The Process of Diagnostic Excellence
AutoTestCon 2002 & the eXpress User's Group

The 2002 AutoTestCon conference will be held in Huntsville, Alabama on Oct 15th—17th, 2002. The conference provides opportunities to gain insight into current diagnostic and test technologies. Join us in Huntsville, Alabama on Oct 15th-17th, 2002 for AutoTestCon 2002 and the *eXpress* User's Group.

This years User's Group Meeting will address "The Process of Diagnostic Excellence." Embark into the progressive realm of integrated diagnostic innovation as DSI reviews the advancements in *eXpress 2001* – the first ever blending of functional and failure based modeling, now integrated with built in FMECA and many other innovative and performance based enhancements. Listen to other industry leaders explain how they are making an impact on the future of complex system designs. See how the integration of the latest tools, working in an open architecture, are focused toward constructing and governing a comprehensive integrated diagnostic process. Learn the best approach for getting started at any phase in your product's development. See how you can significantly improve your diagnostic effectiveness in systems, subsystems or any other sub-tier in the design hierarchy. Learn how choices made when developing diagnostic strategies can improve System safety, Availability, Supportability and Life Cycle Cost. *eXpress 2001* is your total diagnostics design solution for new and existing designs, at any functional level from system to component. Join us in this exciting technology interchange and see how you can be a leader in product development using our advanced, and proven, integrated diagnostics tools and processes.

Limited Space Available

If you plan on attending the *eXpress* User's Group,

please contact us ASAP:

Denise Aguinaga at DSI
(714/637-9325)

A Visit to Kennedy Space Center

NASA researchers recently demonstrated the successful integration of systems engineering technologies designed to converge evolving system and subsystem design data into a Integrated System Modeling Environment that will serve as the diagnostic and Integrated Vehicle Health Management (IVHM) for NASA's Space Launch Initiative (SLI), an Agency-wide effort to significantly increase crew safety while reducing payload launch costs. This joint effort that includes Ames Research Center at Moffett Field, California, Northrop Grumman Corporation in El Segundo, California, and DSI International Corporation in California, produces a design and data exchange environment that not only evades the restrictions laden by previous software integration activities, but also produces a schema for such data exchange that mitigates the risk of software technology obsolescence and evolving hardware/software issues during the life of the vehicle.

Jim Lauffer of DSI recently toured Kennedy Space Center on an investigative study of existing facilities and processes. Shown at right; 1) Discovery being serviced, 2) Jim at the Shuttle launch pad crew escape capture area, 3) Jim at CLCS Console. The crew escape capture area will not be needed with the new Re-usable Launch Vehicle (RLV).
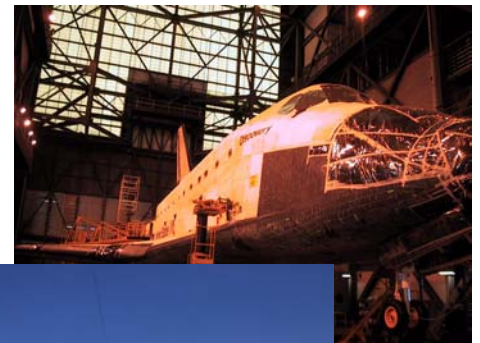
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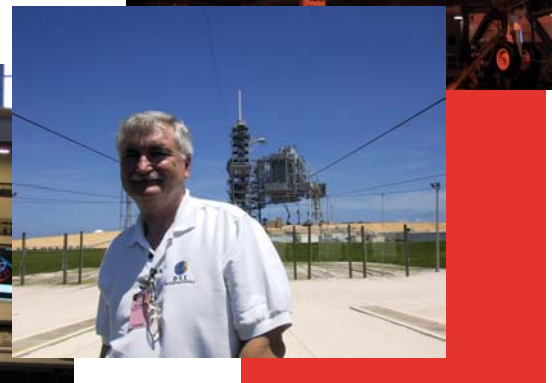
International Friends and Interesting Places

During the last several months DSI has logged a few air miles visiting friends and business associates throughout the world. In the photographs to the right are a few of the many faces and places that make diagnostics so interesting.

The Apsys site in the UK (Node Court, Codicote, Hertfordshire), was once a very large dairy farm that revolutionized the way in which diaries were operated. Today it houses the offices of Apsys personnel who are hard at work developing revolutionary software solutions for their customers...history does repeat itself!. As a side note; the facilities also happens to have the largest thatch roof in the UK. What a beautiful and historically significant place to work!

DSI visited our friends at Ymax Systems Incorporated in Japan. They are our representatives in that region of the world. We attended several meetings with Masayo Tagami of Ymax and met many of the Mitsubishi customers.

Earlier this summer Eric Gould and Jim Lauffer of DSI visited Seriem (not pictured) in France as part of a technical support meeting with one of their customers. French cuisine is even better when shared with friends like Michele Schieber.

We would like to thank our hosts in Japan, the United Kingdom and France for making us feel so welcome during our recent visits and look forward to seeing you again soon.

NODE COURT

In 1927 Node Court was one of the most revolutionary dairies in the country. Today it is home to Apsys, supplier of the some of the most innovative software solutions available.
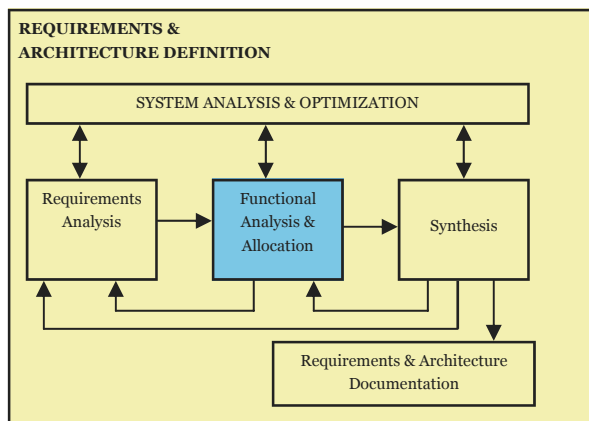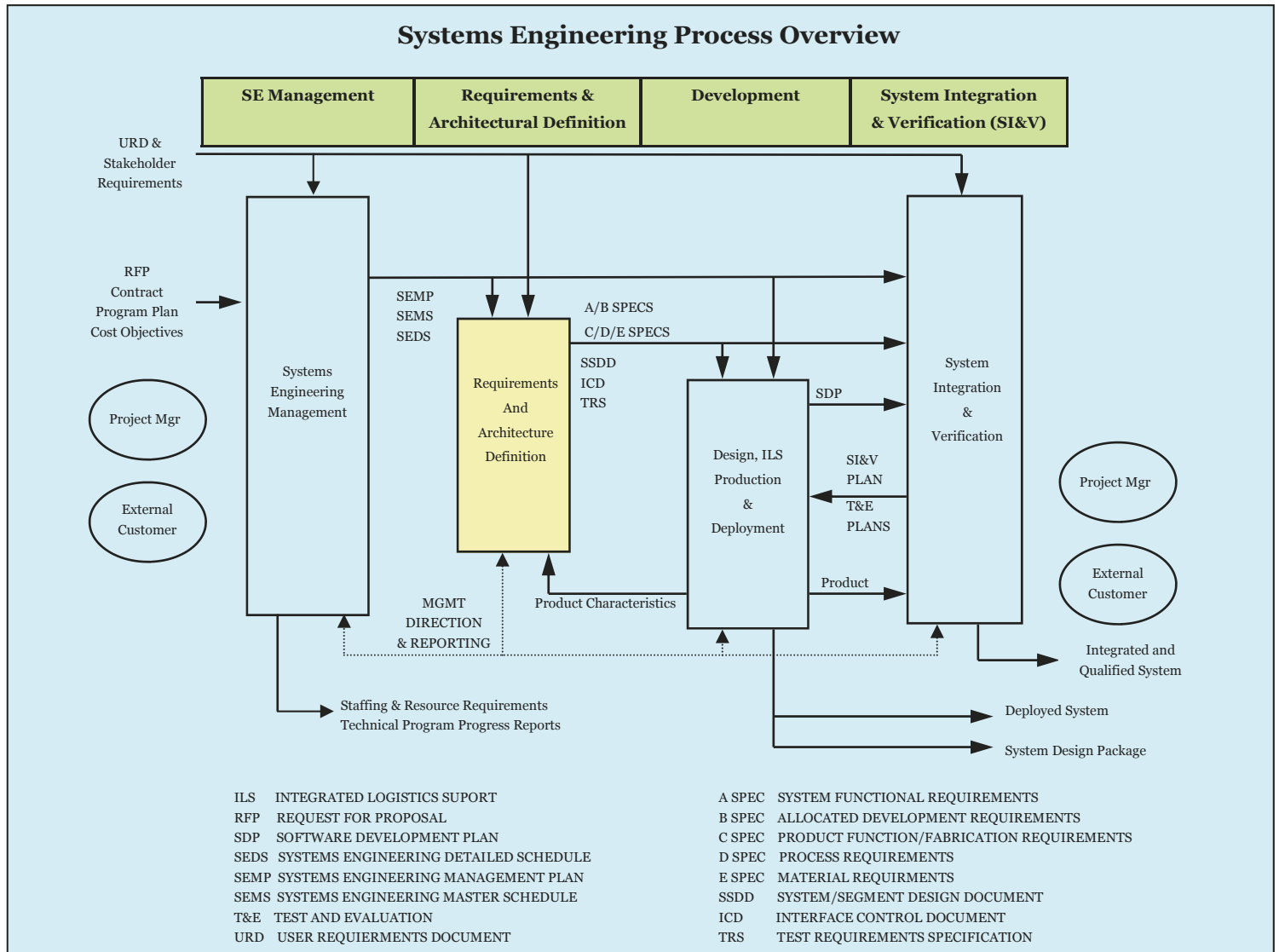
New eXpress Design Attributes Template

One of the many new features incorporated into **eXpress** during the last year is the concept of design templates. These design templates allow the user to create a specific list of customized model attributes that may be used many times within a particular program or project. They prevent the user from having to recreate the attributes for each and every model that he or she needs to develop. By creating custom templates, the user can then provide the templates to other team members to facilitate common model attribute assignments. The two screen options shown here provide a glimpse of the easy to use interface. The screen on the left shows how the user selects the template file which is desired for data publishing. The right screen shows how attributes are created, assigned and edited. This option allows virtually any type of model attribute to be developed by the user and applied to any modeling parameter providing greater flexibility and modeling efficiency. Please contact DSI for further information regarding this exciting time saving feature.
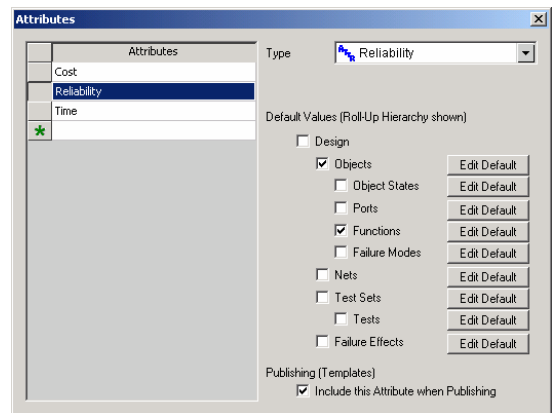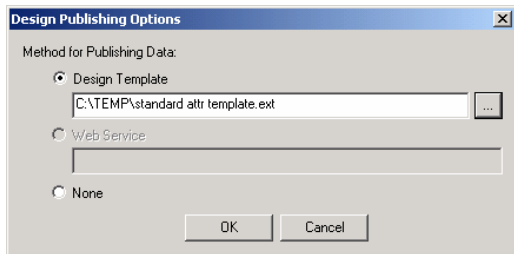
Functional Analysis & Allocation in the System Engineering Process

All credible Testability and Diagnostic Analysis must be based upon some level of functional analysis and allocation as identified in a system engineering process. Failure analysis data may be used to augment the functional analysis to provide additional fidelity. An excellent reference for detailed discussion of the system engineering process is James N. Martin's book *Systems Engineering Guidebook—A Process for Developing Systems and Products* which is available through DSI. The figures below (based on Mr. Martin's book), identify the top level system engineering processes. The "Requirements and Architecture" block shown below is where requirements definitions are analyzed and decomposed into functional elements. If necessary, functional allocations are made and assigned to lower level subsystems.

Systems Engineering Process Overview

SE Management	Requirements & Architectural Definition	Development	System Integration & Verification (SI&V)

URD & Stakeholder Requirements

RFP Contract Program Plan Cost Objectives

Systems Engineering Management

Project Mgr

External Customer

SEMP SEMS SEDS

A/B SPECS
C/D/E SPECS

SSDD
ICD
TRS

Requirements And Architecture Definition

Design, ILS Production & Deployment

SDP

System Integration & Verification

SI&V PLAN
T&E PLANS

Product

Project Mgr

External Customer

MGMT DIRECTION & REPORTING

Product Characteristics

Integrated and Qualified System

Staffing & Resource Requirements
Technical Program Progress Reports

Deployed System

System Design Package

ILS	INTEGRATED LOGISTICS SUPORT	A SPEC	SYSTEM FUNCTIONAL REQUIREMENTS
RFP	REQUEST FOR PROPOSAL	B SPEC	ALLOCATED DEVELOPMENT REQUIREMENTS
SDP	SOFTWARE DEVELOPMENT PLAN	C SPEC	PRODUCT FUNCTION/FABRICATION REQUIREMENTS
SEDS	SYSTEMS ENGINEERING DETAILED SCHEDULE	D SPEC	PROCESS REQUIREMENTS
SEMP	SYSTEMS ENGINEERING MANAGEMENT PLAN	E SPEC	MATERIAL REQUIRMENTS
SEMS	SYSTEMS ENGINEERING MASTER SCHEDULE	SSDD	SYSTEM/SEGMENT DESIGN DOCUMENT
T&E	TEST AND EVALUATION	ICD	INTERFACE CONTROL DOCUMENT
URD	USER REQUIERMENTS DOCUMENT	TRS	TEST REQUIREMENTS SPECIFICATION

REQUIREMENTS & ARCHITECTURE DEFINITION

SYSTEM ANALYSIS & OPTIMIZATION

Requirements Analysis → Functional Analysis & Allocation → Synthesis

Requirements & Architecture Documentation

The diagram at the left shows some of the related data sharing and analysis interfaces that must occur with any functional analysis or allocation. Much of this process can be captured within the *e**X**press* modeling and analysis environment and migrated (using *e**X**press* data exchange capabilities) into other system engineering processes. This enables the data to be used and re-used without re-entry or loss of continuity throughout the life of the system. Following a system engineering process while performing testability and diagnostic analysis helps to provide a vision for how the information and data can be shared with other process supplier / customer interfaces. As a very wise man once said:

"Where there is no vision, the people perish." - Proverbs 29:18

In our next newsletter, we will go to the lower level "Functional Analysis & Allocation" and provide a brief overview of how this process is embodied within the *e**X**press* environment.

DSI International
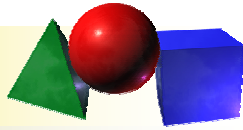
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DSI Welcomes Jim Lauffer!

Jim Lauffer joined the DSI Team in June of last year as VP of Business Development. Jim provides extensive experience in program development and management from his 40 years with Boeing / Rockwell. Jim's expertise covers a broad spectrum of systems integration from managing groups in RM&T, Logistics Engineering, Training and Life Cycle Cost. He has hands on experience in Systems Engineering and Large Scale Integration projects within DoD, DoT, and several international projects.   Jim is presently representing DSI on the NASA 2nd Generation Reusable Launch Vehicle for Northrop Grumman, IVHM, and Boeing, Ground Operations. He is also working new business development for domestic and international programs.   A primary goal of Jim's is to continue to enhance *eXpress* as a total systems solution for diagnostics and health management optimization. We welcome Jim as our business development and project management representative.

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DSI Training & Support

As the leading seller of Diagnostic Software, DSI understands the importance of quality service and support. To meet the needs of our customers, we offer a wide array of training, technical support and service programs developed to address the time-critical issues and stringent diagnostic requirements prevalent on many of today's programs.   DSI is ready to help with specialized software development, diagnostic modeling and analysis, advanced mentoring, and a host of customizable support services to address specific customer needs. For the latest information regarding training courses and schedules please see our website at www.dsiintl.com or contact Denise at DSI at (714) 637–9325.