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## Case study

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# Capturing and (re)interpreting complexity in multi-firm disruptive product innovations

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### Abstract

**Purpose** – This case study research report aims to include collecting additional field interviews with the original and additional executives participating in the original case study (on the Zaplet software applications firm) to enhance the interpretations by the original case study investigators as well as add-in downstream events occurring after the original report. The focus of the study is to increase descriptive knowledge and understanding of innovation and diffusion processes in developing high-tech disruptive software technologies.

**Design/methodology/approach** – The study includes an application of the long-interview method and reinterpretation of original case data along with preparing and interpreting decision system analysis and chronological maps.

**Findings** – The reinterpretation and expansion of the original case study illustrate dramatic revisions in plans and implementing new applications following positive and negative responses by third-parties and lead-user customers to alpha and beta designs. Concrete field trials occur frequently in shaping where and how the firm goes about changing its direction. Third-parties play critical roles in multiple time periods in shaping the firm's new product development direction.

**Research limitations/implications** – The case study reanalysis and expansion are generalizable to innovation and diffusion theory and not to a specific population of firms.

**Practical implications** – The paper illustrates the wisdom of Tom Peter's dictum, "Put it to tin quickly" and Dwight Eisenhower's focus on improvising, "The plan is nothing, planning is everything."

**Originality/value** – Formal sensemaking of what happened helps to destroy the myth that executives must have the resources before innovating. Resources follow vision and action (implementing) is the hidden and great lesson of this paper – what Tom Peters means when he writes about the value in creating a "skunk works" – using "borrowed" time, material, places, and creative juices to make things happen.

**Keywords** Software engineering, Innovation, Diffusion, Complexity theory

**Paper type** Case study

As researchers, we may all be acutely aware of the boundedness of cerebral rationality. But that does not justify us in promoting methods that deny the existence of ambiguity, insight, interaction. Decision making is prospective, introspective, and retrospective, sporadically rational, ultimately affective, and altogether imaginatively unbounded (Langley *et al.* (1995, p. 277).

## 1. Introduction

Humans – including business and industrial marketing (BIM) executives – consciously and unconsciously engage in the process of making sense of events and situations affecting their lives. Such "sensemaking" (Weick, 1995) often includes reviewing decisions made, actions taken, and outcomes

realized. Such pre- and post-action sensemaking most likely is helpful for acquiring wisdom in identifying opportunities, avoiding inaccurate assessments of reality (e.g., Iraq manufacturing weapons-of-mass destruction early in the twenty-first century), making decisions and taking actions appropriate for a given situation. Mindful sensemaking includes applying thinking tools useful for knowing the contexts and when to apply the opposite forewarnings:

- Fools rush in where angels fear to tread.
- He who hesitates is lost.

Mindful sensemaking builds on the assumption that overconfidence bias is a substantial cause for the failures of shallow thinking in framing problems and opportunities, framing alternatives available in making decisions,

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implementing strategies, and evaluating outcomes. Overconfidence bias in cognitive science (e.g. Gigerenzer, 2000; Gilovich, 1991; Gilovich *et al.*, 2002; Lichtenstein *et al.*, 1982) refers to the human tendency to overestimate the accuracy of one's own answers. Mindful sensemaking tools helpful for correcting overconfidence bias include systematic retrospections about past context framing, decisions, implementations, and outcomes; asking independent experts and experienced practitioners for independent interpretations – seeking second opinions and member checking; and using decision aids such as event chronology mapping and decision systems analysis. The present article includes example applications of all three of these tools.

A large share of BIM scholarly reports involve retrospective sensemaking by informants that focus on reviewing/framing contexts, decisions made, actions taken, and outcomes realized – including reports based on closed-ended, fixed-point responses and open-ended written or verbal interviews. Frequently such reports contain inaccuracies and idiosyncratic views of what happened and why it happened. Mindful sensemaking of past and future actions requires taking research steps to confirm beliefs/facts expressed by informants about past or very recent decision making and actions. Given that humans individually tend toward biased self-serving views of reality (Wegner, 2002; Wilson, 2002), relying on one informant's views or one researcher's interpretations about context framing, decisions, actions, and outcomes represents not taking such necessary steps for mindful sensemaking (see Woodside, 2006). The present article describes taking multiple steps for mindful sensemaking; the objective here is to increase accuracy by BIM scholars in reporting what happened and why it happened and to provide tools for BIM executives wanting not to miss opportunities by hesitating and at the same time seeking not to be the fool who rushes in.

Langley *et al.* (1995) advocate conceptually and empirically “opening up decision making” to:

- the ambiguities that surround the relationship between commitment and action;
- the critical role of insight in transcending the bounds of cerebral rationality – the need to examine organization history, experience, affect, and inspiration (e.g., will and vision);
- dynamic linkages so that isolated traces of single decisions come to be seen as interwoven networks of issues; and
- using multiple research perspectives and tools – such as zooming in closer to people and processes under study and zooming out to exploring the ramifications of issue networks and the histories of organizations over long time periods (e.g., Pettigrew, 1995).

For their fourth suggestion, Langley *et al.* (1995) advocate focusing on people and personalities as well as events and on reanalyzing previously analyzed decision processes in addition to new ones. These researchers advocate embracing a more inclusive view for research on decision making.

The article presents and applies a hermeneutical framework (Arnold and Fischer, 1994; Thompson *et al.*, 1994; Thompson, 1997) in research on B2B decision making following Woodside *et al.*'s (2005) hermeneutic template. This article describes conceptual and research tools for achieving deep sensemaking of what happened and why it happened – including how participants interpret outcomes of what

happened and the dynamics of emic (i.e. transformations in informants' own interpretations of what happened and why it happened) and etic (i.e. transformations in researchers' views about what happened and why) sensemaking.

Dynamic sensemaking relates to and advances from hermeneutical research. This article defines hermeneutic research as the inclusion of multiple rounds of informant-researcher interpretations of the dynamics of a specific situation framing-problem-decision-action-outcome by reflective analysis of autonomous text and multiple interviews of the same and different persons in different time periods. Harvard Business School (HBS) cases describing the histories of enterprises along with specific problems-actions-outcomes for these firms and are examples of autonomous text that may be incorporated into a hermeneutic framework. The present article includes re-interviewing informants participating in interviews for the original HBS case report and reporting these informants' interpretations of the original researchers' case report; the present article includes collecting additional data relating to the decision process and outcomes examined in the original case as well relevant data from subsequent time periods. Thus, the present report includes informants' interpretations of researchers' interpretation of prior informants' decisions and actions. Prior reports of multiple rounds of interviewing informants that include informants interpreting researchers' findings do appear in the BIM literature (e.g., Howard and Morgenroth, 1968; Woodside and Samuel, 1981). The inclusion of different sets of researchers, the systematic collection of additional data not included in the original report, and the retrospective focus represent a unique contribution by the present article.

Many HBS cases include quotes from informants, summaries of informant views, and the case writers' interpretations of how decisions were made, the actions prior and following decisions, and both informants' and the case writers' own interpretations of outcomes. What is often missing includes retrospective analysis of the informants' views of the case reports and whether or not post-case-study reports support the interpretations expressed in the original case report. Dynamic sensemaking takes these additional steps –the equivalent of “cold case” file research of opening up seemingly finished reports, re-interviewing original and additional informants and introducing additional evidence and perspective to achieve deeper understanding and description compared to the original case reports.

This article provides a unique and valuable real-world application of dynamic sensemaking using case study research on a multi-firm disruptive new product development within the software technology industry. Section 2 details the hermeneutic analysis for reinterpreting case study research reports. Section 3 summarizes background information on the case study including rationales for its selection for opening up the original case (see Langley *et al.* 1995) for further emic and etic analysis to deepening sensemaking of what happened, why it happened, and for capturing valuable insights for new product development. Section 4 covers the findings from the re-interpretation; this section includes findings from applying decision systems analysis, event, and cognitive mapping before and after emic 2 interpretations. Section 5 describes contributions of re-interpreting disruptive NPD. Section 6 provides general conclusions, strategic implications and suggestions for further research.

## 2. Steps in reinterpreting case data: the hermeneutic framework

Woodside *et al.* (2005) propose a five-level hermeneutic analysis framework. Figure 1 summarizes the initial levels of understanding and research on B2B decision making – up to four levels of hermeneutic analysis. Level I depicts the specific interpretations of the B2B executives descriptions and explanations of what happened and why it happened for a focal decision making issue. In Figure 1 the Level I analysis shows that mental models are crafted and revised during the decision and action under study – at time *t*.

The executive's later (*t* + 1) interpretation and reporting of what happened represents both a summary and an elaboration of the mental models originating during the decisions-actions. These self reporting interpretations are subject to self-editing, memory failure, and personal prejudices and biases (Wegner, 2002).

The hermeneutic analysis framework breaks through the current (early twenty-first century) dominant logic in B2B research which usually stops at collecting Level I data. Arrow a in Figure 1 represents a summary of what the participants in the enterprise report about the decision process under study.

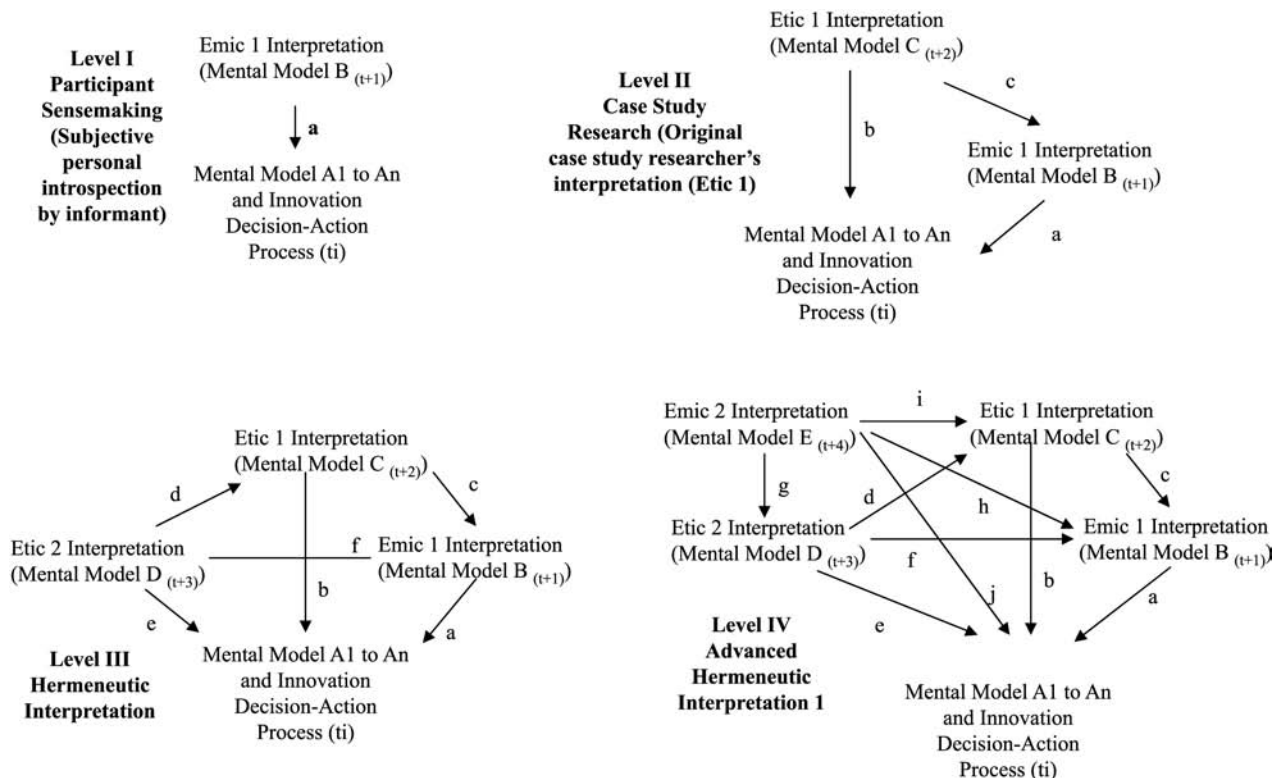
Level II recognizes that a participant's *t* + 1 interpretation of what happened at a previous time, and why it happened, is one view of specific situation, decisions, and outcomes. This participant's emic view does not reflect a complete or a completely accurate account of reality. The researcher provides further commentary and often judgments (arrow c) on the participant's sensemaking account. The researcher collects (arrow b) additional interviews with other participants

and/or analyzes documents to confirm, deny, and elaborate on the participant's report. Most B2B case study research extends to Level II research (see Woodside and Wilson, 2003).

Level III analysis supports Langley *et al.*'s (1995, p. 277) "suggestion 5 (to), reanalyze previously analyzed decision processes not just new ones." Level III provides two etic interpretations with an additional time period and usually independent researchers. Etic 2 interpretations include commentaries of etic 1, emic 1, and mental models and decision process at the time of the original situation – relationships d, f, and e, respectively. Level III analysis here includes chronologically mapping events of the decision process and outcomes reported by the etic 1 researcher. In this framework, the etic 2 researcher applies decision systems analysis (DSA, see Howard *et al.* 1975) based on the text of the original case study done by the etic 1 researcher. Woodside *et al.* (2005) provide a detailed package of extended DSA using a DSA model, an events chronology map and sets of cognitive maps (for more detail see Woodside *et al.* 2005). Level III analysis contains content analysis supported by software tools including TACT ([www.indiana.edu/~letsr/help-services/QuickGuides/about-tact.html](http://www.indiana.edu/~letsr/help-services/QuickGuides/about-tact.html)) and NVivo ([www.qsr.com.au](http://www.qsr.com.au)).

Level IV analysis incorporates an additional round of interviewing of one or more of participants involved in the case study reported by the etic 1 researcher. Participants are asked questions initially related to the etic report mainly addressing accuracy, completeness, and key elements within the report. They are then asked questions that address

Figure 1 Hermeneutic interpretation of sense making in B2B innovation decisions-action processes



Source: Woodside, Pattinson and Miller (2005, p. 366)

accuracy, completeness and suggested updates to the etic 2 material presented to them, which in turn constitute updates to the etic 1 case study account.

Level V analysis includes reinterpretation of all prior emic and etic sets of interpretations. Level V analysis is classified as an advanced hermeneutic interpretation because the analysis includes three rounds of separate etic interpretations that help builds toward sensemaking views of the whole case study. Thus, Figure 2 adds an etic 3 interpretation that revises sensemaking views of prior interpretations based updated data from the emic 2 views on etic 2 materials presented to participants. There is no theoretically fixed number of required rounds of analysis – for example, if there are outstanding ambiguities, paradoxes, and conflicting views, then additional rounds of emic and etic analysis may be conducted to gain further insights. Such analysis may go as far as co-opting participants as co-authors in updated case studies following the participant’s and researcher’s revisions of several rounds of DSA models (see Woodside and Samuel (1981) for an example).

### 3. An application of advanced hermeneutic framework to development of a new software application

This section applies the hermeneutic analysis framework described in the previous section to the development of a software application within a disruptive technology environment. The application includes all the steps within Figures 1 and 2. Thus, the case combines secondary and primary data collection stages that include DSA and chronological mapping of events, cognitive mapping, TACT and NVivo content analyses, and personal interviews with executives participating in the decision process at the time covered by the original case study report.

Christensen and Raynor (2003) highlights email as a disruptive technology and the Zaplet application analysed in this report is a key enabling application to run various other functions, processes and tools within email. Zaplet was a forerunner of a range of technologies that now allow functionality within the worldwide web; these technologies

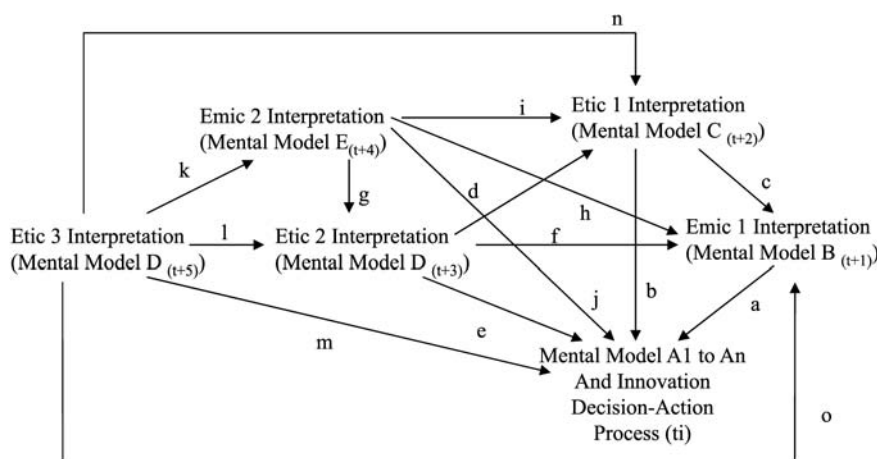
eliminate the need for users to have separate software applications installed on their systems.

The specific case covers the start-up phase, launch and further development of initial of a computer software firm, Zaplet Inc. DeLacey and Leonard (2001) serves as the etic 1 report of the case study. The Zaplet case study explores the parallel emergence and development of Zaplet, the start-up company and the Zaplet application technology which adds substantial functionality to e-mail. DeLacey and Leonard (2001) describe the genesis of Zaplet from 1998 through to late 2000, with emphasis on developing concepts to take to venture capitalists to seek funding, and then after the application technology has been developed assessing potential uses for the application. The critical role that the venture capitalist plays supports Biemans (1991, 1992; Biemans and Setz, 1995) proposal that accounting for the participation of third-parties is necessary for understanding NPD processes.

Figure 3 summarizes event milestones and the emic 1 sensemaking views identified in the data in the DeLacey and Leonard (2001) HBS case study. Subsequently to developing Figure 3, emic 2 and etic 2 interpretations along with DSA and event maps were developed to prepare analysis that Figure 3 presents.

DeLacey and Leonard’s (2001) case provides sufficient description of the Zaplet application development process for development of a relevant DSA model, an events chronology map and three supporting cognitive maps. The etic 2 DSA model and maps for this case were updated following extensive questioning of the accuracy and completeness of the original DeLacey and Leonard (2001) case. Thus, additional (emic 2) data were collected for etic 3 description and interpretation of the Zaplet decision making process as reported in the original case study and for a period of two years beyond that reported by DeLacey and Leonard. Emic 2 data consists of responses from new rounds of interviews with the one of the founders of Zaplet (David Roberts, 2002) and the VP of development in late 2001 CEO (Mala Chandra, 2001). David Roberts was one of the informants for the original HBS case report as well as for the reinterpreting study that this present article reports. Mala Chandra participated as an informant for the first time for this present report.

Figure 2 Level V advanced hermeneutic interpretation 2



Source: Woodside, Pattinson and Miller (2005, p. 367)



Figure 3 Level I analysis of Zaplet case

**Emic 1 (original informants') stated issues:**

- What is the target market?
- Should we be an applications company or a platform company?
- Do we want to focus on the consumer space or the enterprise space?
- What is the value of this technology?



**Emic 1 Initial mental model for 1995-2000:**

- Several ideas for application prototypes based on new Java-Based technology applies to online emails
- Shepherd approach to development process of discovery of new ideas for applications
- Development of management structures

**Decisions-actions:**

- RDC of Zaplet technology; startup company created in secret “stealth” mode
- Early venture capitalist funding plus assistance with idea generation for potential applications using Zaplet technology
- Venture capitalist also sought out of Java programming resources
- Proliferation of business/product management units
- Multi-stage market segmentation analysis
- New CEO and management structure; Zaplet refocuses on enterprise market segment

Figure 4 presents the etic 1 view of the original case researchers regarding the emic 1 views and the major decision and event milestones in the Zaplet case. Thus, Figure 4 offers a succinct summary of the key details of the original case

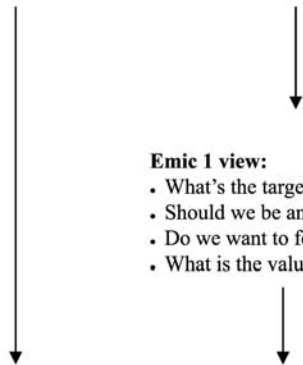
study report. The initial DSA, event, and cognitive maps reported below offer details supporting Figure 4.

Figure 5 is a summary of etic 2 interpretations of etic 1, emic 1, and key milestones as reported in the original case

Figure 4 Level II analysis of Zaplet case

**Etic 1 (summary of original HBS case study) view:**

- RDC of Zaplet technology focused on development potential applications for the technology
- VC's play critical roles in funding, management support, catalysts for idea generation, and provision of application development resources
- Transition of organization structure from diverse small units to executive team focusses on enterprise market segment
- Shortcuts in developmet greatly assisted Zaplet to produce more applications for more potential end-uses
- Company-wide Involvement in multi-stage market segmentation analysis



**Emic 1 view:**

- What's the target market?
- Should we be an applications company or a platform company?
- Do we want to focus on the consumer space or the enterprise space?
- What is the value of this technology?

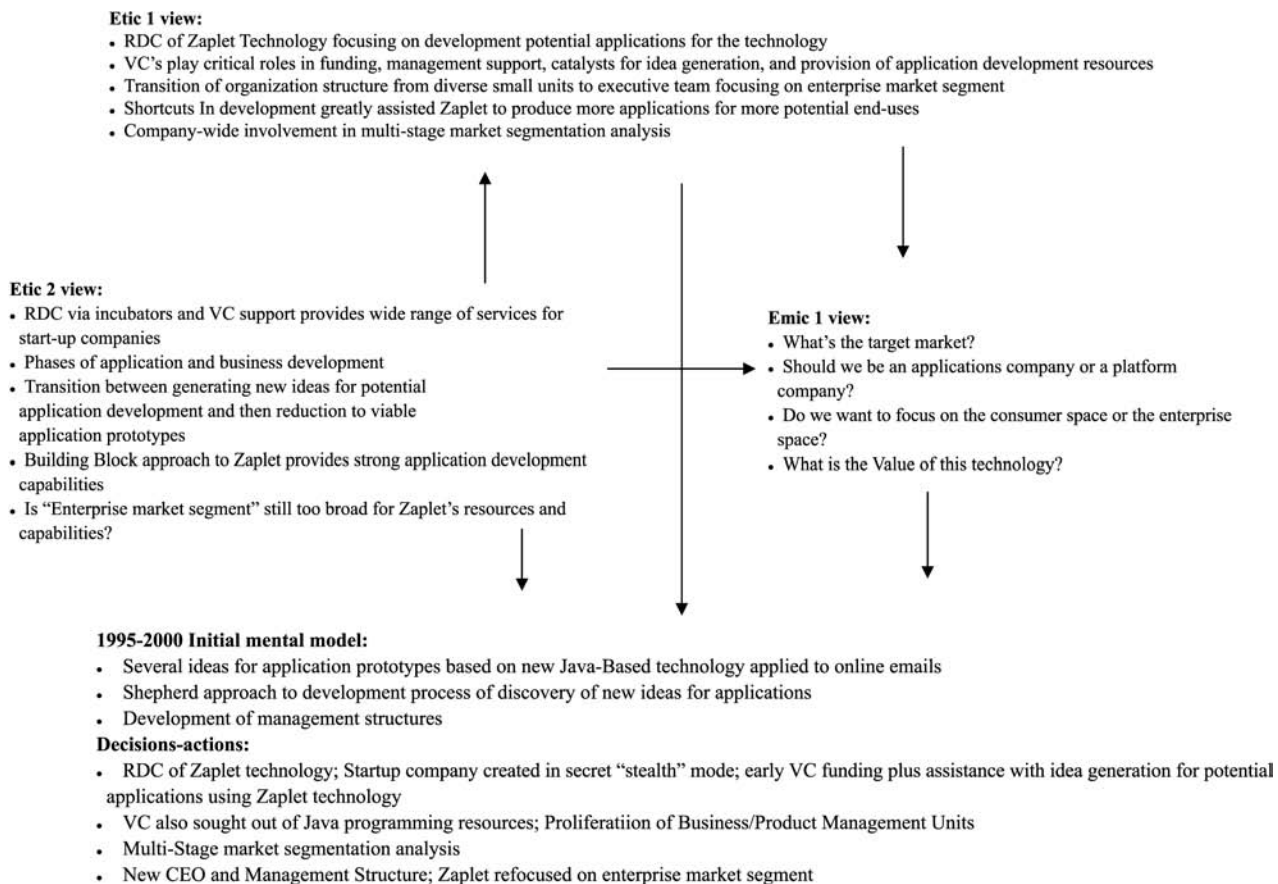
**1995-2000, Initial mental model:**

- Several ideas for application prototypes based on new Java-Based technology applied to online emails
- Shepherd approach to development process of discovery of new ideas for applications
- Development of management structures

**Decisions-actions:**

- RDC of Zaplet technology; startup company created in secret “stealth” mode
- Early VC funding plus assistance with idea generation for potential applications using Zaplet technology; VC also sought out of Java programming resources
- Proliferation of business/product management units
- Multi-stage market segmentation analysis
- New CEO and management structure; Zaplet refocus on enterprise market segment

Figure 5 Level III analysis of Zaplet case



study. Etic 2 comments stress the challenges associated with developing a very new software application and imaging – and practically developing uses for it. Etic 2 comments also highlight contributions that different personalities may offer at various stages of developing a new software technology – both from within and outside the company. The initial DSA, event, and cognitive maps reported below support Figure 5 as well.

Figure 6 encapsulates emic 2 interpretations of mental models and events that the original case study covers as well as for the etic 2 interpretation—including the DSA, event, and cognitive maps developed for the etic 2 interpretation. The completed long interviews with Chandra (2001) and Roberts (2002) provide the data representing the emic 2 interpretation. The revised DSA, event, and cognitive maps presented below follow from the emic 2 interpretations and these maps are part of the etic 3 interpretation (see Figure 7).

The new data from the emic 2 and etic 3 rounds of interpretation validate and deepen knowledge building from etic 2 data and results in new insights relating to:

- How application development intertwines with business development/start-ups—neither stage precedes the other.
- How venture capitalists are critical in providing management, marketing, application development, and funding resources.
- How decision making in switching from “idea discovery” mode to “market segment” mode is transformational.
- How developing integrative applications occur to support a customer ecosystem.

#### 4. DSA, event, and cognitive mapping before and after emic 2 interpretations

This section covers the development and revisions of the DSA, event, and cognitive maps from reanalyzing the original case report and following long interviews with Chandra (2001) and Roberts (Roberts, 2002). The original DSA model builds from a thorough review of the DeLacey and Leonard (2001) case study. The study includes exploring sections of the case describing the types and development of Zaplet building blocks and became the main components for the DSA Model. Figure 8 presents the original DSA model.

Presentation of the original DSA model to both interviewees stimulated a significant “branching” of DSA Model revision. Emic 2 views were collected and written up as a separate vignette (see Appendix 1) which became the base account for developing a new DSA Model. These emic 2 views requested that two distinct DSA Models be developed. One to update Zaplet Technology development, that is, to view Zaplet software as a base platform technology which specific software applications could be built on (see Figure 9) and a DSA Model to address development of a specific software applications built using Zaplet (see Figure 10). The advanced hermeneutic framework easily accommodates creation of additional accounts as typically etic views interpreting additional significant emic issues.

Figures 11 and 12 are the events chronology maps constructed from the original and revised case data. The

Figure 6 Level IV analysis of Zaplet case (includes emic 2—informants’ interpretations of second round of researchers’ interpretations)

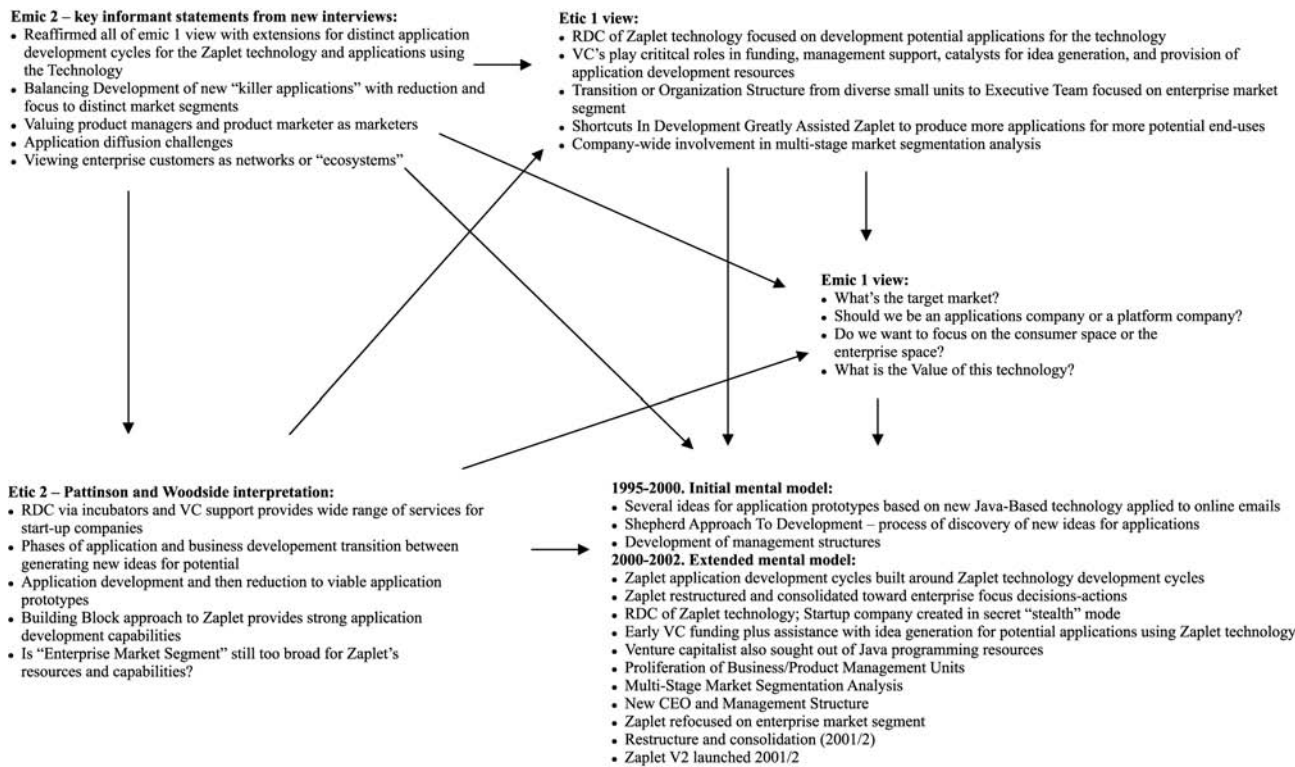


Figure 7 Level V analysis of Zaplet case (includes etic 3—third round on researchers’ interpretations)

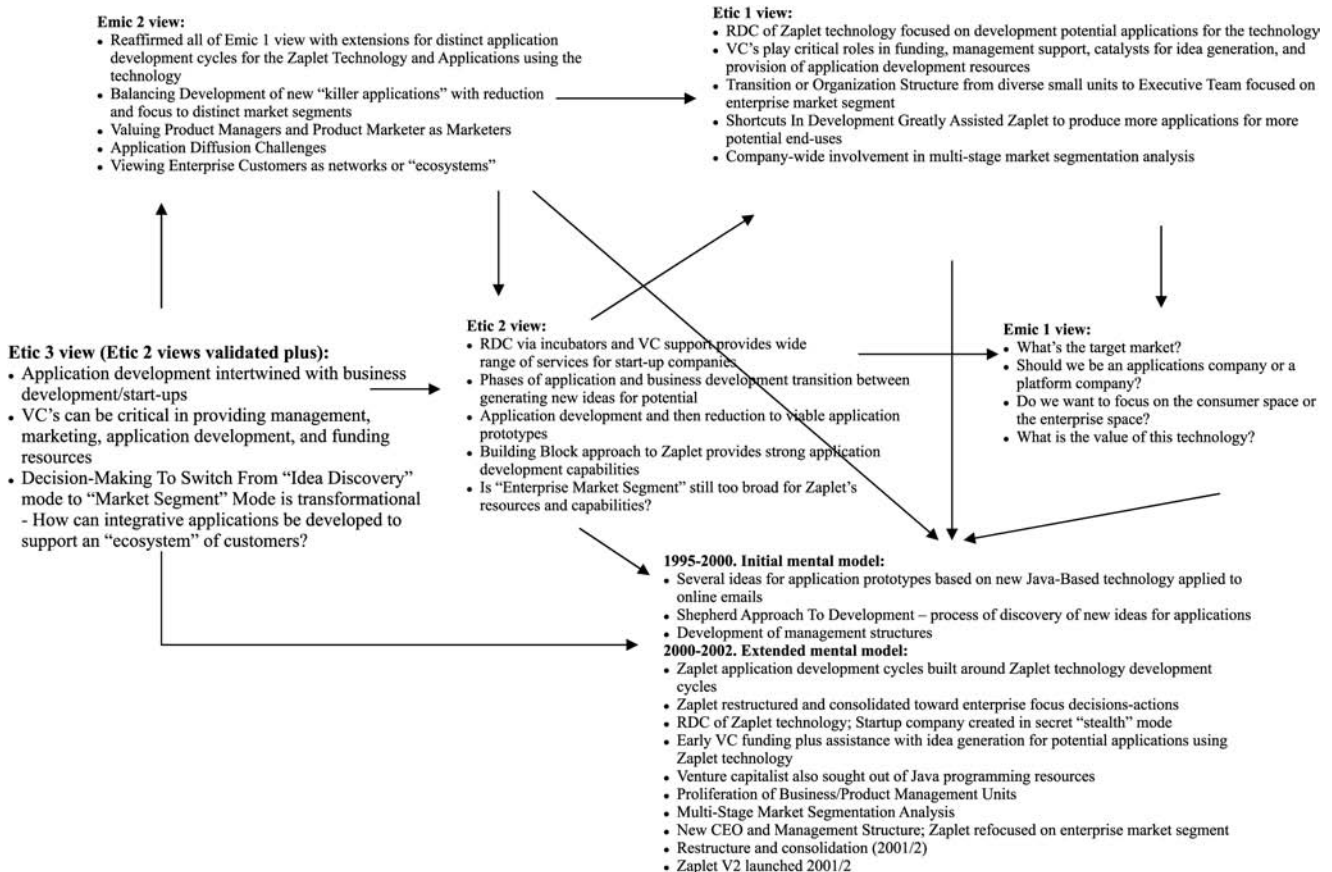
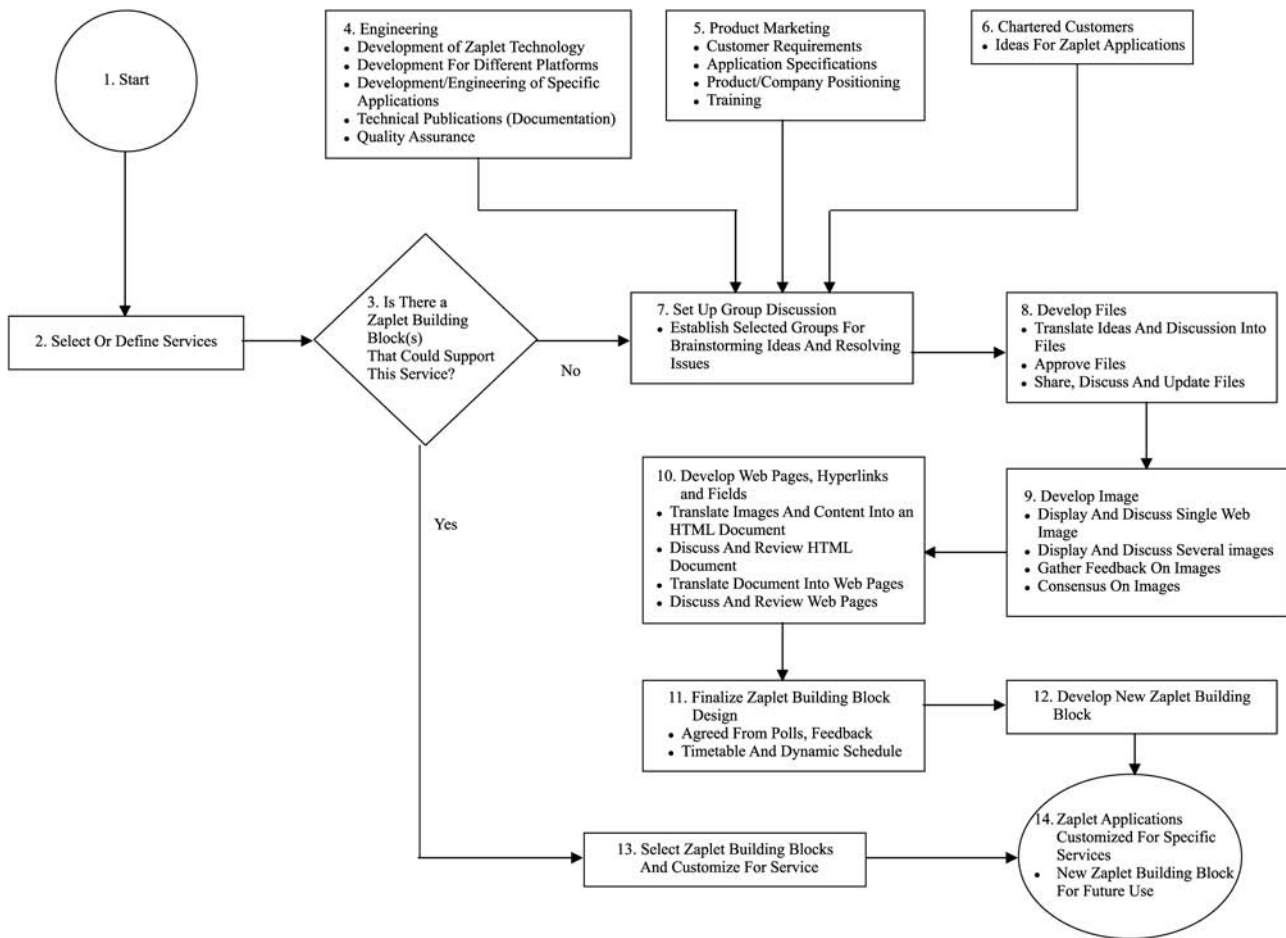




Figure 8 Summary DSA model For Zaplet application development



Source: DeLacey and Leonard (2001)

events Figure 11 shows are limited to the time period in the original case study report. Figure 12 is a revision (including corrections and additions) of the events and chronology found in the original case as well as an update on what happened subsequently for two years after the original case report.

Appendix 2 of this article is a selected extract from the original case study by the DeLacey and Leonard (2001). Comparing the data in the appendices with data from follow-up interviews indicates the great importance of the following sensemaking step – the selection of Java technology to build a new and exciting “killer application” for the Internet would have great appeal to both venture capitalists and leading-edge Java developers from Sun where Java was conceived. Axe and Roberts gained an appointment with Vinod Khosla (world renowned venture capitalist) at Kleiner, Perkins, Caulfield & Byers (KPCB) on 23 July 1999 (box 7 in Figure 11). The appointment and connection with Vinod Khosla were critical to the development of both Zaplet as a start-up company and for the development of its applications. Khosla was excited to learn about Zaplet’s business concept; Khosla (and other KPCB senior executives) agreed to provide financial support for the new concept. The new start-up vehicle was tagged “FireDrop.” Nevertheless, during their first meeting with Vinod Khosla, Axe and Roberts realised that the current

prototypes would have to be thrown away, and the new technology redirected toward the development of new applications.

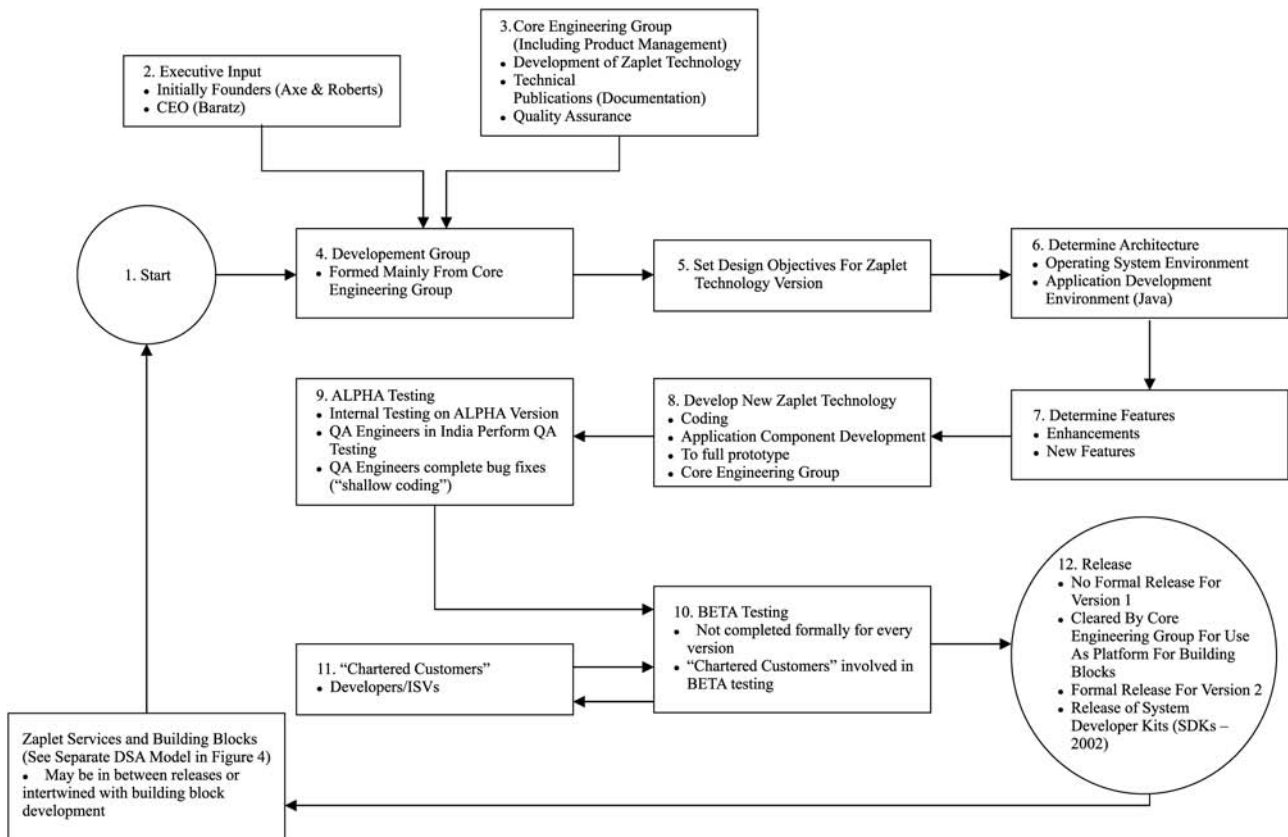
Vinod Khosla’s insights into balancing the development of new ideas and actually developing applications (or products or technologies) assist in understanding development of new internet-based applications in a fast – moving high-technology business environment.

Khosla noted that entrepreneurs are strongly focused on execution but need to dream or imagine new uses for their technologies. Khosla extended his view to defining two company management models for development of new technologies – the sergeant and shepherd models. The sergeant model is appropriate when a technology and its potential applications are well defined. The shepherd model is more appropriate where the technology is new or novel and where there is a potentially large range of uses or applications. Khosla viewed the shepherd model as appropriate for Zaplet.

These models could be seen in themselves as “decision-making” models. They set a decision-making infrastructure or platform within a start-up company, to work with the underlying decision-making processes of the founders of the company. An interesting issue is the point or period at which a company transitions from a shepherd to a sergeant model.



Figure 9 Summary DSA model For Zaplet technology platform development



Source: DeLacey and Leonard (2001) and Roberts (2002)

Over the next four to five months with facilitation from KPCB, Axe and Roberts were able to obtain \$US16 million in funding. They used the funds in assemble an application development team (including Samir Mitra and Mala Chandra who were prominent application developers from Sun Microsystems), and moved into new offices at Redwood Shores (boxes 8, 9, 10 in Figure 11).

According to DeLacey and Leonard (2001), during 2000, Bill Tancer joined Zaplet and initiated a two-stage market segmentation analysis. For the first stage, four segments were identified (box 17). For the second stage the four segments were reduced down to just the Enterprise Segment for further analysis to identify sub-segments and “killer applications” (boxes 18). DeLacey and Leonard (2001) finalised the case study with the appointment of Alan Baratz as CEO in July 2000, plus a discussion on key questions facing Baratz as he assumed the new role at Zaplet (boxes 19 and 20 in Figure 11).

Axe and Roberts were co-presidents up to September 1999, but then, according to DeLacey and Leonard (2001), roles and responsibilities were changed, with Axe assuming a Chief Technical Offer role and Roberts being appointed CEO.

Khosla actively encouraged the exploration of possible uses for the Zaplet technology. Four Stanford MBA students were bought in ostensibly to define intellectual property for Zaplet, but also to develop a list of ideas for Zaplet applications (box 13 in Figure 11) and Brian Axe decided to redirect their efforts toward developing ideas for Zaplet applications. The

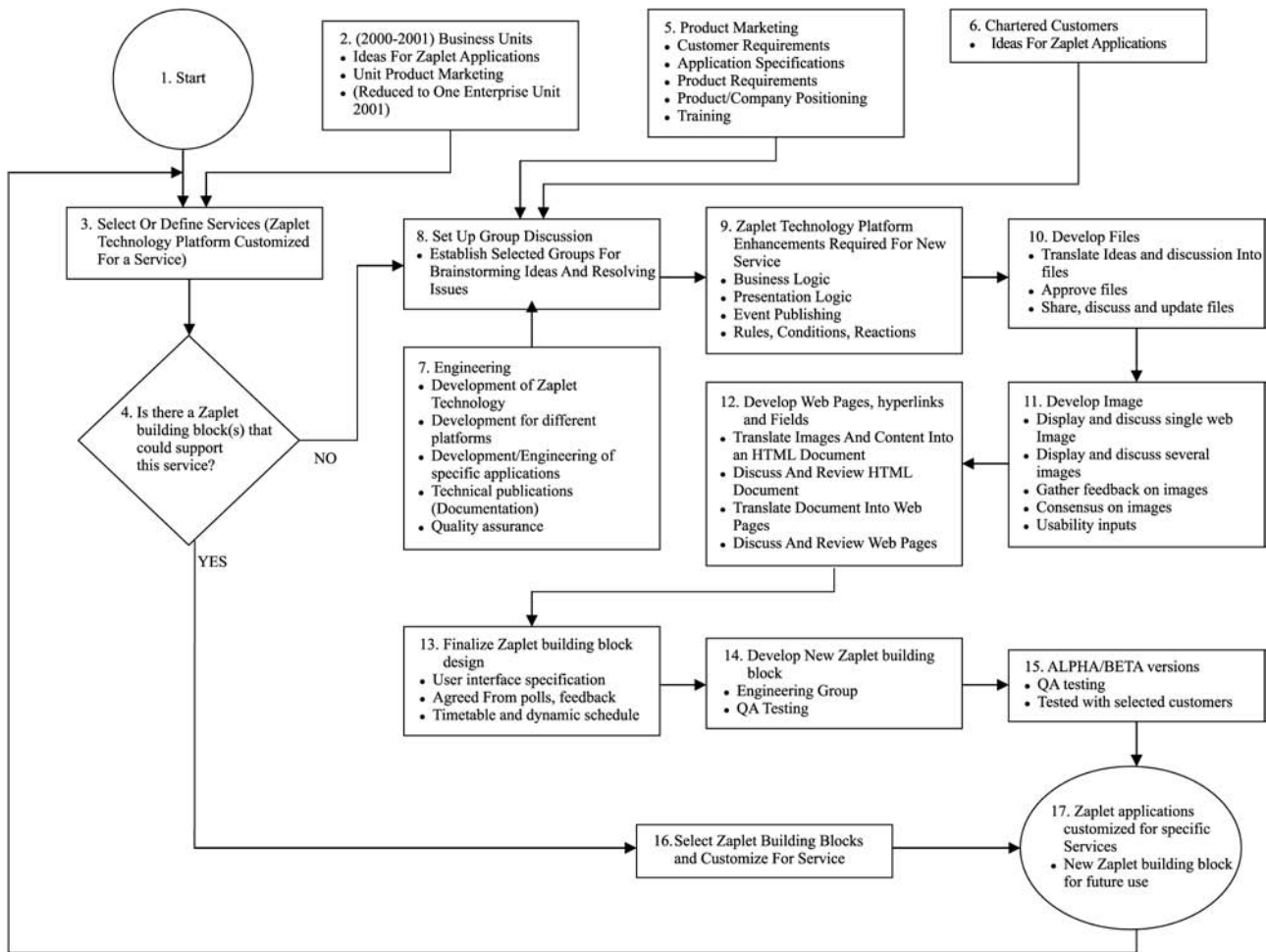
students developed a list of over 200 ideas for applications. The list of over 200 ideas was reviewed by the Engineering Group, which discovered that it could potentially create applications to meet most of the ideas through the development of about 30 specific applications or building blocks (box 14). During December 1999, six business units were set up to focus on the ideas generated by the Stanford students (box 15). Zaplet was launched with this structure as Zaplet.com on 13 March 2000 (box 16 in Figure 11).

The follow-up interview with David Roberts resulting in data for the present article includes significant changes to the original map in details, insights, and event chronology. Also, Zaplet co-founder David Roberts (2002) was keen to correct perceptions in the original HBS case report that either the Zaplet idea or the company was born through discussion between him and Brian Axe (the other co-founder) on the 1998 houseboat trip. In fact there was over a year of e-mail contact between Roberts and Axe before Roberts decided to focus full-time on developing a business plan for Zaplet idea.

In the follow-up interview CEO David Roberts (2002) highlighted not only the technical/business issue, that is, engineers rarely used networked discussion boards, but also that there was a social issue of how collective decisions could be made among friends. This point was added to the event map, encapsulated in a problem box (box 1 in Figure 12).

The sequence of events describing identification of the problem, then the need and Axe’s move to Reactivity (boxes 3, 4 and 5) were unchanged from the original map. However,

Figure 10 Updated summary DSA model For Zaplet application development



Source: DeLacey and Leonard (2001) and Roberts (2002)

there was additional insight into the development of the Zaplet idea at Reactivity (box 6). As noted in the commentary on the original events chronology map, an incubator provided a bundle of services to encourage the development of start-up companies. Reactivity provided Java programmers who assisted with development of early Zaplet prototype applications in mock-up form. In one sense the incubator as exemplified by Reactivity was a “pre-venture capital vehicle” but with some services that a venture capital organization might provide to a start-up company that might approach them directly. The fact the Zaplet concept had been developed in an incubator such as Reactivity likely greatly improved the appeal – and pre-qualification – of Zaplet to a venture capital organization.

The sections in the map (boxes 7 and 8 in Figure 12) covering the development of a business plan and meeting Vinod Khosla remain unchanged but the amount of funding gained from July 1999 to January 2000 was updated with additional information from Roberts and Chandra to reflect a two-stage loan arrangement of \$US 5 and \$US 7 million for a total of \$US 12 million (box 9).

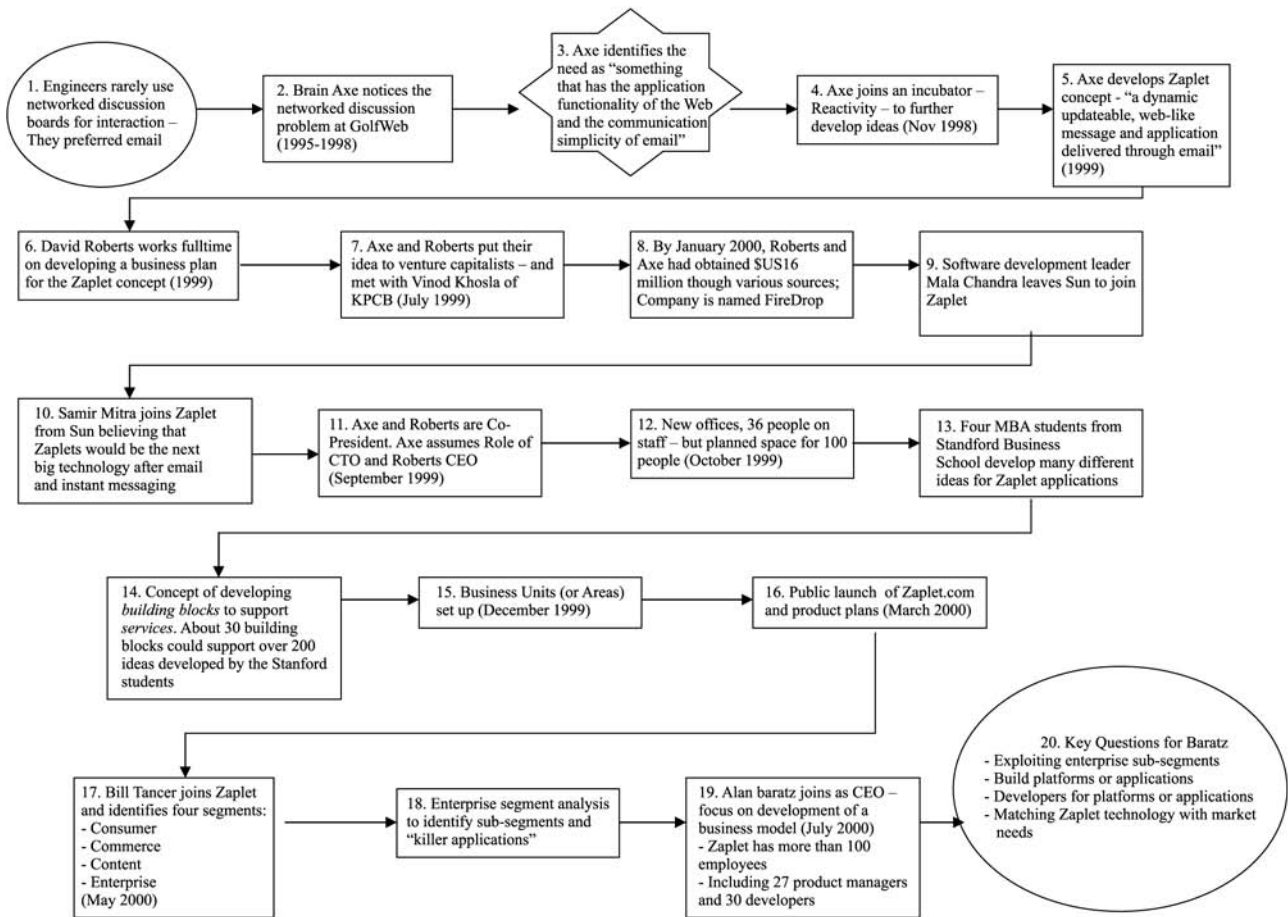
Some job titles were updated or added after the interviews including Mala Chandra (VP, Engineering Management –

box 10) and Brian Axe (VP, Product Development – box 12). Steve Evans was identified as Chief Technology Officer and not Brian Axe. The process of developing the list of Zaplet ideas was actually initiated by Brian Axe (boxes 14 and 15), but this was highlighted in the relevant cognitive map and not updated on the events chronology map.

In the new round of interviews both Roberts and Chandra stress Alan Baratz’s involvement in Zaplet. Baratz joined Zaplet’s Board of Directors in late 1999 (box 16) and was actively involved in identification of business units, the public launch of Zaplet and the enterprise market Analysis before he was appointed CEO in July 2000. Baratz worked with Khosla to define the specific “killer application” segments which became the six business units (boxes 16, 17, 18), that is, SME, Enterprise, Partners, Consumers, Dotcoms and Commerce. Note that in deciding both specific new product platforms and customer segments that the venture capitalist firm and specifically Khosla go beyond the financial-resource view of venture capitalism. The findings here serve to support and extend previous case study findings by Biemans (1991, 1992) and Biemans and Setz (1995).

The events chronology map was extended to include the reduction of the six business units into one Enterprise

Figure 11 Events chronology map – Zaplet



Source: DeLacey and Leonard (2001)

Business Unit in 2001. The map in Figure 12 covers the development Zaplet Version 1 (which was unofficially released) but was not extended to cover the releases of Version 2 and 2.5 in 2002 (Version 3 was released in July 2003).

### 5. Contributions of reinterpreting disruptive NPD

The Zaplet case study highlights issues associating with development of technologies that become platforms for a wide range of software applications, in this case for use within the Worldwide Web. The Zaplet case study addresses mapping strategic thinking associating with application conceptualization, development, and delivery. The advanced hermeneutic analysis framework is effective at identifying key decision-making issues, events, and linkages. This report only addresses a small portion of a rich vein of insights gained from Zaplet decision-makers as further analysis is available related to approaches to market segmentation and more details on taking prototype applications to commercial products.

Both methods provide mapping and validating of initial accounts of decision-making followed up with subsequent revisions of those accounts using a systematic emic/etic representation system. “Application conceptualization” proved to be much more than just creating a software

technology to address online group communication. That aspect of “development” was completed in the reactivity incubator and Zaplet was able to provide a commercial version of its own technology at its launch in March 2000. However, further commercialization of the technology into usable applications required mapping of decision making of Zaplet’s founders working with their venture capitalist to identify ideas for potential application development.

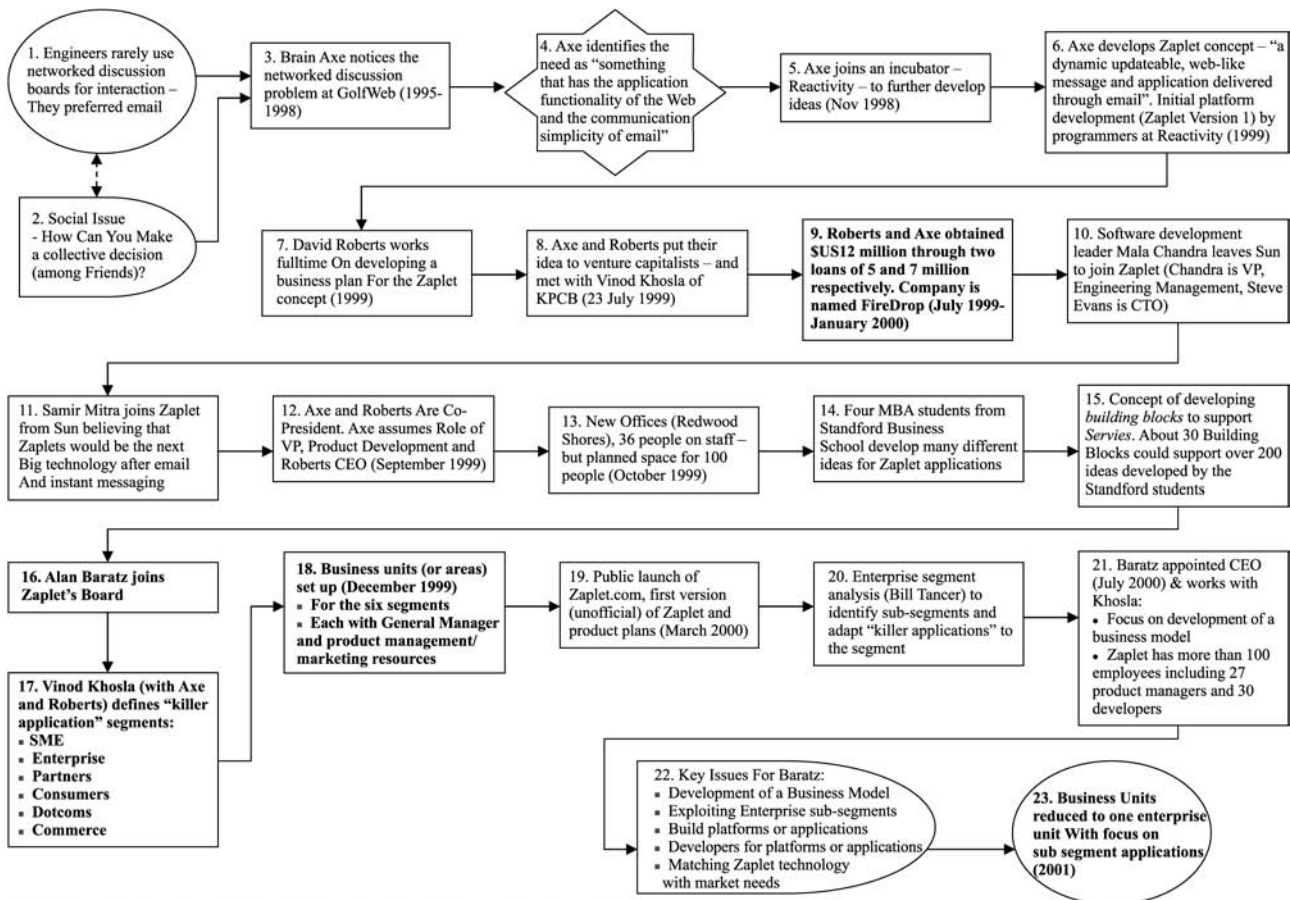
Actual application development initially builds from Zaplet’s Engineering Group making decisions about setting up application building blocks and systematically creating prototypes for those building blocks. Actual customer applications based on the Zaplet application technology was released at about the time Zaplet consolidated into a customer focused company in 2001.

Zaplet’s restructuring in mid-2002, resulted in extending its focus beyond enterprise applications to national security and defense applications including opening a business office in Washington DC. Zaplet 3 was launched on 1 October 2003. Zaplet’s focus and mission revision in 2003 (as the launch of Zaplet 3 states) includes the following statement:

Zaplet<sup>™</sup>, Inc. is a privately held enterprise software company and creator of Zaplet 3, business process management software that brings application functionality directly to a user’s email inbox to complete business processes. Zaplets are task-based applications that can be built or modified by snapping together reusable components and applying rules to define and manage



Figure 12 Updated events chronology map – Zaplet



Note: Figure 12 shows key additional information from follow-up interviews in bold  
 Source: DeLacey and Leonard (2001) plus Interview with Chandra (2001) and Roberts (2002)

process flow. Zaplet 3 offers visibility and audit ability into mission-critical processes such as in intelligence gathering and dissemination, customer relationship management.

Zaplet’s development from an idea to development of a software technology platform through to complete commercialization was visible in the overall case study conducted within the research project. The above points regarding Zaplet’s development show further changes to market and development focus in 2003 beyond the actual case study scope – but in line with direction set in 2000–2001.

### 6. Management implications

Fanatic vision coupled with flexibility in changing product designs to overcome obstacles and leverage opportunities is the main take-away executive decision-making lesson of this longitudinal Zaplet case study. A brief study of Figures 10–12 indicates a group of executives acting as team ready to change direction quickly in response to alpha and beta testing results – and ready to listen and act quickly to third-party creativity (e.g. the MBA students’ ideas in Figure 11). The Zaplet executives’ behavior show zeal in applying Tom Peter’s (2005) dictum – put it to application quickly, reinvent it, and embrace disruptive rethinking-replanning-reimplementing

with frequent communications with third-parties and multiple customer segments.

An artist metaphor is apt in capturing the dynamic happenings in such high-technology innovation-diffusion processes that the Zaplet reinterpretation illustrates: the implementing revises the preliminary vision to result in applications unforeseen initially by the artist-executive. Similarly, the coach on the sidelines attempting to affect the action on (in) the field of play is relevant: high-tech software application development and diffusion is a dynamic blend of mayhem and planning-implementing with dramatic adjustments in plans occurring frequently in response to dramatic responses/breakthroughs among especially following engineers-third-parties-customer interactions.

Tom Peters breathlessly exciting advocacy about creating disruptive innovations may appear over-the-top, his view is correct. “Stick to the plan” is incorrect. The following dictum that is attributed both to Dwight Eisenhower while Supreme Allied Commander during the Second World War, and to UK Prime Minister Winston Churchill, sums up the Zaplet findings: “The plan is nothing, planning is everything” – recognize that the action is going to follow its own disorderly logic, and that the most valuable thing your planning will give you is an ability to improvise when the moment comes.

The wisdom the Zaplet reinterpretation is in the skill in doing the following steps: create-apply-destroy-recreate-apply applications quickly with little time during the process for focusing long on mistakes and obstacles. The maps and thick description dynamics reflect a marriage of concrete trials, rethinking, reinvention – and more concrete trials. Not “what if” thinking but real-life “try this now” doing. Brilliant-and-fast improvising is the summary gloss implication running between-the-lines in the Zaplet reinterpretation case study.

## 7. Conclusions, limitations, theoretical implications, and suggestions for further research

The article highlights benefits and challenges with applying hermeneutical interpretations in B2B contexts to deepen understanding and description of specific decision-making processes. Langley *et al.*'s (1995) appeals for reanalyzing previously analyzed decision processes are useful for mindful sensemaking into decision-making. The hermeneutic framework as presented here provides an effective platform for collecting, articulating, revisiting and restating issues vital to original decision-makers.

Room exists for using the cognitive maps as inputs for systems dynamics modeling as Hall (1976, 1999) outlines, thus translating mental models into highly useful simulation models of real-life systems. Such dynamic-oriented micro case study research efforts should enable more rigorous, accurate and useful generalizations of decision making on a specific issue – and the modelling it – than is found in literature reviews of models of complex systems.

Not using outside auditors to evaluate etc 3 interpretations is a method limitation to the extended Zaplet case study; such outside auditor reports represent an etc 4 level of interpretation (see Brinberg and Hirschman, 1986). Incorporating such etc 4 interpretation is one suggestion for further research.

Woodside *et al.* (2005) call for meta-evaluations of a series advanced hermeneutic B2B research reports of a specific issue (e.g. new product innovation processes). This article addresses complexity associating with developing and commercializing a product that is a component within a disruptive technology – a preliminary step necessary for responding to such a meta-evaluation.

Trade-offs occur in achieving a satisfactory depth of hermeneutic analysis – usually between times, availability of participants, and funding. However, if BIM research is to advance to the level required for useful system dynamic applications then researchers must be prepared to “stay the course” and to dig deep for those nuggets of insight that help to understand a world of complexity and disruption. The present report is representative of the dynamic data collection methods necessary for building system dynamics models that Huff and Huff (2000) achieve. Hopefully, future research will include all the details in such dynamic data collection, system dynamics model building, running simulations of the models, describing the outcomes of such simulations in depth, and applications of the simulation implications by executives. Huff and Huff's (2000) achievement indicates that this next theory-research-implications-application mountain is climbable.

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## Appendix 1. Text extract: Zaplet – Zaplet Technology Development

### Zaplet application platform development

Zaplet technology was originally developed by Brian Axe in 1999, while he was at Reactivity. The first official version of Zaplet (V1.0) was never officially released but was recognizable at about the time of the launch of Zaplet.com (13 March 2000). Zaplet V2.0 was released in March 2002, and Zaplet V3.0 is currently under development.

Zaplet technology is designed to:

- Run on and across virtually all commercial desktop platforms, email programs, and web browsers.
- Deliver lightweight applications to email and the web without added IT infrastructure.
- Offer a fully interactive experience with current generations of HTML-enabled e-mail.

Zaplet technology is a platform developed around J2EE interfaces and Java technology standards. Specific Java technology utilised by Zaplet includes:

- Java Database Connectivity (JDBC) to access the database.
- Enterprise JavaBeans (EJB) to encapsulate business logic.
- JavaServer Pages (JSP) to handle dynamic HTML generation.

The software development process for Zaplet V1.0 as described by David Roberts, took around 12 months and was separate from the software development process for the Zaplet Building Blocks. Three steps were identified in the process:

- 1 Initial planning and design.
- 2 Coding and development.
- 3 Release.

### Initial planning and design

Initially, Brian Axe developed application prototypes of the Zaplet technology with programmers at Reactivity. As the Zaplet organization developed under the FireDrop umbrella, further development of the Zaplet technology was driven by a development group including the founders, Axe and David

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Roberts, core engineering representatives and the early product managers and product marketers.

Some objectives for the new technology had been set by Axe while developing early prototypes but were extended with the development group to incorporate the following design objectives:

- Running on and across virtually all commercial desktop platforms, e-mail programs, and web browsers.
- Delivering lightweight applications to e-mail and the web without added IT infrastructure.
- Offering a fully interactive experience with current generations of HTML-enabled e-mail.

The development group filtered key design inputs such the technology architecture and features. The Zaplet technology was developed for UNIX and WINDOWS operating system environments, with SOLARIS as the UNIX environment and WINDOWS 2000 as the WINDOWS environment.

Axe's development of the early Zaplet technology prototypes using Java technology anchored the Java technology as the preferred architecture for Zaplet, with J2EE interfaces. Java technology provided components that would enable Zaplet to develop a powerful set of features into its technology including:

- Java Database Connectivity (JDBC) to access databases.
- Enterprise JavaBeans (EJB) to encapsulate business logic.
- JavaServer Pages (JSP) to handle dynamic HTML generation.

In later versions of the Zaplet technology (Version 2.0) additional features such as collaboration applications, event and condition features and links to ERP applications were filtered by the development group. Most application features were developed using Java technology.

### Coding and development

The core engineering group developed the Zaplet technology, including the application coding. For Zaplet V1.0 the first prototype was developed in six weeks. According to Roberts this was a full prototype with all the features as requested by the development group!

The ALPHA version of the technology was subjected to testing by a set of QA Engineers in India. The QA Engineers completed "shallow coding" or bug fixes to the technology during testing.

There was no formal set of ALPHA and BETA iterations in the development of Zaplet V1.0, but selected or "chartered customers" i.e. some of those developers or ISVs interesting in Zaplet's technology were involved in some testing of the BETA version of the technology. In Zaplet V2.0, "chartered customer" involvement in BETA testing was more formalised than with the first version.

### Release

There was no formal full release date for Zaplet V1.0, but the technology would be cleared by the core engineering group to be ready for extension to and accommodation of Zaplet Building Blocks. The focus of application development would switch to the selection and development of the Building Blocks. This switch of focus also meant that the approximate 12 month Zaplet technology cycles were not continuous, but punctuated with the Zaplet Building Block development process. However, there was a formal release of Zaplet V2.0 in

March 2002 and there is expected to a formal release of a future Zaplet V3.0.

This vignette was prepared from personal interviews with David Roberts (2002), Personal Interview (face-to-face) and by telephone with Mala Chandra in 2001 by Hugh Pattinson.

## Appendix 2. Text extract: Zaplet – Genesis of Zaplet (1999)

### History of the company

Zaplet, Inc. traces its roots to 1998 when Brian Axe and David Roberts were invited by mutual friends to go on a houseboat trip. This chance meeting precipitated a friendship that eventually led to collaboration. Axe graduated from UCLA in 1992 with an Engineering degree and obtained an MS in Engineering Management from Stanford in 1995. He worked for Hewlett-Packard and IBM before moving to GolfWeb in 1995, when dotcoms began to appear. In his work at GolfWeb, Axe noticed an interesting pattern. Even though engineers had access to a networked discussion board for building product specs, they rarely used it to interact or update information in real time. The same thing happened when he tried to get his friends to use club-type web sites for scheduling and coordinating their group activities. "I found that we kept going back to email", said Axe. Axe identified the need to be met: "It dawned on me, if only we could create something that has the application functionality of the web and the communication simplicity of email."

In November 1998, Axe left GolfWeb to develop his ideas further at Reactivity—an incubators with the following mission: "Reactivity builds software products from concept to delivery. Reactivity combines the talents and skills of preeminent engineering and design teams to provide the best in New Venture Creation and Client Services." As Axe was developing prototypes of what would become Zaplet technology, he started to think about building a company around the Zaplet idea. He contacted David Roberts, a friend with shared values and key experience, to see if he would become a co-founder.

It was the beginning of 1999 when the concept of Zaplet™ appmail took form as a dynamic, updateable, web-like message and application delivered through e-mail. The concept did not fundamentally change, although the venture it launched went through many permutations.

Roberts became increasingly interested and involved in planning how to carry this forward into a business. In early 1999, he quit his job to work full time on a business plan. Roberts brought to the venture over 15 years of technology management experience, having led the development of some of the nation's most complex, state-of-the-art satellite systems. He had been special assistant to the director of the largest single program in the US intelligence budget and served as an executive manager and decorated career officer in the Central Intelligence Agency and the US Air Force. He graduated first in his training class at the CIA and persuaded the CIA to send him to Harvard Business School, where he received an MBA in 1992.

Early prototypes of Zaplet™ appmail included an Event Planning application that allowed a group of friends to coordinate their social activities (such as ski trips) and a Group Purchase application to help friends and family purchase items at a volume discount. (See Exhibit 1 for a

description of Zaplet technology.) In July 1999, Axe and Roberts were ready to put their idea to a critical test—the scrutiny of venture capitalists. They selected four Venture Capital firms they wanted to meet. Through a friend at Reactivity, they were able to arrange an appointment with their first choice, Kleiner, Perkins, Caufield and Byers. (See Exhibit 2 for excerpts from their presentation.)

An Incubator is defined to be “An organization that helps start-ups develop in an accelerated fashion by providing them with a bundle of services, such as physical space, capital,

coaching, common services, and networking connections.” Morten T. Hansen, Nitin Nohria, and Jeffrey A. Berger, “The State of the Incubator Marketspace,” Harvard Business School Publishing, June 2000. Source: DeLacey and Leonard (2001, p. 2).

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