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Abstract:

This case is set in the market for Internet telephony software, which emerged as the result of the convergence of traditional telecommunications technology with new Internet-based speech technology. Clyp is the provider of a software-based IP-PBX, a public branch exchange, which allows companies to set up and self-manage an internal IP-based telephony network, whereby telephony and data share the same computer network infrastructure. Clyp finds itself confronted with an increasingly competitive and converging market. Its growth rates have fallen behind market average, and its product hasn't seen innovative changes for some time. The case is targeted at Postgraduate (master's-level) students in (business) information systems and strategic (technology) management. Its main aim is to facilitate learning on strategic positioning and business model analysis in the faces of converging technology markets and the unique characteristics of a software company. The case lends itself to a three-step analysis: (1) business model analysis, (2) market analysis and strategic positioning, (3) identification of strategic options.

Keywords: IS education, teaching case, collaboration systems, strategic planning, competitive advantage

Editor's Note: A teaching note for this case can be obtained from kai.riemer@sydney.edu.au. Only active MIS faculty who are currently listed in the AIS Faculty Directory are eligible to receive the teaching note.

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I. INTRODUCTION

Mark Lehmann[1] was sitting at his desk contemplating what had happened to him in the past few weeks. It had been an intense time; Mark had started his new position as CEO of German software provider Clyp in June 2008, just over three months before. After working in the telecommunications industry for more than twelve years, Mark had left his last job, in which he had served as Director of VoIP Product Management with Verizon, a large, global communications and IT solutions provider, to sign up with Clyp, a much smaller player in this market. In his new position, he was now co-leading operations of Clyp together with fellow CEO Bert Wollinger. While Mark overlooked product management and software development, logistics, and finance, Bert was responsible for marketing, sales, pre- and post sales and support. In his role, Mark was effectively responsible for all software (i.e., product) and technology-related decisions and thus served in the role of CIO at the same time.

Clyp was a typical technology company. The company, after its founding in 1999, had developed an IP-based telephony solution (a so called IP-PBX[2]) and successfully marketed the product to a base of over 9,000 mostly small and medium-sized enterprises (SMEs). By 2008 the software was serving a total of more than 350,000 users (referred to as IP extensions in the industry). With slightly over 100 employees, Clyp was one of the market leaders in pure IP-based telephony solutions. Its product, called *ClypWare*, had won a range of prominent Internet and technology awards over the years, paying testimony to the company's innovativeness and its product's quality.

IP telephony (often also called *Internet telephony* or *Voice-over-IP/VoIP)* refers to the transport of speech via the Internet rather than the traditional telephone cable infrastructure, called *public switched telephone network* (PSTN). Much as tools like Skype enabled people to use their computers to place phone calls over the Internet, IP-PBXs enabled organizations to set up an internal IP-based telephone system, allowing their people to place calls from their computer or IP-enabled phones. The main idea of IP PBXs is to reduce the cost of maintaining a dedicated company-wide telephone system by converging telephony with existing computer networks (Ethernet/ LAN). Unlike Skype or other proprietary VoIP solutions, however, IP-PBXs connect directly and seamlessly to the existing public telephone infrastructure.

While Clyp had been quite successful in this market, having made a profit for the first time in 2007 after reinvesting all earnings in the previous years, by 2008 its business seemed to have stalled somewhat. While still showing growth in the double digits, growth rates were showing a decline in an otherwise steadily growing market (see Exhibit 3). This meant that Clyp was not capitalizing on the market potential and missing out on possible revenue. Moreover, the company seemed to have lost its former innovativeness. The company had not launched any significant new features for quite a while, and some competitors seemed to have caught up with Clyp in terms of feature range. Mark had been brought in to reverse these trends. More specifically, the board of directors was expecting him to deliver an analysis of the company's strategic market position and its current market challenges, and to derive possible scenarios and robust steps for improving the company's immediate revenue stream, as well as its long-term strategic position. He was due to present at the next board meeting in November.

II. BACKGROUND: COMPANY, PRODUCT AND THE MARKET FOR VOIP TELEPHONY

Clyp started in 1999 with the goal of revolutionizing the way telephony worked by introducing a fully software-based telephony solution. The idea was to develop a product that was not based on the traditional telephone cable infrastructure, but instead used the customer's existing Ethernet computer network. By using the Internet Protocol (IP) for speech transmission, the idea was, on the one hand, to enable customers to make phone calls over the Internet at a fraction of the cost of traditional phone calls, and, on the other hand, to free customers from the investments in and the cost of maintaining a dedicated telephone infrastructure. A software-based telephony solution would also enable internal IT departments to self-administer the telephone system.

[1] At the request of the company, the company name and all names of people mentioned in the case have been changed to ensure anonymity. The case is intended to be used as the basis for class discussion rather than to illustrate either effective or ineffective handling of a management situation. The case follows *CAIS* guidelines for teaching cases, authored by Ali Farhoomand, "Writing Teaching Cases: A Quick Reference Guide," *Communications of the Association of Information Systems*, Volume 13, Article 9, 2004.

[2] Please see Exhibit 1 for a glossary with abbreviations, acronyms, and explanations of the most important technical concepts in the VoIP industry.

Traditional PBXs were usually quite costly to run, as they were administered by external telecommunications carriers, which were likely to charge for every change made to the system. For example, when people moved offices or a company grew (and thus needed new extensions) significant costs were usually incurred. Moreover, traditional solutions meant that a separate physical infrastructure had to be maintained. By having a purely IP-based solution realized as software that could run on standard computer hardware and use existing Ethernet networks, Clyp customers were able to reduce dependency on external carriers, save cost, and gain flexibility for growth. For example, people in the IT department were able to add new users with only a few mouse clicks. The idea of transmitting speech over IP (VoIP) was reflected in the Clyp logo, the "y" representing the convergence of data and speech into one data stream. Over time it also became clear that by moving telephony onto the computer system, manifold opportunities for new communication features and further integration with desktop software arose.

Company History

Clyp was founded as a start-up business by five enthusiasts who had been trained and worked in telecommunications most of their professional lives and who had realized the potential of merging telecommunications with the increasingly ubiquitous computer infrastructures. Financially supported by the five founders and by a business investor, the company started developing its software with a team of ten people. One year later, in March 2000, Clyp officially presented the release candidate of its product at the CeBit trade fair in Hanover and was able to win its first customer contracts. External venture capitalists took an interest in the company and invested. With the software product ready, Clyp started successfully selling its solution in Germany and internationally (especially in the UK).

The company had grown rapidly to almost forty people, when the Dot.com crisis struck in 2001. While financing options dried up and Clyp had to lay off half of its development staff, two direct competitors, which had started with similar solutions and around the same time, went out of business. This had a considerable impact on the market, especially Clyp's home market in Germany. As a result, Clyp management and sales staff had to constantly work to restore confidence in the VoIP idea in general and the viability of Clyp as a company in particular. At the same time, in a move to protect their own business with traditional PBXs, the large telecommunications equipment providers such as Alcatel and Siemens started to publicly tackle the VoIP idea, questioning the reliability of using computer infrastructure for telephony. As Wollinger put it:

> *… we had to battle with perception created by the market incumbents, who were selling their traditional PBXs at the time…. Their communications was to say that VoIP was devil's work, shaky, premature, not up to the job….*

Clyp managed to survive this crisis, in a large part due to solid international sales in the UK market, where companies seemed to have fewer concerns with adopting the IP idea than in the German market. However, the crisis forced Clyp to downsize its development department, which meant that software often had to be developed in a rather ad-hoc manner. As a consequence, parts of the software became more difficult and costly to maintain.

Major milestones in difficult times were the closing of a deal with Siemens (in 2001) to supply their IP telephones and the closing of a distribution deal (also in 2001) with Deutsche Telekom, the incumbent German telecommunications carrier, who agreed to henceforth sell the Clyp software under its own label and brand name. Deutsche Telekom later also acquired a stake in Clyp through its own venture capital subsidiary. While the agreement with Deutsche Telekom meant significant sales potential, the deal also provided a credibility boost for Clyp in its dealings with potential customers. With VoIP telephony becoming increasingly popular and accepted, the following years were characterized by constant growth in license sales. It was in 2007 when problems first became apparent: growth in license sales dropped below market average. Also, Clyp seemed to have lost its former innovativeness, as new features for customers were not created at the rate that had characterized the company in preceding years.

ClypWare: The Product

The Clyp product was called ClypWare; it represented an integrated solution for handling an organization's internal and external telephone traffic. Essentially, it was a software-based IP telephony system, which not only handled all tasks of a traditional telecommunications system, but also offered many new telephony functions. The solution was based on a client-server architecture and consisted of the following components:

- ClypServer was the main server component. Based on the Microsoft Windows Server platform, it carried out all the functions of a traditional PBX. It was the core of the solution and was responsible for line management, call signaling, etc. The server also provided high-performance phone functions for the user, such as call switching, call routing, management of group calls, and missed call management. ClypServer also allowed the connection

of multiple server instances in order to realize a cross-site integration for geographically distributed organizations.

- ClypGate was the gateway server component for connecting with traditional PSTN (ISDN) networks. The component was tightly integrated with the main server; it consisted of a software part and at least one ISDN card. ClypGate converted incoming PSTN calls into IP packets and vice versa.

- ClypIt! was the MS Windows client software, which turned a PC into an advanced telephone (called a *softphone).* This was the component, with which the users interacted when placing, receiving, or diverting calls. It was also used for all advanced features, such as setting up complex call routes in order to divert incoming calls based on caller ID, time of day, or other variables. ClypIt! allowed assigning frequently used contacts to quick-dial buttons. When doing so, users were provided with presence information: a contact was available (green), currently engaged (red), or not logged in (grey), depending on their softphone status. Another highly valued feature was its Skin concept, which allowed users to change the visual appearance of the interface by choosing from a set of predefined configurations. Moreover, within the client arena, a simple Instant Messaging feature allowed users to initiate short text chat sessions with other users.

- MS Outlook integration: ClypIt! integrated with Outlook so that users could speed dial from within Outlook contacts. Also, for every incoming call ClypIt! instantly brought up the caller information taken from the Outlook address book (based on caller ID resolution). Calls could also be redirected, based on Outlook calendar entries.

- USB handset or headset: In order to use the PC as a phone, users needed a convenient device for speech transmission. This could be either a headset (combination of headphone and microphone) or a USB handset, essentially a simple phone receiver without dial pad. The handset was linked with the software in such a way that a call could be initiated by picking up the handset and terminated by putting it back on the telephone cradle.

- Native IP telephones were connected to the local network via Ethernet; they were not attached to a computer. They could act as stand-alone devices, while still providing advanced functionality, or they could be connected to ClypIt! via so-called Computer Telephony Integration (CTI). In the latter case, software and phone acted in unison: existing calls could be seamlessly transferred between computer and phone and both devices provided similar functionality.

- Optional features: Extended Call Routing was an optional component providing a graphical extension of the Softphone's basic call routing manager. The extension helped to define sophisticated call routing scripts, which could be utilized, for instance, in a call center or receptionist scenario. Finally, ClypFax was a fully integrated IP-fax component: Faxes were delivered to users electronically within ClypIt! or via e-mail to Outlook. Moreover, faxes could be sent from within any Windows desktop application.

Licensing Model

Clyp was more or less a one-product company. In the simplest scenario, the customer acquired a ClypServer CD-Rom and installed it on standard computer hardware. It was only through licensing that Clyp realized a modest form of product variation: certain features, which were already contained in the software, were enabled only when the customer paid an optional license fee. Such features were, for example, the fax feature, a call recording feature, an advanced voice conferencing feature, integration of mobile devices, or a hot-backup solution that enabled switching to a backup server in case of hardware failure. In addition to this, Clyp offered hardware bundles, i.e., USB headsets and handsets, and IP telephones. Also, a boxed solution of ClypServer had been introduced in 2008, which was essentially a high-end PC with MS Windows server and a pre-configured ClypServer. Finally, a smaller box was available, which contained an embedded software stack of the ClypServer and which could be used only to connect a branch (with few users) to a primary ClypServer.

ClypWare licenses were bought and paid for up front; they did not entail a yearly payment. Upon payment Clyp provided a PIN key for activating the software (and all features included in the license). By receiving all payments up front, Clyp was able to realize an immediate cash flow and reduce the risk of payment shortfall. License fees were based on a pricing scheme which corresponded with the number of users (i.e., IP extensions) a customer wanted to host on the ClypServer. In that way, when a customer's business grew, the license could be easily upgraded to the next higher bracket (e.g., one-to-ten users, ten-to-twenty-five users, twenty-five-to-fifty users, etc.). Finally, customers could buy a software update service and pay upfront for a one, two, three, or five-year right to receive for free all upgrades to major and minor software releases.

Suppliers

Clyp's product was based on the Microsoft Windows platform and its corresponding .Net (dotNet) developing framework, so Microsoft could be considered a supplier. Apart from this, there were no other software partners, as all software components were developed in-house based on the Windows platform. However, suppliers were used in the hardware department. When Clyp started, the plan was to revolutionize the phone world with a PC-based phone client., It quickly became clear after a year, however, that especially in the conservative German market, people were not ready to let go of their desktop phones. One of their concerns was that telephony should not depend on the functioning of the computer, as computers might stall, and users still needed their phones. Hence, in 2000 the company decided to get their own IP phones built by a Taiwanese supplier. However, it turned out that these phones were not only hard to sell in Europe due to their visual appearance, but also after a few months the first phones showed technical instabilities. As Clyp perceived itself as a high-quality provider and claimed at the same time that IP telephony was as reliable as traditional telephony, the company had no choice but to stop production of the phone.

In 2001 Clyp was able to strike an OEM-supply and licensing deal with Siemens, which enabled Clyp to load its own software and functionality onto one of the most sophisticated IP phone ranges available. Especially in the German market, this turned out to be very valuable, since Siemens phones were popular with customers, as Siemens was recognized for its reliable engineering. Under the agreement, Siemens supplied the phones, and Clyp replaced the software and had the phones branded with Clyp's logo before they were shipped to the distributors. Every agreement was valid only for the most recent range of IP phones and needed to be renewed whenever Siemens introduced a new range of phones. To this point, Clyp had always been able to get the agreement renewed. Finally, the Siemens phone range was complemented by other hardware, such as cheap IP phones (using the open SIP protocol), stocked from various other suppliers, USB handsets, which were sourced from Avaya, and cordless DECT phones, supplied by Ascom.

Distribution Model

In its main market, Germany, Clyp did not sell directly to its customers. Rather, it operated with a two-tier distribution model: Clyp sold its products to two independent distributors, who further sold the products to a large number of resellers, who then sold to the customer. Resellers were usually small- to medium-sized IT distribution and service companies. Since the product was rather complex and feature-rich, it needed configuration and consulting support in order for the customer to best use it. The resellers provided this service; they also sold the accompanying hardware, installed the software, and configured the user workplaces (or trained the customers to do so). In order to ensure knowledgeable resellers and thus a high quality service, Clyp designed a training and certification program. This training was provided by the two distribution partners. Following a train-the-trainer philosophy, distributor personnel had been educated to provide a three-day training program for resellers. At the end of the seminar, resellers had to pass an exam in order to become certified. By 2008 a total of 800 resellers had gone through this process and were certified. However, of these between only 200 and 300 were considered active, in that they brought in new contracts.

Clyp outsourced most of its distribution and support in order to concentrate on software development. By doing so they didn't have to deal with the investments, cost, and complexities of running their own distribution network. In turn, distributors received a relatively high proportion of the gross margin for providing training and second-level customer support. Customer support was realized through the resellers (first-level) and the distributors (second-level). Only those customer support cases that could not be solved at the first two levels were put through to the internal support people at Clyp. Since all reseller sales activities resulted in Clyp providing the customers with a license and a corresponding key PIN, Clyp was able to keep elaborate details on all existing contracts by means of an internal licensing database. In the database for each sale, Clyp kept details regarding the corresponding reseller, the customer (company size, industry, address, etc.), the sales details (software, hardware, types of devices), and the current type of license.

Besides this primary sales channel, Clyp also generated a significant portion of total sales through its OEM agreement with Deutsche Telekom. In fact, almost 50 percent of sales in the German market came through this reselling partnership. Deutsche Telekom essentially sold the same product, albeit with a different brand name and Skin design. Moreover, the carrier took care of customer support for the solution; only complicated cases were diverted to Clyp staff.

Competitors and Market Segments

The most important market for Clyp was its home market, Germany, where the company derived 60 percent of its sales; the rest came from various European markets. With its solution, Clyp mainly targeted the middle segment of the market, SMEs with fifty to 200 IP extensions (users). In this segment, the company was able to realize the best margin on its sales projects. Also, the sales coming in from Deutsche Telekom typically fed into this bracket. Sales in

the segment below (twenty to fifty users) were quite common, as many customers started small and then acquired bigger licenses as they grew. Above 200 users (200–500 extensions), projects were still technically feasible, but increasingly difficult to acquire as competition from larger competitors increased. While these sales were not uncommon, projects with more than 500 users rarely happened; those that existed were closely monitored by Clyp, e.g., in order to learn and improve scalability of its solution. In this segment, large companies, such as Siemens and Cisco, entered sales pitches with their direct sales staff and Clyp with its indirect distribution simply could not compete. Anything above 1,000 users became technically challenging with the existing technical platform. Besides, in terms of market competition, the segments above 500 users were not really the domain for Clyp and its sales channel structure.

Generally, the main competitors in the home market, those that Clyp resellers typically confronted in direct sales pitches, were Siemens, Alcatel, Avaya, Aastra (as a smaller player), and finally Cisco, who came in from the upper end of the market. While Cisco used to do larger projects, they had recently launched a smaller solution. There were also some players such as Estos or Cytel that were of similar size as Clyp, but were not directly comparable in terms of the quality of their solutions. Generally, Clyp was considered a high-price provider with a quality product, and the company was happy to use the higher price as a quality indicator.

At the lower end of the market, serving the segments of up to fifty users, there were two different groups of competitors. German companies such as Funkwerk or Auerswald provided IP-enabled solutions (ready-to-go embedded hardware boxes) that were based on rather old-fashioned technology and did not provide the same types of features and scalability, while nevertheless targeting small businesses with its easy-to-set-up box. Finally, a new breed of competitors provided pure-IP solutions (based on the Opensource platform Asterisk[3]). These start-up businesses (e.g., Nfon) rode on the popular wave of the Opensource idea and tried to sell their software over the Internet (with not much success as of 2008). Alternatively they provided hosted solutions (such as Deutsche Telefon Standard), whereby the customer did not have to run its own server hardware, but acquired remote Internet access to a telephony server.

International Markets

Clyp made 40 percent of its total sales in selected European markets using a similar reseller structure. While the bigger national competitors all operated internationally, direct competition tended to be slightly different in the various markets. The most important international market was the UK, where Clyp also ran a small office with sales staff. Here, the most notable competitors were Mitel, Nortel, Avaya, and Panasonic. Other important markets were the Netherlands, Scandinavia (Denmark, Norway, Iceland), Switzerland, Austria, and Italy. Clyp was not present in Spain and France, among other markets. The main reason for that was the language barrier. Clyp's software was available in German and English. While this seemed to be acceptable for customers in the existing markets, Spain and France were difficult in this respect, as customers in those markets tended to expect a localized approach to doing business. In the international markets, the proportion of projects in the lower segments tended to be higher, mainly because there was no comparable supplier to the fifty-to-200-user-bracket such as Deutsche Telekom in the German market.

III. MARK'S SITUATION

Mark had used the first three months of his tenure to learn about the corporate history, product, and major markets. He had also focused most of his energy on bringing about necessary changes internally to the ways in which the company organized its product development process. Backed by the board of directors (which represented the investors) he had established a product management function. Its main role was to prioritize software-related changes and the introduction of new features, in order to achieve more market-focused development. The new head of product management, Bertram Meyer, reported directly to Mark. Bertram had also started to reorganize the way in which software development was carried out by applying principles of agile software development. The new process made development quicker and more flexible and quality control much easier. When Mark felt that they were on a good path internally he turned his attention to the product and market side. To do so, he organized a strategy development workshop, an off-site event in a small secluded hotel setting, where the most influential people in the organization—the founders and department heads—spent two and a half days discussing, brainstorming, and contemplating future options. Important issues came to the fore, and he learned even more about the product and existing market developments.

[3] For background information on the Asterisk platform see Exhibit 1 and the project's web site at http://asterisk.org.

Perception of the Product

Well aware that Clyp as a company depended 100 percent on its one product, Mark had tried to gain a richer understanding of where the product was headed and how it was perceived in the marketplace. What he found out was very encouraging. Apparently, the product was perceived as a reliable and robust piece of software. Users liked its usability, although the look-and-feel was a bit outdated. A major selling point was its degree of integration and the ease-of-use in deploying and administering the software at the back end.

ClypWare was a *pure-IP* product. All components were IP-based, in contrast to many other products in the market that were marketed with the "IP" label, but that were really based on a traditional approach and thus considered only *IP-enabled.* For example, while such software products might connect IP devices, they did not provide the same flexibility and cost advantage as a pure-IP solution, as they still needed dedicated telephony hardware and more maintenance. ClypWare allowed customers to use standard PC hardware to run the server. Moreover, it was a truly integrated solution. While some competitors had developed their solutions by acquiring smaller companies (e.g., to gain access to IP-fax support), ClypWare administrators only had to learn and administer one server product and not a heterogeneous set of hardware and software, e.g., for connecting to legacy infrastructure (PSTN) or for providing fax support. Another aspect of integration was the fact that in ClypWare all customer settings, voice messages, etc. were stored on the server side, making the user independent of the softclient or IP phone. Essentially, this meant that users could log on to any computer or phone within the company and work with their own settings, message list, and call buttons wherever they went (called roaming profile). In situations such as switching offices, no one had to come and reset any phone configurations (as with IP-enabled solutions). This increased flexibility, particularly for fast growing companies. Finally, ClypWare also provided better integration with Microsoft Outlook than most of its competitor products.

Mark had also learned that the fact that ClypWare was MS Windows-based played well with many customers, especially SMEs in the German market, where administrators were usually familiar with Windows, but less often with Linux. On the other hand, he had also learned that the Windows-based softclient might limit the potential customer base. In particular customers from the creative industries (e.g., graphics design) often used Apple Mac computers, for which no client software was available. While Apple Macintosh did not yet have significant penetration in the German business environment, he was well aware of the increasing success of the platform and wondered what diffusion might be like in other markets. With browser-based applications gaining in popularity he was also considering the idea of a web-based client.

While Mark was pleased with the general perception of the software in the marketplace, he was also very conscious of the fact that for quite a while Clyp had not delivered any significant innovations that were visible at the user end. In fact, some people in the organization started arguing that Clyp had lost its former innovation potential that had made the company successful. Also, it seemed that there was not much in the development pipeline at the moment. He had discussed this with Bertram, who explained that the majority of developers were currently feverishly working toward a major revamp of the core of the server. Apparently, while the ClypServer had been expanded and further improved over the years, the very heart of the server, the call and signaling engine, in large parts still reflected the ideas and concepts of the initial design conceived of in 1999. The fact that the software was still robust and reliable was testimony to the quality of the initial design and the knowledge of Clyp's people. But now the core was in need of a major rebuild. Essentially, it needed to be developed from ground up in order to enable the connection of the software with modern communication hardware and to improve scalability of the system beyond the typical customer size Clyp was currently serving, which did not include enterprises with more than 500 IP extensions. The next major release was due in mid-2009 and was focused mainly on these improvements.

External Communications

Mark had also spent time discussing with the internal marketing people the external communications and the kinds of messages Clyp was sending to the market, e.g., as reflected in the marketing materials provided for the resellers. He realized that the company had grown around its product and that it was very much a technology company. This was reflected in its external communications. Mark was concerned that Clyp was focusing too much on the software and its features and too little on business advantages and user experience.

During the early years, when VoIP as a technology was in its infancy and a rather new idea to most potential customers, communications had mainly been targeted at raising confidence in the technology and building a market. Consequently, marketing messages had been quite technical, with the main selling point being cost savings: less cost for placing phone calls over the Internet and less administration cost when converging data and voice on one infrastructure. But times had changed; CIOs in most businesses today knew VoIP and were demanding it. In fact, any new sales in the industry were IP-based, with old legacy solutions being replaced step-by-step. Also, the telecommunications landscape had changed: Many telco carriers were offering fixed cost plans for corporate

customers, so that the cost for placing phone calls had dropped significantly, eroding the direct cost advantage of VoIP.

Clyp's message was still very product centric, and the technology advantages of its ClypWare, although doubtlessly real, were increasingly hard to communicate, because they were mostly qualitative. In its early years Clyp had always been a step ahead in terms of its feature list, but by 2008 most software fact sheets looked almost the same. When CIOs compared solutions based on these feature lists and technical specifications, solutions might in fact look quite similar. However, Clyp people still saw major advantages for their solution, both for users in supporting their everyday work as well as for administrators in setting up and maintaining the solution. In their eyes, this still justified the price premium Clyp users had to pay for ClypWare.

Mark knew that these soft facts needed a different communications approach. Why concentrate on the software features, when the actual work improvements brought about by using ClypWare were quite apparent? In the softclient users could see their colleagues' presence status, which improved availability and flow of communication. In addition, ClypWare made possible the set up and maintenance of elaborate call diversion rules, freeing the user from much of their daily communication hassle. Also, initiating conference calls, handling of voice messages, and handling of multiple calls was extremely simple. All in all, why not stress the productivity gains companies might realize through integrated media management or frame the product's reliability differently? In essence, Mark suggested stressing the fact that in competitive markets companies could not afford to lose any calls (e.g., from customers).

Market Price Erosion

One issue that had been raised prominently during the workshop was an ongoing erosion of market prices for VoIP solutions, driven by some of Clyp's direct competitors. Especially the bigger competitors, in a move to win business in competitive bids with larger SMEs, were frequently offering their solutions at what seemed to be below-cost pricing. After analyzing some of these instances, it became obvious that competitors such as Siemens were in a position to calculate their offerings differently: Whenever the customer was looking for a bundle of IP software and telephones, Siemens was able to offer their own IP phones at much lower prices then the Clyp resellers. Put differently, Siemens was able to give away their software almost for free, as they could subsidize it via the phone sales. Clyp, however, with its two-tier distribution structure had three parties tapping into the margin for the phones and was thus often not able to match the prices. Hence, while many German customers were demanding reliable phones, the Siemens phones unarguably being among the best, Siemens was also a direct competitor in a considerable number of the sales pitches at the upper end of the market.

The situation was different in markets such as the UK and Scandinavia, which both showed a much lower IP attachment rate, meaning that people were prepared to replace their desktop phones and use USB handsets or headsets instead. As a further indication, one of Clyp's product managers estimated that around two-thirds of all Siemens IP phones were sold in the German market. In fact, in many German offices, especially in larger companies, to have a feature-rich desktop telephone was still considered a status symbol. Hence, sourcing cheaper SIP phones was also not an option, since SIP as a rather simple protocol did not allow executing the same range of functionality on the phones as was possible with the Siemens IP phones. All other important manufacturers of full-feature IP phones (e.g., Avaya or Alcatel) were also among Clyp's direct competitors.

Moving Toward Unified Communications

Having learned that most products in the market for IP-based telephony solutions were more and more similar, at least on paper, and having realized that the market was increasingly competitive in terms of pricing, Mark was keen to explore new options for the future. For quite a while he had had an eye on neighboring markets and had realized that another major development was in the making. After the market had seen convergence of data and voice on the infrastructure level, the next step in convergence was imminent, namely the convergence of telephony and business software under the label of *Unified Communications (UC)*. This convergence not only meant new ideas, concepts, and solutions, but also a number of new potential competitors coming in from the enterprise software and groupware markets. The topic seemed to be the latest fad, with many market players (Clyp being no exception) trying to rebrand their solutions by attaching the UC sticker. However, Mark felt that they needed to get a better understanding of the impact of this new approach. To this end, he had brought in an external UC expert to speak during their planning workshop.

The speaker had emphasized four major UC building blocks (see Exhibit 7). First, Unified Communications (UC) denoted the integration of different communication media (e.g., telephony, Instant Messaging, fax, e-mail, video) on one unified, IP-based platform, combined with rule-based media management that aimed to enable users to better juggle their various media and devices and their increasing communication load. Second, this media integration was

complemented with rich presence signalling capabilities. Much like the increasingly popular Instant Messaging (IM) tools, the UC presence-signalling feature allowed a user to signal to the initiator of a communication act, independent of the recipient's physical location, the ability and willingness to communicate. Unlike IM though, UC systems were able to extend presence information to all kinds of media types. By doing so, UC systems aimed to improve organizational communication by reducing the number of unsuccessful communication attempts. Third, UC solutions were said to reveal their true potential when integrated with the context of the user, in particular with third party business applications (e.g., ERP systems). A core idea thus was to circumvent the need to pre-schedule communication and to solve the users' information needs whenever they arose by immediately allowing them to communicate from their current work context. And fourth, UC extended the integration idea to include richer collaboration features such as application sharing. This might, for example, allow users to upgrade a simple voice call to a screen sharing session, whereby a remote user could be given permission to see or even control one's own computer, in order to enable the shared use of software applications.

By 2008, all of Clyp's direct competitors were positioning themselves as players in the UC market: Alcatel, Avaya, Cisco, Siemens. On top of this, powerful players from the software market were entering the arena, among them Microsoft (with its Office Communicator product), IBM (with Lotus Sametime) and Oracle (with its Collaboration Suite). While UC, in its full vision (as represented by combining the four building blocks), was seemingly targeted at the upper end of the market (e.g., larger companies), Mark felt that the technology was nevertheless redefining the marketplace. But there was still time. Many of the UC solutions had only just recently left prototype status and been turned into products, and all products had yet to exhibit the full range of UC features. On the other hand, the UC idea was clearly starting to gain momentum, as could be witnessed at the latest CeBit trade fare in Hanover. At present, Clyp was not yet recognized as a player in the UC segment by market analysts Gartner (see Exhibit 8), but Mark felt that while they certainly lagged behind in terms of completeness of their UC vision (as their product was mainly concentrated on the media integration aspect), they still had the potential to execute a UC strategy once the next product release provided a stable and extendable platform.

IV. SCENARIOS FOR THE FUTURE

Mark felt he had gained a good overview of the market and the current state of the company's product. Also, he had started to see more clearly the external challenges faced by Clyp. The bottom line was that the market for IP-based PBXs had started to show signs of commoditization: VoIP was without doubt moving toward a mass market. Already, severe price erosion had become evident at the upper end of Clyp's main market segment. Unquestionably, Clyp was still a successful company, and the market acknowledged its product as a high-quality piece of software. But the bottom line was that, while Clyp's revenue growth rate was still in the double digits, it had fallen behind average market growth, which meant that Clyp was not gaining in market share. The company had outgrown its start-up size, but not yet become a mass-market leader. Also, the company had launched no significant new product features for quite some time. Clyp needed to intensify its growth. To do so, Mark needed to find new revenue opportunities in order to start generating new cash flow.

The discussions of the past weeks had brought to the fore a range of ideas that needed to be explored. In addition, Mark was still pondering countless open questions. He knew that he had to start questioning the viability of Clyp's current revenue model. Was the upfront selling of the product still the right way to go? What other options existed for generating more revenue? He felt that Clyp was not yet realizing the true revenue potential of its resellers and existing customer base. Was the current distribution channel still the right one? It was true that a two-tier channel structure was quite common in most European markets, but some of Clyp's larger German competitors operated with a direct sales model. As for growing the business, Mark was wondering if the company should intensify its activities in the international markets. Also, should Clyp venture into new market segments? At the lower end of the market, competitors were experimenting with hosted solutions, providing the hosting of telephony solutions as a monthly-paid-for service. Clyp had already produced a smaller box solution to target smaller companies. Would a hosted solution be the logical next step? What about the product in general? Was a one-size-fits-all product still the right way to go? Or should Clyp start targeting certain industries with specific solutions? Was there anything specific about telephony anyway?

The biggest market driver for the next years was likely to be Unified Communications. Moving toward UC seemed inevitable in the (maybe not so immediate) future. But what were the implications for the product? Where should they go? While there were new competitors coming into the market, Mark also saw immense potential by shaping the IP market in the UC direction. In the short term, most customers would not start buying UC. Replacements of legacy technology would nurture the market for more years to come. But market growth was showing signs of stagnation and competition was increasing. He felt that Clyp had to concentrate on differentiating itself in the eyes of the customers.

While the company was presented with a range of strategic challenges, Mark felt optimistic that with the changes they had achieved internally, the company was ready to move forward. But he also knew that before starting to develop new product ideas and market scenarios for the future, they needed to come up with a sound analysis of the current business model and strategic position in the market vis-à-vis the different market parties. As the day of the board meeting drew closer, Mark felt that he had done his homework. He had already compiled the latest market data available from external analysts (see Exhibits). It was now a matter of coming up with a sound strategic analysis of Clyp's situation and deriving a plan for future growth. As the world was looking to the US, where Barrack Obama was poised to make history on November 4, he knew he had to face his own destiny in the upcoming board meeting on the same day.

V. EXHIBITS

Exhibit 1. IP Telephony Glossary	
Asterisk	Asterisk is an Opensource software, providing an IP-PBX and telephony engine, the code of which is freely available. It can be used to realize simple IP-PBXs or as the basis for developing more advanced solutions.
CTI	(= Computer Telephony Integration) is a technology that enables interactions between a telephone and a computer. With CTI phones such as stand-alone IP desk telephones can be integrated with a → softclient of the same user: both ring at the same time, a call can be seamlessly transferred between the two, the computer can dial, while the phone is used to take the call.
DECT	(= Digital Enhanced Cordless Telecommunications) is a standard for digital portable phones (cordless telephones), commonly used indoors for domestic or corporate purposes. DECT handsets communicate wirelessly with a base unit, which is connected to the telephone network.
Ethernet	Ethernet is a family of computer networking technologies for local area networks (LANs). The term is often used synonymously to denote a local area network, such as the internal network of a company. The network is used to connect all internal computers of an organization, based on the IP protocol. The Ethernet is then connected to the Internet.
IP	(= Internet Protocol); responsible for routing (different kinds of) data packages between computers based on Internet addresses (IP addresses). Using so-called Quality of Service (QoS) protocol extensions, voice packages are given priority in transport to avoid typical problems such as delays and speech interruptions.
IP attachment	IP attachment is industry jargon for having an IP desktop telephone attached in addition to the →softclient, which runs on the computer.
IP extension	IP extension denotes an IP user in industry jargon. Sales success, for example, is measured by the number of IP extensions (or units) sold.
IP telephone	Ths is a standalone desk telephone, which is connected to an IP network (→ Ethernet), rather than to the traditional telephone network (→ PSTN). The phone has its own IP address and can be connected and addressed like a computer. IP phones can be used on their own or be connected to a computer via → CTI.
ISDN	(= Integrated Services Digital Network) is the public circuit-switched telephone network. Speech is transmitted on a dedicated "line" reserved for the duration of a call. It replaced analogue networks as the standard telephony infrastructure.
Linux	Linux is a generic term that refers to Unix-like computer operating systems. There are several Linux versions available in the marketplace. Linux operating systems are predominantly used to run server computers, as they are renowned for their reliability.
OEM	(= Original Equipment Manufactures) is a company that manufactures products or components, which are nevertheless marketed under the second company's own brand name.
PBX, IP-PBX	(= Public Branch eXchange) is the central unit of an internal phone system, connecting all internal phones and devices (e.g., within an organization), enabling internal calling, and also providing connection to the outside, to either the → PSTN or the Internet (in case of IP-enabled or pure-IP PBXs). IP-enabled PBXs are based on traditional telephone technology, while still able to connect to an IP network such as the Internet. Pure-IP PBXs are software-based and operate solely on computer technology and use IP networks such as the Ethernet and public Internet.
PSTN	(= Public Switched Telephone Network) is another term for circuit-switched telephone networks, e.g., → ISDN.
SIP	(= Session Initiation Protocol) is a signaling protocol, used for controlling multimedia communication sessions such as voice and video calls over the Internet Protocol (IP). As an open protocol and due to its simplicity, SIP has been widely adopted by vendors and providers in the industry. Its simplicity, however, also means that the standard represents the smallest common denominator, which lacks more advanced telephony features.
Softclient	(or softphone): small software application running on the user's computer providing (advanced) phone features without the need of a physical (desktop) telephone. The user typically uses a USB headset or handset connected to the computer.

Exhibit 1 (continued)	
UC	(= Unified Communication) stands for integrated, managed communication. UC systems integrate traditional and novel communication media (speech, text, video) and devices (phone, computer) with presence information and further collaboration features. Another key aspect is the integration of UC functionality with business information systems (e.g.. ERP, CRM software) and, therefore, with the core business processes of a corporation. UC aims to reduce communication response time and to improve reach-ability of people in distributed work contexts, which often is essential in decision-making.
USB	(= Universal Serial Bus) is a computer interface for connecting peripheral devices such as keyboards, mouse, printers, but also microphones, headsets, or telephone handsets.
VoIP	(= Voice over IP, also: IP telephony, Internet telephony) denotes the concept of using the Internet for voice communication rather than the → PSTN. With VoIP no physical phone line needs to be reserved. Rather, speech is converted to digital format, compressed and then chopped in pieces, wrapped as data packages and sent (via the IP protocol) to the addressee; the process is reversed at the receiving end, where data is turned into speech again.

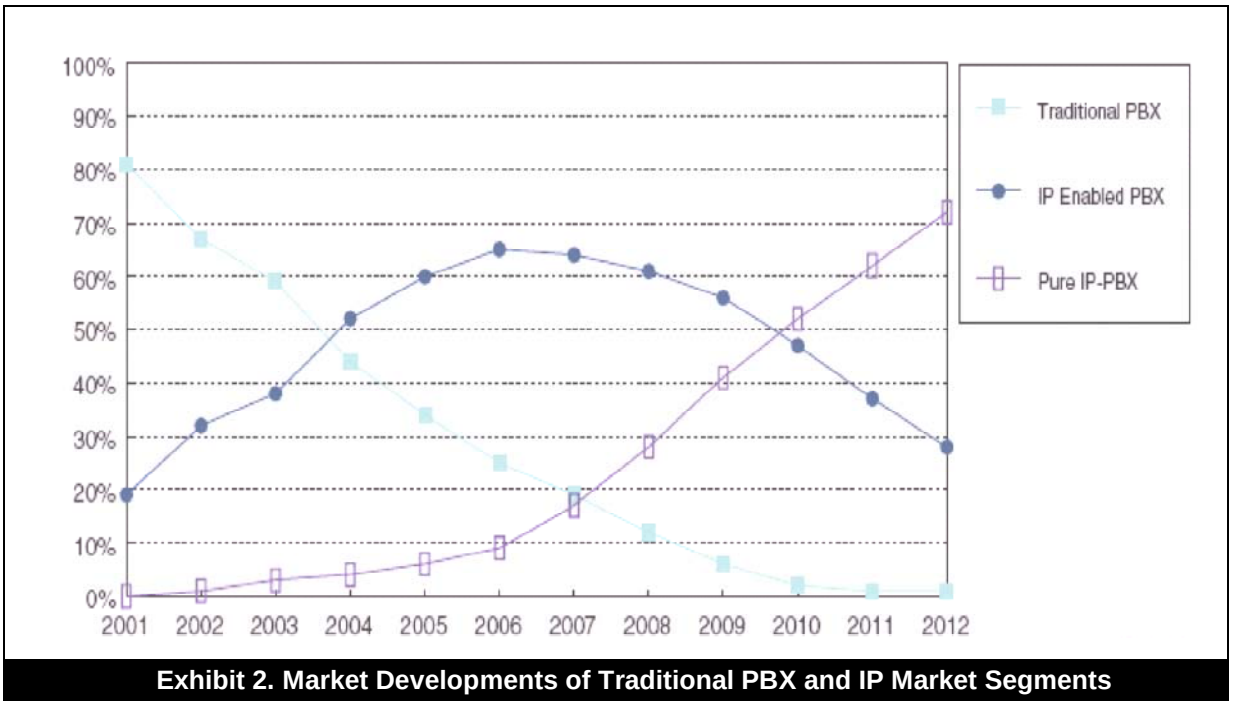


Exhibit 2. Market Developments of Traditional PBX and IP Market Segments

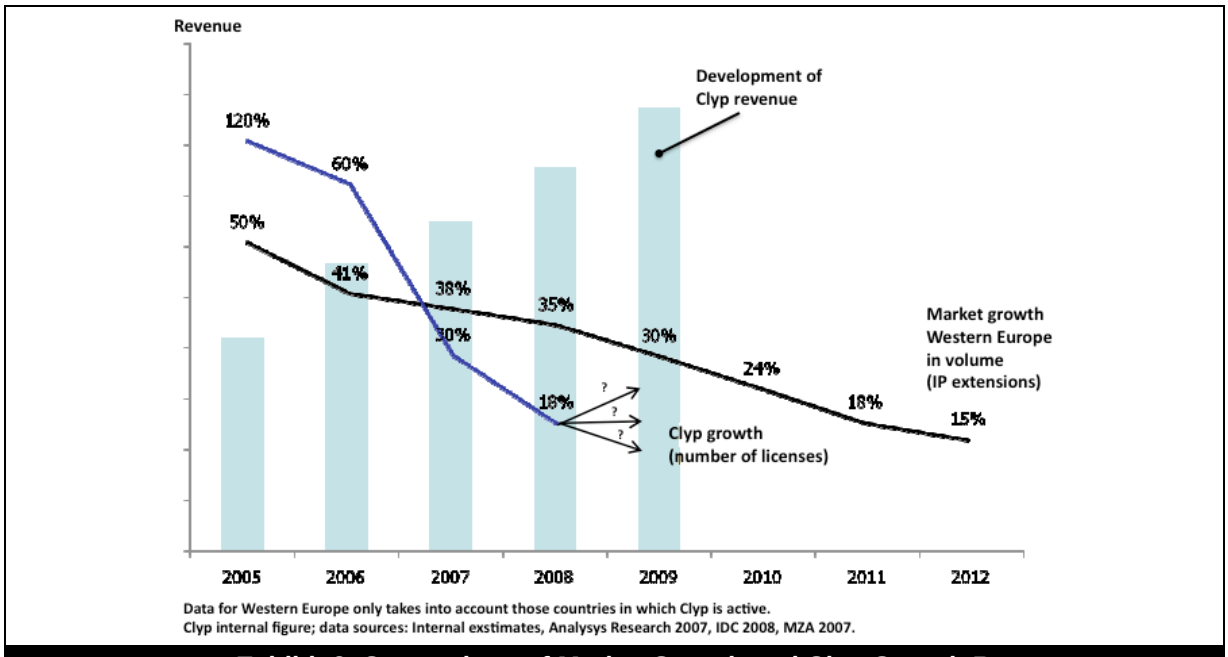
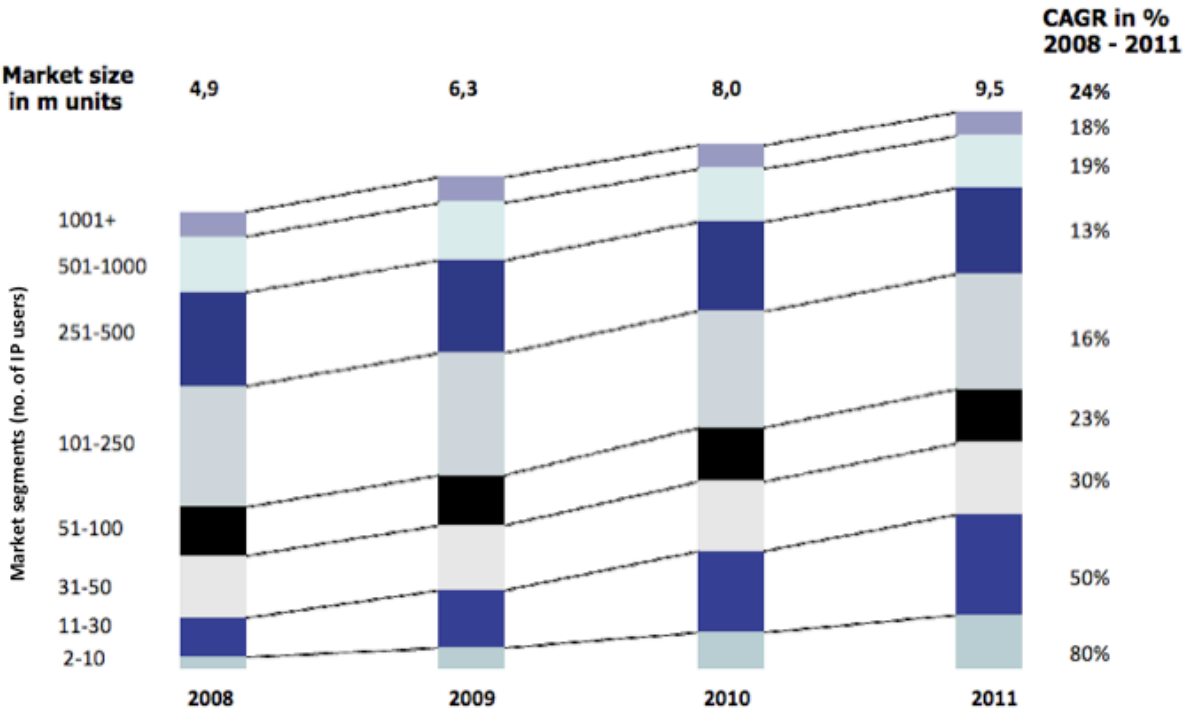
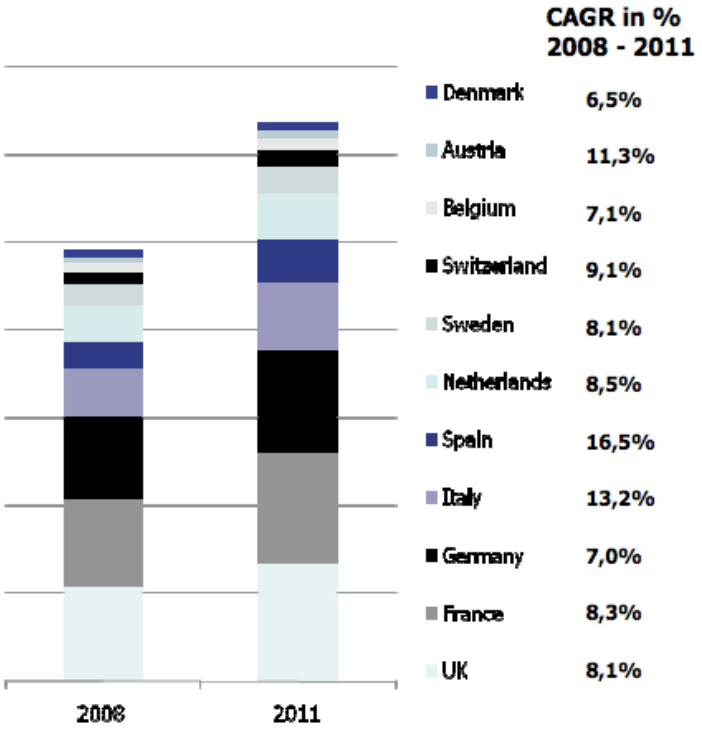


Exhibit 3. Comparison of Market Growth and Clyp Growth Rate



Clyp internal figure; data sources: Internal exstimates, Analysys Research 2007, IDC 2008, MZA 2007.
CAGR: compound annual growth rate

Exhibit 4. Market Development VoIP per Segment in Western Europe in Extensions



Clyp internal figure; data sources: Internal exstimates, Analysys Research 2007, IDC 2008, MZA 2007. CAGR: compound annual growth rate

Exhibit 5. Market Development VoIP in Western Europe

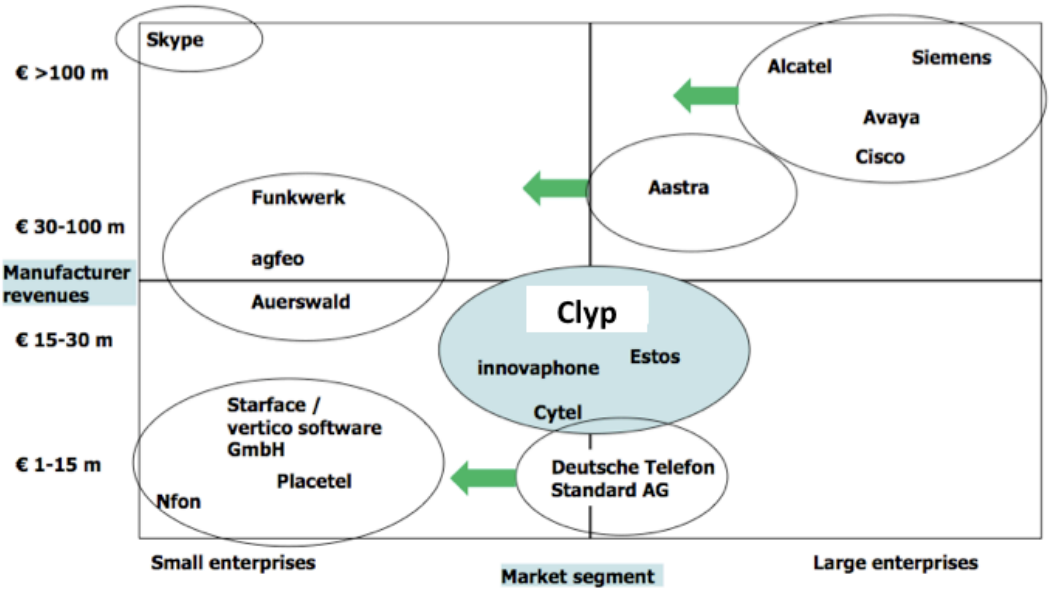


Exhibit 6. Competitor Analysis

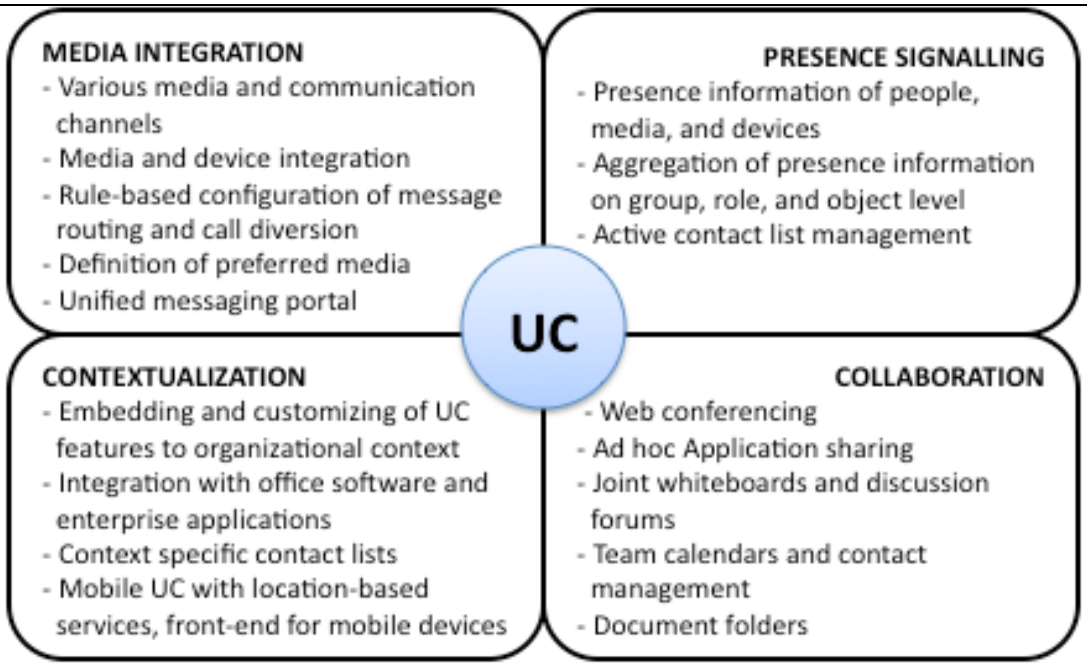


Exhibit 7. Unified Communications Building Blocks

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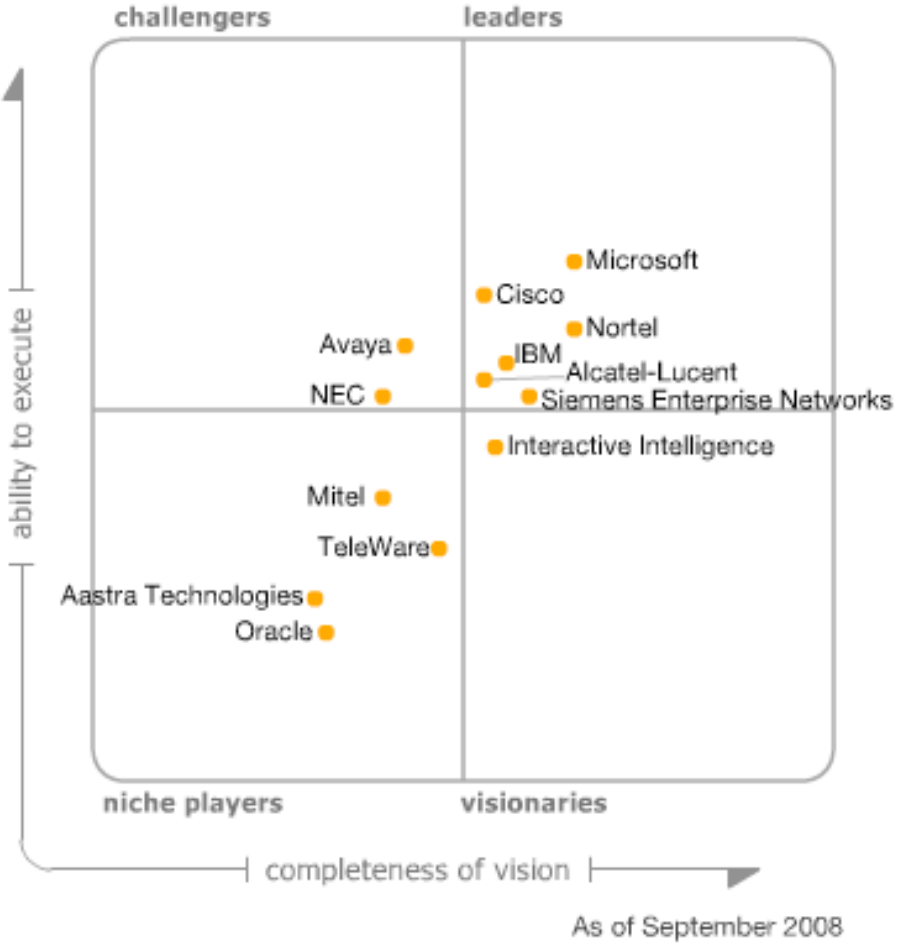

Exhibit 8. Gartner Magic Quadrant of UC

Features of ClypWare

Telephony functionality

- Assistant configuration
- Automatic redial
- Blind call transfer
- Call deflection (forward ringing calls before pick up)
- Call forwarding (forward unconditionally)
- Call hold, Call pick-up, Call swap, Call transfer
- Call waiting indication
- Callback on busy (internal calls),
- Callback on no reply (internal calls)
- Caller list, with date and time
- Consultancy call
- Dialling by block dialling, by overlap sending
- Dialling from all Windows applications (special support for Microsoft Internet Explorer)
- Speed dial
- Dialling of vanity numbers
- Disable lines

Ease of Use and Enhanced Functions

- Announcement before connection to dialled subscriber
- Application sharing
- Call recording via ClypIt! (manual and automatic)
- Call Routing Manager
- Call signalling for internal and external calls
- Call signalling via pop-up information
- Conference manager, Conference room
- Conferencing - ad hoc (user initiated)
- Conferencing - dial in (via extension)
- Configuration of ClypPhone function keys
- Context sensitive online help
- CTI/TAPI for ClypPhone
- Display of time and date
- Drag and drop (e.g. of phone numbers)
- Fax and DTMF support
- Fax integration
- Group calls, Group functions, Group signalling
- Handset on/off hook support
- Hotkeys
- Individual graphical user interfaces (skins)

Call Routing

- Default handling of a call that cannot be connected
- "Do Not Disturb"
- "FollowMe"
- Individual redirection using Call Routing
- Delayed redirection
- Fixed redirection
- Redirection if absent
- Remote configuration of redirection

Call Management

- Advise of Charge (AOC)
- Call Detail Records
- Call restrictions for subscribers (internal calls only, local, long distance, & international calls)
- Least Cost Routing
- Mapping of project numbers to outgoing calls
- Number replacement table for external calls
- Status display for all connections

Quality of Service (QoS) / Voice Quality

- Line echo compensation (G.165)
- Microsoft® Windows® User Authentication
- Support of QoS Level 2 (802.1pQ) & Level 3 (DiffServ)
- Voice compression (including G.729A)
- Voice encoding - G.711 (64kbits/s)
- DTMF generation
- Global phone directory
- Inquiry call
- Manager-secretary function
- Mute microphone
- Name dialling from phone book with auto complete
- Name resolution of dialling numbers
- Personal phone book
- Phone directory with user status
- Recording wizard
- Redial list with date and time
- Roaming user profiles
- Selection of caller ID for outgoing calls
- Shortcuts
- Signalling of availability in phonebook/on speed dials
- Suppression of own caller ID for external calls
- Supervised call transfer

- Interactive Voice Response (IVR) via DTMF
- Intercom
- Polyphonic ringtones for ClypIt! client
- Programmable speed dials
- Remote access to emails using text-to-speech (TTS)
- Remote access to voicemail
- Scripting with VisualBasic extensions
- Scripting - cascading script execution
- Secondary call signalling, configurable
- SIP (Session Initiation Protocol) calls can be made from ClypWare
- Selection of user name at program start up
- Silent 'ringing'
- Skin editor
- Sound wizard
- TAPI 2.2 (TSP)
- Tip of the Day (on start up)
- Voicemail - user defined compression
- Voicemail - recording of announcements, including via remote inquiry
- Voicemail – transmission via SMTP

Microsoft® Outlook® Integration

- Call redirection depending on schedule entries in Outlook Calendar
- Dialling from Outlook contacts
- Logging of calls in the journal
- Name resolution from contacts in ClypIt! client
- Name resolution from contacts with pop-up of contact

Installation and Administration

- ISDN Cards with 4 BRI or with one/two PRI available
- Automatic fallback to back up server,
- Automatic server recognition
- Automatic service restart in case of error (watchdog)
- Configuration via Microsoft Management Console
- Connection logging and display
- ENUM support (Telephone Number Mapping)
- Fax over IP (T.38)
- Internal ISDN PRI/BRI for data transfer
- Inter-site coupling
- Music on hold using a selectable .WAV file
- Status display via Microsoft® Management Console
- STUN support (Simple Traversal of UDP through NAT firewalls)
- Supports DECT handsets, H.323 (version 2) telephones
- Supports IP phones with self labelling keys
- Supports SIP (Session Initiation Protocol) trunking
- Up to 76 ISDN B-channels per ClypGate PC

Exhibit 9. List of ClypWare Features

ACKNOWLEDGMENTS

The author wants to thank Olga Volkoff, Simon Fraser University (Canada), first, for her valuable comments, which have significantly improved the quality of this case, and, second, for including the case in the annual CaseIT competition (caseit.org), the experience of which helped tremendously in shaping the teaching note accompanying the case text. Moreover, the author wants to thank two anonymous reviewers and the Associate Editor for their valuable comments during the review process, as well as the case company for providing generous access to strategic business data.

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