2) Telephone contact during interpretation (N=2)
Nirvana Dutch 46435, 7810. ⁷ , 1820. ⁸ , 69105. ⁹ 5920	2006	2	2 75 minutes each	Mr. P (CEO) Mw. R. (Marketing)	Location & Respondent observations News articles Industry meetings (N=2) Orbis Telephone contact during interpretation (N=2)
The Beatles Dutch 90012 5920	1997-2000	7 (formerly 10)	2 45 minutes each	Mr. B (CEO) Mr. V (PM)	Respondent observations News articles Industry meetings (N=2) Orbis

² Abbreviations: CEO: chief Executive Officer / PM: Product Manager / GM: General Manager / P: Publisher

³ SIC code 5920: sound recording & music publishing activities

⁴ SIC code 90012: producer of theater music

⁵ SIC code 46435: wholesale in sound- and image carriers

⁶ SIC code 6311: data processing/ webhosting

⁷ SIC code 7810: labor mediation

⁸ SIC code: 1820: reproduction of recorded media

⁹ SIC code 69105: patent office

1820, 69105 (46435)					Telephone contact during interpretation (N=1)
U2 Dutch/pop 5920 9002 ¹⁰ , 93299 ¹¹	2006	6	2 60 minutes 45 minutes	Mr. B (CEO)	Location & Respondent observations News articles Industry meetings (N=2) Orbis Telephone contact during interpretation (N=1)
Beastie Boys Classical 5920 46435	1995	9	2 60 minutes 30 minutes	Mr. R (CEO)	Location & Respondent observations News articles Orbis Telephone contact during interpretation (N=2)
Pearl Jam Classical 90012 6312 ¹²	2001	8	1 50 minutes	Mr. V (GM)	Location & Respondent observations News articles Orbis Telephone contact during interpretation (N=1)
Radiohead Classical 5920 6201 ¹³ , 59111 ¹⁴ , 46471 ¹⁵	1994	26	2 60 minutes each	Mr. J (F/CEO) Ms. F (PM)	Location & Respondent observations News articles Orbis Telephone contact during interpretation (N=2)
Talking Heads Classical 5920 7490 ¹⁶	2008-2015	1 (formerly 28, restart)	1 45 minutes	Mr. B (SM)	Respondent observations News articles Bankruptcy report Orbis Telephone contact during interpretation (N=1)
The Doors 6420 ¹⁷	2003-2010	0 (formerly 25)	1 30 minutes	Mr. M	News articles Orbis
Kiss Major 1820	1958	20	2 60 minutes 30 minutes	Mr. V (GM) Mr. S (DM)	Location & Respondent observations News articles Orbis Telephone contact during interpretation (N=2)

¹⁰ SIC code 9002: Services in performing arts

¹¹ SIC code 93299: remainder recreation

¹² SIC code 6312: webportals

¹³ SIC code 6201: develop/produce/publish software

¹⁴ SIC code 59111: producer of media

¹⁵ SIC code 46471: wholesale of home furniture

¹⁶ SIC code 7490: other specialised financial services

¹⁷ SIC code 6420: holding

Black Sabbath Major 1820 6420	1934	20	2 60 minutes 30 minutes	Mr. G (DM) Mr. E (GMD)	Location & Respondent observations News articles Industry meetings (N=1) Orbis Telephone contact during interpretation (N=2)
Industry experts			8 60 minutes each	Buma Stemra – Mr. L. (DM) SENA - Mr. B. (CEO) & Mw. R. (GM) ClickNL – Mr. O. Kazaa & SURFnet – Mr. H. Sony Music USA – Mr. Stapleton & Mr. Finlay Expert - Mr. Mertens Expert - Mr. Doeland	
Industry meetings			3	BUMA NL '14 IASPM Benelux '14 Eurosonic Noorderslag '15	Various informal interviews with key players in the music industry
Industry reports				NVPI (2004- 2014) IFPI (2010- 2015)	GfK (2014)

Appendix D: Interview guide multiple case study

Appendix D. I: Interview guide

Topic	Goal
<i>Introduction</i>	
Introduction & goal of the interview	Introduction
General Information: <ul style="list-style-type: none"> • Name • Position • Background • Company & company identity 	Who am I talking to? What kind of company am I talking to?
<i>General experience “disruption”</i>	
“Disruption”: <ul style="list-style-type: none"> • General experiences • Main challenges • Main opportunities 	General experiences, mood, perceptions, etc. How did the disruption affect the company and the company’s identity?
<i>Critical Events Timeline</i>	
Timeline: <ul style="list-style-type: none"> • Company specific • Developments over time 	Retrospective view on development industry & company – experience, response, time Changing identity: Central Distinctive Enduring
Identity developments over time: <ul style="list-style-type: none"> • Past • Present • Future 	Pre-disruption / disruption / post-disruption identity
<i>In comparison to others</i>	
In comparison to others: <ul style="list-style-type: none"> • Response • Performance • Position 	Identity as relational construct, External evaluation, Industry positioning, quality of the response

Appendix E: Data sources & Participants Focus Group Study

Appendix E.1: Data Sources Focus Group

Focus Group			
Type of group	No. of participants	No. of meetings	Secondary Sources
Focus Group	8-11 per time	11 & Launch	Company presentations Development reports Meeting minutes Publicity plan Promotional & news material Email exchanges Progress reports News articles
Industry experts	9	9 60 minutes each	Buma Stemra –Mr. L (DM) SENA - Mr. Bs (CEO) & Mw. R (GM) ClickNL – Mr. O Kazaa & SURFnet – Mr. H Sony Music USA – Mr. Stapleton & Mr. Expert - Mr. M Expert - Mr. D Expert - Mr. B
Industry meetings	n.a.	3	BUMA NL '14 IASPM Benelux '14 Eurosonic Noorderslag '15
Industry reports	n.a.	n.a.	NVPI (2004-2014) IFPI (2010-2015) GfK (2014-2015)

Appendix E.2: Data Sources Case Study Participants

Focus Group Participants

Firm Type Genre	Year of establishment	No. of employees	Participant(s)	Secondary Sources
B Music Independent Record Company Dutch	1997	7	Mr. B (CEO)	Individual (informal) interviews News articles Industry meetings
CN Music Independent Record Company EDM/Dutch	2004	9	Mr. D	Individual (informal) interviews News articles Industry meetings
N Music Independent Record Company Dutch	2006	3	Mr. P (CEO) Ms. DR Ms. S Mr. Z	Individual (informal) interviews News articles Industry meetings
BN Music Independent Record Company Dutch/Pop	2006	7	Mr. VB (CEO)	Individual (informal) interviews News articles Industry meetings
C Music Independent Record Company Dutch	2013	3	Mr. V (CEO) Mr. L (CEO)	Individual (informal) interviews News articles Industry meetings
H Music Independent Record Company & Publisher Dutch	2006	5	Mrs. R (CEO) Mr. VN (CEO)	Individual (informal) interviews News articles Industry meetings
Major Major	1934	25+	Mr. VE (GMD)	Individual (informal) interviews News articles Industry meetings
Brand Music Marketing Entertainment	2009	9	Mr H (CEO)	Individual (informal) interviews News articles Industry meetings
Tech Music White label Technology	2007	10	Mr. VR (CEO) Mr. Z	Individual (informal) interviews News articles Industry meetings

Appendix F: Chronology of MusicNL

Date	Description of Event MusicNL	Description of Event Music Industry
2001-2004		Introduction illegal downloading services Reduction of sale revenues in the Dutch music industry Numerous lawsuits against piracy
2006		iTunes online in the Netherlands
2007	Aggregator: <ul style="list-style-type: none"> - Introduction aggregator service by Tech Music, NMusic, BMusic - BNMUSIC: direct deal with iTunes - Others: Fuga 	Increasing popularity mobile phones with internet connection
2010		Spotify online in the Netherlands Increasing sale revenues from digital music in the music industry
2010-2014	Birth idea of MusicNL <ul style="list-style-type: none"> - Target market of Dutch language music consumers is online <10% - Existing streaming platforms slow to adapt to local market requirements (e.g. iDeal, label for “Dutch” language music) 	Bankruptcy Music Store (2012)
2014 <i>Phase 1</i> <i>Phase 2</i>	Start collaboration MusicNL <ul style="list-style-type: none"> - May: B Music & Tech Music - July: Major & BN Music - August: Other independents & Brand Music - November: Install advisory board (BN Music & CN Music) - December: Define cooperation 	Telco retreats from developing national streaming service (May 2014) Bankruptcy retailer Free Record Shop (Dec 2014)
2015 <i>Phase 3</i>	<ul style="list-style-type: none"> - January: Formalize responsibilities & guarantees - March: Technical & legal issues delay development (delay till 8-2015) - May: First app presentation - June: Web version presentation, include new billing method - July: Extensive testing - August: Installment back office Crash Apple Store (delay till 10-2015) - September: Fuga refuses to create “Dutch” label (delay till 11-2015) - October: Final call discussions - November: MusicNL online 	BMusic closes retail shop Launch Apple Music in NL Apple App Store Crash Apple Reduction floor space at Blokker Bankruptcy retailer V&D (2015)
2016	Slow growth MusicNL MusicBE expected to be launched	BUMA NL promotes MusicNL