


SYSTEM DEVELOPMENT RISK ASSESSMENT

A RISK MANAGEMENT
APPROACH

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SUD WORKSHOP

- ◆ Purpose 
- ◆ Risk Assessment Methodology
- ◆ Reporting

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PURPOSE

- ◆ review audit scope and objectives
- ◆ define Hallux SUD audit model
- ◆ outline risk assessment methodology

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AUDIT OBJECTIVES

- ◆ meets functional requirements
- ◆ managed during development
- ◆ subject to change management
- ◆ likely to achieve benefits
- ◆ appropriate control framework
- ◆ give the project a “heads up”

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AUDIT SCOPE

- ◆ initial planning to final implementation
- ◆ follows normal SDLC
 - flexible for “one of” developments
- ◆ relationship to other major initiatives
- ◆ value-added review process

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SUD NATURE

- ◆ value added essential
- ◆ cost-effective recommendations
- ◆ perhaps no recommendations
 - risk identification

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PROJECT CHALLENGE

- ◆ complex, evolving environment
- ◆ each project unique
- ◆ senior management expectations
- ◆ review must match pace of project
- ◆ audit expertise must change

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PROJECT CHALLENGE

- ◆ new technical environments & methodologies
 - evolutionary prototypes
 - rapid application development
 - client/server delivery mechanisms
- ◆ reliance on other forms of review
 - quality assurance
 - IV&V



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PROJECT CHALLENGE

- ◆ large teams of experts
 - diverse sets of expertise needed
 - more views to record and assess
 - multiple sets of documentation
- ◆ impact on auditor
 - cannot be an expert in everything
 - but - must maintain high level of training

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PROJECT CHALLENGE

- ◆ management concerns largely unchanged
 - change/scope management
 - benefits management
 - business process re-engineering
- ◆ project management largely ignored by senior management to date
 - management of change

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SUD AUDIT APPROACH

- ◆ initial preliminary survey of risks
- ◆ proactive drop-down technique
 - key point in time assessments
 - continuing presence
- ◆ timely, focused reporting
 - risk matrix

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HALLUX CHARACTERISTICS

- ◆ subjective
 - framework - requires experienced auditor
 - can be applied at any stage of development
 - any size project
 - can include major re-engineering activities

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HALLUX CHARACTERISTICS

- ◆ review must be added value - process improvement needed
 - cannot only deal in control framework
 - system development organization and support critical
 - CoBiT with others good source
 - SEI/CMM good source of process assessment

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HALLUX CHARACTERISTICS

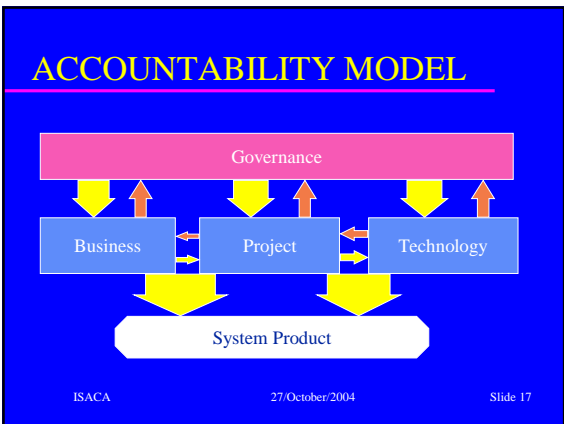
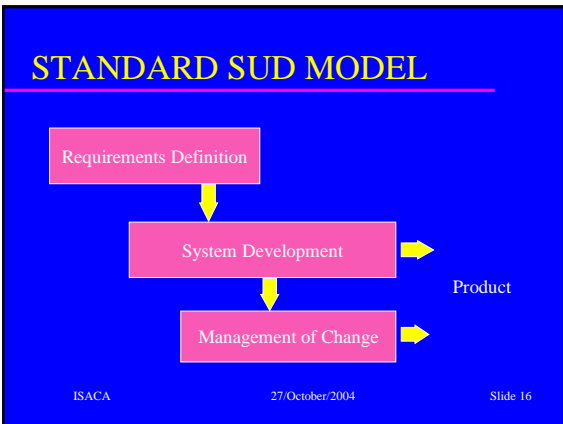
- ◆ enterprise-wide concerns
 - management of change often ignored
 - impact of several changes from different sources
 - process re-engineering
 - large package implementation

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HALLUX CHARACTERISTICS

- ◆ one of potentially many tools
 - old SDLC approach focused on details
 - higher level issues ignored
 - tendency to select one tool for every thing
 - many tools now exist - audit should have kit

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SUD WORKSHOP

- ◆ Purpose
- ◆ Risk Assessment Methodology ←
- ◆ Reporting

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RISK CATEGORIES

- ◆ follows elements of the model
 - governance
 - business
 - project
 - technology
- ◆ not all tools and techniques mentioned will apply to all projects
 - flexible application



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GOVERNANCE RISK

- ◆ Senior Management accountable for
 - management control framework
 - scope/change management
 - benefits achievement



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SENIOR MANAGEMENT CONTROL FRAMEWORK

- ◆ planning
 - strategic plans, environmental assessment
- ◆ organizing
 - mandates, delegations
 - committee structure
- ◆ leading
 - management commitment

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SENIOR MANAGEMENT CONTROL FRAMEWORK

- ◆ controlling
 - records of decision
 - management information
- ◆ communicating

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CONTROL FRAMEWORK RISKS

- ◆ lack of management commitment
 - decisions needed
- ◆ insufficient communications
 - unrealistic expectations



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CONTROL FRAMEWORK SOLUTIONS

- ◆ project sponsors/champions
- ◆ empowered project steering committee
- ◆ linkages to organizational committee structure
 - executive committee
- ◆ formal communications process
- ◆ proactive committee members

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SCOPE MANAGEMENT

- ◆ scope/change management
 - risk assessment
 - change control
- ◆ other initiatives
 - multiple new systems
 - environmental change

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SCOPE MANAGEMENT RISKS

- ◆ inability to adapt to changing conditions
 - changing relationships with other initiatives - systems, technical infrastructures
 - legislative, market change
- ◆ scope creep
 - business change
 - ambitious expectations



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SCOPE MANAGEMENT SOLUTIONS

- ◆ active and proactive PSC role
 - environmental scan - business and technical
 - coordination with other initiatives - corporate renewal
- ◆ rigorous change management process
 - PSC approval
 - impact analysis
 - formal Change Control Board

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BENEFITS ACHIEVEMENT

- ◆ cost/benefit decisions
 - business case definition
 - management submissions
 - business case management - cost/schedule/performance
- ◆ benefits measurement
 - benefits definitions
 - systems/processes

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BENEFITS ACHIEVEMENT RISKS

- ◆ inappropriate business case
 - poorly defined costs and benefits
 - management decision questionable
 - cost/schedule/performance impacted
- ◆ inability to measure benefits
 - leakage to other initiatives or situation

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BENEFITS ACHIEVEMENT SOLUTIONS

- ◆ supportable estimates
 - PSC review and acceptance - members from business, system and technology areas
- ◆ benefits and costs refined throughout project process
 - systems, processes to capture
- ◆ complete assessment post-mortem

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RISK CATEGORIES

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- ◆ not all tools and techniques mentioned will apply to all projects



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BUSINESS RISK

- ◆ Business area accountable for
 - business requirements
 - solution design
 - management of change

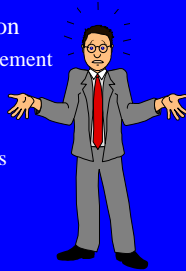
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BUSINESS REQUIREMENTS

- ◆ user requirements definition
 - expert business user involvement
 - change control
- ◆ business rules
 - complexity, capture process
 - control, audit, privacy
- ◆ requirements validation
 - business review, IV&V



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BUSINESS REQUIREMENTS RISKS

- ◆ inadequate functional requirements identification process
 - gaps in coverage
 - uncontrolled changes - scope creep
- ◆ insufficient user involvement
 - unfocused analysis
 - interpretation problems

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BUSINESS REQUIREMENTS SOLUTIONS

- ◆ requirements management process
 - business rule capture, validation
 - change control
 - IV&V
- ◆ requirements vs SDLC
 - prototype evolution & evaluation
 - user focus groups

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SOLUTION DESIGN

- ◆ fit of functionality
 - traceability
 - technology not a driver
 - investment versus functionality
- ◆ control framework & security
 - risk assessment
 - measures selected

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SOLUTION DESIGN RISKS

- ◆ inability to deliver all functionality within timeframe and budget
 - uncontrolled development/enhancements
 - related to requirements management
- ◆ inadequate internal control and security
 - often not seen as part of the recognizable business rules

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SOLUTION DESIGN SOLUTIONS

- ◆ balancing decisions - delivery vs investment
 - needed throughout the process
 - part of management role - need information
 - requirements traceability essential
- ◆ control and security addressed at same time as rest of business needs

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INTERNAL CONTROL FRAMEWORK

- ◆ control identification
- ◆ auditability and audit modules
- ◆ privacy and data integrity
- ◆ management reporting

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SECURITY FRAMEWORK

- ◆ compliant with organizational policy
- ◆ security team and mandate
- ◆ analyses - threat risk assessment
- ◆ measures defined and implemented
- ◆ reviews

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MANAGEMENT OF CHANGE

- ◆ process re-engineering
 - % change
 - user involvement
 - roles & responsibility
- ◆ organizational impact
 - readiness to accept
 - work force adjustment

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MANAGEMENT OF CHANGE RISKS

- ◆ inadequate re-engineering of business processes
 - essential for system success
 - affects user buy-in
- ◆ inability to manage change to the organization
 - lack of senior management attention

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MANAGEMENT OF CHANGE SOLUTIONS

- ◆ process re-engineering critical part of project plan
 - in large projects can be 55% of total cost
 - can be role of requirements manager
- ◆ ensure project charter includes organizational change
 - have senior people on team
 - get senior management support

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RISK CATEGORIES

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PROJECT RISK

- ◆ Project management accountable for
 - project organization & management
 - control process
 - development process



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PROJECT ORGANIZATION

- ◆ organization & staffing
 - team structure & experience
 - accountability
 - informatics partnership
- ◆ decisions
 - committee operation
 - records of decision
 - management information

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PROJECT ORGANIZATION

- ◆ communications
 - within the project
 - external to management
 - external to potential users



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PROJECT ORGANIZATION RISKS

- ◆ lack of senior management support
 - inadequate staffing
 - poor informatics partnership
- ◆ poor team structure
 - lack of information
 - poor accountability

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PROJECT ORGANIZATION SOLUTIONS

- ◆ project team structure part of senior management commitment
 - appropriate project charter
 - appropriate PSC membership - staffing a key responsibility
- ◆ formal management information flow
 - regular PSC presentations
 - formal status reporting

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CONTROL PROCESSES

- ◆ planning
 - structure and organization
 - relationship to strategic level
 - resourcing
- ◆ financial control
 - budget process
 - financial history
 - variance analysis



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CONTROL PROCESSES

- ◆ problem tracking & resolution
 - critical issues, risk monitoring
 - tools
- ◆ contract management
 - award process
 - financial control
 - amendment process

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CONTROL PROCESSES

- ◆ quality assurance
 - plan & approach
 - resources
 - audit reliance



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CONTROL PROCESS RISKS

- ◆ loss of project direction, slow or non-delivery
 - poor planning, scheduling, monitoring
 - lack of problem identification & resolution
 - lack of decision tracking
 - poor delivery control, contract management

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CONTROL PROCESS RISKS

- ◆ loss of financial control
 - poor budgeting, monitoring
 - little or no variance analysis
 - poor contract management, amendment control, impact analysis
 - no accountability for budget delivery

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CONTROL PROCESS RISKS

- ◆ poor quality deliverables
 - no quality assurance capability on the team
 - little reliance on audit
 - lack of partnership with informatics
 - no quality management initiatives within organization

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CONTROL PROCESS SOLUTIONS

- ◆ critical path and deliverable monitoring
 - issue/problem tracking process - PSC decisions
 - automated planning tool, updated often
 - decision reporting
- ◆ financial monitoring
 - regular variance assessment
 - good internal expenditure control
 - contract delivery assessment - c/s/p

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CONTROL PROCESS SOLUTIONS

- ◆ formal QA process
 - plan, approach and resources
- ◆ system under development review

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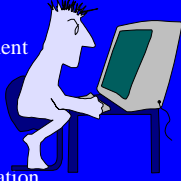
DEVELOPMENT PROCESSES

- ◆ SDLC process
 - compliance with company policy
 - schedule of major deliverables
 - informatics involvement in delivery
- ◆ design process
 - conceptual design, cohesion - architect role
 - data management
 - design control

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DEVELOPMENT PROCESSES

- ◆ construction process
 - deliverable status
 - test approach & status
 - configuration management
- ◆ pilot/parallel test
 - plan & approach
 - problem management
 - certification & accreditation



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DEVELOPMENT PROCESSES

- ◆ transition
 - implementation strategy & approach
 - schedule (other initiatives)
 - client readiness - training
 - data management - conversion

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DROP-DOWN DETAIL

- ◆ all elements of this approach can be further detailed as drop-down audit programs
- ◆ pilot risk assessment - an example

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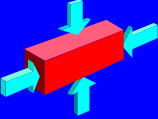
PILOT APPROACH

- ◆ Organization
 - ◆ roles & responsibilities
 - team & user group
 - ◆ identify focus for activity
- ◆ Strategy
 - ◆ measurable objectives
 - coverage
 - success criteria
 - ◆ pilot architecture
 - scope - related processes

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PILOT APPROACH

- ◆ Test Discipline
 - pre-pilot (unit, system, integration)
 - QA - user acceptance
- ◆ documented approach
 - test results
 - problem reporting
 - case tool
 - signoffs



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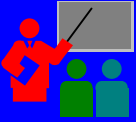
PILOT APPROACH

- ◆ Test Discipline (cont'd)
 - identify throughput levels
 - representative data
 - representative processes
 - ◆ critical factors
 - needed for implementation
 - ◆ non-critical factors that should not impede implementation

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PILOT APPROACH

- ◆ communications
 - ◆ audience selection
 - ◆ medium selection
 - ◆ organization
- ◆ pilot evaluation
 - tool selection
 - pre-existing conditions



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PILOT CONDUCT

- ◆ Process
 - ◆ set-up
 - planning
 - training
 - conversion
 - installation
 - ◆ support
 - configuration management
 - identification of source of changes
 - management/user commitment

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PILOT CONDUCT

- ◆ Coverage
 - completeness
 - reporting
- ◆ functionality
 - desktop procedures
 - system operation
 - interfaces
 - LAN management



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PILOT CONDUCT

- ◆ Coverage (cont'd)
- ◆ technology
 - capacity
 - architecture
 - contingency/fall back

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RESULTS - LESSONS

- ◆ Certification & Accreditation
- ◆ test results
 - evaluation survey
 - analysis results
 - signoffs
- ◆ implementation recommendations
 - approach
 - coverage
 - record of decision



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RESULTS - LESSONS

- ◆ Management Submission
- ◆ costs
 - accumulated costs
 - variance analysis
- ◆ benefits
 - updated expectations
- ◆ assumptions, special requirements or constraints

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DEVELOPMENT PROCESS RISKS

- ◆ inability to delivery on workplan
 - poor SDLC or inadequate compliance
 - lack of knowledgeable staff
 - inadequate conceptual design, design control
- ◆ poor quality of delivery
 - poor design control
 - inadequate test approach
 - inadequate configuration management

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DEVELOPMENT PROCESS RISKS

- ◆ badly managed impact on users
 - poor transition management - schedules, training, etc...
 - poor data conversion
 - lack of pilot & lessons learned

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DEVELOPMENT PROCESS SOLUTIONS

- ◆ formal SDLC
 - not necessarily the regular, mainframe type - RAD
 - conceptual design management - system architect
 - professional, experienced manager and staff

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DEVELOPMENT PROCESS SOLUTIONS

- ◆ design management
 - central design control
 - configuration management
 - integrated with data management
- ◆ test management
 - approach, plan and results monitoring
 - pilot - certification & accreditation

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DEVELOPMENT PROCESS SOLUTIONS

- ◆ transition management
 - key component of project plan
 - assure lots of training, local coaches
 - get data conversion right
 - pilot - configuration management flows through to delivery

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RISK CATEGORIES

- ◆ follows elements of the model
 - governance
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TECHNOLOGY RISK

- ◆ Technology area accountable for
 - infrastructure
 - technical transition



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INFRASTRUCTURE

- ◆ current environment
 - architecture & topology approach
 - project fit with architecture
- ◆ planned infrastructure
 - plans
 - % change
 - management understanding

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TECHNICAL TRANSITION

- ◆ informatics readiness
 - applications, network, technical support
 - specifically - network impact assessment
- ◆ delivery mechanisms
 - configuration management
 - release management
 - software distribution

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INFRASTRUCTURE RISKS

- ◆ inappropriate technical architecture
 - project in isolation - no informatics partnership
 - informatics in isolation - changes without consulting project
 - conflict with organization standard
- ◆ poor choices in technology
 - undersized components
 - software conflicts

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INFRASTRUCTURE RISKS

- ◆ inability of host organization to migrate to new technology
 - lack of support for applications, technology
 - poor delivery mechanisms

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INFRASTRUCTURE SOLUTIONS

- ◆ develop an informatics partnership
 - technical people on the PSC or sub group
 - mutual training opportunities
- ◆ infrastructure key element of project team
 - part of conceptual design and design control
 - ensure impact assessed

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INFRASTRUCTURE SOLUTIONS

- ◆ corporate software/hardware standards
 - support infrastructure
 - delivery processes - configuration management, hardware installation, software distribution, user help desk

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SUD WORKSHOP

- ◆ Purpose
- ◆ Risk Assessment Methodology
- ◆ Reporting 

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RATINGS OF RISK

- ◆ elements of risk
 - inherent
 - specific to project
- ◆ levels of risk
 - high, medium, low
 - nature of risk, likelihood of occurrence and consequences

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REPORTING OF RISK

- ◆ timeliness the major problem
 - management letters vs audit reports
 - paragraph style vs point form
 - risk identification vs full recommendations

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REPORTING OF RISK

- ◆ management letters
 - for level at which project reports
 - relatively fast turn-around
 - project "heads-up"
- ◆ audit reports
 - synthesize issues for senior management
 - recommendations, action plans for improvement

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REPORTING OF RISK

- ◆ identify factors affecting success
- ◆ project management = risk management
- ◆ rating an indicator, not a judgment
 - high risk means more attention needed
- ◆ lots of communication - no surprises
 - interim reporting of critical issues

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REPORTING OF RISK

- ◆ matrix style, point form
 - allows greater flexibility
 - does not disrupt client/audit relationship
 - can be repeatable for continuing presence
 - non-threatening
 - useful to all clients
 - can speed up the process



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RISK MATRIX

ACTIVITY	CONCLUSION	RISKS & RECOMMEND'S
FACT	OPINION/ ANALYSIS	LESSONS LEARNED

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RISK ASSESSMENT MATRIX			
MANAGEMENT & ORGANIZATIONAL RISK			
RISK AREA & RESOLUTION	FOLLOW UP OBSERVATION	CURRENT OBSERVATION	ASSESSMENT & AREA FOR IMPROVEMENT
1.1 Senior Management Central Framework Lack of communication over lifetime of the project. Regular weekly meetings with the Project Sponsors have been scheduled facilitating a continuous exchange of information. Project administration will be approved and key issues resolved by the Steering Committee. The manager of Corporate Services will serve as the link between the Steering Committee and the Exec. Committee and the Exec. Committee will be updated as part of the Change Management and Communications processes.	Interdepartmental Information Committee (IIC) has taken over from the Project Steering Committee as the major management channel for this project and other major initiatives. - representation from all Departments, usually the central services manager. - old IIC not formally closed down. Active challenge role to be played by IIC. - significant authority to review, monitor and approve or suspend activity; decisions are recorded by minutes. - intended to meet monthly. IIC has not been regular. - IIC to start meeting every two weeks. - focus comparatively narrow on project and Technology Information. Project Sponsors must cooperate with the Project Manager weekly. - identified across board, and minutes provided. - as a result, project continues to be well supported by management and the Departments.	Major elements of the IIC OF continue to exist, but have changed thereafter. - new Project Manager for the same reports directly to Corporate Services. - Sponsors group now represented, Corp Services only. - management now heads the group - provides direct linkage to exec. - meet weekly, provides corporate direction. - IIC will have broad representation, but nature of the focus is to change. - will not focus on information, will concentrate on management concerns in the Corporation. - the operating as intended - meeting monthly bi-weekly rather than bi-weekly as intended. - new format also initiated - Managers of various Network. - has met several times to date, project tasks coordinated against team. - intended to deal with corporate restructuring.	Risk remains low. - communication reflected in current adjustments in the central framework. - Problems corrected include: lack of communication with Sponsors, clarity of Sponsors to resolve corporate issues, inability of IIC to make policy decisions.

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RISK ASSESSMENT MATRIX			
MANAGEMENT & ORGANIZATIONAL RISK			
RISK AREA & RESOLUTION	FOLLOW UP OBSERVATION	CURRENT OBSERVATION	ASSESSMENT & AREA FOR IMPROVEMENT
1.2 Change Management Lack of change management strategy and process which includes a number of action steps has been developed.	Change management will be controlled through an online process which has been devised to raise concerns to Sponsors and the IIC. - example - delay in getting version for Windows NT will delay testing for version 3.0 for the project team. - supplier will not likely have this software until the first quarter '04. - had planned for testing in Jan '04 - will be delayed. - has also caused change to implementation definition process - will now proceed to do earlier AS IS models for the complete application rather than by module. - process is working well from the perspective of the Sponsors. - no issues yet raised to IIC.	Issues raised to Sponsors and IIC (or its replacement) to control change. - some process pointed out concerns with the role of IIC as it could not make decision on corporate policy. - manager of an observed change at IIC - without support or Sponsor team, they also could not make decisions. The organization is going into a high risk time from a year with potential budget cuts arising again. - delays in delivery will cause problems with completed project staff. - some are expected back Dec 04/05. - no documentation about extending the membership wait. - some staff have been directly affected by budget cuts - under Project Organization. - also, some concerned about maintaining 2 systems with down-rated organizations.	Medium risk. - Although a formal process exists to identify and analyze critical issues and the Sponsors have improved capability to monitor issues, the level of risk reflects the current environment. - A watch item.

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RISK ASSESSMENT MATRIX			
MANAGEMENT & ORGANIZATIONAL RISK			
RISK AREA & RESOLUTION	FOLLOW UP OBSERVATION	CURRENT OBSERVATION	ASSESSMENT & AREA FOR IMPROVEMENT
1.3 Benefits Achievement Ability to achieve or identify benefits.	Benefits will have not been specified yet so plan yet exists to achieve these benefits. As a result of the change to the acquisition process, the initial AS IS modeling task will be completed for the entire application. No detailed modeling will be attempted due to version 3.0 delay. - this allows for better overall understanding of the requirements, and this prevents benefits. Preliminary ideas on potential benefits, so how to measure same, should be possible in the AS IS and TO BE process conditions. - criteria are required for benefits measurement. - the criteria are not yet into the new work process with the remaining benefits and impact.	Still working within the budget estimated during the planning phase - no direct change to the cost side of the process etc. - however, critical cost benefits that would be the actual dollar benefits involved. - anticipated reduction in problems, but too many unknowns forestalled. - Disruption of these reductions. - this, reduction already achieved by the project program. - full benefits tied to functional modules need to be implemented. - initial data has given the ability to compare metrics. - the benefits available only as long as the data is maintained correct. Project objectives and goals tend to be generally met and - measurements needed. - quantitative analysis on current systems processes not yet done. - example - current time to deliver metrics. - analysis to be carried out by as part of the on- going functional module delivery.	Risk remains at the medium level. There is still no record of benefits and a plan mechanism to measure their achievement. This risk will arise as the project progresses, and as work is focused in the area. - A watch item.

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