

# Locales Framework: Exploring foundations for collaboration support\*

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## Abstract

*We believe that virtual simulation of physical environments is an insufficient basis for building collaborative support systems. In response, we present a locales framework which frames collaboration as the interaction of individuals within social worlds regardless of whether that interaction is physical or virtual. The overview describes the five aspects of the framework: locale foundations, where locales are the basic structures providing the affordances for the work of social worlds; mutuality in interaction, including presence and awareness issues; individual views of multiple locales of interest, defined by the individual's participation in multiple social worlds; interaction trajectories, capturing the temporal dimensions of interaction; and civic structures, which embed locales and the collaborative work of groups in the larger public sphere.*

## 1. Introduction

Computer scientists in the Computer Supported Cooperative Work (CSCW) field are concerned with building systems to support people working together. However, building the right system is a difficult task. This is evidenced by the general trends in CSCW systems development. Many early systems focussed on a particular activity such as document co-authoring [6]. Other systems focussed on action-based models of work in the form of workflows [26]. These systems were aimed at the more formal aspects of work. Experience with such systems in practice has shown they are unable to support informal communication nor handle the situated, contingent nature of even the most seemingly predictable work [18]. More recent work has seen a move away from these formalised models of action to spatial metaphors as the basis for system support, e.g., offering 2-D virtual desktops [11] or 3-D virtual meeting rooms [1].

Spatial metaphors are intuitively appealing - we live and act in a spatial domain. They can “take advantage of the highly fluid and dynamic nature of space” [1]. Spatial models more easily account for context and the contingent nature of situated action than do action-based models.

We argue however that current interpretations of spatial metaphors for the support of collaborative work are fundamentally flawed - they are based on the assumption that we can simulate the physical world in the virtual. But physical space is very different from virtual space and the intuitions from one do not always map easily to the other.

More specifically, our criticism is that spatial metaphors put an emphasis on the physical location of actions in the real world instead of the interactional context of actions and the needs that are met by using the affordances of the space. This is understandable in that the physical location is what is immediately visible about work in the real world. What is less visible is the multiple work activities that may be represented or take place in the one location.

We contend that a metaphor for collaborative work support should be considered in terms of place, not space, i.e., place as defined by the needs of the cooperating group, not by 2-D and 3-D representational forms or correspondence to the physical world. It should also account for the fact that people will use a variety of domains, media and mechanisms to get their work done, not all of which will necessarily need to be captured or supported wholly within a virtual realm.

It is not the domain itself that is important in collaborative work but how the media and mechanisms of the domain are able to afford certain ways of working and interacting. People will mobilise aspects of the domain as they find a use for them according to their collaborative work needs. This approach is similar to some of the assumptions that Dourish et al [7] make in their analysis of long-term use of media spaces, i.e., that a real-world baseline is not always appropriate for analysing technologies, and that adaptive complex behaviours can evolve over time with use of technology.

Therefore, a model for collaboration should be independent of the characteristics of any particular domain, be it

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physical or virtual. At the same time it should be mappable to any domain. For this reason, we believe that a more appropriate starting point for considering support of collaborative work is exploring the nature of groups and how they get their work done.

### 1.1. The wOrlds project

In the wOrlds project [10, 17] we are concerned with developing a collaboration framework using an interpretation of place built first on understanding collaborative work needs rather than the environment in which the work happens to occur. We believe that this understanding must rest on a broader theoretical basis than intuitive characterisations of desirable technology or intuitions from the physical world, and that an appropriate basis for such a theory can be drawn from existing results in sociology.

We are not the first researchers to attempt to use the work of social scientists to motivate the construction of computer systems. Many workers in the field of CSCW have attempted to leverage various results in sociology, anthropology, and psychology. A common experience has been either that theory in the social sciences is too abstract to directly motivate the design of software or that empirical work in the social sciences is not abstract enough [16].

In an attempt to bridge this gulf between sociology and technology, we have begun construction of an intermediate framework, called *locales framework*. This framework draws particularly on the work of sociologist Anselm Strauss and his emphasis on the centrality of *interaction* in human life and the notion of *social worlds* as a structuring mechanism for interaction, as well as on insights from a number of workplace studies in the CSCW literature.

Our aim is to build a framework that explores the structural and temporal implications of an interactional approach to the support of work. This framework must be able to support the semantically rich and continually evolving social and environmental contexts in which work gets done, and to support the fluid movement between different work activities, formal and informal, physical or virtual.

We use the name ‘locale’, drawn from Giddens [12], as the setting for interaction. A locale is not simply the environment in which interaction occurs but it is the environment as part of the interaction. Hence, we purposely use the term locale to move the focus away from the space itself to capture some of the purpose for which space is used. It also avoids the necessary implication that the space has physical characteristics as is the case with ‘room’ or ‘desk’. In this sense, we see locale as a term that can encompass many interpretations and instantiations of space that may or may not have a physical mapping.

There are five aspects to the locales framework as currently defined:

1. *Locale foundations* define the basic locale structures that provide the affordances to support the work of social worlds.
2. *Mutuality* describes the way in which interactions between members of social worlds are supported through presence-awareness, and capability-choice mechanisms.
3. *Individual views* describe the way in which individuals construct personalised views of the multiple social worlds of which they are a member based on their current level of participation in those worlds.
4. *Interaction trajectories* describe the temporal dimensions of interactions.
5. *Civic structures* define the relationship of locales into public spheres of interaction.

This paper is structured as follows. In the next section, we overview Strauss’ theory of action. In the following section, we describe in more detail the five aspects that make up locales framework. Related work and conclusions follow.

## 2. Work and social worlds

As stated previously, we are using the work of sociologist Anselm Strauss [24] as the primary basis from which to evolve our locales theory, in particular his notions of continually permuting actions and of social worlds. More detailed motivations and overview of Strauss’ theory and concepts can be found in [10].

In short, Strauss’ *social worlds* concept provides a rich multifaceted way of understanding the structure and dynamics of collaborative group interactions. A social world is a group of individuals (or groups), bonded by a common, sometimes implicit, goal. Social worlds are not necessarily bounded by traditional social or organisational boundaries but instead by the limits of effective communication. Their duration is dependent on the task at hand. Membership of social worlds can be considered along a number of dimensions: size, duration, longevity, the organisation of members into roles, the formalisation of membership and many more. For example, membership in a social world can range from highly informal and/or transient to highly formal and/or persistent. Social worlds may be composed of sub-worlds which themselves may be composed of sub-worlds and so on.

Members of a social world perform actions to accomplish the shared purpose of the world. A central feature of these actions however is that they continually change to meet the contingencies of the situation at hand. (It is for this reason that using actions as a basis for the codification of work for collaborative systems support will fail.)

Social worlds need ‘site and means’ [23] to facilitate their shared interactions, and to provide shared context and

resources. We will use the term locale to denote this aggregation of site and means used in social world interactions.

In short, Strauss' action theory provides us with an understanding of the working of social worlds to meet their shared goals. This understanding is complemented by the growing body of ethnographic studies of specific work environments that are reported in CSCW literature, e.g., [3, 14]. However, we are still not any the wiser about how to clearly identify areas where collaborative technologies may be useful, nor how to go about building appropriate support environments.

### 3. Locales framework manifesto

The locales framework is an intermediate framework mapping the implications of Strauss' theory, complemented by insights from the other studies, to a form that can be used for both work analysis and system building. Note we say the "implications of Strauss' theory". While Strauss does indeed identify the importance of site and means for social world interactions, it is not an aspect that he explores in depth in the reports of his studies. Interaction is his primary concern. This is to our advantage because it allows us to explore the notion of locale according to interactional need, regardless of any particular domain's characteristics, be it physical or virtual.

Hence, the locales framework attempts to identify what are the defining aspects of 'sites and means', or locales, if the interactions of social worlds are to be supported. This is an abstraction level away from representational choices and actual domain characteristics. The features of the domain, be they physical or virtual, are to be used as appropriate for an interactional need rather than a simulation requirement. We contend that the total environment for collaboration, often involving multiple domains, will require support for all of the aspects we outline here. A weakness in any area will lead to a weakness in the support of work and often be the cause of breakdowns in work.

Starting from interactional needs means that many of the issues we will explore may seem trivial in the physical world, because they are such an implicit and unconscious part of our interactions there, but may be complex explicit issues for the virtual domain, and vice versa. For example, presence is trivial in the physical domain because people have physical bodies located in space. In the virtual domain, there is no implicit sense of presence or embodiment. Movement in the virtual domain can occur via a simple mouse click or a command. In the physical world though movement often involves considerable cost in terms of time and effort. The very reason we believe we need such a framework is that many of these issues are interpreted from one domain only, often the physical, where the focus is on the domain instead of the interactional needs for which characteristics of the domain are being used.

In the following discussions we overview the five aspects of the locales framework: locale foundations, mutuality, individual views, interaction trajectories, and civic structures. We present them here as a 'manifesto' rather than as concise, formally structured prescriptions. The focus of our ongoing work is to make use of the framework for both work analysis and system design so that, as we gain greater understanding, it can be evolved into a more detailed and functional framework.

#### 3.1. Locale foundations

Strauss defines the concept of a social world. We outline here the basic locale foundations needed to support social world processes and activities. Locale foundations relate to the basic structuring of domains of work based on social world needs, providing the affordances to support social world interactions. The key concepts we will address in this section include: the structuring principle of centres rather than boundaries; membership issues; and support for social world processes that defines a spectrum of possibilities for interaction for the group.

The notion of *centres rather than boundaries* is an important difference between social world locales and rooms.

Rooms metaphors work on the principle of *boundaries* and map a social world activity to a single space. This is based on our familiarity with physical rooms. A physical room contains various entities. An entity (person or object) is either in or out of a room, and can usually only be in one space at a time.

Instead of this strong notion of boundaries, we contend that social worlds have *centres* formed by their collective purpose. Primarily, the social world centre helps to define, structure and relate the relevant people, objects, tools and resources around the collective purpose. A locale supports the various relationships of such entities.

The notion of a social world centre also allows for varying levels of *membership* and involvement for entities. These levels range from core to peripheral involvement. Hence we can have a social world made of the listeners of a radio program, or we can have a social world of the members of a particular choir.

Membership promotes the appearance of a boundary by defining a natural limit to the range of the collective purpose's attraction, especially where strict membership rules apply. But even within a group with strict participation rules, we can see different orderings or centrings of people and activity, dependent on the current focus of the world. Consider the choir and the different relationships between people, interests, and objects that exist at a choir planning meeting compared to a live performance.

Where membership is more flexible, it is still possible to draw arbitrary boundaries. The defining issue is the shared

purpose that relates the people and resources at particular levels of involvement. Similarly, it may be the 'limit of effective communication' that defines the arbitrary boundary, as in the case of the radio audience. Boundaries in this sense are more to do with degrees of participation and limits rather than fixed divisions between in and out.

Different levels of membership can promote *privacy* in a social world by granting or denying access to resources. Locales can provide mechanisms to support access control to resources based on membership levels.

Membership of social worlds, and hence of their associated locales, can also provide a particular perspective of the broader environment where certain locales are part of a person's experience and others are not. Strauss states:

"In sum, the various kinds of urban perspectives held by the residents of a city are constructed from spatial representations resulting from membership in particular social worlds."([22], p.67)

A similar phenomenon is noted in a virtual environment in [9]. Hence social world locales are a way of *structuring* the bigger environment and making it comprehensible, i.e., making some parts more visible than others.

Associated with the issue of membership are the *processes* that support the fluidity of social worlds, e.g., the processes by which members join and leave a social world, authenticate members, socialise members into the world, negotiate a shared vision, negotiate roles/division of labour, resource activities, etc. While many of these processes are purely in the social domain, the locales used by social worlds may support and facilitate these processes in various ways. (This is not to imply any precedence of creation. Both locale and social world are part of a dynamic and continually evolving system.) The support may be at an interactional level by permitting or constraining certain action. Or it may be at an informational level where the social world processes are captured in common documents. These social world conventions define a *spectrum of possibilities for interaction* to be facilitated by the locale.

In summary, a locale defines the collection of people and objects, such as information, tools, and other resources, in relationship to the central purpose of the social world. A locale provides a point of shared interaction and understanding for social world members. It is a *group place* that has meaning only in relationship to the social world that uses it.

A locale may or may not have a spatial identification. The interactions of a social world may be mapped to certain places at certain times and these places may be physical or virtual, spatial or non-spatial.

It is important to note that a locale is not a social world, nor is a social world encapsulated in a locale. Social worlds exist as dynamic entities in the 'real' world. Locales are mechanisms to relate the resources needed to support social

world interactions. It may be possible though to include in the locale a characterisation of the various social world members who have the right or potential to interact there, as with a membership register, or the rule that only people over a certain age are able to enter.

For the design of systems to provide virtual locales, there are many issues to be considered. These include the identification of the social worlds involved, their resource requirements, how these are related to the shared goal, what the social organisations are within the world, what the range of possibilities are for the social world processes, e.g., the constraints on joining and leaving, on access to the locale and its components, and so on.

### 3.2. Mutuality

*Mutuality* arises as an implication of Strauss' theory and from insights and concepts from other workplace studies about the importance of awareness in collaborative work situations, e.g., [3, 8, 14]. Mutuality concerns the support of interactions within locales for the purposes of maintaining a sense of shared place. The relevant issues include *presence*, *awareness*, *capability*, and *choice*. We will use the term 'entity' for the people, objects, and actions that may interact within locales.

*Presence* and *awareness* are complementary and interdependent. Presence is the aggregation of 'personal' information that an entity makes available to other entities. This information can encompass identity, functional and interactional possibilities (i.e., what you do with it), current activity, etc. Awareness relates to the information about other entities that is accepted or focussed upon by an entity. Presence and awareness information may be communicated in a variety of ways. Giddens [12] talks of the 'media of availability' of presence in locales.

Presence-awareness are important issues not just for synchronous interactions but also for asynchronous interactions where these interactions may not necessarily take place in the same locale.

Each entity has *capabilities*. Capability is the media it has available to transmit and receive information. The physical and the virtual domains each offer different media possibilities.

Within the realms of capability, each entity is able to choose a desirable or optimal level of awareness-presence. This *choice* may be formed by personal preference, group protocol, negotiation with the 'other', and, most importantly, the requirements of the collaborative task at hand.

When considering mutuality in relation to locales, we can see that the medium of the locale and the mechanisms provided there can be used to facilitate and constrain mutuality.

In the physical domain, the spectrum of presence-awareness options is often a continuum, requiring minimal

explicit effort to move positions along the spectrum. Many features of the physical environment, e.g., walls, doors, glass, air etc., provide capabilities to facilitate various forms of awareness that are part of the background of physical interaction. Physical presence can be defined in terms of body, voice, footprints etc.

When thinking about building virtual locales for social world interactions, the spectrum of presence and awareness options may need to be defined in more explicit, discrete, and manageable units, but should still be considered as points along a continuum. The characteristics and purpose of the social world involved will be central to this process. For example, synchronous participation by a number of people in a group locale might require that all have a high degree of presence and awareness for that locale. Membership will also have a role in defining available mutuality in both capability and choice.

There are many issues to be considered when providing explicit mutuality support in virtual locales. For example, how much of mutuality is optional vs mandatory, e.g., does a social world demand a certain minimal level of presence? At what level of granularity should such options be available, i.e., to different parts of a locale or to the locale as a whole? What is the spectrum of possibilities appropriate for each entity? Should movement along the spectrum be automated or implicit, or should it be manual or explicit?

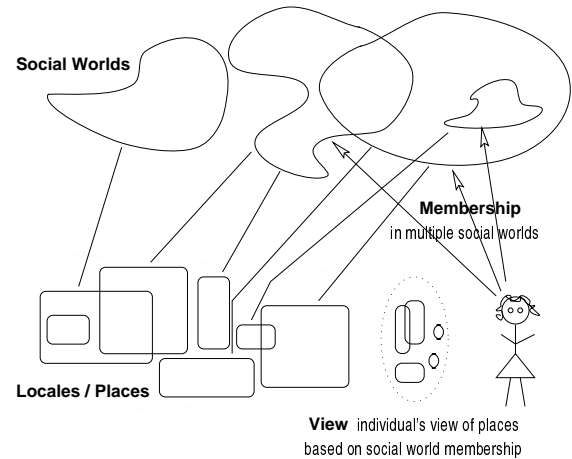
### 3.3. Individual view over multiple locales

Much of what we have outlined relates to a social world as a group and the group members within a locale. We now draw out the implications of our simultaneous membership of multiple social worlds. The *individual view* provides a further structuring or perspective across multiple locales based upon an individual's social world memberships and current levels of interaction. The key concepts here are *locale view* and *view intensity*.

As individuals, you and I do not just participate in one world at a time. We belong to multiple social worlds simultaneously. However, while we maintain our various social world memberships, we do not share a fixed group view of each of these worlds all the time [9]. We have instead our own idiosyncratic view of the social worlds and their activities dependent on our current level of participation. Our involvement in, and attention to, these worlds will vary dynamically.

We have already stated that a social world acts as a centre to attract the people and resources to achieve its collective purpose. The individual as a member of multiple social worlds acts as another centre of attraction above the social world locales level. From the locales they are interested in, individuals will draw the resources they need to meaningfully engage in their work activities. We call this their view

or perspective over multiple locales. What is drawn into their view, and from where it is drawn, is shaped by their current level of participation in their social worlds. This is depicted in figure 1. The *individual view* therefore is an aggregation of the various *locale views*.



**Figure 1. A conceptual depiction of an individual's view over locales based on their membership in multiple social worlds and current interactional needs.**

People engage in a range of work activities with different social worlds and hence different locale views. This happens in both the physical and the virtual domains (see [9]) though in different ways. They move seamlessly and often unselfconsciously between activities, maintaining dynamically varying levels of focus and participation in the different locales, from full intense focus, as if being in only one locale, to having background awareness, to being 'out of sight'. We define this level of intensity of the locale view as *view intensity*.

By implication, view intensity and mutuality are closely inter-connected. An individual's view intensity is facilitated by the capabilities for mutuality as defined at the group level - the spectrum of possibilities. Individual views over locales are constructed by choosing different levels of awareness for the members and resources within a locale, and having the ability to change these levels as required. By virtue of the overlapping locale views, an individual can experience mutuality across locales.

In summary, we have locales which are conceptual structurings of the world centred on social world purpose. We then have an individual's idiosyncratic view of those locales based on their current level of involvement in the associated social worlds.

This approach raises some interesting questions for the

support of individual views in a collaborative system. For example, how do individuals identify the entities that they need? What will they have to 'do' to draw those entities into view and leave others at a lower level of focus? How easy/difficult is it to change views? How are the entities in the view identified with the originating locale? If not fully focussed on a locale, how does one maintain a sense of shared workspace?

### 3.4. Interaction trajectories

Interaction trajectories are concerned with the temporal dimension of interaction within and across locales - past, present and future. A trajectory is a term used by Strauss to encompass both a course of action as it evolves over time and all the actions and interactions that contribute to its evolution.

Individuals come to an interaction with a history of all their past experiences and changing involvement in multiple social worlds. They have plans for their own futures which are adapted and evolved as their trajectory unfolds. Social worlds have trajectories, comprised of the collective actions of their members as each of their own trajectories coincide for the purposes of the world. Because multiple people are involved, negotiation, conflict resolution, and other group-related processes are central to the evolution of the social world trajectory. Locales can have trajectories, arising from social world interactions with them. Even the entities within locales can have their own trajectories.

The sub-concepts Strauss associates with trajectory include trajectory *phasing* (breaking the trajectory into smaller action sequences), *projection* (the vision of the expected course of action), *scheme* (the plan designed to shape the interaction), *arc of action* (the cumulative action to date), *reciprocal impact* (the consequences of interactions that become part of the conditions for future actions) and *management* (of the evolution and enactment of the trajectory). As with all his concepts, Strauss explores trajectory along a number of dimensions. Each of the sub-concepts has related characteristics and properties. For example, the trajectory scheme may be detailed or vague, sure or unsure, implicit or explicit and so on.

Locales can provide varying degrees of support for social world trajectories. An arc of action as captured in a documented history can be an important point of shared context for social world members. Shared projections and schemes are also important areas of negotiation within social worlds as they seek to understand and manage trajectories.

In designing computer-based locales, the issues to be considered concern how and with what can locales support interaction trajectories. Current work in the process support/workflow communities concentrates mainly on the codification of trajectory schemes. However, it is important that

this work be balanced by support for the other sub-concepts, especially trajectory management and evolution. The issue of granularity is also of concern, i.e., at what levels is it appropriate or meaningful in a social world context to capture and support trajectory, and what about trajectories that span locales? Because individuals have their own trajectories, it is also important to consider support for the management of individual trajectories to complement the trajectories of the social worlds they belong to.

### 3.5. Civic structures

Civic structures concern the facilitation of interaction with the wider community beyond a person's known social worlds and locales. This aspect addresses three main issues: 1. how locales fit together in the public sphere; 2. how to structure connections to facilitate serendipitous encounters; and 3. how to facilitate the emergence and dissolution of social worlds.

If we think of the broader community as a 'whole world locale', then we can think of civic structuring as the global version of the basic locale structuring mechanisms, with mutuality and interaction trajectory notions interpreted for the public domain.

Civic structures take into account all the available locales and create a structure that gives the sense of a broader community or public context. This structure determines relationships between locales, how we find our way around the public sphere, what paths we are likely to, or able to take, and how we know where we are and where we can go etc. Hence, related concepts include legibility [19], navigability and way-finding, and the creation of public thoroughfares and locales.

Within this context there is the issue of how we interact with people and locales beyond our 'own'. The way in which civic structures are established can facilitate discovery of other locales, people and resources that may be of interest. The opportunity for discovery may be focussed (e.g., is there a locale that supports origami activities?), or it may be serendipitous through chance encounters.

If there is support for a public civic life, then by definition there also needs to be support for differentiating public and private places and communicating these to the broader community. In the public sphere, locales themselves can have a presence, or, more precisely, objects can be constructed which give the locale a public face. *Boundary objects* [21] are one mechanism for this. The members of the related social world may construct boundary objects containing the information or entities that they wish to make available to the rest of the world. This boundary object constitutes the locale's presence to those external to, or less involved in the detail of, its work.

Civic structures provide important supports for social

worlds processes that happen at a broader community level. These processes include the formation and emergence of new social worlds and their locales, their segmentation and dissipation, and the discovery of new social worlds (or their individual members) and locales (or components of locales).

As social worlds emerge and dissolve so will their associated locales. *Residual objects* are a way of providing post-locale presence when required. Often the output of a world's work will need to be known beyond the life of that world. Residual objects provide a way to encapsulate the results of this work, leaving a trace of the locale after the social world has completed its collective task.

#### 4. Related work

Spatial frameworks are being widely used. But much of the work that is being done in this area is from a particular technological and representational standpoint.

The spatial model developed by Benford and Fahlen [1] and further reported in [2] exploits the way we use physical space to mediate interactions. Their key concepts are object aura, nimbus, focus, and adaptors to control mutual levels of awareness in an interactional space. However, this work is restricted to systems where a spatial metric can be defined. Even though the model has been applied to text-based conferencing systems, it is largely focussed on 3-D virtual reality applications using block characters, and 3-D information spaces. We believe our locales framework can account for much of this work at an abstraction level away from spatial metrics.

Work is also being done in the CSCW community addressing some of the component levels of our framework.

Awareness in general is being increasingly recognised as central to the way people get work done together. Many researchers are exploring ways in which awareness can be supported in CSCW systems, e.g., see [8, 13, 20]. The GroupLab research group [13] especially are undertaking a systematic study of the way in which different light-weight widgets they are developing can be used to support awareness. The technologies resulting from their work are potentially very useful for supporting the range of awareness options within locales. The locales framework can also provide clues for when and how such mechanisms may be useful.

Work in the process support and workflow area is of relevance to interaction trajectories. Experience has shown however that being able to abstract a workflow description and encode it in a computer-based system is inadequate to support the complex contingent nature of even the most seemingly routine work. This has led to an increased emphasis on supporting the dynamic emergence and evolution of work processes, i.e., taking account of trajectory management [4]. However, much of this work is still based on

the notion of de-contextualised action as the basic unit. We consider trajectories as being firmly embedded in locales and social world contexts.

In relation to civic structures, Bowers [5] has undertaken experiments to study way-finding and the spatial distribution of encounters using various 3-D visualisations of virtual cities. The cities were constructed using Hillier and Hanson's [15] algorithms from their analysis of real world settlements. While the results are interesting, their applicability is limited to spatial representations of public life.

At a higher level, we believe that by considering each of the above aspects within the context of the broader locales theory, a more coherent framework is provided to relate issues that are inter-dependent in our everyday working life.

On the other hand, because our framework is expressed in high level interactional terms rather than being domain or technology dependent, it can be widely instantiated and applied. For example, the framework can be applied to the physical or virtual domain, to highly intensive collaborative VR systems or simple unix environments, for understanding work domains or designing systems to support work, for multiple world environments or single world systems.

#### 5. Conclusions

In the body of this paper, we have provided a brief introduction to our locales framework and its five aspects of locales foundations, mutuality, individual views over multiple social worlds, interaction trajectories and civic structures. While these aspects are presented as distinct areas, they are in fact highly interdependent.

We believe these aspects are the key elements of any collaborative environment, whether that environment is wholly in the physical, mainly in the virtual, are a mix of both the physical and the virtual. Characteristics of each domain can be seen as supporting the various interactional needs that underlie this framework.

The framework provides three benefits to CSCW. It provides a structure to analyse both physical and virtual work environments. It offers challenges to system designers by identifying some of the basic infrastructure functionality that a system may be asked to provide. Finally, it provides a general model in which existing systems can be interpreted as contributing to one or more aspects of the framework.

We believe that an iterative dialogue between exploration of theoretical frameworks and prototype building is essential if either are to be advanced. Hence, we acknowledge that this is a working framework that will be evolved as we attempt to use it for the purposes of both analysing work domains, and building and deploying systems for collaboration support. In fact, the material presented in this paper is based on the lessons learned in trying to implement an earlier interpretation of locales for social worlds support in

a prototype system called wOrlds [10], [17]. We expect the locales framework to evolve as we explore its uses and implications in further studies of work and in a further prototype system called Orbit. Architectural considerations for Orbit based on this framework can be found in [17].

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