1. When the Cloud Runs Out of its Silver Lining

Abstract:

Cloud computing services are central to most organizations' IT portfolio. Adopting a cloud computing strategy typically involves a one-way migration of IT skills and capabilities out of the organization. Therefore, it is interesting to observe what happens when organizations wish to end such engagements. Based on a survey of Spanish firms, we list some key insights on software as a service (SaaS) contracts in comparison to contracts containing Application development and maintenance and others containing hardware services. We find that satisfaction levels are generally high and premature termination is lower in the case of SaaS contracts compared to application development and hardware contracts. Post-termination, the typical strategy is to move to new external providers. Termination is associated with vendors' service quality rather than relationship management. Unlike in the case of application or hardware contracts, SaaS contracts do not appear to suffer from the challenges of know-how transfer.

Keywords

Outsourcing, SaaS, Termination, Exit Satisfaction.

1.1 When the Cloud Runs Out of its Silver Lining

Firms have been steadily moving to the cloud as the dominant source for procuring Infrastructure and Software. Gartner estimates the market size for this industry to be around $250bn [1]. Moving IT infrastructure to the cloud brings with it various advantages of scalability, reliability and better cash flow management [2]. However, as in any outsourcing arrangement transaction costs can undermine the value of outsourcing.

Transaction costs or friction in the outsourcing arrangement can manifest itself in creating hold-ups between vendors and clients that have made relation-specific investments. To counter such friction, contracts have evolved to include a fine balance of formal and informal controls [3]. Literature has also addressed how clients that have severed an outsourcing arrangement might opt for backsourcing, where the client takes back in-house work that was once outsourced [4].

The context of cloud computing shares various similarities with traditional outsourcing but differs starkly in others. The concerns, drivers and values accrued from cloud computing are often like those from traditional outsourcing [5].

1.1.1 Comparison of the Drivers of Adoption

Let us first consider the literature on IT outsourcing drivers:

The drivers of outsourcing tend to be cost reduction, the ability to focus on the core business while the vendor can specialize in the service being provided, and access to scarce capabilities.

Comparing the drivers for outsourcing IT internationally, Apte et al [6]. find cost reduction to be the most important driver followed by access to capabilities that the firm did not possess. Ang and Cummings [7], McLellan et al [8], Smith et al [9] highlight the focus on reducing the cost of the IT operations. Loh and Venkatraman [10] separate the cost argument further into the cost reduction potential in IT and the cost reduction potential of business operations.

Loh and Venkatraman [11] list the internal business cost structure, and internal IT cost structure as two key determinants. The paper also shows that low internal IT performance is an important driver to lead to externalizing IT.

The aspect of enhancing the performance of IT departments was also identified by McLellan et al. [8]. They also raised the issue of financial motives to outsource the functions of the IT department. Building on the literature on Resource Based View [12] scholars of IT outsourcing have identified accessing scarce capabilities an important motivation to outsource IT capabilities [13]. The argument here being that IT service providers with superior capabilities and economies of scale can offer IT capabilities that the focal firm may not be able to possess even at a higher cost.

The third common explanation for why firms would outsource their IT capabilities is to focus on strategic core functions and assign their non-core IT functions to external providers. Slaughter and Ang [14] examine the labor side of IT capabilities. They identify that in uncertain times and dynamic economic times, firms seeking a competitive edge are likely to outsource IS jobs when IS is not core to their business. Further given that IS jobs are likely to face volatile demands, the job functions that have a surplus supply are likely to be kept in-house while the scarce skills are likely to be sourced from elsewhere.

Let us direct our attention to sourcing software from the cloud:

The value offered by cloud computing is fundamentally similar. Cloud services allow the firm to benefit from the providers' specialization to enjoy lower operation cost and better reliability, enjoy almost infinite access to capacity and capabilities [15]. The client firm can then focus on the value-generating part of the business while having access to better capabilities that the service providers offer.

Cloud computing aims to provide computing capability as a utility [15]. For individual firms, controlling every piece of IT infrastructure comes at a price. Installation, updating, and planned obsolescence are critical to operations but rarely afford much strategic advantage. Outsourcing such applications to a third-party provider lower some of the inconvenience but firms had to give up a certain extent of control to while entrusting a third party. Cloud computing allowed firms to maintain a larger level of control while freeing themselves from the constant cycle of installing and updating. Cloud computing as in the case of IT outsourcing allows firms to access individual applications, or complete solutions or even the hardware to host such solutions which were all hosted on the internet and managed by a service provider against service level guarantees.

1.1.2 Terminating Externalized Services

Contract termination for outsourcing typically involves at least some of the following: compensating the service provider if the termination is for convenience, an asset-buy back clause, employment offer provisions for transferred employees, hand over protocols, and transfer provisions for licenses and know-how [16]. In comparison cloud service providers are less likely to demand compensation for the termination of a cloud service contract as hardly any transaction specific investment is made by the service provider [17].

Terminating cloud services, offer yet another convenience over traditional outsourcing: the enforced standardization in the hardware, software, protocols and internal processes (at least in the migration to a public cloud if not a private or hybrid cloud) can help transition from one provider to another or back in house if the need should arise. From a technical perspective, virtualization which is a key element in cloud-based architecture is best exploited with standardized hardware [18] and standardized protocols [19]. On the organizational size, cloud migration is often associated with a move towards service centricity. This tends to tilt the organization from processes limited by ad-hoc internal IT constraints to a focus on centralized delivery of standardized services [20]. Taken together standardized process hosted on the cloud are, at least theoretically, easier to terminate and bring back in house or to transfer to a new provider.

However, despite the theoretical ease of re-integrating or transitioning services between vendors, the failure of cloud providers to adopt universal standards in data storage does pose a real challenge [21].

In addition, in both cases, a business process once outsourced to a service provider on a multi-year basis is likely to be accompanied with a reduction in the internal IT staff associated with those processes. Limited internal capability to perform this task later, should the client choose to bring back the task in-house, is what that makes such re-integration (also called backsourcing) especially challenging [4].

1.2 Survey Findings

In this chapter, we report the findings from the annual survey conducted in 2017 jointly by Quint Wellington Redwood (https://www.quintgroup.com/en/) and Whitelane Research (https://whitelane.com/). Our focus in the analysis is on why firms terminated outsourcing arrangements especially cloud services, how they subsequently proceeded, and what the biggest challenges were.

1.2.1 Data Description

In the first half of 2017, Quint Wellington Redwood and Whitelane Research conducted a survey that was to provide the data for their annual report on IT Services Outsourcing, Spain [22]. In this survey, 206 Spanish firms responded to a survey about various aspects of their technology sourcing arrangements. They reported 697 service contracts with over 27 service providers.

The services included in these contracted covered the typical gamut of infrastructure services such as Datacenters, Managed Infrastructure services, Hosting, Networks, Telecom and Helpdesk; Application services such as software development, maintenance and testing; and Software-as-a-Service. Outsourcing represented 10-50% of the IT budget in about 50% of the respondents and over 50% for about 30% of the firms. The respondents represent a heterogeneous mix of industries. Overall, the sample is heterogeneous and representative.

Percentage of total IT budget dedicated to IT Outsourcing	Number of firms	Percentage of firms
<10%	13	11.30%
10-50%	64	55.65%
>50%	38	33.04%
TOTAL	115	100%

Table 11.1: Summary statistics of share of the IT Budget dedicated to Outsourcing

1.2.2 Overall Satisfaction

Looking at the entire sample, we see that overall satisfaction is high. 93% of the contracts in our sample have satisfactory outcomes. And almost 20% of these contracts (124 of the 697 contracts) are reported to have very high satisfaction. Unlike the satisfaction levels for cloud services, when the firm has outsourced infrastructure, satisfaction levels are likely to drop.

The survey captured to what extent vendor capabilities were the drivers of general satisfaction. Vendor capabilities were captured along four dimensions: Delivery Competencies, Relationship Competencies, Transformation Competencies, and Commercial aspects. The first three correspond to the vendor capabilities in Feeny et al. (2005) [23].

Overall satisfaction is most highly associated with Delivery and Relationship management competencies and less with price levels. Competencies of transformation and innovation appear to play a less important role than Delivery in creating general satisfaction.

	Mean	Range*
General Satisfaction	1.357	-3 to +3
Exit Satisfaction	0.763	-3 to + 3
Exit Satisfaction (if prematurely terminated)	0.4	-3 to + 3
*Very Unsatisfied (-3), Somewhat unsatisfied (-2), Unsatisfied (-1), Satisfied (+1), Somewhat satisfied (+2), Very Satisfied (+3)		

Table 11.2: Satisfaction levels in general and upon exit.

VARIABLES	(1) General Satisfaction Coef	(2) Se
Service Delivery	0.334***	(0.0328)
Account Management	0.137***	(0.0319)
Proactivity	0.0626**	(0.0293)
Trust	0.0987***	(0.0348)
Price Level	0.0797***	(0.0298)
Contractual Flexibility	-0.0133	(0.0256)
Innovation	0.0238	(0.0265)
Transformation	0.0499*	(0.0300)
Business Understanding	0.0136	(0.0334)
Constant	0.199***	(0.0733)
Observations	652	
Number of ids	201	
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		
R-sq: overall = 0.3803 Prob > chi2 = 0.0000		
(Firms have reported multiple contracts. An unbalanced panel was set up and a random-effects model was chosen based on the Breusch-Pagan test)		

Table 10.3: Random-effects GLS regression of General Satisfaction on Vendor capabilities.

Comparing the drivers of overall satisfaction across the three kinds of service contracts we see the following:

In the case of application maintenance and development contracts, satisfaction levels are significantly associated with Delivery competence and Relationship competence. In addition, vendors who can offer acceptable price-levels are likely to generate a greater overall satisfaction when it comes to application services contracts. For infrastructure and hardware, while Delivery competence still matters, the variability seems to arise from Trust and the Transformation competence. Service providers that possess these competences are likely to benefit from greater overall satisfaction in the clients. Client satisfaction with cloud computing service contracts appear to mainly be driven by Delivery competence. It is likely that given the largely homogenous set of offerings from cloud service vendors, satisfaction levels are also driven by proactive solutions from service providers. The comparability among offerings from the different providers is likely the reason why vendor pricing does not seem to influence satisfaction in cloud services contracts.

VARIABLES	(1) General Satisfaction Coef (Apps)	(2) General Satisfaction Coef (HW)	(3) General Satisfaction Coef (SaaS)
Service Delivery	0.391***	0.354***	0.434***
Account Management	0.168***	0.0508	0.00613
Proactivity	0.121**	0.00584	0.201**
Trust	0.0793	0.128***	0.0307
Price Level	0.144***	0.0445	-0.0751
Contractual Flexibility	0.0196	-0.00671	0.0624
Innovation	-0.0278	0.0197	0.0880
Transformation	0.0639	0.109***	0.0259
Business Understanding	-0.0373	0.114**	-0.0168
Constant	-0.0805	0.151*	0.376*
Observations	302	370	102
Number of ids	136	177	71

Standard errors have not been reported in the interest of space *** p<0.01, ** p<0.05, * p<0.1
(An unbalanced panel was set up and a random-effects model was chosen based on the Breusch-Pagan test. Each column represents a restricted sample of contracts that include Apps, HW or SaaS respectively.)

Table 11.4: Random-effects GLS regression of General Satisfaction on vendor capabilities by contracted service types.

1.2.3 Premature Termination

The respondents were asked what their reasons for termination were. Approximately 60% of our responding firms (127 firms) had terminated a contract in the past year and of these, 53% (68 firms) had terminated a contract before the natural expiration of the contract. Despite the maturity of the outsourcing process and the general satisfaction with sourcing IT services and infrastructure, such *premature* termination of service contracts appears to be common. Further, there appears to be no systemic difference in the likelihood of premature terminations in Applications, Infrastructure contracts or SaaS contracts.

However, the service provider capabilities associated with premature termination appear to vary with the services sourced. Premature termination tends to be highly correlated with Delivery competence, just as overall satisfaction is. Relationship management skills while not the most important factor in general satisfaction seemed to show an impact in reducing the likelihood of premature termination. Other reasons for termination such as a lack of Delivery competence and Transformation Competence and mismatched Prices.

	(1)	(2)
VARIABLES	Premature Termination	Exit satisfaction
Service Quality	7.450***	-0.822***
Account Management	2.009*	-0.613**
Proactivity	3.201**	0.112
Price Level	7.568***	0.249
Contractual Flexibility	3.650	-0.221
Transformation	4.609***	-0.640**
Business Understanding	7.204**	-0.615
Others	13.30***	0.00916
Constant	-6.463***	1.117***
Observations	419	419
Number of ids	127	127

Standard errors have not been reported in the interest of space *** p<0.01, ** p<0.05, * p<0.1
(An unbalanced panel was set up and random-effects estimation was chosen based on the Breusch-Pagan test: Logit model for column 1 and a GLS for column 2.)

Table 11.5: Random-effects regressions of Premature Termination and Exit Satisfaction on Vendor capabilities.

1.2.4 Exit Satisfaction

Firms that terminated contracts responded with their levels of satisfaction while exiting the contract. 79% stated that they were satisfied with the exit process with 15% being extremely satisfied. This is expectedly lower than general satisfaction (79% versus 93%) and further there is only a 15% correlation between the two. In fact, 56% of the responses indicated a greater general satisfaction than exit satisfaction. Quite naturally, premature terminations have significantly lower exit satisfactions. However, it is interesting that the satisfaction levels even at termination is relatively high. It is likely that the high satisfaction levels reflect a tendency towards standardized services and limited asset and process specificity.

When looking at the associations of service provider capabilities with exit satisfaction we see a clear negative association with service delivery capability, change management and relationship management. Comparing the coefficients of regression, we see a clear pattern that exit satisfaction lowers with Delivery, Transformation and Relationship capabilities in that order. The hierarchy of service provider competencies stay consistent in determining overall satisfaction, premature termination or satisfaction with exiting a contract. The evidence seems to point towards the importance of Delivery over Transformation and least of all on Relationship management.

	(1)	(2)	(3)
VARIABLES	Exit satisfaction	Exit satisfaction	Exit satisfaction
Service Quality	-0.754***	-0.731**	-1.333**
Account Management	-0.780**	-0.554	2***
Proactivity	-0.273	0.731	
Price Level	0.541	-0.00595	-1.333**
Contractual Flexibility	-0.696	0.452	
Transformation	-0.323	-1.387***	
Business Understanding	-0.0156	0.495	0.667
Others	0.351	0.148	0.667
Constant	0.959***	1.242***	2.333***
Observations	208	210	12
R-squared	0.1	0.07	0.655
Number of ids	89	98	

Standard errors have not been reported in the interest of space *** p<0.01, ** p<0.05, * p<0.1
(An unbalanced panel was set up and random-effects estimation was chosen based on the Breusch-Pagan test: Logit model for column 1 and a GLS for column 2. Column 3 reports an OLS regression as the smaller sample caused multicollinearity in the RE GLS model)

Table 11.6: Random-effects regressions comparing the effect on Vendor capabilities on Exit Satisfaction in contracts with Apps, HW or SaaS alone.

It is interesting to examine the difference in exit satisfaction based on service types. Exit satisfaction is lower for application development and maintenance contracts. However, exit satisfaction in contracts with hardware is higher than in contracts with no hardware and higher still when contracts contain SaaS rather than not. The higher levels of satisfaction with the exit of SaaS contracts suggests an easier transition from one SaaS provider to another or back in-house compared to doing the same with traditional outsourcing of application development and maintenance or hardware.

	Apps		HW		SaaS	
Variables	Mean (group0)	Mean (group1)	Mean (group0)	Mean (group1)	Mean (group0)	Mean (group1)
Exit Satisfaction	1.071	0.62***	0.689	1.005**	0.808	2.167***
Exit Strategy						
Internalized	0.090	0.144*	0.139	0.095	0.115	0.167
New Known Provider	0.190	0.168	0.182	0.176	0.177	0.250
New Reputed Provider	0.081	0.053	0.043	0.090*	0.064	0.167
New Provider from Competitive bids	0.716	0.649	0.627	0.738**	0.688	0.500
Challenges						
Know-how Transfer	0.592	0.779***	0.746	0.624***	0.695	0.333***
HW Transfer	0.123	0.034***	0.038	0.119***	0.079	0.083
SW Transfer	0.038	0.087**	0.086	0.038**	0.064	0.000
IP Transfer	0.024	0.019	0.033	0.010*	0.022	0.000
People Transfer	0.137	0.130	0.129	0.138	0.133	0.167

*** p<0.01, ** p<0.05, * p<0.1

T-tests to compare the significant difference in means. Group1 is the group of contracts that contain the respective service and Group0 does not.

Table 11.7: Comparing the mean Exit Satisfaction in contracts with Apps, HW or SaaS alone.

1.2.5 Exit Strategy

Unlike outsourcing stand-alone software development projects, outsourcing application development or infrastructure or cloud services is associated with a certain dependence on the service provider for continuity of service. As a result, when such an engagement is to be terminated firms need to identify an exit strategy for business continuity. The two options, should negotiations fail, are of backsourcing or finding a new provider to take over the provision of service.

Literature has highlighted the challenges in bring back in-house outsourced application development and maintenance contracts in terms of knowledge re-integration [24], re-staffing and organizational disruption to re-integrate these processes [25]. Only 12 percent of our respondents that terminated a contract found it worthwhile to bring the task in-house.

These challenges are likely less concerning when the services that have been outsourced require minimal customization as in the case of Hardware compared to Application maintenance and development. This likely explains why our survey suggests that firms are less likely to hesitate with terminating hardware or cloud service contracts. While transitioning to a new vendor is theoretically easier in the case of Cloud computing compared to traditional outsourcing, a non-standard implementation of data structures limits easy transferability.

Literature is relatively silent on preparing for a transition post-cloud computing. However, we can learn from the observations made on early IT outsourcing arrangements that were reintegrated back to the focal firm. Veltri et al. list that backsourcing IT is accompanied by challenges in re-staffing, bringing back IT assets and activities that were once outsourced.

In our sample, 88% chose to go with a new provider after termination. Reaching out to a new vendor poses another challenge. Does a firm seek a new vendor based on prior experience, reputation or through an open competitive bid process? Going with a service provider familiar with the business has been shown to be a standard risk mitigation technique as it can reduce adverse selection [26]. Among the 88% that seek a new provider, 68% went with a new provider selected through a competitive bid process. From a transaction cost perspective, when there is less relationship specificity, then the market offers a more efficient source of capabilities [27]. That a significant portion chose a new unfamiliar provider suggests standardization and limited relationship specificity.

We see a small yet statistically significant differences in the behavior of application development and maintenance contracts from hardware contracts. As one could imagine, transferring application development to a new vendor is riskier and more complicated and we see a small preference towards transferring the task back in house rather than to a new provider. Backsourcing is the choice for 14% of the application contracts that have been terminated while only 9% would backsource in contracts that do not have application development and maintenance services. Not surprisingly we see the opposite behavior for hardware contracts. Services such as telecom and networking come with a lesser need for customization and not surprisingly we see terminated hardware contract are more often taken to the market seeking a new provider. Further those seeking new providers chose to go with competitive bidding rather than relying on reputation or prior experience with bidders.

Considering the exit strategies along with the satisfaction levels of exiting we see a pattern emerging of firms likely to consider a more transactional approach to sourcing for hardware or cloud services but a more relationship specific approach to application maintenance and development contracts.

1.2.6 Challenges with Exit

As in any contract termination, terminating an IT services contract comes with its own challenges. These challenges arise because of the service providing capabilities disappearing from within the organization. The issue of vendor lock-in is not trivial in both traditional outsourcing and cloud computing services. Typically, the range of challenges include transferring knowhow, software, hardware, people and IP licenses. The greater the challenge the less likely that the contract would in fact be terminated.

One can expect that services such as Application development and maintenance which comes with a greater expectation of customization would face greater challenges, while hardware services would be lower. Given the promise of SaaS of offering a more generic service on the cloud one would expect far lower levels of exit challenges with SaaS. However earlier studies have shown that despite the existence of cloud standards enforcements of such standards were not common resulting in limited portability between providers [21].

In our data, we see that in the case of application contracts, the challenges lie in the transfer of know-how and software transfer. The challenge with know-how transfer is heightened with a premature termination. As expected, hardware contracts typically face higher levels of challenge in transferring the hardware and lower levels of other challenges. Interestingly, contracts that have SaaS claim none of the listed challenges as increasing and in fact show a statistically significant drop in knowhow transfer as a challenge. It is likely that cloud service providers have moved towards more consistent adoption of standards in terms of storage and APIs.

1.3 Conclusion

We started out wanting to know what the end of a cloud computing service contract looks like. The insights came from a self-reported survey with responses from senior IT staff from over 200 firms. The survey captured details of three classes of outsourced services: application development and maintenance, hardware and SaaS. Tracking these three services, allow us to contrast the behavior of clients when it comes to SaaS as against more traditional services.

We see indications that overall, sourcing services externally is mature and established as a business process. While low levels of satisfaction and failed contracts were quite common in the early 2000's we see here a high level of overall satisfaction. Premature termination lowers the satisfaction levels but exit satisfaction even when premature is still high. Vendor capabilities that are most sought after tends to be Delivery competence over Relationship management.

Our analysis seems to suggest that client firms seem to seek standardized services from external vendors which can explain both the satisfaction upon exit and the strategy adopted post-termination. Firms tend to go with a new provider rather than bringing the task in-house. Further, this new provider is chosen via competitive bidding in the open market.

A key restriction in terminating contracts has often been that of vendor lock-in. Studies in outsourcing and cloud computing have pointed out this challenge in terminating contracts. We see such a challenge when applications and hardware are outsourced, yet we do not see such a challenge with SaaS contracts.

Taken together, the insights from our survey seem to point to maturity in sourcing cloud services, higher levels of satisfaction, limited challenges in terminating such services and further an explicit effort to source new providers to exploit market efficiencies.

From a service provider's perspective, it is likely that we see far greater adoption. Given the low levels of perceived challenges with exit, it is likely that service providers will see greater churn in clientele. While this can be problematic for large incumbent providers, it creates opportunities for new entrants offering specialized cloud computing offerings with consistent quality of service assurances and better relationship management capabilities.