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<p style="text-align:center">The Failure of Mobile Video Telephony</p>

When previously wired communications technologies unwired, humankind cultivated a noteworthy consequence: the prospect of being permanently reachable, while simultaneously being able to reach out to others at any time. The mobile phone (and the pager before it) supplemented opportunities for social scheduling and information access. When it converged with other media worlds, such as messaging, calendaring, and imaging, it became seemingly indispensable for managers and teenagers alike. Mobiles facilitate communication, sociability, and status (Plant 45). Integrating moving images into mobile communication devices seems to be the next big thing. This new technology varies in functionality and purpose. Some devices permit image capture and replay like a "camcorder" (King). Others display unidirectional TV programming, live (Economist), or via download (see VCAST <http://getitnow.vzwshop.com>). This paper, however, is concerned with real-time, bidirectional cellular video telephony (PR Newswire).

The telecommunications industry often suggests that there exists consumer appetite for richer functionality (see for example Vodafone's Future Website at <http://www.vodafone.com/flash/futures>). This argument is inherently suspicious. Analogously to printing presses and agriculture, telecommunications firms only operate profitable when they maximize system size- and utilization. Vendors therefore entice consumers to acquire equipment, and to subscribe to services they allegedly need. Airtime profits generate when a user makes a call, sends an image, or browses digital content. Advertised benefits of using mobile services range from improved methods to interact socially, to greater ability to conduct business. There is, however, a non-monetary "price" (Norman 18) consumers pay for innovation. Its currency is complexity and infiltration. This paper argues that the mobile phone industry's attempt to enhance the functional richness of cell phones with video telephony comes at an inopportune time. Consumers' emerging desire for usability and learned sensitivity toward weakening boundaries between discrete social spheres will eventually thwart the diffusion of mobile video telephony.

<p style="text-align:center">Interaction</p>

Users demonstrate a variety of interaction practices with their mobile phones. Plant explores holding patterns ("firm grip" versus "light touch," and phone shielding, 52), status perception (device presentation, 38+, fake call 49), and using the apparatus as a fashionable item (44-5). Figure 1 depicts potential decision-factors in interaction, exhibited by mobile phone users when evaluating an incoming call.
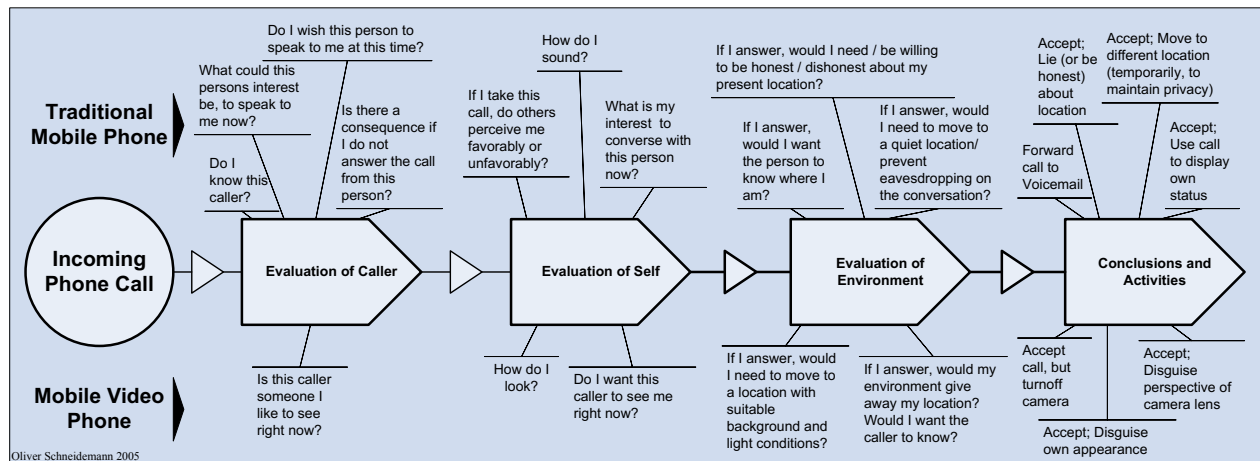
Figure 1: Call acceptance when using traditional and video phones

Most interaction practices exhibited during audio-only calls (see top area of Figure 1) apply to video-calls, too. Users evaluate the caller, the self, and the environment before deciding whether to accept or reject a call. The assessment is more complex when using a videophone, as the lower area of the illustration shows. The individual receiving a video call is aware of the augmented visibility enabled through the built-in camera. This awareness influences the decision whether to partake in a video-call. The visual representation of the self, a core attribute of the video exchange, reduces the capacity to mask own appearance, mood, and location.

Mobile communication devices are location neutral from a caller's point of view. Unidirectional pager messages, for example, seem to disappear in a black hole. Dialog occurs asynchronously and the sender receives a reply only if the receiver chooses to respond. Cellular phones introduced synchronous mobile communication and effectively detached users from "time *and* space" (Sherry and Salvador 118). Traditional mobile conversations often begin with the question "where are you" (Plant 61), and sometimes end with a lie. Common seems to be insincerity about the current location (Chihara cited in Townsend). Users admitted to lying about emotions and to mobile-phone-facilitated infidelity, too (Plant 55+). Video telephony affects traditional conversational dynamics and the willingness to accept an incoming call due to the higher prospect of being caught red handed. Unlike with regular cell phones, making sense of appearance and whereabouts of a person becomes possible with video telephony. Due to the added visual representation, the *caller* gains access to a private space belonging to the *called* person, which was previously inaccessible. We should thus anticipate a variety of responses to incoming video calls. When rejecting the call (which is not novel) is not an option, users might disable the lens and claim it does not work, or adjust its perspective. The main issue is that users accept phone calls on traditional phones *as long as* the audio does not compromise potentially discomforting situational characteristics, such as location or personal condition. Clearly, mobile video technology increases the potential for occasions in which a user may be motivated not to accept a call, or may end up having to explain situational characteristics. The possibility for concealment greatly diminishes for the person called. The resulting perceived threat of the camera lens causes interaction stress, which users rather avoid. However, these factors alone will not cause the failure of mobile video phones. Functional obscurity is a significant problem, too.

Convolution

Technological complexity is an abstract concept and mostly synonymous with quantity. Consider Word for Windows 97, for example. McGrenere and Moore found that most users are only aware of 50% of the programs functions and that they use merely half of those (4, 9). Kluth reports that a more recent Microsoft survey revealed that the majority of users never use 90% of Word's possibilities (8). Two different program generations considered in these studies could explain the digression (a later release commonly entails more functionality than its precursor when vendors engage in a "Feature War" (McGrenere and Moore 1) over market shares). McGrenere and Moore note that functional richness increases intricacy and that researchers have done little to better comprehend usability (1). They propose that application designers abandon the "one size fits all"-customizable user interface in favor of user-selectable design templates that camouflage complexity by moving functionality out of sight (10).

Seemingly, telecommunications firms follow the software industry's lead and cram more and more complexity into the mobile. Berg, Taylor, and Harper find that "[3G's] technological progress appears to be outpacing economic and marketing developments…" (433) and propose "field studies" and "prototyping" (439) to determine user needs. Hinckley, Pierce, Sinclair, and Horvitz discuss another kind of complexity: the circumstantial mandate. They configured a mobile device to interpret interaction scenarios. Touch-, tilt-, and proximity sensors detect when a user desires landscape orientation of the display or begins a voice recording (96-7). Such level of machine intellect reduces human interaction quantitatively by automating the response to frequently expressed behavior, and thus partly eliminates interaction stress. In such scenarios, by the way, we should really speak of *behavior* instead of interaction, because of the combined attributes of intent, touch, motion, and vicinity. Other proposals for improving device interaction are concerned with logical presentation of information and automatic configuration (see Connelly et al, Dahlem et al, Kjeldskov, and Strang). Yet *all* aforementioned propositions attempt solving issues by exploiting metaphors, hiding buttons, and automating functions, instead of devising truly revolutionary solutions. The fallacy of workarounds is that they induce overhead (how unobtrusive will concealing the interactivity challenge be?) and create temptation to fill the void left by the supposedly disappeared interaction problem with novel functionality. Norman calls this "the paradox of complexity" (19) and advocates simplification and specialization as opposed to a jack-of-all-trades design mentality. The keys to simplicity, according to Norman, are purpose-centric design concepts, unobtrusiveness of the technology, and transparent data synchronization (cited by Bergman). Designers should therefore evaluate interaction paradigms while considering history, use context, functional effectiveness, utility for the user, overall learnability (viz. device complexity and user ability), and psychological and sociological factors of the experience (for example, perception of self and others). Technology users have become more critical, tech-savvy, and complexity-aware in the information age. They no longer tolerate difficult products of dubious value. And without usability, innovation does not diffuse since complexity and adoption are inversely related (Rogers 257).

Crossroads

The concept of elevated sensitivity toward melting social "domain" barriers (Cooper 22) is only slightly better graspable. Family TV programs began dissolving social "boundaries" in the 1970s (Taylor cited in Croteau and Hoynes 180) and mobile phones continue this trend. Palen, Salzman, and Youngs review how new users embrace cell phones

and find that novel dialog opportunities emerge because "phones exist in places where they didn't before and can be used at times when phones weren't normally used in the past." Gant and Kiesler note that the association of a phone number with a person (as opposed to a physical space) lessens hesitation to call at formerly unusual times. Similarly, Sherry and Salvador discuss mobile communication in workplace scenarios and observe that continuous openings to "[do] things that are free of time and space" (118) divert attention. Time/space irrelevance and perpetual accessibility accelerate the dismantling of social boundaries. Consequently, family and work, day and night, as well as public and private realms converge.

Users primarily maintain social networks with their mobile (see Rogers, Plant, Palen et al). Mobile discourse thus helps satisfying an essential human need for social contact. Yet the technology promotes dialog due to *opportunity*, not because of *necessity*. Because of discourse quantity and -frequency, superficiality substitutes for emotional depth. Eitzen writes that technology-enabled discourse "increases interaction while reducing *intimacy*." This seems to prove technological determinists right. However, users comprehend probable consequences of technology because they "[evaluate and perceive it] in comparison to existing practice" (Rogers 249, 254). Based on their cell phone experience, users anticipate a further deterioration of social boundaries and reject video phones to protect the personal space.

Legacy

Briggs and Burke suggest that AT&T's Picturephone failed due to fiscal issues (307). Kraut and Fish argue that a number of problems beyond affordability hindered its diffusion. For one thing, they contend that video calling adds little utility to traditional telephony (701, 703). Empirical data shows that users perceive "video telephony [to be] more like the telephone than … face-to-face communication" (704). The latter is rather perplexing, if we speculated that a video image, emulating face-to-face contact, reinstates the intimacy lost due to the electronic nature of the dialog and absence of visual cues. Additionally, Kraut and Fish point to the systems' qualitative constraints and find that having few other users to call on a video phone lessens the motivation to begin using the service (710). Lastly, they refer to studies illustrating that non-business users "viewed a video phone … as an *invasion* of privacy" more than corporate users did (718, see also Lipartito). Like the Picturephone, mobile video telephony will fail because users see little benefit in using it, and because they dislike its invasion of their privacy. However, mobile video phones will also be unsuccessful because users will associate the Picturephone's legacy of failure with it. Negative perception of a preceding related technology "can damn the adoption of future innovations" (Rogers 245).

Scott Weiss of Usable Products (Personal Communication 31 March 2005) believes that the Picturephone failed because users "do not want to be seen" during phone calls and agrees that adding functions increases the complexity of a technology. Since mobile video calls are more complex to prepare for and partake in (e.g. positioning the phone on a table, keeping the self and the phone stationary, and making sense of the image on the miniaturized screen), Weiss anticipates that video messaging, analogously to audio-voicemail, could become a popular alternative. Mobile video telephony, he believes, "will be rare." Yet in his opinion, complexity must not cause the consumer to reject an innovation when the "design is done properly." Weiss thinks that "people surrender to complexity" and that good design "offsets" the effects of functional quantity and complexity. Admittedly, the latter has worked for automobiles, which required abundant interaction with choke and oil supply only during their infancy (Kluth 7). However, the nature

(temperament) of digital technology's evolution and the character of workarounds might cause a contrary effect: a compound increase of complexity.

Using video communications in professional environments is a more likely success story (see Kraut and Fish), if the technology matures. The underlying infrastructure will only conceptually resemble the Picturephone. As system environments improve, and Internet, telephony, and video further converge, stationary business video-conferencing could become pervasive. In social professions, video communication could conceivably be useful during medical examinations (Monti and Motta), and when caring for others (Parker Oliver et al).

Conclusion

Every innovation introduces desirable and undesirable characteristics. Telegraph and newspapers, for example, bridged geographical distances and created entire industries, but also laid the foundation for contemporary de-contextualized news reporting (see Postman). Besides regular interpersonal communication, video telephony permits extreme uses, or abuses, too. Video exhibitionism (Masnick) as an offspring of phone harassment could unveil the dark side of video telephony, whether the device used is mobile or stationary. This type of exhibitionism simultaneously breaks and establishes barriers. Like the public exhibitionist, the video exhibitionist violates privacy and performs an act society disapproves. However, by avoiding close proximity to the targeted object, the video exhibitionist also maintains distance. Still-image-voyeurism and industrial espionage (Schmidt, McAleavy), in contrast, will only evolve toward higher sophistication when using video phones, due to the higher information value of moving images.

In this paper, I have shown that consumers' preference of usability over functional richness and their increasing awareness of dissolving social domain barriers will cause mobile video telephony to meet the fate of its earlier sibling, the Picturephone. A mature technology user, which includes veterans who learned from experience and young adults who learn through public discourse, comprehends probable consequences of an innovation. Experience with multifaceted technologies in the information age promotes awareness of interaction stress due to excessive functionality and complexity. The perforation of personal and social boundaries started by telegraph, television, and mobile phone, on the other hand, results in users' anticipation that the videophone will further the weakening of domain barriers since it breaks the visual barrier. Consumers will not surrender to interaction stress or psychological discomfort because technology does not shape behavioral or social patterns (Croteau and Hoynes 306, 331-2). The interaction with and through a technology shapes the "meaning of an innovation" (Rogers xxi). Yet there is another reason why TV/video should not converge with pervasive mobile technology. Postman explained how effortlessly digestible TV news-program-fragments condition viewers "[to abandon] logic, reason, sequence and rules of contradiction" (105). Mobile discourse, on the other hand, causes focus-distribution by increasing pace and quantity of concurrent "social intercourse" (Thurlow and Brown). Fragmentation and diversion deteriorate comprehension skill and the ability to process abstract thought. As a result, users lack talent to establish proper links between interrelated information segments and struggle to avoid accidental links between truly unrelated information. How will eye, ear, and brain sustain persisting composite audio, visual, and emotional stimuli, if mobile/video telephony and TV join forces?

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