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Getting IT to work for marketing: Exploring collaboration between marketing and IT functions for the delivery of marketing innovation

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Abstract

The success of marketing automation investments depends on information technology (IT) delivery possibilities being effectively linked to marketing business needs. Innovators, however, have run into problems with collaboration between marketing and IT, which has impacted the effectiveness of the delivery of these IT-enabled projects. Addressing these problems has provided the impetus for this study, which has made use of established frameworks. However, instead of focusing on new product development in large manufacturing firms — the typical context for previous research — this study has explored the business context of marketing innovations, considering projects that are IT-based services, rather than the physical products considered in previous research. Exploratory research of eleven firms consistently found problems with collaboration between marketing and IT departments, with subsequent impacts on the delivery of IT-enabled innovations. All the firms acknowledged interpretative barriers to collaboration and employed a variety of different tactics to overcome them. The key implication of the study's findings is that the success of marketing automation projects can be improved by dealing explicitly with interpretative barriers to collaboration. This paper offers suggestions for a framework to describe the barriers, possible mitigation tactics and direction for further research.

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Introduction

Digital marketing relies on technology

The importance of information technology (IT) systems to enable marketing innovation is increasing,[1] be it marketing automation systems, such as Aprimo, customer relationship management (CRM) systems, such as Salesforce, or lead nurturing systems, such as Eloqua. Gartner[2] continues to report strong growth in these sectors, for example CRM market growth of 14 per cent in 2013. Accenture[3] noted that 'marketing is more about digital now' and, in the research for this paper, the head of marketing for a large technology services firm commented that 'marketing

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has become massively reliant on IT platforms as we swing to digital marketing'. As marketing invests more in IT, the effective delivery of those systems is becoming critical to the success of modern marketing teams. An added complexity is the merger activity in this sector — for example, Aprimo was acquired by Teradata in 2011 and Eloqua by Oracle in 2012.

Cost over-runs, delays and scope-cutting

However, many IT projects struggle to deliver, resulting in either over-runs in costs and time, or scope-cutting to meet deadlines. McKinsey[4] found that 'on average, large IT projects run 45 per cent over budget and 7 per cent over time, while delivering 56 per cent less value than predicted'. The research for this project found that all firms interviewed had difficulties, with very few achieving on-time delivery and most experiencing cost overspends or scope-cutting to stay within budget or time constraints. Participants most commonly described their response to project delays as follows: 'we will extend the time to get the scope we really wanted to have'. This is probably in part due to typical optimism bias[5]. However, participants were consistently negative, for example when asked to rate IT project delivery using a scale of one to ten, with ten representing perfect and one disastrous. The comments of the participants in this study ranged from 'it's probably somewhere between two and three' to 'I would say they're eight out of ten'.

Collaboration is critical

While many elements contribute to these delivery difficulties (see Literature Review), the focus of this paper is the collaboration between marketing and IT functions (see Figure 1). Research for this project discovered that this was critical for all the firms interviewed. It is also of interest as it is a distinct project-related factor and, therefore, may be most easily addressed. Other success factors, such as business culture or technology complexity, are broader or external and, therefore, potentially less easily addressed.

Consistent experiences

This paper is based on exploratory research of eleven firms in the United Kingdom in 2014–2015. The interview participants were marketing or divisional leaders who had experience of implementing a range of IT-enabled marketing innovations (see Table 1). The participants reported consistent experiences across a variety of IT systems for marketing, ranging from CRM to digital acquisition projects.

Figure 1: Collaboration between Thought Worlds

Table 1: Research participants

					
Head of marketing Digital product	Divisional CEO Digital product	Head of marketing Business services	Head of marketing IT service product	Head of marketing IT service product	Head of marketing Business services
					
Chief marketing officer Digital product	Divisional CEO Professional services	Head of marketing IT service product	Divisional CEO Business services	Head of marketing Digital product	

Translation difficulties

All firms reported collaboration difficulties and consistently explained that these collaboration challenges had to do with the lack of a common language or framework. The most common problem was translation difficulties between marketing and IT functions. One divisional CEO commented that 'the firm's boundary person or "translator" speaks their [IT function] language rather than humanoid, so I have to ask him, "What on earth do you mean?" '

No common language

While many of the research participants employed tactics to address the collaboration challenges, there was a wide range and no common language or framework to describe these tactics. Moreover, while collaboration was described in all interviews as important, few firms had employed structured tactics and most had ad-hoc approaches. The most common mitigation tactic was employing a bridging or boundary person to translate.

Other findings were that most firms were increasing the IT understanding of their marketing staff and most reported that marketing was increasingly driving the IT agenda. In addition, most firms were in the process of adopting agile, the new approach to software development (explained in Literature Review). No participants described this as a contributory barrier, with most categorizing the shift to agile as a positive factor.

A structured problem framework

Collaboration between functional groups has been well researched by academics in other contexts (see Literature Review), but typically within large manufacturing companies. However, this research considered IT services-type projects that do not have a physical presence. A marketing automation system cannot be collaboratively discussed in the same way as a prototype for a physical product, such as a car or table.

The research for this project presents both frameworks for describing the collaboration challenges, or interpretative barriers, between functional teams[1] and potential tactics to overcome these barriers.[6–8] Some of these tactics were employed by the research participants. This paper offers a structured problem framework, which can be used to identify or describe problems with collaboration between marketing and IT for marketing automation projects, and gives examples of mitigation tactics that hold the potential to overcome these problems.

Literature review

Over-optimism about IT

A firm's competence in leveraging IT has been extensively described as a competitive advantage[9,10] and as a form of dynamic capability.[11] However, many firms struggle with IT development delays or cost overspends when delivering new product or service innovations. Considerable labour and research has been invested in the estimation of software development efforts, yet organizations continue to be overly optimistic about the cost and time of IT builds. In the United Kingdom, one of the world's largest IT developments was abandoned in 2013 by the government after costing £10 bn.[12] More recently, this situation has been further complicated due to the increasing adoption of agile software development.[13]

Barriers and mitigation

The delivery of IT systems for marketing depends on the collaboration between marketing and IT functions. The importance of collaboration

between functional teams for innovation is well established in the literature.[14–16] The primary concepts from the literature used to frame the research problem were:

1. Interpretive barriers to innovation.
2. Associated mitigation tactics to overcome these barriers.

IT systems for marketing

The use of IT systems for marketing has been researched over a decade of steadily expanding use. In particular, companies have invested significantly in CRM systems. Gartner[2] estimated the market for CRM software in 2013 at $20 bn. However, multiple studies describe problems with CRM investments. Hendricks *et al.*[17] found no evidence of increased profitability or share price for firms that invested in CRM. Reimann *et al.*[18] found that the success of CRM implementations depended on many factors, including industry type. Additionally, Khodakarami *et al.*[19] also found a range of CRM success factors, including the primary business focus, for example, customer service v analytical decision support. Foss *et al.*[20] found that CRM success factors included appropriate planning, clarity of objectives and change management. Hunter *et al.*[21] explained that a critical success factor of CRM and associated sales automation tools to achieve results was the skills of the salesforce users of such systems — this is comparable to the Technology Acceptance Model.

No simple answer

While the research describing the measurement of success of information systems is extensive and well established,[22] the research on factors that drive success is very broad. As could be expected for a complex business problem, as demonstrated by the examples above, there is no simple answer to ensure success. This paper focuses on one success factor: collaboration between the functional teams of IT and marketing.

Interpretive Barriers

The foundational paper by Dougherty (p. 182)[1] describes interpretative barriers to new product innovation and explains that 'departments are like different thought worlds', and 'organisational routines separate, rather than co-ordinate the thought worlds'. These thought-world interpretive barriers result in the partitioning of information and meanings, which 'produces a qualitatively different understanding of product innovation' (p. 195). The organizational routine interpretive barriers 'inhibit the kind of collective action that is necessary to innovation' (p. 195). Dougherty describes two interpretive schemes that inhibit innovation: departmental thought worlds and organizational product routines. Dougherty's article builds upon three findings from previous literature relating to product innovation:

1. commercial success depends on meeting customer needs;
2. collaboration among departments contributes to product success; and
3. technology is not often linked with marketing

Mitigation tactics

Mitigation tactics are described by Dougherty as 'collaborative mechanisms' to overcome interpretive barriers (p. 195). The foundational articles for research of this area are those that discuss boundary spanning[6,7]

and new product innovation team organization.[8] Carlile[6,7] explores the way in which knowledge can be both a source of innovation and a barrier to innovation, and proposes a pragmatic approach with different boundary objects, depending on the boundary type.[6] A 'syntactical approach' involves process objects (eg, standardized methods) when there is a common language between teams, and a 'semantic approach' attempts to integrate or translate objects (eg, models or maps) between specialist 'thought worlds'.[1] More recently, Carlile[7] has described a case study of a 'collaborative engineering tool' to help with boundary communications.

Organisational mitigation

A further mitigation tactic is the team organization approach to integrating functional, or specialized, capabilities, explored by Clark and Wheelwright.[8] They introduce the concept of heavyweight teams and describe this approach in action, using the example of Motorola's Bandit pager development. The heavyweight structure gathers members from functional groups into a semi-autonomous team with the responsibility and resources to take a project from idea to implementation. Clark and Wheelwright describe three alternative organizational structures as 'functional', 'lightweight' and 'autonomous'. Clark and Wheelwright's autonomous structure is comparable to creative project teams.[23,24]

Collaboration for innovation

The underlying issue of the study was how complex organizations, which are sub-divided by necessity into functional teams, collaborate together on new product innovation.[1,6,8] The literature describes new product innovation as dependent upon the effective collaboration between functional teams.[14–16] Leonard[25] argues that most innovation takes place at the boundaries between disciplines. Smith, Collins and Clark[14] found that, in technology firms, 'the rate of new product and service introduction was a function of the organization member's ability to combine and exchange knowledge'. Collaboration problems in the new product development (NPD) process have been described in the literature as barriers to success.[26–28]

Collaboration for NPD

More broadly, interpretive barriers and boundary spanning are frequently referenced as major themes in the literature. Most recently, a meta-analytic review of the literature on NPD team performance concluded that 'effective boundary spanning within and outside the organisation and a shared understanding of project objectives are paramount to success' (p. 803).[29] Consistent with Dougherty's[1] description of interpretative barriers, an article by Cross and Cummings[30] argues that relationships crossing organizational boundaries can 'provide unique information'. Relating this to outcomes, Smith, Collins and Clark[14] propose, based on a study of technology firms, that the rate of new product introduction is related to the ability of team members to 'combine and exchange knowledge' and they argue that knowledge creation is linked to new product innovation.

Agile v waterfall

Agile software development is a high-profile trend among businesses.[13] It is a range of industry-standard methods for managing software design, coding and testing. A highly iterative and interactive organizational routine, it is very different from the traditional approach, often referred to as 'waterfall', which is a linear, very structured and documentation-

dependent approach. While agile dates from the late 1990s, its adoption by non-software firms is a work in progress, as demonstrated by the findings from this research.

Working software over documentation

The goal of agile is to reduce IT development costs through a very different organizational routine, and it has the potential of surpassing the efficiency of waterfall methods by significantly changing functional team collaboration.[31] Agile methods 'value working software over comprehensive documentation',[32] and therefore the process of collaboration with IT departments changes from the emphasis on documentation in the waterfall method to the personal interaction advocated by agile methods. In this paper, 'agile' refers to agile software development and does not refer to the business trend towards applying the agile approach to marketing[33] — this was not raised by any of the interview participants.

Storytelling and agile user stories

Storytelling has been considered a tool for innovation,[34] but it is extensively used in agile methods to transfer and translate knowledge between the product design and IT development teams.[31] In comparison, traditional waterfall development relies on detailed documentation of requirements. Agile user stories have a very specific format, designed to help the author (new product innovation functional team member, often called the 'product owner') to be descriptive and the reader (IT department team member) to take action. User stories follow a pattern: 'As a [persona], I want to [do something] so that I can [derive a benefit]'. These user stories are written on cards, usually index cards or Post-It notes (Figure 2), which are then posted on 'task boards' for review and prioritization in 'stand-up' meetings. These user stories are, in practice, examples of semantic boundary-spanning objects[6] that are intended to integrate and translate between the specialist 'thought worlds'[1] of the new product and IT functional teams.

IT documents

By comparison, in the traditional waterfall method, the IT department is typically the author of the documentation of requirements (see Table 2). This documentation describes the behaviour of the system that is required, detailing the functional requirements. Typically, the author (IT department) will require the new product innovation functional team to

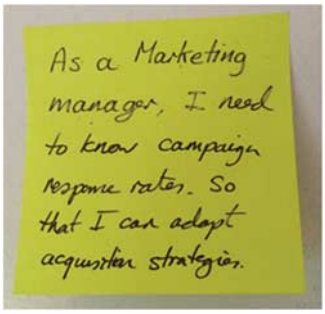

Figure 2: Agile User Story

Table 2: Waterfall IT requirements descriptions

Function	Title	Description
A001	Schedule check	Retrieve appointment schedule time slots Express time slot may be available while normal slot is NOT available for Day +1
A002	Appointment schedule	Open calendar window Display 10-day view from current date. Future weeks are available with scroll up to 3 months

formally sign off on this requirement document at the end of the analysis stage in the IT waterfall process.

Collaboration v transactional communication

An important difference between agile user stories and waterfall requirements specifications is that the former are iterated jointly by the new product owner (called 'certified product owners' under Scrum Alliance's approach to agile) and IT teams (led by a 'certified scrum master' under Scrum Alliance's approach to agile). Knowledge of what can be built, as well as familiarity with customer need, is exchanged and integrated using the user stories as boundary objects. By comparison, waterfall requirement specifications are part of a linear process, where knowledge is typically communicated in a single direction, that is, from the new product team to the IT department.

Literature development

Development in the literature of the collaboration concepts[1,6,8] is generally through articles that explore their application in specific industries or situations. Examples of this include the situation specifics of collaboration across hierarchical boundaries[35] or the industry specifics of collaboration in the development of the high-speed train line from Amsterdam to Brussels.[36] Literature referencing boundary spanning[6] includes articles that test the application of, for example, boundary objects as tools to mediate conflict among distributed networks of graduate student engineers.[37]

Clark and Wheelwright's[8] new product innovation team organizational concepts have been further developed in the literature. For example, Obstfeld[23] defines 'creative project teams', which are a refinement of Clark and Wheelwright's autonomous structure, but also make the link to organizational routines.[38–40] Obstfeld argues that creative project teams are non-routine and therefore overcome the stability or inertia of organizational routines. Further to this, Bakker *et al.*[24] investigate the impact of time frames on the outcomes of temporary creative project teams. They propose that teams with a short time span 'utilise a more heuristic mode of information processing'[24] and, although these teams may include representatives from different functions or Dougherty's 'thought worlds',[1] they adopt a high-level approach to analysing information and overcoming collaboration barriers.

Additional concepts from the literature that were considered but not included were modularization[41,42] and organization routines.[38–40] On reflection, these concepts did not help answer the research question and the opportunity to build upon them was limited.

Limitations

This literature review demonstrates a general acknowledgement of the importance of collaboration between functional teams for new products. However, not all topics are addressed by the literature.

Lack of empirical data

First, there is limited research investigating the different tactics to mitigate interpretive barriers and to support collaboration between functional teams.[35,36] More generally, the literature on barriers to innovation, only one of which is collaboration, considers only broad themes and empirical data is not common.[28]

Non-physical projects

Second, seminal articles on the barriers to collaboration[1] and on mitigation[6,7,43] are largely based on product development in manufacturing firms and not on the marketing innovations in service-orientated firms, in which the research question for this study was primarily interested. For example, Dougherty[1] researched five large firms in the computer and chemical industries, Carlile[6] researched high-volume product production firms, and Clark & Wheelwright[8] described Motorola's Bandit pager development. Instead, this research explores non-physical marketing automation IT projects. The lack of a physical boundary object between IT and marketing potentially means that the functions will not have shared mental models.[44,45]

Little research into impact of agile

Third, no articles were found that researched the impact of the adoption of agile on collaboration between functional teams. Since it is relatively new, it is understandable that any academic literature on agile focuses on its application and benefits,[31] rather than impact. There are articles discussing research methods for the internal organization of an agile team[31], but not how an agile team works in a broader organization.

Research design

Research problem

The research question guiding the project was: 'How does collaboration with IT functional teams relate to marketing innovation success?' Behind this question was the research problem, which considered typical IT development delays or cost overspends that firms encounter when delivering new service product innovation. Considerable effort and research[46] has been invested in the estimation of software development efforts, yet organizations continue to be overly optimistic about the cost and time of IT builds.

The key concepts from the academic literature that were explored in this research were the interpretive barriers to collaboration between functional teams for new product innovation[1] and mitigation tactics to overcome these barriers, including boundary spanning[6,7] and new product team organization.[8,23]

Barriers are hard to investigate

The research approach was exploratory, since it was meant to provide insights and understanding of interpretive barriers (thought worlds and organizational routines) between marketing and IT functional teams.[1,47] It also sought to understand the associated mitigation tactics to overcome these barriers, including boundary spanning objects, roles and communications,[6] and team organization.[8] The exploratory approach was appropriate as interpretive barriers to collaboration and mitigation tactics, the subject of the study, are difficult to investigate with business participants.[48] In addition, as the adoption of agile is a recent trend, its

relationship to collaboration required further definition before any findings could be confirmed with a conclusive research design.

Elite interviews

The research method used semi-structured interviews with marketing managers from service-orientated firms who had some responsibility or oversight for new marketing innovations. Semi-structured, elite interviews are appropriate for an exploratory approach because they have the advantage of uncovering a greater depth of insight than, for example, focus groups or survey methods (see Malhotra p. 87,[47] and Cassell p. 11[49]). One drawback of elite interviews is that they necessitate a relatively small sample size — however, a small sample size is appropriate for an exploratory research design. Another risk of this method is exception fallacy: the interviewees' accounts may not be accurate, since an executive may not know all the details, or the subject being discussed may be politically sensitive. However, to mitigate the latter, this research used strictly anonymized interviews to reassure the participants. The risk of exception fallacy was minimized by either using two interviews from each firm or triangulating a single interview with secondary data.

Complex stock of knowledge

There is a potential interpretive barrier between academic concepts and business practitioners. The concepts from the literature use the concepts of 'boundary objects'[6] and 'heavyweight teams'[8] that are unknown in business. Therefore, interviews were also appropriate for this study as they allowed the interviewer to explain these concepts and check understanding. Semi-structured interviews are appropriate when participants have a 'complex stock of knowledge' (see Flick p. 157[50]) as the method enables theory-driven, open-ended questions to help make 'interviewees' implicit knowledge more explicit' (Flick p. 157).

Interactive interviews

More specifically, elite interviews were deemed appropriate for this study as they enable access to topical insights and facilitate the explanation of concepts to the interviewees, therefore delivering better data than other tactics (see Dexter p. 3[51]). The use of interviews enabled interactive exploration of barriers to innovation and provided the opportunity to address problems tactfully. The chosen participants for this study were considered elite because, as senior managers, they are usually difficult to access. This group was selected because innovation is important to business success[29] and, as senior managers, they had a viewpoint on their organization's marketing innovation.

Research propositions

Building on the key concepts from the literature in light of the research question, the research propositions were, therefore, as follows:

- To replicate previous research, demonstrating that collaboration between functional departments is a factor in the business outcomes of new innovations.[14–16]
- To extend the findings of previous research to service-oriented projects regarding common interpretive barriers to collaboration between functional departments.[1]
- To add empirical findings to the literature that considers research on firms using comparable tactics to mitigate the interpretive barriers between functional teams.[6,7] These tactics include organizational routine or processes, in addition to boundary and organizational responses.

Participants and sample

Focus on service innovations

The population for this project was firms with a service product emphasis, or marketing departments focused on service innovations (such as marketing automation). In keeping with the focus of the research question, NPD in manufacturing firms was consciously excluded from the sample, since this population had already been widely researched.[52] The unit of analysis was the firm. To mitigate the risk of exception fallacy, either two participants from each firm or one participant plus contemporary background materials were used.

Service-oriented firms

The research design involved a purposive extreme sample (see Malhotra p. 96[47] and Jankowicz p. 279[53]). This was in keeping with the research question and the extreme examples were intended to explore different firm types (eg, professional services v digital products). These extremes were selected because much of the existing literature only considers larger manufacturing firms and because they were in keeping with the research problem, which acknowledges that IT delays or overspends are common in service-oriented firms. In total, eleven firms were included to enable triangulation — three through secondary elite interviews, six through informal meetings with other staff and the remaining two through secondary documentation.

Senior managers and leaders

The sampling frame was senior marketing managers and business leaders from firms that have insight into the process and outcomes of new marketing innovations. The participants were asked whether their comments could be shared by other departments, for example business intelligence or finance, which were also involved in the projects. For three of the firms, the secondary interviews were of participants from the IT function. The different views of other departments were explored, either by questioning the participant or through secondary interviews or secondary documentation.

Data collection and analysis

Commercial confidentiality

The participants were accessed from existing business contacts. The interviews of between 45 and 60 min were generally recorded and transcribed. To ensure confidentially, all participants were asked not to use company names or recognisable details in the interviews and recordings were password protected. Template analysis was used to reflect the exploratory approach outlined above. This is a method used for realist qualitative analysis of semi-structured interviews, when the objective is to explore 'underlying causes'(see Cassell p. 256[49]). For the purposes of this research, it was used to explore the underlying causes of interpretative barriers to collaboration and mitigation tactics for overcoming them. Software (HyperRESEARCH) was used for the coding of the transcript and the template was revised throughout the analysis (Cassell p. 259). An initial, '*a priori*' template was developed based on the concepts found in the literature.[1,6,8] This was revised throughout the interview process[49] — the final template is shown in Appendix.

Research findings

The findings from the research sample of eleven firms are shown in Table 3. The key themes found are outlined below, summarizing how they contribute to the understanding of this business issue.

Delivery problems

All firms struggled to deliver IT projects for marketing. One participant commented, 'It was bloody painful'. This was mainly due to experiencing delays. Another participant admitted, 'We will extend the time to get the scope we really wanted to have'. All firms struggled with collaboration between IT and marketing and reported that this contributed to the delivery difficulties.

One head of marketing commented on the gap between the functions: 'When I went down to the IT floor … there was this general look of, "who is this person? He's not obviously in IT and what is he doing on our floor? Has he come to the wrong floor?" ' However, a couple of firms stated that collaboration was improving significantly: 'It's probably the first time in my career that … we can tick all the boxes … We're ahead of where we were expected to be … We're proud of that'. Collaboration between functional departments was found to be a factor in the outcomes of marketing innovation, thus replicating previous research.[14–16]

Need for translation

The need for translation, or descriptive barriers,[1] between marketing and IT was the most frequently found barrier to collaboration, with one participant commenting, 'I had to learn a completely new language that was specific to IT … I have a translator, who is my operations director, and he went native years ago, so that he speaks their language rather than humanoid, so I have to ask him, "what on earth do you mean? What does that acronym mean?" And there is definitely a barrier there and that needs to be broken down'. The participants focused on the problems, despite being asked neutral questions (Jankovicz p. 268[53]).

Siloed behaviour

Other barriers included different interpretations of the same information by different functional teams. According to one participant, 'It is siloed behavior … People happily … thinking they're doing the right thing. It's only when you get to the big unveil — or just before — you realize, actually, you've misunderstood'.

Inhibitions on collective action

Although less common, differences in 'ways of working' and organization routines[39] or process barriers also contributed to collaboration difficulties. These limited the interaction of the different functional teams and inhibited their collective action. For example, one participant said, 'Communication can be a barrier. People not understanding the development lifecycle of IT can cause confusion and frustration'. These findings replicate previous research,[1] although in a new context of service-product-type development.

Increasing use of agile

None of the interview participants stated that agile had a negative impact on collaboration and many were positive. Most firms were increasing their use of the agile approach to IT development, but it was a work in progress for all.

Variety of mitigation tactics

All the firms participating used tactics to mitigate the interpretive barriers between functional teams — the discovery of these tactics adds to the findings of previous research.[6] For example, one organization had implemented a structured process for communication between functional

Table 3: Research findings

		Digital product	Digital product	Business service	IT service-product	IT service-product	Business services	Digital product	Professional services	IT service-product	Professional services	Digital product
Business profile												
	Service product firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Interview participant role	Head of marketing	Divisional CEO	Head of marketing	Head of marketing	Head of marketing	Head of marketing	CMO	Divisional CEO	Head of marketing	Divisional CEO	Head of marketing
Problem scope	Business outcome impacts											
	Perceived problems?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Over time?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		
	Over budget?										Yes	
	Out of scope or quality?					Yes	Yes		Yes	Yes	Yes	
Barriers to collaboration	Factors impacting IT and marketing collaboration											
	Collaboration barriers or problems?	Yes	Yes	Yes	Yes	Yes	Yes	Improving	Yes	Yes	Improving	Yes
	Descriptions or language differences?	Yes	Yes	Yes		Yes	Yes			Yes		
	Interpretation of facts or data differences?				Yes				Yes	Yes	Yes	Yes
	Organization process or routine differences?						Yes		Yes			Yes
	Collaboration impacts outcomes?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Agile contributes to problems?											

Table 3: (*Continued*)

		Digital product	Digital product	Business service	IT service-product	IT service-product	Business services	Digital product	Professional services	IT service-product	Professional services	Digital product
Response tactic	Mitigation tactics to facilitate collaboration											
	Boundary objects					Yes		Yes	Yes	Yes	Yes	
	Boundary roles	Yes	Yes	Yes			Yes		Yes		Yes	
	Boundary processes and communications				Yes	Yes	Yes	Yes				Yes
	Organization design or teams					Yes		Yes	Yes		Yes	Yes
	Effectiveness of these tactics	Medium	Medium	Medium	Medium	Medium	Medium	Improving	Medium	Low	Medium	Medium
Context	Business environment											
	Skills transfer or career moves	Low	Low	Low	Growing	Growing	Growing	High	Growing	Growing	Growing	Growing
	IT and marketing											
	Power, budget, knowledge or hierarchy	IT	Business, growing	Marketing growing	Marketing growing	Marketing growing	Marketing growing	Business	Business	IT	Business	Business
	Use of Agile IT	Growing	Growing	Low	Growing	Growing	Low	Growing	Growing	Low	Growing	Growing

teams that 'create[d] a common language for both teams to sort of talk about and understand something that the organisation want[ed] to go and do, an innovation'. However, these tactics varied considerably between organizations, both in the type and in the depth of the use of these tactics. While there was awareness by the participants of boundary roles (eg, 'we hire project managers who know both the business and IT to help translate'), the tactics employed were varied and the descriptions messy. Only probing in the interviews exposed the differences in approach. The most frequent response was the utilization of a 'translator' boundary role between the teams. But others used processes, such as steering committees and approvals, although some were negative towards this tactic, stating, 'ours is the bureaucracy model … death by committee'.

T-shaped skills

Finally, most firms were increasing the IT understanding of their marketing staff, and most reported that marketing was increasingly driving the IT agenda. Most participants were in the process of adopting agile, with most describing this as a positive contribution to collaboration, that is, 'it drives collaboration'. This tactic of training marketing staff to have an insight into or appreciation of IT is well described as T-shaped skills,[54] where a person with deep knowledge, in this case of marketing, is represented by the vertical bar of the T and those with shallower but broader boundary-spanning competencies, including IT, are represented by the horizontal bar of the T.

Research conclusions

Barriers to collaboration

Interpretive barriers to collaboration between functional departments, similar to those discovered in previous research,[1] were consistently found during this study. For example, one participant said, 'communication can be a barrier. People not understanding the development lifecycle of IT can cause confusion and frustration'. Another participant explained the problems that occurred when the marketing team needed to prototype ideas, but the IT team was structured for large projects: 'I'm often surprised when we have this great idea and just to [have someone] look at the idea you get a bill for a couple of hundred thousand dollars'. Despite neutral questions and prompts (Jankovicz p. 268[53]), the interviewees focused on the problems or barriers, for example, 'a culture of fire-fighting struggles to understand constraints or perceived constraints of IT deliverables'. Barriers were mentioned more frequently than mitigation responses. These findings added to previous research by contributing empirical examples from service or virtual product projects.

Problem framework

A potential common language

Leveraging the known and established academic frameworks (see Literature Review), and reflecting the research findings from this paper, Table 4 display a potential common language, or framework, that can be used by business practitioners to identify and understand their firm's problems, which can then enable them to make the case within their organizations to deal explicitly with the interpretive barriers to

Table 4: Problem framework

Collaboration barrier	Description	Example
Descriptive 	The functional departments of IT and marketing inhabit different thought worlds, often with different languages	'[IT] has a completely different language from the one that we [marketing] understand … "instances" and "service" and "data warehousing" … Then we, the marketing people, have to roll our sleeves up and try to understand' For example, both IT and marketing have different meanings for 'test'. A test for marketing can be of a new campaign against a control. IT, however, especially with waterfall development, is usually testing code or systems against test scripts, for pass or fix
Interpretative 	Marketing and IT can interpret data or facts differently	'It is siloed behavior … People happily … thinking they're doing the right thing. It's only when you get to the big unveil — or just before — you realise actually, you've misunderstood' Again, using the example of tests: IT interprets the failure of a test script as requiring fix and re-test, whereas marketing responds to the failure of a test campaign by creating a new campaign for test
Process 	Process, or organization routines in firms, can be defined formally in company policies, or informally in the culture, as the way things are done. Departments can have different processes that are not complementary. These barriers, or differences in process, 'inhibit the kind of collective action that is necessary to innovation' [1]	'Part of the reason for the massive delay … [is] a lack of co-ordination of effort', and, on marketing and IT processes, 'they are certainly not linked in any way' One example is marketing's process for allocation of budgets, which is often linked to sales or other customer goals, whereas the IT budget process may be centred on maximizing the utilization of a fixed resource base, often called a 'tech pool' On implementation of agile: 'Well, I think it drives collaboration', and, 'it seems to be working better'

collaboration that contribute to problems delivering IT for marketing innovations.

Barriers to collaboration

Table 3 provides examples of the collaborative problems (barriers) described during the research interviews. All participants reported examples of the interpretative barriers, with the most common being descriptive or language barriers (see Research Findings). Given these collaborative problems, all participants also consistantly reported delivery problems of IT-related marketing innovations. For example, one participant said of a CRM system, 'We implemented in around three-and-a-half years and, honestly, it was bloody painful'.

Mitigation tactics

Tactics to overcome the interpretative barriers are known and established in the academic literature (see Literature Review), although, again, these are mainly from studies evaluating a different business context (NPD in manufacturing firms).

All the firms participating in the study used tactics to mitigate the interpretive barriers between functional teams, and discovering these added to the findings of previous research.[6] The mitigation tactics found in the research for this paper (see Research Findings) varied considerably between organizations (see Table 5). The most frequent tactic was using a 'translator' boundary role between the teams. Another organization had implemented a structured process for communication between functional teams that 'create[d] a common language for both teams to sort of talk about and understand something that the organisation want[ed] to go and do, an innovation'.

Varied mitigation tactics

The descriptions of tactics were even more varied. While there was awareness among participants of boundary roles (eg, 'we hire project managers who know both the business and IT to help translate'), uncovering the other tactics required exploratory questioning, as they were all described differently (see Table 6). Other mitigation tactics described in the literature include organizational routines or business processes to bridge between functions.[6,7] This tactic is to build a process of approvals, committees or documentation that link marketing to IT development. One participant in this research described his firm's process-based response to collaboration difficulties: 'Ours is the bureaucracy model … Everything has to go through the IT governance on the forms and stuff that goes with that'. The same participant did go on to comment: 'Some of those disciplines are very good. But, the problem with those disciplines is they're very rigid. They're a committee meeting, a form … So, that makes it more difficult to do some of the newer stuff'.

Project teams

Finally, a further alternative mitigation tactic is organizational structure or project teams.[8,23,24] Barriers can be overcome through creating a semi-autonomous team that includes members from functional groups and

Table 5: Mitigation tactics summary

Mitigation tactic	
Boundary roles Translator role to bridge between functions	
Boundary objects Prototypes, documents or descriptions to bridge between functions	
Thought world skills Training to build insight into other functions	

Table 6: Examples of mitigation tactics

Mitigation tactic	Description	Examples
Boundary roles	Translator role to bridge between IT and marketing functions	One participant spoke of the digital project manager role: 'They do a translation where they "interpret" … for IT'. Another described their boundary person: 'He speaks their language, rather than humanoid'
		
Boundary objects	An example from manufacturing is a clay model of a prototype car on which both engineers and product designers jointly collaborate to develop. With service products or innovations, the virtual equivalents include user stories (which are core to agile) or user journeys	Participant firm for 'digital innovation' built a virtual prototype for which they not only collaborated with marketing and IT to develop, but also with key customers: 'Amazingly, they gave us oodles of time — really phenomenal', with outstanding results. 'When we finally went to market, the product worked … and, surprise, surprise, customers actually wanted to buy it'
		
Skills, thought worlds	Up-skill or hire marketing staff with an insight on IT language, processes and technology. The emerging UX roles are examples	Up-skill marketing with new skills: 'All marketeers have got to be digital'. Or recruit new skills: 'I worked with the IT Director, who had an IT guy who was much more interested in marketing than he was in IT and we practically herded him from one team to the other — and it worked brilliantly'. And 'They were recruited specifically because they have a foot in both camps' Briefing IT function on business details: 'I took myself and a couple of the key team members over, sat with IT and explained to them why we wanted it in this particular market … Got a good response … Made a difference in delivery times'
	Engage the IT department on business strategy beyond development of needs definition	

giving them both the responsibility and resources to take a project from idea to implementation. The teams can either be temporary, with representatives from functional departments who retain their organizational reporting but have a project responsibility to an empowered leader of the 'virtual team', or they may be made up of more permanent secondments, who could be brought into a special project, 'skunk', or special project team. Research for this paper identified a few instances of this. For example, one participant described how a team functioned: '[We] gather a spokesperson from each group … Get alignment … Go

back to align their part of the ship', with the goal that 'we'd all, of course, start rowing in that direction'.

Future research

Relevance to business practitioners

These findings are intellectually relevant, as they build upon existing concepts from the literature, extend the literature with empirical findings from contexts not previously researched (marketing departments in service-oriented firms and marketing service innovations), and add insight into a topical business issue (the agile process). The findings are relevant to business practitioners, especially regarding the explicit consideration of mitigation tactic options, given the prevalence of interpretive barriers and their impact on business outcomes.

Use of agile

Future research could explore further the different benefits of the mitigation tactics. A future, more in-depth study could raise awareness of the range of mitigation tactics and ways of implementing them, where appropriate. More specifically, the use of agile and user stories, mentioned by a number of the participants, could be explored as a potentially high-benefit mitigation tactic. As one participant explained, 'With agile, you're doing stories and there's less documentation. It's got to be all about collaboration and people coming together, and working through the service product requirements in real time … You move very quickly'. Given its collaborative method, agile has the potential to be an effective mitigating tactic for the problems found in this research. Agile user stories could potentially act as the boundary object for IT service projects that physical prototypes provide for manufacturing firms.

Shifting power balance

The research findings included insight into the development of IT skills in marketing and the potential of the 'UX' (user experience) roles. Findings also included insight into the power balance between IT and marketing, with a trend towards the latter controlling the budget. While the findings did not highlight differences between functional teams' underlying perceptions of collaboration, this was not explored in detail. Further research could explore these aspects of skills and organizational culture.

Agile marketing

Finally, future research could explore the implications of an agile function collaborating with marketing departments that are either traditional brand-led marketing teams, or are what is sometimes described as 'agile marketing' with a more digital 'test-and-learn' approach.[33]

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Appendix

Interview guide

Q1. What is your organization's level of adoption of agile methods?

Q2. How would you describe your organization's experience of delivering new product or service innovation projects?

- 2.1 Tend to be delivered on time?
- 2.2 Tend to be delivered on budget?
- 2.3 Tend to be delivered to quality or scope?
- 2.4 Tend to perceived within your organization as a success?

Q3. How would you describe your organization's experience of collaboration between functional teams in the new product or service innovation process, and any impacts on business outcomes?

- 3.1 Does the new product or service team and the IT team interpret the same information or data differently?
- 3.2 How would you describe alignment or co-ordination between the organizational processes or procedures used by the IT team and the new product team?
- 3.3 How does the IT team work with the new product or service development?
- 3.4 When developing new products or services, are there differences between descriptions or language used by the IT team and the new product team?
- 3.5 Are there differences in ways of working between the new product or service team and the IT team limit that complement or complicate their interactions?
- 3.6 How does collaboration impact new product innovation business success?
- 3.7 How does adoption of agile impact collaboration?

Q4. How would you describe your organization's strategy or tactics to facilitate effective collaboration between functional teams in the new product or service innovation process?

- 4.1 When developing new products or services, is collaboration helped by the use of common documents, models or objects to bridge between departments?
- 4.2 When developing new products or services, is collaboration helped by staff with specific roles to bridge between departments?
- 4.3 When developing new products or services, is collaboration helped by communication procedures or processes that combine knowledge and bridge between departments?
- 4.4 How do these tactics help new product innovation business success?

Q5. How would you describe the organization and authority?

- 5.1 Skills transfer, career paths, valuation of cross-team skills or encouragement? What proportion of your team has worked on the other team?
- 5.2 Who has formal power (budget, resources) vs. informal power (expert, relationships and influence)? Who controls the NPD budget? And what happens if IT budget is overspent?

Q6. Would your descriptions of collaboration be shared across the organization?

(Semi-Structured Guide for Elite Interviews, adapted from Malhotra p. 87[47] and Cassell p. 11[49])