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# Multi-Disciplinary Collaborations in New Media: Experiences in MDCN

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**Abstract**

New media is an exploratory artistic investigation which creates new forms of engagements between users, technological artifacts and their environments. Usage of technology is the intersecting point between new media and HCI where enriching collaborations can happen. To manage creative collaborations, existing paradigms within each domain have to be adapted as well as new collaborative processes and software tools needs to be forged. This paper exposes some useful collaborative practices within new media, which can be reused to further the partnership between new media and HCI.

**Keywords**

Multi-disciplinary collaboration, research management, new media, context aware mobile application, game, software tool, usability study.

**ACM Classification Keywords**

H5.3. Group and Organizational Interfaces: Computer – supported cooperative work; Evaluation/methodology; Organizational design.

**Introduction**

New media is an exploratory art form which utilizes technology and existing environment to create new forms of engagements between users, technological artifacts and the environment. Technology is used to enrich and intensify these engagements. The usage of computer technology is the primary point where new media and human computer interaction (HCI) domains

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can intersect. New media designers can use the available knowledge of HCI domain, whereas the HCI practitioners can extend and validate their understanding in more demanding application environments. In this respect these two domains compliment each other. However, managing and maintaining such collaboration would not be trivial.

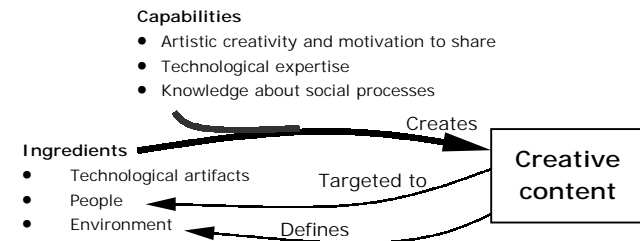
Design arts practitioners successfully brought art and technology practice in a common new media arena to extend the design space and stimulate technological developments. But most importantly, they raised a expectation that multi-disciplinary collaborative explorations can deliver additional benefit to the society [1]. Simultaneously computer scientists had been trying to improve computer interfaces by studying human behavior within HCI domain. Now new media and HCI practitioners can share their visions and anticipate multi-disciplinary explorations. It is expected that during this collaboration, further harmonization of the methodologies, processes and goals of: art; computer technology; and sociology domain; would be required, than what exists today within HCI and related realms [2,3,4].

To accomplish and maintain a successful union, both, new media and HCI, need to expose their respective practices and collaborative experiences to find common points of interest and identify appropriate collaboration strategies. To achieve this exposure, new media practitioners need to: articulate their vision with respect to new media; affirm the roles and contributions of the constituent sub-domains; and most importantly, articulate strategies that fostered collaborative multi-disciplinary research and consolidated the benefits of the cross-pollination. It is hoped that their past collaborative experiences will be useful in this proposed collaboration between new media and HCI.

In this paper we, as new media practitioners, attempt to articulate the bigger picture about new media exploration, its potential role, and the role of the individual constituent sub-domains: art; technology; and sociology. By this we affirm the existence of a common vision which is shared by all three constituent sub-domains and also possibly by HCI. A shared vision will be facilitate development of symbiotic multi-disciplinary research models. Then we present our observations on issues which might have been behind the compartmentalization of the three domains which constitutes new media. Understanding these issues may aid their de-compartmentalization. With this background, we present a case study on our multi-disciplinary new media research group, the Mobile Digital Commons Network (MDCN). Through this case study, we attempt to identify strategies that fostered multi-disciplinary explorations within MDCN.

### New media exploration: A multi-disciplinary, creative, human centric process

New media exploration is an instance of socio-economic process that drives development in human civilization (Figure 1).



**Figure 1.** Engagements between new media art and society

The creative people: artists, writers, designers, technologists and social scientists, utilize the available ingredients – technology artifacts, people/participants and the current environment, apply their creativity,

technical expertise and understanding of sociology and communication, to create new desires and visions. These desires and visions are expressed in art form. With time these arts forms regress to become basic human necessities, evolve the environment and become part of it. Flying machines which were once fantasy of imaginative artists in past, soon became the subject of active technological research and have regressed to become quotidian necessity or even issue of survival for many at present. New media artistic expression and statements of today have such potentials to become the reality and necessity in near future. Thus new media explorations express and articulate the vision of the emergent environment and influence the path of development of human society. More discussions can be found in [1].

Traditionally, design arts practitioners initiated new media projects, hence the artistic motivations primarily decided the goals and expectations in new media. Artists are adept and imaginative in pushing the envelope of expectations and defining new horizons, which appears to be both fantastic and mercurial. On the other hand, technologists had delivered technology artifacts to realize these fantasies. These technology artifacts expand the environment by creating additional layers, like virtual or augmented environments and thus defines emerging environments of tomorrow. An understanding of the human processes, and economic implications are also essential components of new media study and explorations. Role of sociology is relevant, because new media is about human engagement with the ingredients, among themselves, and about human perception of these engagements. With understanding of the human processes, new media activities can be further leveraged and may be focused to achieve certain socio-economic objectives. But managing the ingredient triad and the capability threesome to produce non-quotidian outcomes is a non-trivial process and pose several challenges.

### **Collaborative experiences within new media**

There exists quite some conflict and tension between these three constituent domains: art, technology and sociology, due to difference in their: belief and value system; methodological orthodoxy; evaluation approaches; vocabulary and language, which makes communication and sharing vision across domains quite arduous. The tension of mismatch between technology and social science is less prominent primarily because technology and sociology practitioners did not interface directly. And perhaps also because both realms share a similar linear, repeatable, objective methodology of reasoning and knowledge building. But the disconnect between art and technological or social science practice is most conspicuous.

Undoubtedly, this disconnect is a more recent and it is also an artificial phenomena to a significant extent. Because in past we found the same individuals like da Vinci, practicing both art and technology. Even today we find architects at the cusp of art and technology, whereas civil and building engineering, a fairly old domain has casted its practice within more strict, rigid and objective standards which do not leave enough space for explorations. On the otherhand new technology domains like computer science provides more opportunities for diversity in practice therefore more tractable to cross domain collaborations. Hence we attempt to generalize that, a combination of factors are behind the compartmentalization of the domains. Some of these are: maturity of the domain, development of standards, education and training, institutional support, dominant professional cultures and expectations within its domain which determines the breadth of explorative and creative space. All these determines how tractable a domain would be for cross-domain collaborations.

New media is an experiential investigated form, which favors individualistic creative process and subjective

evaluation and interpretation of outcome. But there is a definite movement to synthesize this artistic process with analytical methodologies that emphasize structured processes, goals and evaluation. Such synthesis of methodology is based on the expectation that the synthesized process will repeatedly yield the benefits of well orchestrated and managed production process and yet it will leave enough scope for experiential individualistic creativity to flourish. However in practice, such symbiosis can fail and the failure symptoms are manifested as perceivable frustrations in all quarters regarding mismatch between expectations and outcome, a shared feeling of helplessness, a lack of shared vision and communication, conflict of professional and project goals, contradictory objectives of multi-disciplinary team members. In this regards to successful maintenance of collaborations within new media, the relevant questions were:

- How to design cross disciplinary communications, design and production processes?
- What tools are necessary to facilitate communication and share visions across domains during project conceptualization and production ?
- How to mesh the different types of iterative and linear design processes favored by various domains and individuals. How these diverse processes may interact in a multi-disciplinary new media design and production team, what are the interaction points, what are appropriate designs for such interfaces which will facilitate appropriate interactions, how to design these interfaces ?
- How to insulate participants from over-interactions, to preserve the creativity and disciplines of individual domains. Engineering work is closely tied to artistic design. Technologists require realistic, well articulated and well understood tangible goals a-priori to plan their tasks and execute them.

Whereas artists need to iteratively evolve designs. But if engineers are asked to change their designs too frequently, they will never achieve anything, where as forcing artists to plan and declare outcomes a-priori will simply suffocate the artistic creativity. So question is how much synthesis, synergy and separation is needed, how and where to materialize them at appropriate points in the overall new media and domain specific processes ?

- Design art and new media explorations tend to be execution based. Whereas act of theorizing dominates research in technology and sociology. In an academic research environment it is important to understand how new media research objectives will translate to meaningful research objectives for all academic researchers from technology, communication and sociology, to keep them motivated.
- How institutions, education and professional development activities can promote cross disciplinary explorations and skill building? What are the concerns in designing appropriate policies to achieve this ?

### **Managing multi-disciplinary explorations: Case study of MDCN**

MDCN is a group of students, researchers and educators from arts, technology, communication and sociology working on multiple collaborative research projects. Some of their activities are discussed below.

*Memichi mobile game project:* Memichi was a context-rich location based new media game that ran on mobile phones. This project had fair amount of art and technology content. The game designers evolved the content through multiple iterative design cycles. In each cycle they required the fully developed software version for each alternate content scenario considered, before they choose one and froze some specifications

for the final software. Game designers required reasonably complete software to get the real feel of the new media. Which means that either the single final version of the specification set be spelt out a-priori or the multiple alternate software versions be generated economically and rapidly. The first option will lead to chicken and egg deadlock, so the second path was chosen. This avoided the conflict between the two processes, the traditional linear software engineering process and the experiential iterative design process favored by the artistic game designer. This practical approach did not presuppose any utopian or idealistic art-technology synthesis but yet achieved a symbiosis.

To materialize this, the software engineering team built the Mobile Experience Engine (MEE) which automatically generates software code within few hours, once the content is formally specified. The designers specified alternate contents and the MEE automatically generated the alternate software versions to choose from. MEE architecture and its development was carefully planned so that the core modules of MEE was available in the early phase of the project. The software engineers went on developing and maturing the MEE whose design was decided a-priori. This insulated them from the frequent changes in the content specification. The content production crew went on producing the multi-media content artifacts, where as, creative designers went on experimenting with the alternative version of the content and evolving the design. The creative crew were insulated from the exacting demands to plan and formally articulate the design outcome a-priori. The MEE tool and appropriate project execution allowed the three processes to work side by side, interface at well defined points and yet maintain their own distinct individual creative work-flows. The MEE tool and the associated production process successfully satisfied the following requirements: (1) enable designer's own processes; (2) provide designers with high fidelity experiential review

at all stages of the design and development process; (3) manage both the technologist's need to simplify, abstract and formalize requirements and the designer's need for sufficient details, without making tradeoffs; (4) manage rapid evolution of software components along with the content design; and (5) reduce the semantic and linguistic gap between content designer's artifacts and technologist's design views which frustrates materialization of the content on a technology platform.

Along with the MEE tool and associated production process management, other strategies also contributed to the success of Memichi project. The project was initiated with a "participative design" workshop which involved engineers, designer, project managers and researchers. This perhaps exposed the hurdles of multi-disciplinary production process well before the project started, so that MEE work could be visualized and planned quite early on. Multi-disciplinary brain storming workshops along the way, also provided enough multi-disciplinary interface points for planning purpose.

*Mobile games market study:* MDCN commissioned a study to assess the market potential of the mobile games. Through this, new media practitioners received realistic feedback from business analysts about the socio-economic potentials of their work.

*The Evaluation Mobility Usability study:* In this project sociologists and communication researchers studied user's engagement with new media art forms. The evaluation snap shots at present day might: indicate likelihood of success of the produced art in its intended role; identify the key challenges of communication; and identify opportunities of improvement as useful feedback to the designers. Improved understanding gained from these usability studies may even identify new applications of new media art form. This project added an evaluation stage and feedback loop in the new media design process, which had been missing.

The shared expectation was the designers would decide how to interpret and use the study results.

This study also indicated that new media content designing is much more complex process which requires in depth knowledge of the target audience and their perception processes. The gap between what effect was intended and what was perceived pointed towards the need for more realistic usability models. To achieve the intended effect on user, perhaps the users need to be prepared through some mediation process.

*Policies and institutional support that favored multi-disciplinary research:* MDCN recruits students and collaborators from multiple disciplines. In addition to dissemination and exposures in design art forums, several publications from MDCN are underway in technical and sociology conferences. MDCN also enjoys support from institutions like Concordia University, Hexagram, Banff Institute, OCAD etc. which have strong commitment to multi-disciplinary research.

### Conclusion

Successful collaboration between new media and HCI will require addressing several methodological and project management issues. Existing experiences and practices related to multi-disciplinary collaborations within new media arena can be useful to materialize this new collaboration between HCI and new media. There is a need to modify/adapt practices, methodologies, expectations and cultures in all constituent domains to execute collaborative projects. New modes of communication, processes and project execution methodologies will be also needed. Good software engineering practices and tools may aid this process. During the production, increasing interaction between domains, yet selectively insulating the core creative processes of each domain would be a key critical success factor. The bottom line is- each constituent domain needs to maintain symbiotic inter-

disciplinary relationships, deliver value to it and benefit from it.

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