

# Under Cloud Cover: The 'Processes For Organization Meanings' Model, Dialectics And The Battle Of Britain

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**ABSTRACT - This paper analyses the historical account of the Battle of Britain given in Checkland and Holwell [1], contrasting it with a more adequate history, given the explanatory goals which they have set for themselves. Subsequently, concepts from dialectics are applied to show how and why the differences between the two accounts reflect different methods of conceptualisation, focussing on the nature of processes of abstraction and the bounding of problems and systems in understanding the impact of information systems. In this light, we point to similarities and differences between the two meta-frameworks used: SSM and materialist dialectics.**

## INTRODUCTION

How we conceptualise a real world situation adequately for the purpose of intervention or analysis is central to both IS development and research. In this paper, we analyse the historical account of the Battle of Britain given in Checkland and Holwell [1, Chapter 5], contrasting it with a more adequate history, given the explanatory goals which they have set for themselves. Subsequently, concepts from dialectics are applied to show how and why the differences between the two accounts reflect different methods of conceptualisation. This in turn points to similarities and differences between two meta-frameworks: Soft Systems Methodology (SSM) and materialist dialectics.

Our purpose is not to provide an overall analysis or critique of SSM, but rather through this analysis to raise certain questions which are important for IS theory and practice, namely:

- the consequences of deciding how and where to draw the boundary between a system and its environment;
- a deeper understanding of the role and function of processes of abstraction in defining our concepts and thus the models used in IS;
- the problems of interpretivist methods of analysis.

## TWO HISTORICAL ACCOUNTS

### A. *Historical method and conceptualisation*

Historical analysis has certain particular features as a testbed for methods of conceptualisation. Firstly, as its

subject matter lies more or less complete in the past, it is possible, with the benefit of hindsight, to see historical processes as a whole rather than through the more partial view of contemporary actors and observers, who cannot yet see the outcome of their own activity. 'The Owl of Minerva flies at dusk' - true understanding is only possible once events have worked themselves out. Secondly, historical analysis has both the advantage and disadvantage that the historian has to reconstruct the past in an indirect way through a variety of historical evidence, which usually excludes his or her direct experience. Thus there is a need for a specific historical method, which has recently come to be seen as something that has an application in the analysis of information systems [2].

It may be objected that SSM - in distinction to dialectics - makes no claim to be a method for historical understanding of this type outlined above. However Checkland and Holwell themselves use it as a retrospective framework for making sense of "their experiences in the field", which of necessity requires a form of historical analysis, as well as using the 'Process for Organization Meanings' (POM) model to explain the more obviously historical account of the Battle of Britain. We do not develop a historical method here, but rather believe that the demands of historical analysis are well fitted to show up other limitations of their model as a method of conceptualisation.

### B. *Checkland and Holwell's account of the Battle of Britain*

The Battle of Britain is the name given to the air war over Britain that took place between August and October 1940, when, after the Fall of France, Britain was thought to be under imminent threat of invasion by Germany. Up to September 7th, the Luftwaffe aimed at obtaining mastery of the air by destroying Britain's limited reserves of aircraft and trained pilots through aerial battle and the bombing of airfields and associated facilities. The Luftwaffe then turned to bombing cities, particularly London, but the British remained in control of the air and invasion plans were postponed indefinitely in October 1940.

Checkland and Holwell summarise their reading of its history as follows (p.128):

"...during the summers of the late 1930s, the Royal Air Force's Fighter Command created an 'information system' ... which enabled the German Luftwaffe to be defeated. Faced with Goering's inability to destroy the RAF over Southern England ... Hitler eventually called off 'Operation Sea Lion' - the planned invasion of Britain and turned to the Eastern Front, attacking the USSR in 1941. This failure to defeat Britain in 1940 made it possible for the Western Allies to invade continental Europe from Britain in 1944. This would not have been possible without winning the Battle of Britain; and winning that battle would not have been possible without Fighter Command's information system, which had been created in the late 1930's thanks to the forward thinking of Hugh Dowding and Henry Tizard. So the title of this chapter ["The Information System Which Won The War"] is not too much of an exaggeration."

The information system in question consisted of the integration of coastal radar stations and inland observer posts with distributed but co-ordinated facilities for analysing the incoming information about the location, number and direction of German aircraft. Information was gathered, filtered, assessed and passed to overall commanders at Group HQ, as well as the Sector HQs on the individual airfields and thus eventually to the pilots, who acted on it. [See fig. 1. And also [1], Ch. 5 for a full description.] It was intended to allow: (1) RAF fighter squadrons to intercept incoming German aircraft accurately with a minimum of time and fuel wasted looking for them; (2) overall co-ordination and control of the battle.

Their account has the following goals:

- G1: to demonstrate that the information system enabled an Allied victory in the Battle of Britain;
- G2: to demonstrate that that victory made possible the winning of World War II...
- G3: ...and that therefore "the information system won the war";
- G4: to demonstrate that this information system was unconsciously developed in line with the principles of systems thinking and, in particular, the POM model developed in Chapter 4 and thereby to vindicate it as a method of conceptualisation for systems development.

C. An alternative account

Our alternative account of the outcome of the Battle of Britain rests on two premises: that the Germans lost it as well as the British winning it, and that the role of the radar-based information system cannot be assessed without taking into account other factors that enabled it to function and played at least as great a role in the result. The information system therefore played a crucial, but not decisive role. The failure to

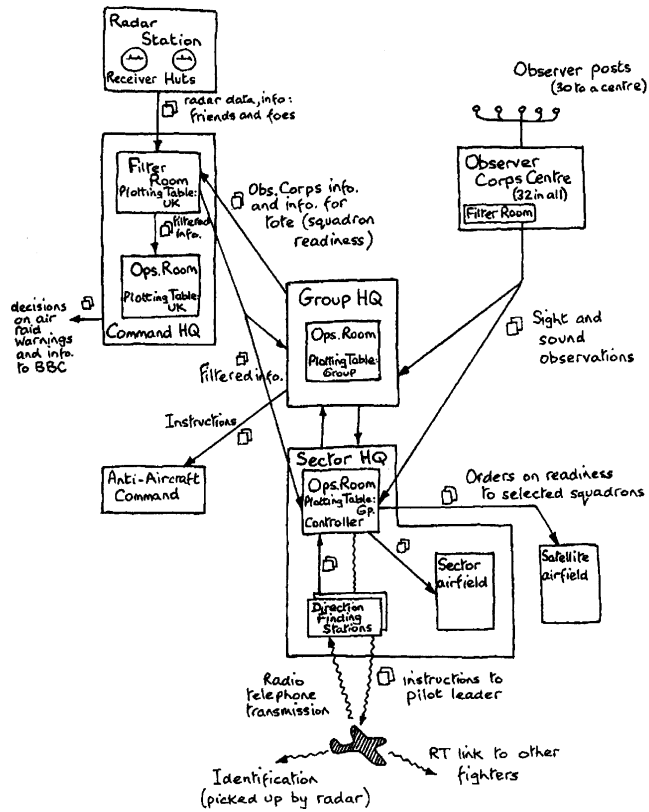


Figure 1: The radar information system used during the Battle of Britain. From [1], p147.

invade was not merely a result of the successful air defence of Britain, but also of German unpreparedness.

D. The other side

Which German decisions contributed to the result? Firstly, they failed to recognise the importance of the radar system and, after an initial attack, abandoned bombing radar stations on the grounds that it would be fruitless to do so [3]. Secondly, on September 7th, when Fighter Command's airfields in the South East were close to destruction and seven of the sector stations that were crucial to the operation of the information system were out of action, German air activity switched from bombing airfields to raids on major cities, particularly London. This enabled the RAF to recuperate and to inflict major casualties on a German bombing raid on London on September 15th. The Luftwaffe would never subsequently come close to control of the air and the projected invasion of Britain was postponed indefinitely on October 2nd [4].

The most immediate cause of Hitler switching to bombing the cities was a British raid on Berlin on August 28th, which led to him vowing revenge to bolster German civilian morale. However, to examine why the invasion failed to take place

## A DIALECTICAL ANALYSIS

and Hitler turned to attack the USSR, it is necessary to take a view that goes beyond examining the Battle of Britain itself.

Hitler had not expected to be faced with Britain as his sole opponent and had no prepared plans for an invasion. (The first studies were commissioned on July 2nd, while in July he also commissioned plans to invade Russia that autumn [5].) He had "no wishes to push the conflict with Britain to a decisive conclusion" [6, p.85], expecting, rather, peace negotiations on his own terms as offered in his speech of July 19th, in which he offered to respect the integrity of the British Empire. It has therefore been suggested by some high German officers that the invasion plans were a bluff to force Britain to the negotiating table [5, p.593]. More likely is that Hitler took seriously the nervousness of the naval and army leaders faced with an ill-planned invasion and therefore accepted that air superiority was necessary prior to it [4]. He remained hopeful that the bombing of cities and industries would have the same effect of bringing Britain to negotiate.

Macksey [7] thus comments that "The basic reason for Germany's failure to invade Britain in 1940 is very likely to be found in the lack of any preconceived will or necessity to do so, with the result that not until after the outbreak of war was the problem contemplated."

### *E. The information system in the war of attrition*

Checkland and Holwell tend to see the role of the information system separately from two interrelated problems that had to be overcome: the shortage and attrition of both trained pilots and their aircraft, both of which threatened to become crucial during the battle. While the IS enabled better use to be made of these resources by enabling both to spend more time in effective combat, if either of these shortages had not been met, it would not have been sufficient to win.

Calder [3, p.168] remarks:

"To assign credit for the successful outcome of the battle is a complex and eventually impossible task. It is sometimes most helpful to see it, not as a struggle between men, but between rival technologies of which the British proved superior... Even so, had [the Luftwaffe] been better equipped for the job in hand, the outcome would probably have been very different."

Thus what he called "excellent (though far from infallible)" information system played a necessary but not sufficient role in the Battle of Britain (as did other factors such as rapid aircraft construction and repair), achieving Checkland and Holwell's G1, but not being an adequate explanation for either G2 or G3.

Is this merely nit-picking or only of interest to historians? The differences between these accounts point to problems with the framework within which Checkland and Holwell undertake their analysis and reveal certain issues which are important in IS. We will now use tools from dialectics to point to these weaknesses and alternative methods of conceptualisation.

### *A. A one-sided battle*

Checkland and Holwell's account of the Battle of Britain is one-sided - not just in the literal sense that their explanation of its outcome ignores any decisions taken on the German side. In dialectical thought, one-sidedness is the consequence of an inadequate so as to encompass all of its contradictory aspects. It is "the seizing on one side of a dichotomous pair or contradiction as if it were the whole thing" [8]. A totality, in this context, is defined by Lukacs [Quoted in 9] as:

"...first of all the concrete unity of interacting contradictions...; secondly, the systematic relativity of all totality both upwards and downwards (which means that all totality is made up of totalities subordinated to it, and also that the totality in question is, at the same time, overdetermined by totalities of a higher complexity...) and thirdly, the historical relativity of all totality... [which] is changing, disintegrating, confined to a determinate, concrete historical period."

This notion of totality clearly has a lot in common with the notion of 'holons' and hierarchically organised dynamic systems, which Checkland [10] sees as central in systems thinking, with the addition, however, of the idea of contradiction, of the simultaneous presence of interaction and antagonism, which forms the basis for change and "historical relativity" in dialectical thought.

Given these similarities, why then do Checkland and Holwell fail to define the totality of the Battle of Britain adequately to meet their explanatory goals? The underlying concepts that they use to define the context of information systems implementation and impact are neither broad nor flexible enough to provide a conceptualisation of the relevant aspects of the history. These tools are:

- the idea that the organisational level is 'the main context of work on IS' [1, Ch.3];
- taking networks of activities sharing a distinct purpose, the 'human activity system' (HAS), as the basic unit of analysis;
- an emphasis on the construction of meaning as the basis for purposeful action.

These three concepts are all central in their book and in the POM model, which is retro-fitted to the development of the information system used in the Battle of Britain. The organisation examined is that (or rather those) charged with the Air Defence of Britain, the human activity system that of all those charged with defeating the German air offensive during the Battle and the sense-making the way in which they came to understand both the necessity and functioning of the information system and the way the Luftwaffe operated.

While a systems developer may be *forced* to accept the organisation and human activity system as the boundaries of what she can affect, analytically they are too narrow to explain either the course of development of an IS or its impact. In the case of the Battle of Britain, they are too weak foundations to take the weight put upon them even in terms of G1, the most specific of Checkland and Holwell's assertions. For example, to explain the creation of the radar system, it would be necessary to examine the inter-war politics of rearmament, which was directly implicated in its origins and financing [11]. In attempting to prove G3 (that the IS won the war) - an assertion that calls for the broadest possible analysis of the causes of the final result of WW2 - Checkland and Holwell have to implicitly play down as contingent, irrelevant or less important such global factors as Hitler's decision to attack Russia, US entry into the war or the economic problems Germany had with fighting a protracted war.

### B. Modes of abstraction

SSM and dialectics share a recognition that the boundaries of 'wholes' are not objective features of what they are, but rather the product of the human activity of abstraction, that is selection from the myriad interrelationships of reality. Accordingly, the POM model posits a "cognitive filter" that comes between humans and the world as perceived and which transforms data into "capta". Rejecting the idea that the SSM analyst can be a privileged observer outside this framework [12], we apply Ollman's analysis of "modes of abstraction" (based on a reading of Marx's dialectical method) to pinpoint the sources of the weakness of Checkland and Holwell's analysis of the Battle of Britain. Ollman distinguishes three aspects of abstraction - "boundary setting and bringing into focus [...] occurs simultaneously in three different, though closely related senses" [13, p.39] - through the extension, level of generality and vantage point of our abstractions. Associated with each of these modes of abstraction is a particular form of contradiction or tension between elements that are interdependent, yet antagonistic, pulling in different directions.

### C. Abstraction by extension

The extension of an abstraction is broadly the scope of what is included, the boundaries of its coverage in space (i.e. the range of its interconnections) and time. As we have seen,

Checkland and Holwell draw narrow boundaries of analysis around the Battle of Britain, corresponding to the time period and process of the information system's development and use as seen solely from the British side. In, for example, excluding the German decision to switch to bombing cities, this extension favours certain types of explanation which emphasise the role of the information system in the outcome. In terms of the POM model, this narrow extension should be sufficient to explain organisational sense-making, all else being relegated to "external changes" that only have influence insofar as they affect the way organisational participants see the world. Narrow extension is therefore built into the POM model, as its name suggests. Yet in G2 and G3, they draw conclusions and posit causal relationships across a longer period and a broader canvas.

Accordingly, there is a mismatch between their analysis and conclusions, which points to the inadequacies of the initial boundary drawing and to the typical contradiction associated with inadequately broad abstractions - that between what is included and what is left out but remains real - even though it is outside this particular abstraction. If the Germans' actions were part of the model, it would become untenable to hold that the IS was the thing that won the battle. If one took a longer time scale than the Battle of Britain, more factors would become apparent which would explain Germany's defeat.

Dialectical method therefore always points towards beginning from abstractions with a broad enough extension to incorporate the main elements of the totality under consideration and show their interconnections, their essences and the unfolding of their development through time, from past to potential futures.

### D. Abstraction by level of generalisation

The same phenomenon can be viewed at a number of different levels of generalisation, each of which throws a different light on its internal and external relationships and how one defines its essence. Here the contradiction lies in the different implications of the individual levels taken as the basis for abstractions, even though they are merely different, equally true ways of describing one thing [14]. Checkland and Holwell talk about the different levels of intentional action in the battle e.g. strategic, tactical and operational, placing their own analysis at the operational level - "the 'how' of finding and shooting down enemy aircraft". In passing, they also describe the battle in tactical and strategic terms. In this case, this is not a major issue as, on the British side, the operational, tactical and strategic were closely intertwined by the simplicity of the defensive imperative of survival.

However more generally, Checkland and Holwell state that the organisational level is the correct level for understanding IS, though they argue that their model can be applied at a number of different levels. This will tend to emphasise

internal organisational matters as the defining factors in the success of IS and to ignore broader political and power structures. Thus in assessing the disputes between the RAF commanders during the battle, they refer to "the intrigues and pursuit of personal agendas which are the stuff of politics" (p.151) and to the exclusion of those involved in developing the system "for being too clever in a national culture which suspects cleverness or for being 'unclubbable' when judged by establishment norms." This reduction of politics to organisational office politics enables them to ignore totally the real political decisions which were involved in the development of the radar system.

#### *E. Abstraction by vantage point*

Ollman [13] uses the notion of vantage point in two interrelated senses. Firstly, in the literal sense as the point at which one stands to survey the subject matter from which one is abstracting. Taking a vantage point implies that certain features will loom larger than others and that these are more likely to become part of the abstraction. Thus Checkland and Holwell see the Battle of Britain from the vantage point of information systems experts, which naturally means that the radar system looms larger as an explanatory factor of the outcome and that other contradictory ones are abstracted out of the picture. Adopting a vantage point thus creates contradictions between abstractions insofar as a vantage point gives a particular perspective that will not be shared when viewing the same reality from others.

His second sense follows from this in that Ollman sees typical vantage points as rooted in social structures and roles, which lead the observer to see the world in a particular way and thus to form abstractions from those vantage points. In this way, social structures, practices and conflicts come to play a role in the process of conceptualisation and their contradictions are carried over into it [14]. In our specific example, it is worth noting that the Battle of Britain, together with the debacle at Dunkirk that preceded it and the Blitz that followed, has played a major ideological and mythic role in a post-war Britain faced with economic and imperial decline as the moment when Britain stood alone and united and successfully defied overwhelming odds. This comes together with Checkland and Holwell's other concerns to make it also a moment of triumph for their model of information systems development.

That the relationship between alternative vantage points and extensions can lead to radically different aspects of the same reality coming to the forefront can be seen from the Marxist historian Challinor's [15, pp 6-7] description of the morale of British troops leading up to Dunkirk, in which he makes these different aspects of abstraction explicit:

"To understand why the Dunkirk disaster happened, it is necessary to investigate all the underlying influences - the ineptitude of the British army high command, the British

government's half-hearted prosecution of the war, the numerous surreptitious peace negotiations with Nazi Germany etc. All these must have had an effect on the British Tommy's morale, making him question whether he should be prepared to recklessly lay down his life. Nothing appeared worth fighting for in 1930s Britain. If lucky he would return to the slum house, the dole queue, the poverty..."

Challinor thus takes the vantage point of the ordinary British soldier, trying to explain the influences on his morale in 1940 and why a relatively small incident led to a breakdown of the will to fight on a large scale. In order to do so, he adopts a wide extension which will encompass all the underlying influences - both the more immediate causes and the chronologically and geographically more distant conditions of life in 1930s Britain. In doing so, he defines a totality adequate to his goal. In contrast, Checkland and Holwell's scope is too narrow to support G2 and G3. We see here the relationship between the nature of the abstractions, their content and the nature and force of the explanation given.

#### COMPARING MATERIALIST DIALECTICS AND SSM

We now come to consider the more general issue of the relationship between dialectics and SSM as reflected in Checkland and Holwell's historical analysis, focussing on three issues: the ambiguous status of models in SSM, the question of boundary drawing and the relationship between a system and its environment, and the adequacy of the POM models focus on meanings.

##### *A. The ambiguous epistemological status of the Checkland and Holwell's account*

The chapter on the Battle of Britain consists firstly of a historical narrative, followed by the fitting of the POM model to that narrative. The POM model itself "does not purport to be a descriptive account of *the* organisational process", instead being a sense-making device, which nevertheless "embodies the principles upon which information systems are created and so its language may be used to give an account of any real-world information system" (p.148).<sup>1</sup> The narrative is objective, aiming to reflect the real history of the RAF's IS, while the model, which embodies the principles described in the narrative, remains an "intellectual tool which helps furnish a process of inquiry for making sense of a field" (p.238). Yet, as we have seen, this separation is artificial as the extension and vantage point underlying the narrative are precisely those which enable the POM model to fit rather

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<sup>1</sup> The contradiction by which models are "ideal types" and "intellectual constructs" yet the SSM analyst develops precisely those models that can later be claimed to provide the basis for organisational action (thus validating the methods used) is characteristic of SSM as a whole and shows the same ambiguity we describe here.

than those which give the most adequate explanation of events.

This rather extreme case of wanting to have one's cake and eat it is a reflection of the confusion that results from the relativist epistemology that stops short of radical scepticism, which is characteristic of Checkland and Holwell's book [12]. They presumably claim their account of the Battle of Britain is a true, if incomplete one, but can have no basis for doing so as their historical narrative is no less an intellectual construction than the POM model. Vygotsky's comment [quoted in 16] that "Idealism is *forced* to find its ground in materialism" must also hold here insofar as they make those truth claims for their narrative that are indispensable if the writing of history is to be distinguished from that of fiction.

This ambiguity naturally extends to an understanding of the status of models and of constructs such as "system". It contrasts with an approach based in materialist dialectics in which human conceptualisation has to have its starting point in the real world, in that to be useful the model must reflect aspects of what it is describing, even if there is no unique way to do so and the many possible alternative views of reality mean that it is a process involving human action and choice. The relationship between model and that which is being modelled must be a non-arbitrary one based on real interconnections and shared properties, yet it is not a one-to-one relationship in which reality is directly reflected 'as it is' in the model, in which case abstraction and the model itself would not be necessary [14, 17].

### B. Boundary drawing

As we have seen, to evaluate the impact of an information system and the consequences of its implementation, it is necessary to draw the boundaries of what we consider more widely than is provided for by the framework of the Human Activity System (which is, according to von Bülow [18], "the operationalisation of the systems idea" in SSM) or the framework of an organisation. These units are presumably chosen on the basis of Checkland's distinction between system and environment: "an environment may hopefully be influenced, but cannot be 'engineered', whereas a wider system can ... be engineered." [10, p.174]<sup>2</sup> As Levins [19] argues: "The choice of boundary between what is the system and what is outside is usually a consequence of the history of each field and especially of the division of labour between disciplines... Traditional boundaries between disciplines act to restrict models of problems to include the acceptable

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<sup>2</sup> As von Bülow points out, this is not the only notion of the boundary between system and environment to be found in SSM and they are not all consistent. She adds her own version: "Whatever the analyst chooses to model will be 'the system'... *everything* not in the system is *ipso facto* part of the environment." Changing definitions of system and boundary presumably in any case only have limited consequences as the models are considered as no more than aids to sense-making rather than descriptive accounts of reality.

pathways of intervention." Checkland's is the narrow vantage point of the action researcher as organisational engineer and thus limited to the scope of what might be susceptible to change, which contrasts with the typically broad one of the historian (who, of course, cannot change the past, only perceptions of it).

What is considered to be "environment" is not considered part of the necessary causal relationships of a systemic explanation. Accordingly, the POM model relegates causal elements outside its narrow focus to the status of "external changes", only represented insofar as they cause changes to the perceptions of those involved in organisational change<sup>3</sup>. This builds one-sidedness into the model from the start, both in its organisational focus (narrow extension) and its emphasis on meanings and sense-making (partial view of the relationship between subject and object).

This contrasts with a dialectical approach in which no *a priori* boundaries are set to totalities, as the boundaries we draw never exhaust or match exactly the real world interconnections we are investigating. Both the nature of the subject matter and the stance of the observer will define the boundaries best suited to a particular goal. Levins [8] suggests that the tendency towards narrowness, towards only seeing parts even when one aims at holistic explanations, comes from the impossibility of seeing *the whole* (i.e. everything in all its interconnections) and a resulting overeagerness to deal with what appears tractable. As a counter-heuristic, he suggests that "at some stage of an investigation we should examine a larger system than is thought relevant", both because it may provide more adequate explanations not previously considered and because interconnections will be seen in a broader context. Setting our boundaries widely allows us to see the necessary internal dynamics of the system under consideration, rather than requiring the *deus ex machina* of "external changes."

## CONCLUSIONS

We have examined the inadequacies of Checkland and Holwell's historical account as rooted in its inability to see the Battle of Britain and the subsequent wars as totalities, rather focussing on elements which are made to bear too heavy an explanatory weight. These were analysed firstly in terms of the three aspects of abstraction in dialectics and found to have a too narrow extension and be based on an implicit and limited vantage point. These problems were then suggested to have roots in the broader conceptualisations of SSM, particularly the Human Activity System, the boundary drawing between system and environment and its interpretivist epistemology. They also suggest that to assess

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<sup>3</sup> That non-subjective factors are only considered insofar as they affect human subjectivity is a necessary weakness of the less extreme forms of interpretivism. [16]

the development process of an IS, let alone its impact and outcome, it is necessary to look beyond the immediate context of that process.

Our analysis has also shown both similarities and divergences between materialist dialectics and SSM. The concepts of abstraction / cognitive filter, vantage point / Weltanschauung and totality / holon are clearly related, though not identical. This follows from Levins' [8] view that dialectics and systems theories both try to tackle similar problems posed by finding an alternative to mainstream, reductionist science. However, there are also clear differences, particularly in the absence of the idea of contradiction in SSM, its ambiguous notion of the status of models and its method of boundary drawing. The two approaches need to be compared more systematically to decide whether the two frameworks are absolutely incompatible and whether therefore we need, as Dahlbom and Mathiassen suggest [20], a third school of dialectical systems thinking alongside the already established hard and soft varieties.

#### ACKNOWLEDGMENT

Figure 1 is from P. Checkland and S. Holwell, 'Information, systems, information systems - Making sense of the field'. Copyright John Wiley and Sons Limited. Reproduced by permission.

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