

**Synergies Protocol on Interdisciplinary Research
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This document presents formulated guidelines for institutions, for funding bodies, interdisciplinary researchers and groups. Edited by Simon Penny, based on input from participants in Synergies Workshop on Interdisciplinary Research June 28-30 2013, and especially Roc Parés and Swen Seebach.

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1. Arguments for interdisciplinary research.

Interdisciplinarity has two main areas of value, one is pragmatic, the other epistemological.

The pragmatic aspect lies in solving complex real-world problems and minimising unintended side effects. The complexity of situated problems requires diverse input.

Interdisciplinarity is generally recognized as a key technique for generating new knowledge and solving hard problems in emerging and changing technological, environmental, social contexts, such as global communications, ubiquitous computing, emerging digital cultures and their legal and political aspects, global warming and sustainability problems.

As with the pragmatic aspect, in the epistemological aspect, interdisciplinarity helps to solve boundary problems and has a mediating function between disciplines. The epistemological aspect involves negotiation of the relationships between disciplines and interrogation of the coherence of assumptions and methods.

Interdisciplinarity encourages reflexive consideration of disciplines. Philip Agre called this Critical Technical Practice. It reveals operational metaphors and methodological errors and exposes hidden assumptions of disciplinary cultures by denaturalization and interrogating operational metaphors and structuring narratives. It can help find disciplinary lacunae and extend disciplinary research scope/paradigms. It allows mediation between disciplines and helps get into the gaps between the so-called 'silos'. The 'silo' metaphor, commonly deployed in commentaries in English, sees disciplines as rising like columns over time. As they get higher, they both reinforce their own conventions and cross communication between silos is reduced.

Niklas Luhmann explained interdisciplinarity in terms of the cybernetic notion of the observer of the second order. Someone who does not see just the object through the eyes of the discipline but who, thanks to his distance, sees and can reflect on the object, the discipline, and on the bonds between them, which may transpire to be questionable.

Interdisciplinarity in this case would mean to create a position beyond disciplines. Roland Barthes identified a similar condition when he said - *"In order to do interdisciplinary work, it is not enough to take a 'subject' (a theme) and to arrange two or three sciences around it. Interdisciplinary study consists of creating a new object, which belongs to no one."*

Applying the methods of one discipline to the material of another can produce valuable productive outcomes or results of interdisciplinary research. In his work *Cognition in the Wild*, Ed Hutchins' approach to distributed cognition opened up cognitive science by challenging its methodologies to account for problems outside the normal problem set. In the social sciences, mixing methods from anthropology, social psychology and sociology has contributed to important epistemological turns in the social sciences.

Academic research (often characterised as the 'Ivory Tower') is perceived to be isolated and not responsive to real (public, citizen) problems. "Real life" is about real life problems which do not stop at disciplinary boundaries. Interdisciplinarity opens inquiry to diverse participation, as indicated in the concerns of citizen science initiatives.

2. Disciplines as cultures

The 'Silo problem' is a way of describing the self-defining and self-justifying quality of disciplinary formations. It also draws our attention to the inaccessibility of the spaces between the silos.

Disciplines are not absolute, they are historically contingent, they arise and decay. The existence of Interdisciplinarity is a symptom of disciplinarity (and their lacunae). Disciplines emerge out of interdisciplinary initiatives. Examples in recent decades include women's studies and gender studies; science and technology studies, media studies, game studies, software studies, computer science and informatics. We can also see interdisciplinarity as historically prior. The Greeks worked with geometry, physics, biology, in an interdisciplinary and applied way. Disciplines are platonic ideal types, which support increased specialisation and abstraction but also detach research from worldly questions.

Methodologies which are standard in one discipline are often unknown in another.

For instance, Grounded Theory, Discourse Analysis, qualitative interview, methodologies from social science are not taken seriously in 'harder' sciences, even in economic studies.

Knowledge and practices are discipline/domain specific. The very act of transferring 'data' or ideas from one discipline to another often results simplistic interpretations due to the shift in disciplinary cultural references. An example might be the use of J. J. Gibson's notion of Affordance in Design and HCI. Of course, such 'misinterpretations' which occur as terms drift across epistemological territory are often themselves generative.

3. Problems encountered in interdisciplinarity

a). Problems of communicating across disciplinary boundaries. Virtues for participants in interdisciplinary projects include humility, reflexivity,

diplomatic skills and general goodwill. Participants who are committed to the world-view of their own discipline will struggle and will create impediments for the group.

b). Problems of commitment and continuity. How can continuous engagement be guaranteed? This depends on the type of interdisciplinarity and on the organization within such a project - hierarchical, symmetrical, collaborative.

c). Problems of funding and support. Dependent on the project type there are different funding issues.

d). Milestones and Benchmarks. Criteria for evaluation and even completion which hold in disciplinary contexts may not hold in the interdisciplinary realm. Continuous negotiation of goals and criteria is a necessary aspect of an interdisciplinary project .

e). IP and appropriate credit. Participants in interdisciplinary projects should accrue the kinds of rewards which are of value in their worlds, personal and professional. This might include authorship of papers, credit in creative projects (films, exhibitions) and physically tangible assets - a boat, a well, a power supply.

f) Institutional support. Funding bodies and institutions actively (though not intentionally) impede interdisciplinary projects by ascribing value to only certain kinds of outcomes - a grant, a peer reviewed paper. Allowing credit for an exhibition, a film, or a protocol they contributed to would encourage interdisciplinary work.

It takes time and effort for people from different disciplines to understand each other's ways of seeing. An obvious point but perhaps overlooked because people from different disciplines make assumptions about what the other disciplines are about, think they understand their languages. Other possibility is accepting ignorance and being humble about knowledge of other arenas.

4. Interdisciplinary Project Scenarios and Structures

Individual

Small group informal and community driven groups

Small academic group

Large scale institutional and multi-institutional groupings

Special purpose top down instigated/funded projects - often military -ie paradigmatically, Manhattan Project.

Interdisciplinary projects can have a diverse range of organization types: hierarchical, symmetrical, collaborative. They can involve both paid and voluntary work and can be anonymous. Geographically distributed and internet coordinated projects are increasingly common. Open source software development is a well-known case of voluntary,

networked and often anonymous collaboration. This also involves development of collaborative infrastructure, ie, collaborative platforms, protocols and tools such as Codendi, Redmine, ProjectPier.

5. Approaches for Interdisciplinary projects

Problem driven approaches, driven by government agencies, NGOs, foundations, patrons.

Open exploration - emergent goals.

Community identified goals.

Interdisciplinary subcontracting. In some large scale scientific research grants, the public education and dissemination pieces are subcontracted to artists, curators, bloggers or citizen organisations. An arts organisation like Hangar might be brought in to do public presentations for a scientific research project. Such an approach is pragmatic and effective but may not contribute to negotiation of disciplinary world-views etc.

Common goals without common ground. It is possible to imagine that intelligent people of goodwill can come together to achieve a goal which they share, and for which they are motivated to work, both because they believe in the goal and because they will depart with a reward in a currency they can use. The solution to such a problem is not the subjection of all participants to one disciplinary worldview, nor the assumption of the possibility of universal language which will undergird the enterprise, but rather the recognition that knowledge and experience are fundamentally heterogenous and that common languages must be negotiated.

The process itself can stimulate interdisciplinary action. Make the process itself pleasant. Personal bonds and shared experiences can be a good basis for working together, as well as the satisfaction of working with a community. Shared experiences often contribute to working together. Shared events, research trips, shared humour and myths contribute to the building of community coherence.

6. Process of project development

6.1 Problem framing

The history of large-scale engineering is littered with projects which get the right answer to the wrong problem. Any interdisciplinary project must begin with an analysis of the 'Big Picture', to ensure the right questions are asked. Who sees the big picture? Global Economic/Social/Environmental/Political contextualization. Importance

of involving 'Big Picture people'. Appropriately chosen artists can often play a key role due to the professional formation of artists as interdisciplinary integrators and discerners of cultural and environmental patterns. They serve as observers of the second order and as a nodes (in Castells sense).

6.2 Research Methodologies

Mixed methods approach

Action research

Grounded theory (anthropology says its really just anthropology)

Critical design

Participatory design

Ethnomethodology

Actor network theory

Pickering's Mangle - performative and representational modes

Activity theory

Process ontology

Mike Michael argues for the "idiotic method", wherein the idiot as a revealing and critical role, asking the right uncommon questions:

<http://www.cci.edu.au/node/1491>

7. Outcomes

Academic outcomes

Non-academic, non-textual (performative) outcomes.

- Material artifacts (txtmob)
- Artworks, installations, exhibitions (non didactic?)
- Civic projects (library, science shop, living lab)
- Citizen mobilization

Collective practices, creation of durable social bonds between researchers,

- new knowledge,
- new critical approaches (such as Actor Network Theory)
- new disciplines
- new interdisciplinary research centers.

8. Assessment, Reporting, Dissemination

Developing new assessment criteria and reporting methods

Reporting on methodological innovations

Reporting failure

The problem with institutionally defined approaches is that the assessment criteria already define possibilities, terms on which

success is defined, and mitigate against ‘surprises – ie identification of circumstances which lead to reflection, changing paradigms etc.

9. Challenges for institutions and funding bodies

Provide opportunities for open-ended creative experimentation which may have no short term market application.

- Foster investment not only in technical infrastructure or in traditional, ‘content’, but also in media projects that create access and participation.

- Make small-scale and short-term project funding available.

- Provide for long-term structural support.

- create structures that support projects based on methodology as opposed to subject

- promote “cross bridges” between university departments, research labs etc.

- recognize non-traditional outcomes – such as public manifestations, documnetaries, etc.

would add, support and fund applied science labs in universities (support actively interdisciplinary work), give accreditation for interdisciplinary contributions, pay extra-money for interdisciplinary contribution in universities (courses, presentations, lab work). Support investigation within the “wild”

10. Practical tips for survival, success and sustainability

People who have had deep experience or education in two or more particular disciplines or arenas may be of value in facilitating interdisciplinary activity or at least in understanding some of the challenges.

Humility in accepting one’s own lack of understanding in an area is key. Tied to this is the problem of commonly held prejudices or distrust in other principles. Scientists may assume that art is simply trickery (which, even if it was, might not be a bad thing) or artists may assume that scientists think simplistically or mechanically about the world and are incapable of lateral thinking.

Confrontation as well as agreement should be expected and permitted. There should be a means of encouraging critical discussion without taking it personally.

Dangerous tendencies and recommended solutions:

- Communicate early and often – face to face
- Communicate at the beginning via metaphors and visualizing language
- Try to make assumptions and expectations explicit at the outset.
- In all research steps ensure that you agree: what is the issue, problem?
- Create shared experiences with others, despite the project itself : e.g. being in one building, working on one table, creating shared events.
- Diplomacy - manage and nurture relationships
- Be humble - avoid disciplinary hubris
- Mutual respect - Don't be patronising. Sometimes encountered when ie engineers and computer scientists 'speak down' to artists, but just as often the opposite.
- Share work, rewards and recognition

Appendix 1:

[RESEARCH ARTS](http://www.research-arts.net/ra_researching.html) sept2013,
http://www.research-arts.net/ra_researching.html
 includes recent papers by Penny, Parés and Seebach :

What do we mean with interdisciplinarity and why do we care?

Simon Penny

A physicist, a sociologist and an artist come into a bar... - What is the impact of humor on different types interdisciplinary projects? Swen Seebach.

The cultural relevance of interdisciplinarity in the context of an unsustainable technified hyper-consumeristic society. Roc Parés.

Appendix 2 - General reference Texts, examples of methodological critique

Hubert Dreyfus - What computers still can't do.

Philip Agre - Lessons Learned in Trying to Reform AI

Emily Martin- The Egg and the Sperm.

Anthony Chemero - Rat behavior experiments (need ref)

Ed Vul - Voodoo correlations in FMRI studies.

<http://www.edvul.com/voodoocorr.php>

Voodoo Correlations are everywhere

<http://pps.sagepub.com/content/6/2/163>

"In general, paradigms can be understood as conventional setups for producing idealized, inflated effects."

White Paper on the Interrelation of Art, Science and Technology in Spain. (Even though the economical historical context has changed a lot since the mid 90's I still suggest reading the Conclusions and Recommendations in pages 149 to 154. RP- need ref)

ONTOLOGY AND ANTIDISCIPLINARITY Andrew Pickering in A Barry and G Born (eds), *interdisciplinarity: reconfigurations of the natural and social sciences.*

ART-SCIENCE From public understanding to public experiment
Georgina Born and Andrew Barry. *Journal of Cultural Economy*, Vol. 3, No. 1, March 2010 ISSN 1753-0350 print/1753-0369 online/10/010103-17 2010 Taylor & Francis DOI: 10.1080/17530351003617610

Appendix 3 - examples of interdisciplinary (art/design) projects

Alviso's Medicinal All Salt. *all-salt.com/* <http://vimeo.com/14827462>
Crowd memo - pampas project <http://crowdmemo.wordpress.com/>
Center for postnatural history <http://www.postnatural.org/>
Protei <https://sites.google.com/a/opensailing.net/protei/>
Crochet coral reef <http://crochetcoralreef.org/>
Coal powered computer. Harwood.

Appendix 4 - Some examples of interdisciplinary sustainability projects, Living labs, citizen science, studies of embodied practices, etc.

"The Cook, the Farmer, His Wife and Their Neighbour",
Amsterdam, 2009: a participatory project by the Slovene artist and architect Marjetica Potrč (b. 1953) and Wilde Westen, a group of young designers, architects and cultural producers, combines visual art and social architecture to redefine the village green.
(http://stedelijkindestad.nl/projects/in_west/posts/stedelijk_goes_west_t_he_cook_the_farmer_his_wife_and_their_neighbour_)

This initiative transformed a public non-walkable green space into a common scale vegetable garden, and an unused room at Lodewijk van Deyselstraat 61 into a neighbourhood kitchen. This bottom-up organization of urban landscape gave the neighbours access to and use of public property, and therefore questioned the exclusion of access (e.g. the kijkgroen) associated with the regime of private

property. The project raised the question of the commons, and of the ability of user communities to define effective access and usage rules. (More: http://www.research-arts.net/hinterfragen/ra_questioning_sharedspace.html)

Pia Lanzinger. "Petzer Freedom", 2011. Petze, a village in Lower Saxony, experimented a development from an original farming village to a housing development in a catchment area of a large city. Car mobility and changing habits have caused a loss of communicative structures. Some villagers missed therefore an informal meeting place in the village, partly because Petze as a "street village" has never had a village square. The project "Petzer Freedom" picked up this request by initiating the design of an appropriate place. Step by step, through various events, actions and installation interventions the shape the village square became a form and was established as an open space. With a proposal for the structural transformation an additional input for further use and appropriation was given, that remain left to the residents.

More (German):

http://www.pialanzinger.de/download/deutsch/PL_PetzerFreiheit.pdf

Science Shops

Science shops, as small entities that carry out scientific research in a wide range of disciplines – usually free of charge and – on behalf of citizens and local civil society. The fact that Science shops respond to civil society's needs for expertise and knowledge is a key element that distinguish them from other knowledge transfer mechanisms.

Different types of interfaces exist between researchers and society, one of which are the 'Science Shops', organisations created as mediators between citizen groups (trade unions, pressure groups, non-profit organisations, social groups, environmentalists, consumers, residents association etc.) and research institutions (universities, independent research facilities). Science shops are important actors in community-based research (CBR). There are many differences in the way Science Shops are organised and operate, as well as some important parallels.

More: <http://www.livingknowledge.org/livingknowledge/science-shops>

The international Living Knowledge Network (LK) aims at giving citizens access to scientific research. The network is for people interested in building partnerships for public access to research. Members of the network exchange information, documentation, ideas, experiences and expertise on community-based research and science and society relations in general.

More: <http://www.livingknowledge.org/livingknowledge/>

The PERARES (Public Engagement with Research And Research Engagement with Society) project aims to strengthen the interaction between researchers and Civil Society Organisations (CSOs) and citizens in Europe. 26 partners from 17 countries (Science Shops, social organizations, universities and a research funder) will jointly organize transnational debates on scientific research and set up new Science Shops in 10 European cities. The project runs from 2010 until 2014.

Science Shop Bonn, WILA Bonn: "Outrage over the fact that scientists conduct their research in their ivory tower to no benefit of the public gave students and scientists the impulse to create the Wissenschaftsladen Bonn in 1984. Since then it has been our goal to bridge the gap between scientific findings on one hand and questions by the layperson on the other. With 30 employees and a turnover of about two million Euros our non-profit organization has never been this successful. In addition, it is also the largest science shop worldwide."
More: <http://www.wilabonn.de/en/>

The Science Gallery in Dublin, - a 'science gallery' shopfront by the university.
<http://sciencegallery.com/>

Machine project in LA is a grassroots organising center running workshops on everything from circuit bending to fallen fruit.

Center for PostNatural History, Pittsburgh.

"Volpelleres Library Living Lab Project"

A question to be raised within the Library Living Lab Project project would be how to find new ways to deal with the stored knowledge of libraries but also of collections and archives of scientific objects. "RE-VALUING ARCHIVES" of knowledge to pioneer new views on the problems of the 21st century. You can find an article about this issue here:

"What does an ethnographical museum have in common with a museum of natural history? How does the methods and procedures used to examine the 'scientific objects' in their collections compare. The article examines scientific objects, such as stuffed animals, which have been taken out of the context of their historical archives. It also studies how ethnological artefacts, such as weapons, are liberated from the patina of their colonial past.

The trend to re-evaluating archives is illustrated by two examples. Firstly, by introducing the research of visual artist Richard Schütz. His

work not only alters the meaning of artefacts from collections through visual storytelling, but also encourage us to envision their future. Secondly, the innovative concept of the exhibition "Object Atlas" of the Weltkulturen Museum / Frankfurt is presented, where innovative research methods have enabled artists and museum staff to take on new roles in their research relationship. Both approaches show how collections can further develop their potential to pioneer new views on the problems of the 21st century."

More: http://www.research-arts.net/uebersetzen/ra_translating_nat-cult-collections.html

a) how could we foster a library profile activating participation in sustainability issues

b) how can we add the local people stories and experiences: Volpelleres storytelling, this gives the people a possibility to make a dissemination of their local projects and to get engaged in the library project

c) how can local people get involved in political processes, into the development of a more deliberative democracy than the present representative model: Volpelleres delegates, specific people become delegates of their concerns, scientists help them to develop their problems, and mediators empower them to talk and negotiate directly with local politicians. They get a course in capacity building to look through the eyes of politicians to discuss for instance sustainability issues and conflicts, to develop their own view on political policies.

A key goal would be to link the Library Living Lab Project to the UAB Campus: how could we foster a library profile capable of translating the public demands on research and to make scientific results accessible to questions raised by the civil society.

Embodied practices

Anette Rose "Encyclopaedia of Handling". 2006 - 2010.

<http://www.cluster-berlin.de/anette.html>

http://www.humtec.rwth-aachen.de/index.php?article_id=786&clang=1

"...Encyclopaedia of Handling shows my artistic research as a part of the working process. In the course of this long-term project I am thus building up an archival collection in order to show the current and future working and production conditions that determine social practices."

Phil Niblock THE MOVEMENTS OF PEOPLE WORKING, 1974

www.xtr.com/artists/phill-niblock/ Niblock's films and videos play an important role in his presentations. His films portray human labour in its most elementary form. Construction work, harvesting, planting and fishing – physical exertion, with the help of basic tools. They are scenes of people in non-industrialized communities doing manual labour involving continually repeated movements, while their faces are often kept outside the frame.