The Purpose of Emergent Learning Maps™

The purpose of Emergent Learning Maps is to help work groups learn from experience to improve future performance, and to capture and share knowledge across projects and LOBs. EL Maps are designed to be as simple as possible, so that groups can apply them to any kind of business challenge and scale them to different project scopes and group sizes. EL Maps can be used to:

- Improve performance in critical areas of expertise
- Test thinking about upcoming projects
- Use what worked (or didn't) in the past to inform the group's strategy and actions going forward
- Develop a transparent knowledge creating and sharing tool without creating unwanted overhead
- Ramp up new members quickly around team culture and the thinking behind the project

This web-based tool is designed to respond to our need to be able to work virtually when time, cost and schedule conflicts interfere with face-to-face meetings, and, at the same time, to create a low-cost, low-overhead knowledge repository for capturing and sharing lessons learned.

The Structure of an EL Map

An EL Map consists of two lines that create four quadrants on a page. Each line has a meaning:

- The **horizontal line** separates events in time from our thinking about these events.
- The **vertical line** represents today and separates what has happened in the past from what is going to happen in the future.

These two lines create four quadrants:

- **Ground Truth**: Events that happened in the past related to the map's topic.
- **Conclusions**: Our thoughts and interpretations about what happened in the past; our "Lessons Learned."
- **Action Field**: Events that will happen in the future – opportunities we can use to test our hypotheses and implement lessons learned.
- **Hypotheses**: Our thoughts about what will work in the future, based on what we've learned from the past, and taking into consideration what might be different about the future.

These quadrants are designed to create and document a disciplined conversation about the chosen topic. You may choose to input ideas into the map in real-time during your meeting, or to take notes and document the meeting with a map after the session is completed. In either case, having the visual map in front of you during your conversation will help group members to clarify and "ground" their thinking.

Applications for EL Maps

The structure of an EL Map is intentionally simple, in order to encourage work groups to apply the tool in as many different ways as you can imagine. We strongly encourage you to try out EL Maps where they seem to fit your needs. Here are a few ideas to get you started, and a suggested process to use to complete the map. Feel free to improvise your own process or adjust ours to suit your needs.

IMPORTANT: Please send us a message telling us about what you try and how it works for you, as well as any problems you had in using the tool. We want to collect and share your experiences with others. Also, this tool is still being refined. We need your feedback to improve it!

Conducting a project phase review

Suggested process: Start by knowing when and how you will use conclusions from this session. Will they be used to improve the next phase? The same phase of the next project? (Actually, we recommend that you try to do both simultaneously.) Be sure the right people are in the room to take these lessons forward. Then go from Ground Truth to Conclusions to Hypotheses and Action Field.

Doing this process over a series of project phase reviews will give your work group an easy way to see common problems and document performance improvements over time.

Running effective work group meetings

Suggested process: Choose a challenge or problem that comes up repeatedly for your work group. Make that a continuing theme for a small part of each staff meeting until you feel you've made visible progress and can move on to the next topic. Describe the challenge as a "Framing Topic" and create a map. Each time something happens between meetings in your group's "Action Field" related to that topic, have a member of your group create and present a new edition of your map describing the Ground Truth and his or her initial Conclusions. Take notes of any Ground Truth or Conclusion comments added by the group. Then brainstorm Hypotheses and identify opportunities that are coming up to try them out. Add the meeting comments and post the map for future reference.

With practice, this whole process could take as little as 15 minutes and add a sense of discipline and accomplishment to your work group meetings.

Solving problems with an EL Map

Suggested process: When a problem comes up – especially one that has come up before – create a map starting with all of the Ground Truth instances the group can think of where this problem has surfaced. Look for common themes or patterns across instances and note those in Conclusions. Think about both the current problem and the next time this problem is likely to arise. Note those in your Action Field. Then identify Hypotheses about how you could address the problem this time, as well as how you might avoid the problem next time.

Taking this dual approach to problem-solving may help you to get ahead of some nagging problems so that you can focus instead on opportunities.

Planning an EL Map session (who and when)

AN EL MAP SESSION DOES NOT REQUIRE EVERY PARTICIPANT TO BE IN THE MEETING. It is important to include at least a few people who know the history of this group related to the topic. But because this is an iterative process and a map can be added to and edited after the meeting, it is more important to get those who can be there together and create a map than to wait for 100% participation.

Anyone who has an interest in the Framing Topic can valuably participate in an EL Mapping session. For any EL Mapping process, the most important participants are potential 'customers' for the learning – either the group itself or other groups who might benefit from what is being learned. EL Map sessions can also be valuable for new work group members who need to get up-to-speed quickly on the history of the project or the group.

When should you do an EL Mapping session? The answer is fairly obvious for improving staff meetings or solving problems. But not so for project reviews. Unlike the traditional "post-mortem," the ideal time to conduct an EL Mapping session is when the next project or next phase is in sight and the work group is forming, not when the last project or phase is completed. Even at the risk of losing some participants due to reassignments, the closer a work group is to a new start up phase, the more likely they are to be able to apply and integrate what they've learned.

Likewise, it is much better to conduct several smaller, more targeted EL Mapping sessions during the project than waiting to do a complete and lengthy post-mortem after the project is done and nothing can be done to use the lessons learned to improve project results.

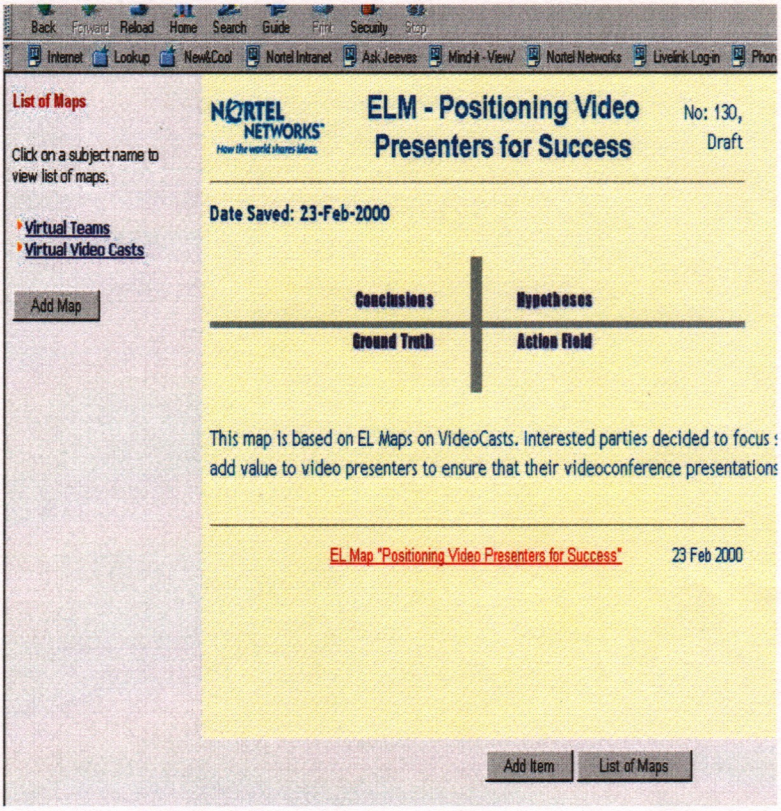
Defining a Framing Topic for the Map

The framing topic will define the focus of the session. The best topics are future-focused. It can be a statement or a question. The topic might be strategic: : "How do we improve our "customer coupling" processes?-It might be operational, "How do we turn our product around in 6 months instead of the 9 months we're taking now?" It could be organizational, "What would it take to make our investment decision making processes more effective in the TTM business model?" Or it could be project-oriented: "What do we need to modify to make our Project Planning Process more closely address user requirements?" It is not uncommon for the topic to be revised by the group during the session as the EL Map evolves, often becoming more strategic or systemic in perspective.

The best framing topics are areas that you or other work groups are likely to come back to. Even if it may be a one-time challenge for you, if you can frame the question in terms of a larger issue that is commonly faced by work groups working on TTM, it will make it easier to transfer and compare Lessons Learned across projects. It will also make it more likely that you will come back to the topic over time and compare your own thinking and performance in the future to what you are experiencing today.

Using the Web-based EL Map Tool

What a Web-Based Emergent Learning Map Looks Like:

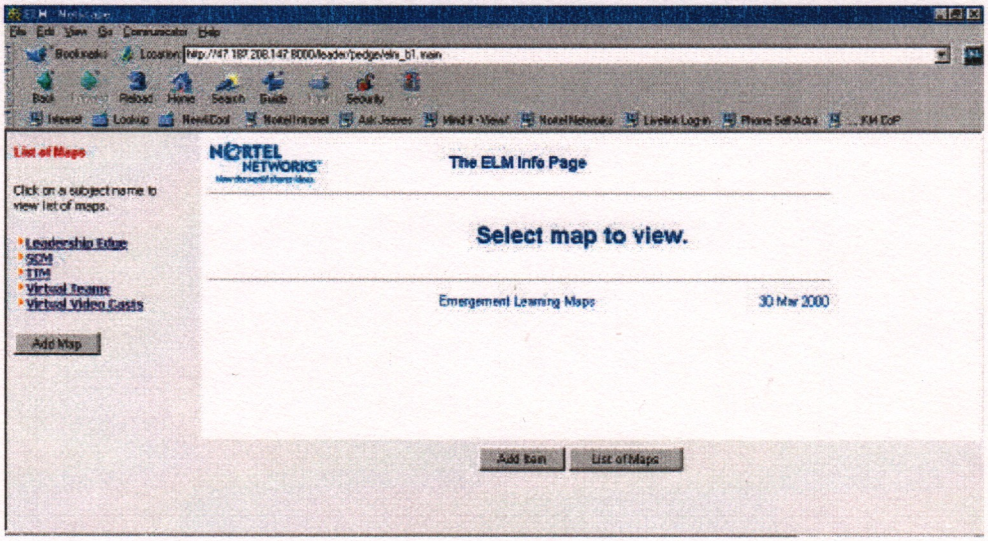


Your work space lies in the yellow field, while the gray field offers other options for you, such as:

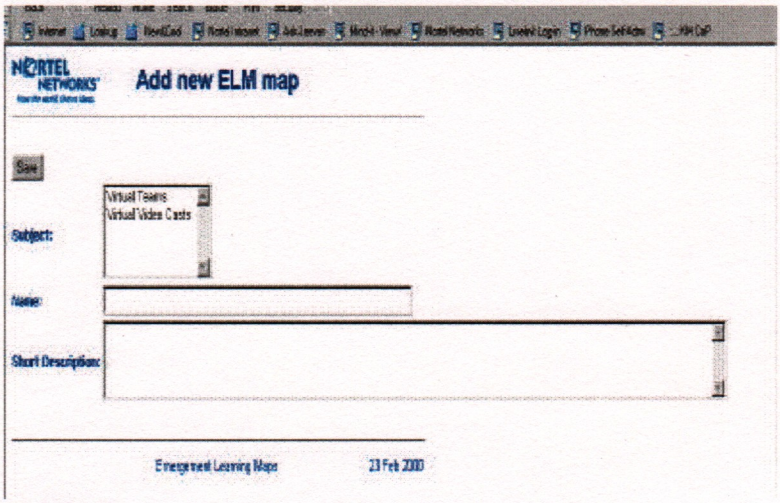
- tAdding another new map
- tAdding an item to the map in the yellow field
- tViewing a list of maps in the database

Creating an EL Map

List of Maps Window:



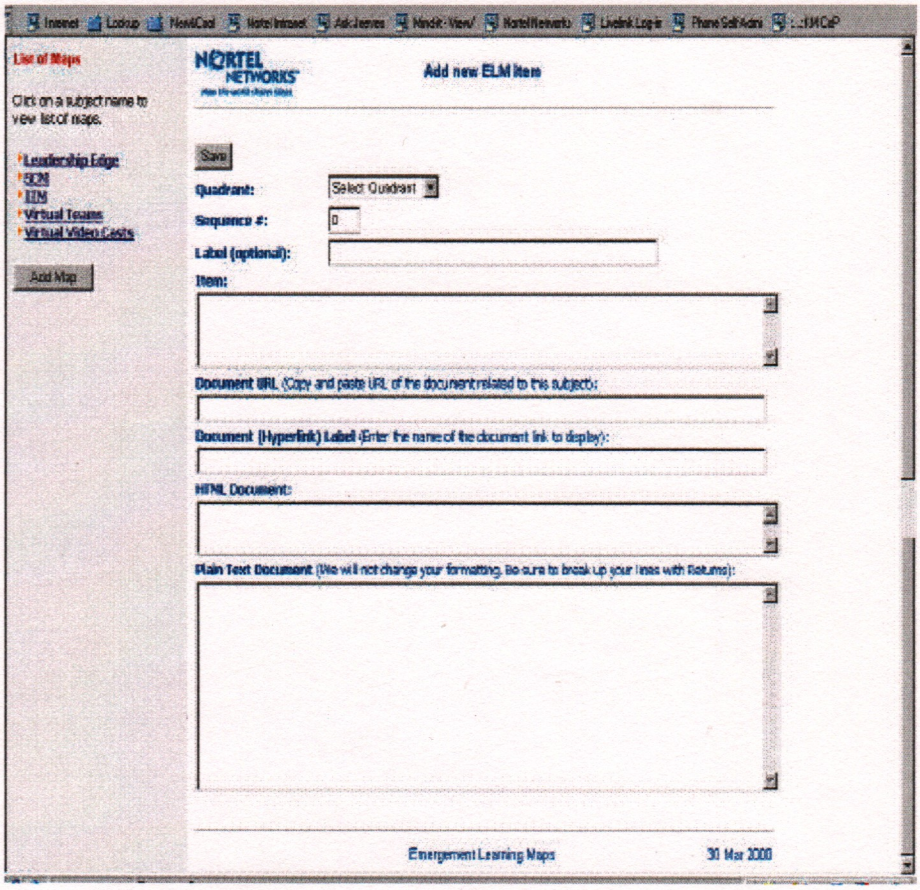
Add a new Emergent Learning Map Window:



Instructions

- **Click "Add Map"**
- *Add new ELM map window appears*
- **Select the subject** under which the new map should fall
- **Enter title** (length < 30 characters)
- **Enter short description**, describing
  - Purpose of the map
  - Value to the business
  - Map Contributors / Topic Stakeholders
  - **Save** to Complete the action

<u>Adding a new item window:</u>



Adding new bullets to a quadrant in the map instructions:

- **Click add item** button
- Fill in the form
- Select the **quadrant** you want to add the info
- **Sequence**: Type in the number where you want to place the info (which becomes a bullet in the quadrant). By leaving the sequence field blank the info will be placed as the last bullet in the quadrant
- **Labels** are the first 40 characters of text. It is important to create a label that best summarizes the content of the bullet you're adding, since it will be scanned during key word searches
- **Item**: can be typed in in this field
- **Click Save** to complete the action of inputting data into the map

Instructions to Inputting / Attaching Documents:

- When adding a Document URL
  - **Click** on Input/Edit button of the bullet to which you wish to attach a URL, if you are not already on the "add new item" page
  - **Copy/Cut** the URL of the document/site you want to attach
  - **Paste** it into the Document URL text Field
  - **Click** save

- When adding an HTML Document
  - **Save** your word document in html, or Web Page format
  - The document will show up in the form of a WebPage
  - **Click View**, and select html source
  - **Cut/Paste** the source code into the HTML document text Field

- When adding a Plain Text Document
  - **Cut/Paste** your word doc (in rich text format) into the Plain Text text field

Functionality to Come:

- Adding a new subject to the map (Currently you'll need to call Cyndy M-A to request the addition of a new subject heading.)
- Authentication of Users
  - The differentiation between an owner of a map and other map users.
- Deleting Bullets and Maps

Glossary of Terms:

Actions Field: Upcoming opportunities to test our hypotheses and implement lessons
Conclusion: Our thoughts and interpretations about what happened
Document (HyperLink) Label: The title of the document you are attaching to a map's bullet.

Document URL: A URL which is cut/pasted and attached to a particular bullet in an EL Map.
Dynamic Map: a map composed of data originating from many maps, synthesized by the database when prompted by a key search, or created by an amalgamation of data bridged together by a person or group of people
Ground Truth: What really happened
HTML document: A document attached to a bullet in an EL Map, which is provided in html source code.
Hypotheses: Proposals going forward and expected results
Plain Text Document: A document which is attached to a bullet in an EL Map which is cut/pasted from a word document.
Static Map: a map which has been produced by individuals or groups

Iterating through creating "editions" of your EL Map

TTM's web-based EL Maps sit atop an Oracle database. Once a group creates a map on a topic, that map automatically becomes a sharable entry in their knowledge base. Each time a group creates a new map on the same topic, a new "edition" is created. Over time, these editions form a history of the group's experience, or even multiple groups across projects, in addressing a particular challenge. Please note: If you wish to track your editions in sequential order, it is recommended to label your map editions with an obvious label, such as "Recognizing Hi Potential Employees v.1; Recognizing Hi Potential Employees v.2" etc.

Emergent Learning Map™

Plato - Eliminating Time Delays (PHILLIPS)

Will the participants look for ways to eliminate times delays from the supply chain? (Similarity to Map4?) Owners: Andrea Shapiro, Scott Phillips

Last Update: 31-Mar-2000 No: 517, Draft

Conclusions

1. (PHILLIPS,31Mar00)
   Web cycle 3 People did not notice that a major change from web cycle 2 to 3 was eliminating half the time delays in the supply chain
2. (PHILLIPS,31Mar00)
   customer visibilities Players do see the visibility of to the customer
3. (PHILLIPS,31Mar00)
   Players burned out Based on observations, by the time players have received the results of Web Cycle 3, they begin to lose energy.

Hypotheses

1. (PHILLIPS,31Mar00)
   Time delay emphasis If we mention from web cycle 1 on that each box represents a day's time delay, then people we see more clearly that they represent time delays and then see the effect of eliminating time delays more clearly.
2. (PHILLIPS,31Mar00)
   Participants tired If the results of Web Cycle 3 are held until after the debrief, the participants may remain more engaged throughout the debrief and retain the lessons related to time delays.

Ground Truth

1. (PHILLIPS,31Mar00)
   NO Mentions of time delays! There were no mentions in the feedback of the effects of time delays in the feedback quotes
2. (PHILLIPS,31Mar00)
   web cycle 2 to 3 There are two changes between cycle 2 and 3: 1) view to the customer 2) eliminating time delays

Action Field

 Emergent Learning Maps Data as of: 2000-Jul-05 04:07 EST

Emergent Learning Map™

OFE Facilitation (PHILLIPS)
How can facilitation practices be improved to ensure that participants leave with a solid grasp of the 5 key learnings?

Last Update: 31-Mar-2000 No: 529, Draft

Conclusions	Hypotheses
Ground Truth	**Action Field**

1. (PHILLIPS,04Apr00)
   Experiential versus PowerPoint The value of experiential learning versus classroom/powerpoint learning is very clear among participants.
2. (PHILLIPS,04Apr00)
   Team Planning Some groups felt that there was a need for additional team planning time before each web cycle, even though team planning time was built into the game format.
3. (PHILLIPS,04Apr00)
   Time wasted during tabulation Some participants felt that the time during results tabulation could have been better used.
4. (PHILLIPS,04Apr00)
   Cross-Functional Participation Many participants felt that broad representation from all functions at each table would contribute to the learning and breaking down of silos.
5. (PHILLIPS,04Apr00)
   Nortelization Some participants commented on how the game mimiced the Nortel supply chain while others would have preferred to see a stronger connection to actual Nortel products and metrics. Not just moving bingo chips.
6. (PHILLIPS,04Apr00)
   Real Competitors There were mixed feelings about the competition between Nortel Teams, some feeling that the competition was healthy and others feeling that internal competition should not be fostered.
7. (PHILLIPS,04Apr00)
   Time-Outs When one node gets significantly "behind" the others, it can have a negative impact on the experience for the entire table.
8. (PHILLIPS,04Apr00)
   What would you KEEP and CHANGE Participants did not value the ending exercise to discuss things that they would keep and things that they would change in Nortel.
9. (PHILLIPS,04Apr00)
   Debriefs too Long Some participants felt that the time spent in debriefs was too long.
10. (PHILLIPS,04Apr00)
    Not all lessons learned The five key lessons to be learned in the OFE experience were not equally represented in the feedback given, in particular those related to the importance of structure and time delays as a driver for supply chain

of structure and time delays as a driver for supply chain performance and consolidation of data.

11. (PHILLIPS,20Apr00)
Co-Facilitators Contribute to Energy Co-Facilitators have a large impact on the energy level in the room which has a large impacton the amount of learning that takes place.

 Emergent Learning Maps **Data as of: 2000-Jul-05 04:07 EST**

Emergent Learning Map™

Eliminating Serial Dependencies (PHILLIPS)
Will participants look for ways to eliminate serial dependencies in supply chain? (Similarity to Map 3?) Project Plato, Order FulFillment Experience Owners: Andrea Shapiro, Scott Phillips

Last Update: 31-Mar-2000 No: 508, Draft

Conclusions

1. (PHILLIPS,31Mar00)
   Serial Dependencies Participants quotes of silo mentality and end-to-end views indicate an understanding of the effect of "serial dependencies"
2. (PHILLIPS,31Mar00)
   See the need, but no mention of doing People seem to feel that the silo mentality is so engrained that they feel"powerless" to change it

Hypotheses

1. (PHILLIPS,31Mar00)
   Discussion and Feedback If we take part of the debrief time to allow in-team discussion and feedback to the entire group on how they can eliminate serial dependencies in their own job, then people would be more likely to do some elimination.

Ground Truth

1. Docs (PHILLIPS,31Mar00)
   Mentions of silos There are several quotes around "silos" in the quotes. (Theme 3)
2. Docs (PHILLIPS,31Mar00)
   Mentions of 50K views There are several mentions of 50K views and of end-to-end view. (Theme 3)
3. Docs (PHILLIPS,31Mar00)
   "bigger than me" Mentions of silos being engrained in Nortel mentality and that Nortel needs to eliminate them - not that the individual needs to eliminate them (Theme 3)
4. Docs (PHILLIPS,31Mar00)
   "no bugs on me" Mentions that others have silo mentality. (Theme 3)

Action Field

1. (PHILLIPS,31Mar00)
   Participant Discussion At an appropriate point in the debrief following Web Cycle 2 in the next OFE session, a portion of the debrief time will be devoted to exploring with the participants various ways that serial dependencies can be eliminated from portions of the supply chain they are involved with on a day-to-day basis.

 Emergent Learning Maps **Data as of: 2000-Jul-05 04:07 EST**

Emergent Learning Map™

JobDOTs Lessons Learned (Documentation) (MEDEIROS)

Last Update: 21-Jun-2000 No: 1120, Draft

1. (MEDEIROS,22Jun00) **Time pressure drove** implementation without regard to adequate testing
2. (MEDEIROS,22Jun00) **Too much on people's plates, so** stakeholders were pulled in too many directions at one time (reorgs, outsourcing, etc.)
3. (MEDEIROS,22Jun00) **Lack of common processes** (with Wireless and Enterprise for example)
4. (MEDEIROS,22Jun00) **Skill sets were missing** especially in the analytical and process development areas. People in those roles were not fully trained.
5. (MEDEIROS,22Jun00) **Not enough emphasis on** process before the technology was developed
6. (MEDEIROS,22Jun00) **HardWare (HW) support issues** Issues existed with hardware support included 1- overextended and/or non-local resources and 2- funding and 3- complexity of code.
7. (MEDEIROS,22Jun00) **Overall- there was a lack of** communication with development team
8. (MEDEIROS,22Jun00) **Due to firefighting activities** there was no time for training
9. (MEDEIROS,22Jun00) **System was so complex** that team was unable to perform end to end testing in a test environment
10. (MEDEIROS,22Jun00) **Risk factors were not acknowledged**
11. (MEDEIROS,22Jun00) **Changing of requirements** was not embedded into a process, nor were change impacts documented
12. (MEDEIROS,22Jun00) **Knowledgeable resources were** not available during planning
13. (MEDEIROS,22Jun00) **Knowledgeable resources did** not sanitize the infrastructure until the application was in production
14. (MEDEIROS,22Jun00) **People said it was ready when it wasn't**
15. (MEDEIROS,22Jun00)

1. (MEDEIROS,22Jun00) **see below in Action Field** All hypotheses are joined to a specific Business Decision Point meeting

Culture is reluctant to give bad news
16. (MEDEIROS,22Jun00)
Mgmt emphais is more on dates than on the life cycle process
17. (MEDEIROS,22Jun00)
Poor initial set up and configuration
18. (MEDEIROS,22Jun00)
Team was unstable due to constant changes in membership

Conclusions

Ground Truth

1. (MEDEIROS,21Jun00)
HW- if transfer to Proc.Serv. then application will be restructured to comply with Processing Services standards
2. (MEDEIROS,21Jun00)
Core vs. New Technologies (CvsN) - Purch ased WebLogics Application server to support enterprise java beans architecture.
3. (MEDEIROS,21Jun00)
CvsN - Lack of know-how Very few internal resources have knowledge on this server. We are still having problems with the server, which continues to be fixed by internal resources, along with assistance from vendor.
4. (MEDEIROS,21Jun00)
CvsN- IS couldn't support new technology IS said they had no resources to support the application server, and suggested that resources be found within the dept. The dept. decided on and purchased a longer term technology solution under the assumption that DOT 6.0 would be in place and offer enhanced capabilities over time. DOT 6.0 was cancelled. Consequently, the dept. is left with an application server and without the expertise really needed. Currently some contractors are learning more about the technology in "learn by doing" fashion.
5. (MEDEIROS,21Jun00)
Resource Churn (RC)- There is tremendous churn due to high turnover and reorganization of RFTs, contractors, managers.
6. (MEDEIROS,21Jun00)
RC - Contractors who knew how to run the new technology, WebLogics, knew neither the existing JobDOTS application, nor Nortel business, so a lot of time was required to ramp them up,
7. (MEDEIROS,21Jun00)
RC - People were brought in midstream to finish the development of JobDOTs, as well as deal with unresolved issues, but needed first to

Hypotheses

Action Field

1. (MEDEIROS,21Jun00)
Decommisioning of DOTS 4.0
2. (MEDEIROS,22Jun00)
Strat BDP - Pay greater attention to the skills that both the Business and IS Project Managers are bringing to the table, to ensure they can meet the requirements of the project. (DY)
3. (MEDEIROS,22Jun00)
Overall - call *out of bounds* without fear of retribution (BMC)
4. (MEDEIROS,22Jun00)
Strat BDP Consider providers for Phase 2, Gilmore (DY)
5. (MEDEIROS,22Jun00)
Biz BDP Create smaller delivery chunks if risk to the customer is high, even if it costs more (CP)
6. (MEDEIROS,22Jun00)
Before Strat BDP Incent major teams in a major way at the beginning of the project (BMC)
7. (MEDEIROS,22Jun00)
Strat BDP- locate qualified process people for the project (DY)
8. (MEDEIROS,22Jun00)
Mrkt BDP- Use existing web requirements template (Calibre, Rationale, etc.) (DM)
9. (MEDEIROS,22Jun00)
Mkt BDP- Hire professional software testing company to create, plan, and manage testing
10. (MEDEIROS,22Jun00)
Strat BDP- Have a backup manual process (CP)
11. (MEDEIROS,22Jun00)
Biz BDP- ensure system support teams are identified and support structure in place (MP)
12. (MEDEIROS,22Jun00)
Strat BDP - in the event of another reorg/repat, ensure that some IS folks stay

deal with unresolved issues, but needed first to understand the databases, data models, GUI, and various processes.

8. (MEDEIROS,21Jun00) **Process (P) - process was impacted by** divestiture and realignment of client's organization. For example, there was lack of consistency in the proposed action to pair every order with a 901. Since the decision, coding had been modified to accomodate the "pair process." Only after the coding efforts was the realization that 901s were not being attached. The scope of how this unattained process was very difficult to define.
9. (MEDEIROS,22Jun00) **HW- currently owned by Regional Services**
10. (MEDEIROS,22Jun00) **Strategy BDP - Key stakeholders changed** in mid project
11. (MEDEIROS,22Jun00) **Strategy BDP- Decision to use** contractors instead of RFTs
12. (MEDEIROS,22Jun00) **Strat BDP- Lack of dedicated** business SMEs and decision makers
13. (MEDEIROS,22Jun00) **Strat BDP- initial project scope too big** to begin with
14. (MEDEIROS,22Jun00) **Strat BDP- complex processes existed** in the project that were not defined
15. (MEDEIROS,22Jun00) **Biz BDP- Installation documentation was** late
16. (MEDEIROS,22Jun00) **Strat BDP- Team resources were** inadequate from the very beginning of the project
17. (MEDEIROS,22Jun00) **Scope Creep**
18. (MEDEIROS,22Jun00) **Market BDP- Inaccurate software** development estimates were made
19. (MEDEIROS,22Jun00) **Biz BDP Process issues existed**
20. (MEDEIROS,22Jun00) **Biz BDP - User training was offered** when people were under duress of the outsourcing activities.
21. (MEDEIROS,22Jun00) **Biz BDP- Hardware failed once system was** in production
22. (MEDEIROS,22Jun00) **Biz BDP- Testing was not done and/or** done

reorg/repat, ensure that some IS folks stay with the business unit and do not go away (DY)

13. (MEDEIROS,22Jun00) **Strat BDP- Include groups responsible** for supporting the hardware are involved in up front planning (MP)
14. (MEDEIROS,22Jun00) **Channel BDP- esnure the requirements** provided are functional in the system before system implementation (MP)
15. (MEDEIROS,22Jun00) **Channel BDP- have a full biz test of** both system and process prior to load.
16. (MEDEIROS,22Jun00) **Before Strat BDP -** decide on a development strategy and choose either a fixed cost model (a long detailed up front strategy) or an iterative development model with phased percentage development, to be reviewed at each BDP meeting

inadequately
23. (MEDEIROS,22Jun00)
Biz BDP- Network failures on multiple occasions for several different reasons
24. (MEDEIROS,22Jun00)
Biz BDP- contract resources were put into strategic positions
25. (MEDEIROS,22Jun00)
Biz BDP- No end to end system testing
26. (MEDEIROS,22Jun00)
Overall- resource changes brought stress and knowledge loss on a continuous basis
27. (MEDEIROS,22Jun00)
Biz BDP- Many problems found after production implementation
28. (MEDEIROS,22Jun00)
Customer BDP- Project was late
29. (MEDEIROS,22Jun00)
Customer BDP- System down
30. (MEDEIROS,22Jun00)
Customer BDP- Missed deadlines
31. (MEDEIROS,22Jun00)
Customer BDP- Project was not ready when put into production
32. (MEDEIROS,22Jun00)
Customer BDP- Software bugs after production
33. (MEDEIROS,22Jun00)
Strat BDP considering transferring DOTS application to Processing Services
34. (MEDEIROS,22Jun00)
Strat BDP- Options yet undecided as to whether IS should own it or keep it in the Business Unit
35. (MEDEIROS,22Jun00)
Biz BDP - Process team was given new assignments in middle of project
36. (MEDEIROS,22Jun00)
Strat BDP- Gilmore divestiture created an imposed, and rushed, cut off date
37. (MEDEIROS,22Jun00)
Warning signs of problems coming up were ignored
38. (MEDEIROS,22Jun00)
Biz BDP- People said *ready* when it wasn't
39. (MEDEIROS,22Jun00)
Customer BDP-Software changes were made on the fly to accomodate new and/or modified processes

 Emergent Learning Maps **Data as of: 2000-Jul-05 05:07 EST**