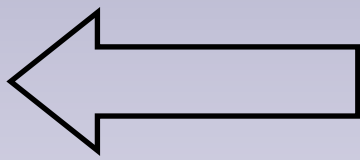




Linear-K

The Maintenance Wizard



Agenda

- Maintenance – Challenges and Needs
- IETMs – the Solution
- Linear-K
- From Documents to Interactive Content
- Demo



Maintenance – Challenges

- Service-related costs are too high
 - Equipment downtime costs
 - Direct service costs - wasted technician time, wrong fixes
 - Indirect costs - unhappy customers, lost opportunities
- Maintenance is based on skills - not on best practices
 - Gaps between diagnosis/troubleshooting by different technicians
 - Conflicting, missing or too much information
- No collaboration and information sharing among technical staff

Existing Documentation does not address these challenges !



Maintenance – Needs

<u>With regular documentation</u>	<u>Needed</u>
Technicians spend 20-50% of their time looking for information	Easily accessible up-to-date information
Documents are “generic”, not applicable to specific item being maintained	Full and specific information for actual task being done
Most enterprises rely on technicians knowledge and past training	Clear and structured troubleshooting guidelines
Usually informal, ad-hoc, islands of information-sharing	Systematic sharing of maintenance knowledge gained over time



Maintenance – the Solution

- IETMs (Interactive Electronic Technical Manuals)
- Provide Maintenance staff with up to date, correct and focused information
 - No wasted time to search for data
 - Catalog information – immediately available
 - Troubleshooting Guidelines
 - Step by step maintenance
 - Wiring data
 - Information sharing



Some IETM Benefit Examples

- **Maintenance**
 - 58% improvement in Fault Isolation
 - Decrease in False Removals (26% - experienced staff, 37% - less experienced staff)
 - Time to order parts reduced by up to 90%
 - Estimate – 20% reduction in Maintenance Costs
- **Documentation**
 - Decrease of 7% in documentation creation cost
 - Decrease of 36% in costs of updates
- **Safety**
 - Contrary to paper documentation or PDFs, notices in IETM cannot be ignored
- **Training**
 - Reduction in Training course length (\$1M savings per year for one product)



IETM Market

- Traditionally – mainly Aerospace & Military
 - Mil-Std requirements
 - Budget allocation
 - Seeing a very significant increase in demand in 2007
- Moving to commercial products
 - InfoTrends Analysis (6/2007)
 - “This is just the tip of the iceberg with respect to IETM-use potential”
 - Foresees accelerated penetration to Automotive, Medical Equipment and Consumer Goods
- S1000D – Worldwide agreement on Standard



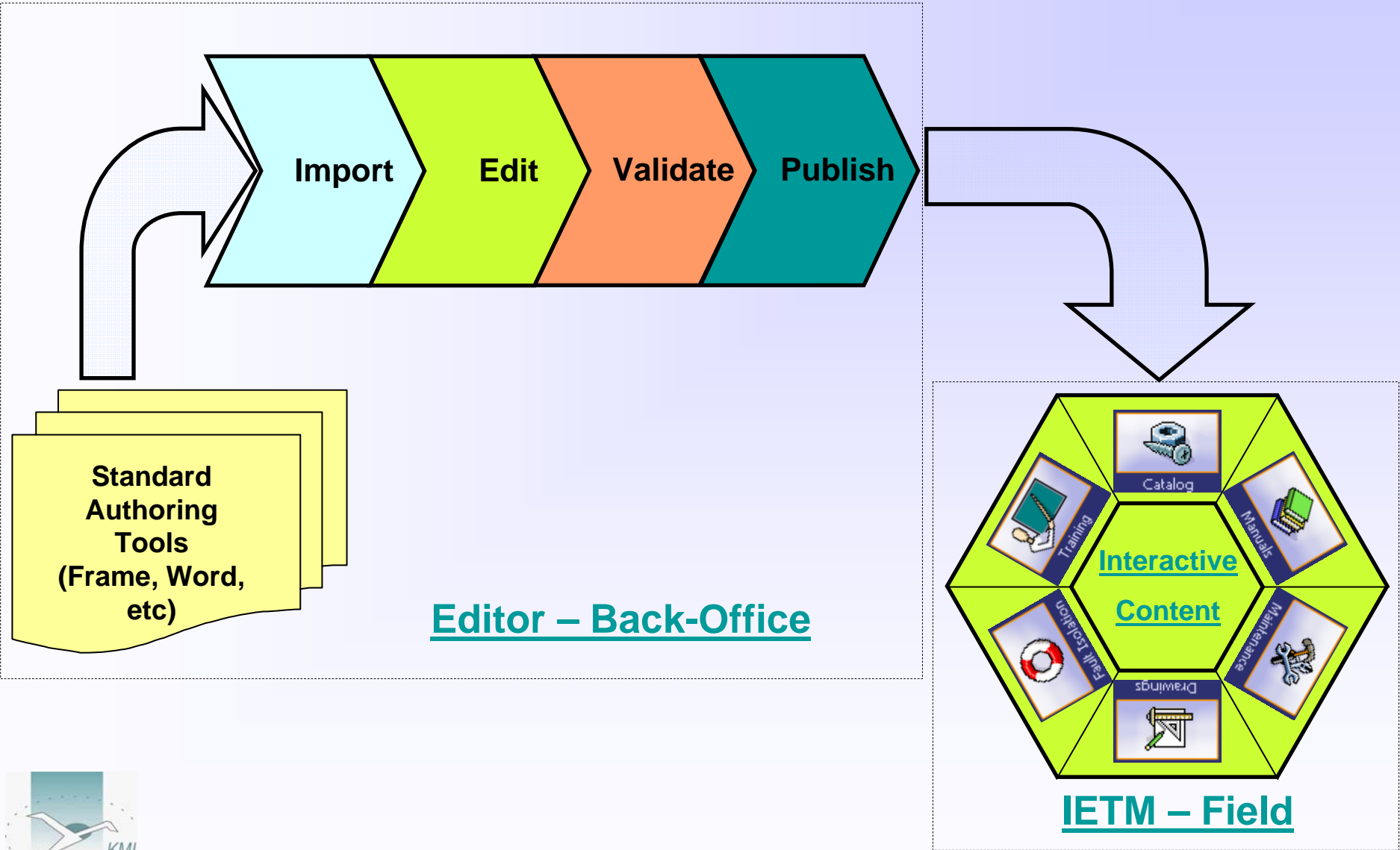
Linear-K

- Linear-K is a state-of-the-art IETM authoring tool
- Creates web-based “end to end” solutions for integrated technical and maintenance content (Catalogs, manuals, maintenance, drawings, guidelines)
- Selected as Tool-of-choice for Electronic documentation by IAI – Israeli Aerospace Industries
- Resulting solutions are filtered by user role and equipment effectivity.

ALL the relevant information,
ONLY the relevant information,
FULLY integrated at the disposal of field staff



From Documents to Interactive Content



Linear-K – Benefits

- Decrease in asset downtime
- Decrease maintenance costs
- Elimination of errors in operation, maintenance and training
- Cost savings through improved knowledge transfer
 - More efficient training of technical staff
- Support for military and industrial standards
- Built-in implementation of the business processes involved in documenting, operating and maintaining equipment

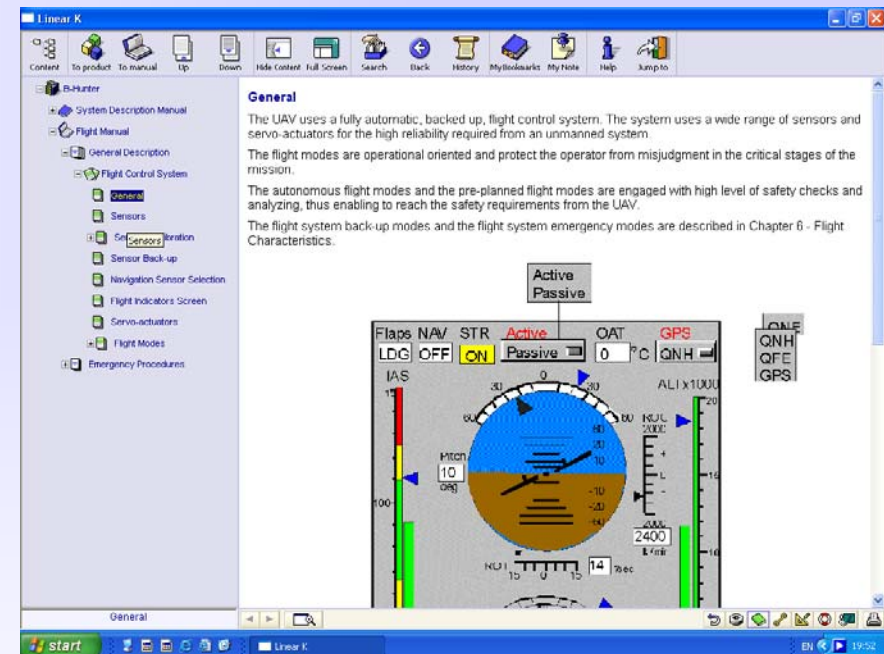


Thank You



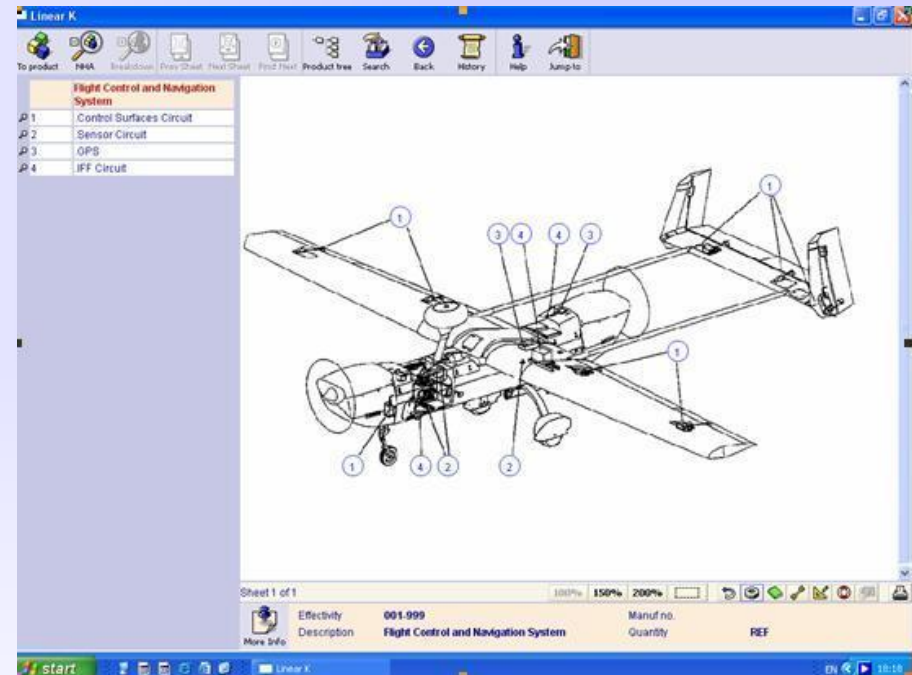
DESCRIPTION AND OPERATION MANUALS

- The contents tree on the left
 - Displays the different subjects in the manual.
 - Windows-explorer look and feel
 - Selecting a subject displays its description.
- Simple navigation in manuals
 - Various search methods
 - Bookmarks
 - Personal notes



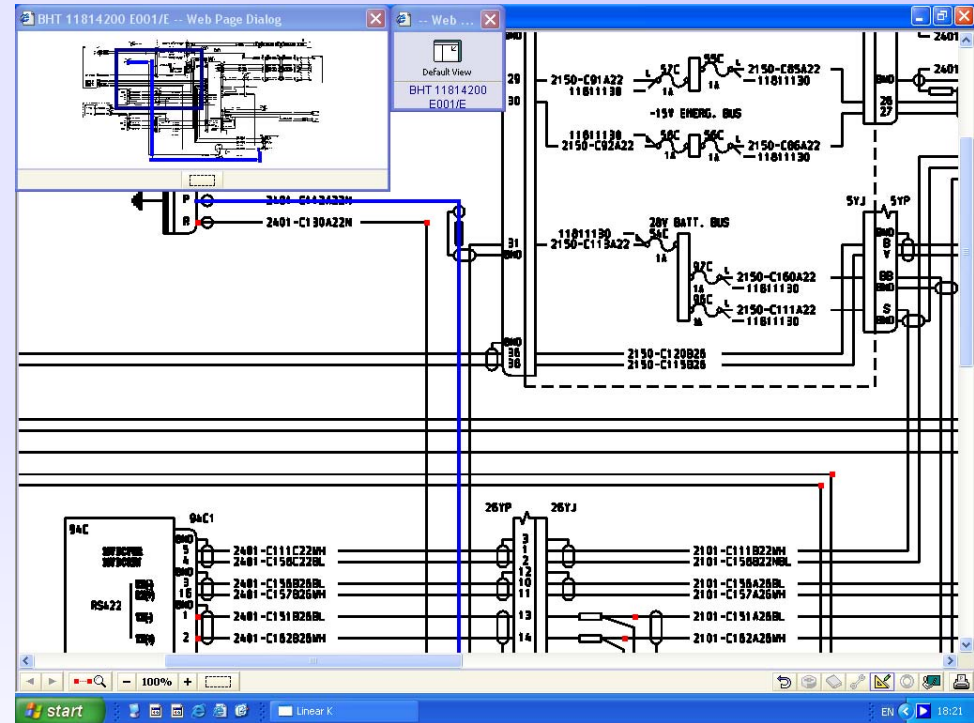
CATALOG

- The user can display multiple Illustrated Parts Catalogs
 - The item list on left
 - Figures and details for every item on the right
 - The zoom toolbar and the selected item's properties at bottom
 - Searches in the Product Tree
 - More Info popup
 - Navigation to breakdown and next higher assembly



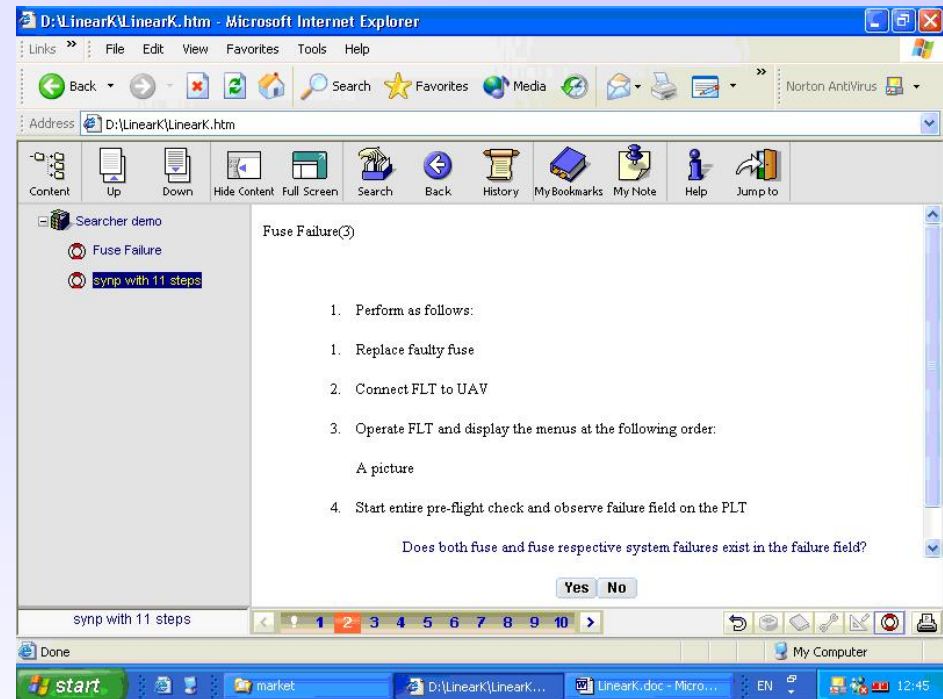
DRAWINGS

- The user can navigate the drawings, trace wires, add notes and bookmarks and carry out automatic troubleshooting in electrical systems.
 - The Locator
 - Wire Tracing using the illuminator

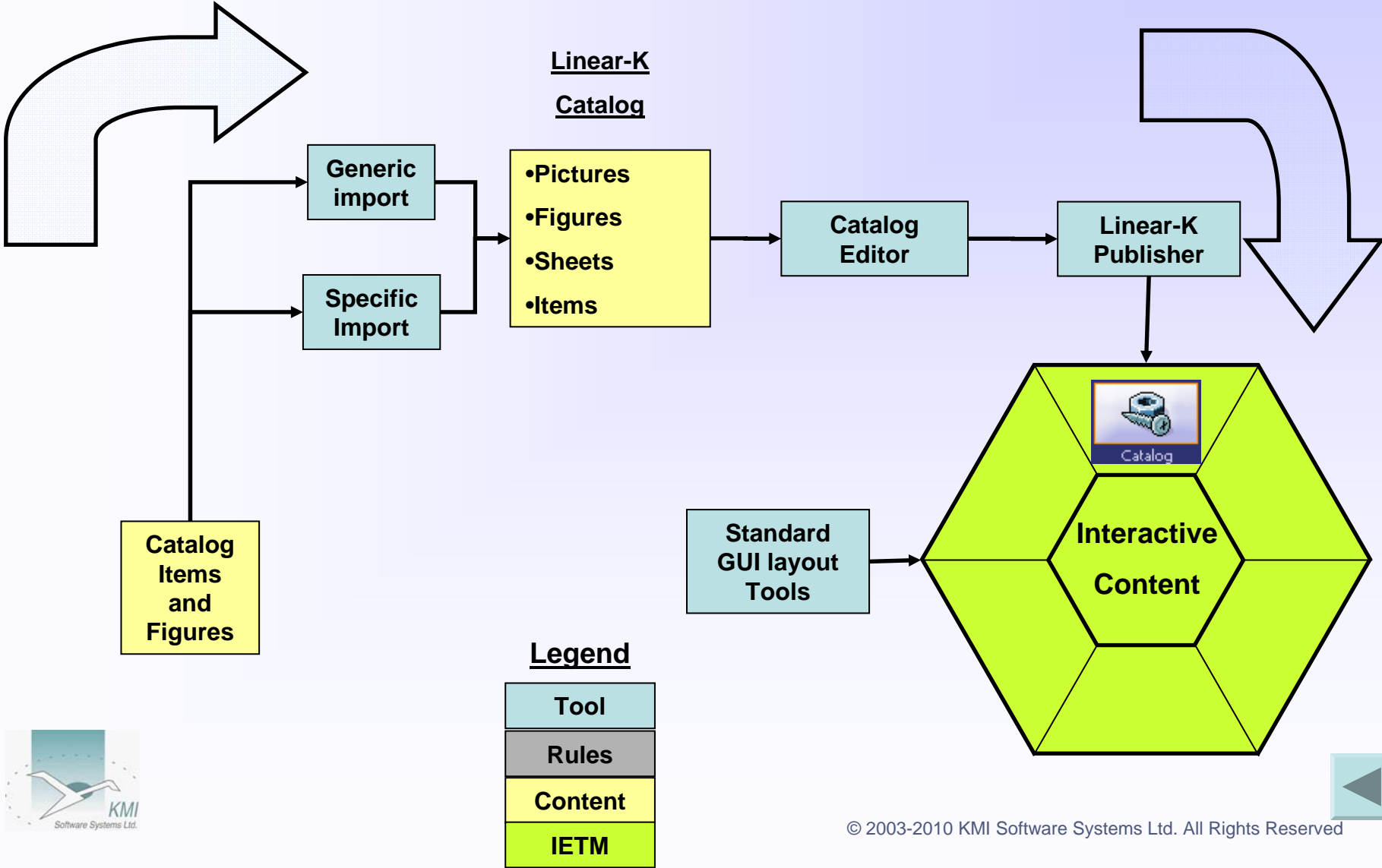


FAULT ISOLATION

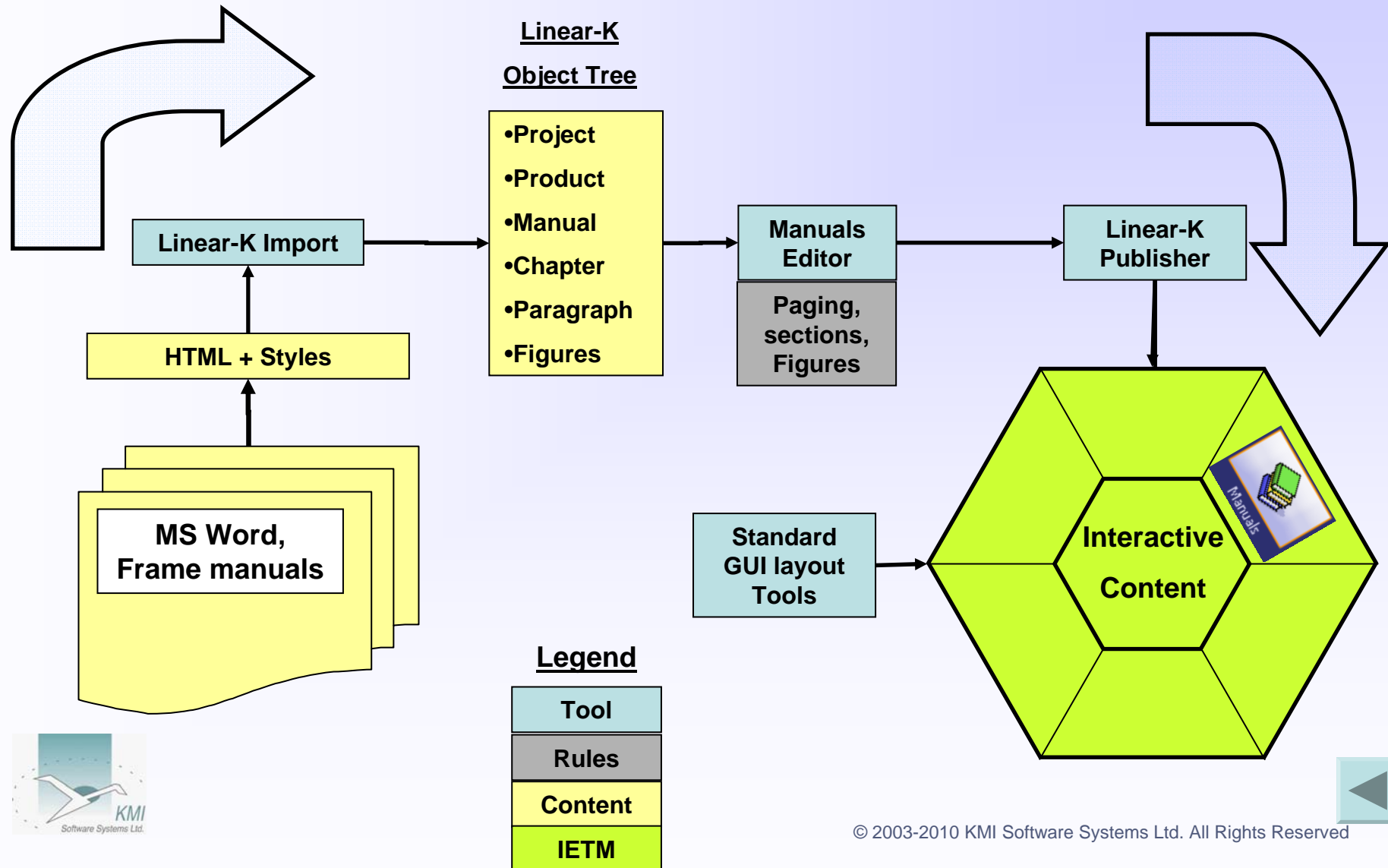
- The system guides the technician to find the root cause of a problem by using fault isolation
 - **Corrective action recommendation**
 - **Detection of correct symptoms**
 - **Verification that the malfunction is fixed**



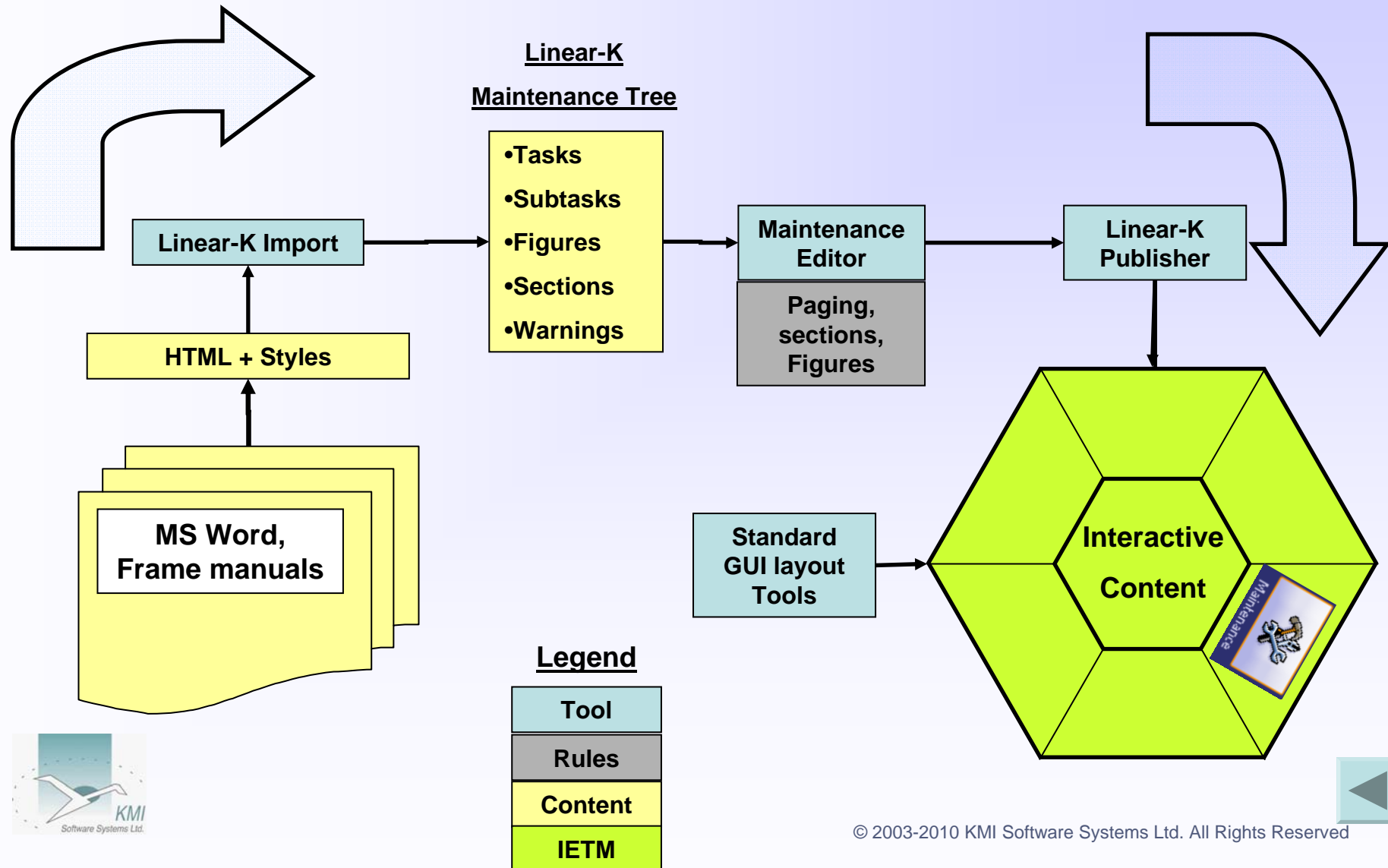
From Doc to IETM - Catalog



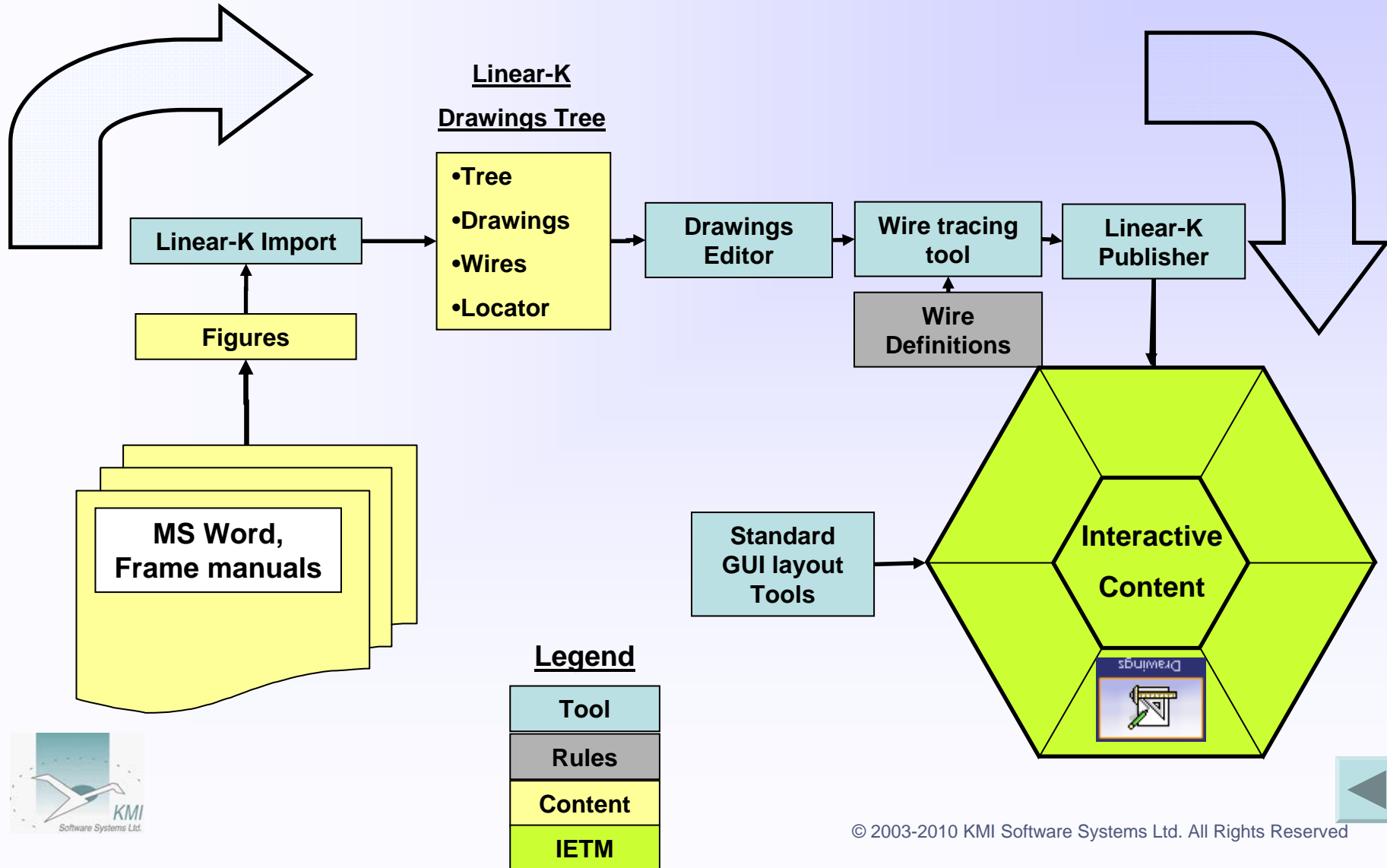
From Doc to IETM - Manuals



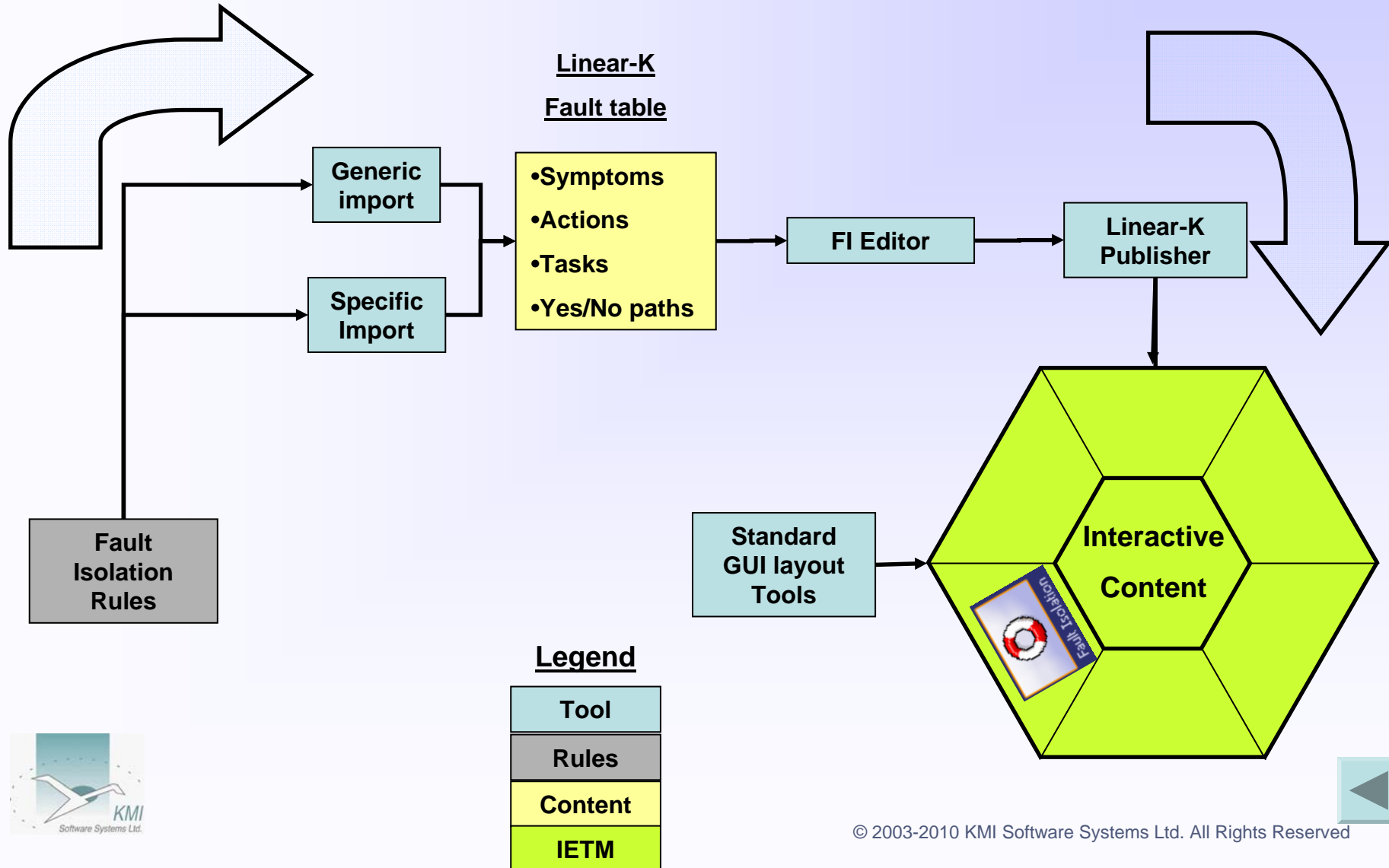
From Doc to IETM - Maintenance



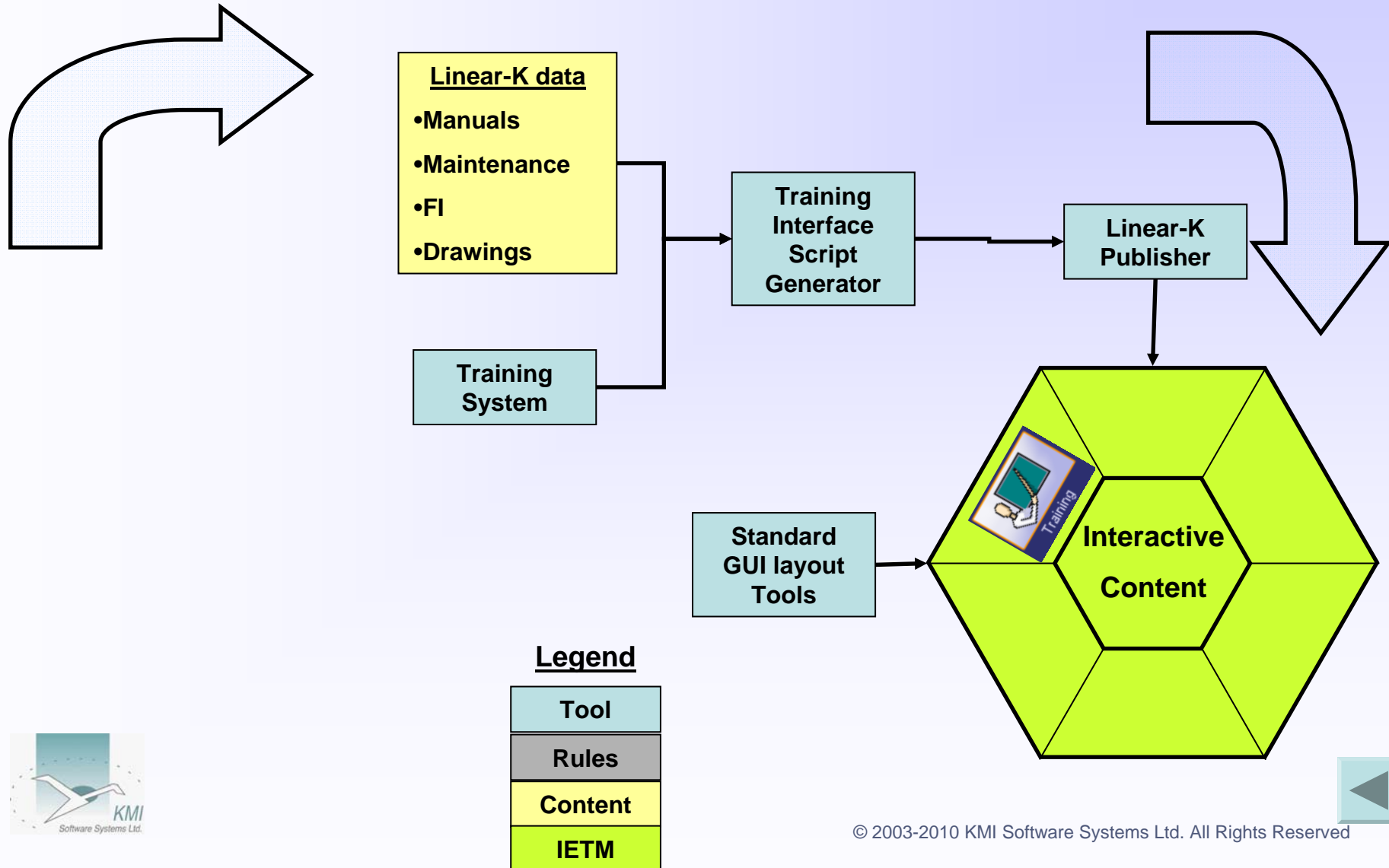
From Doc to IETM - Drawings



From Doc to IETM – Fault Isolation



From Doc to IETM – Training Interface

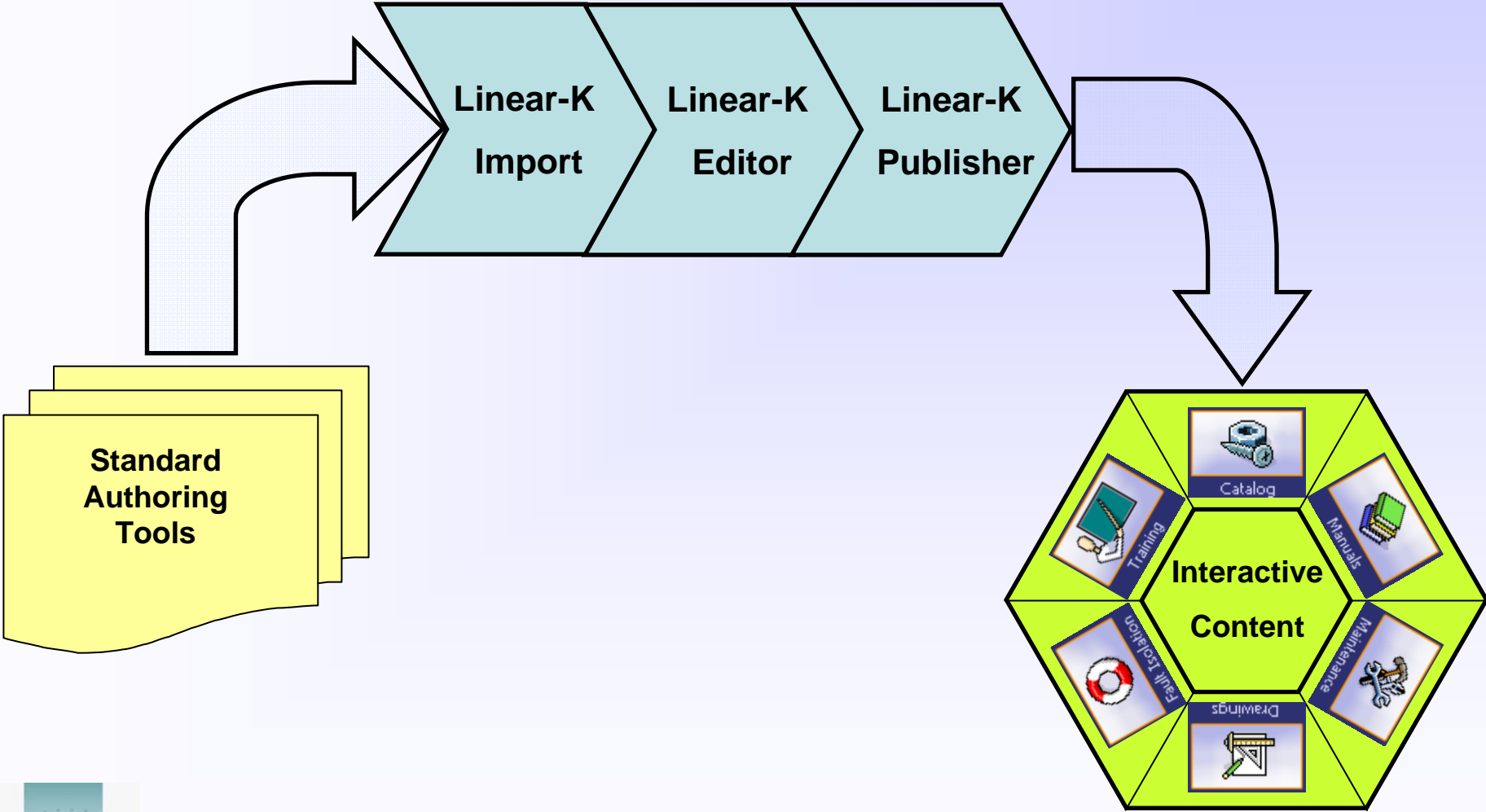


What is an IETM?

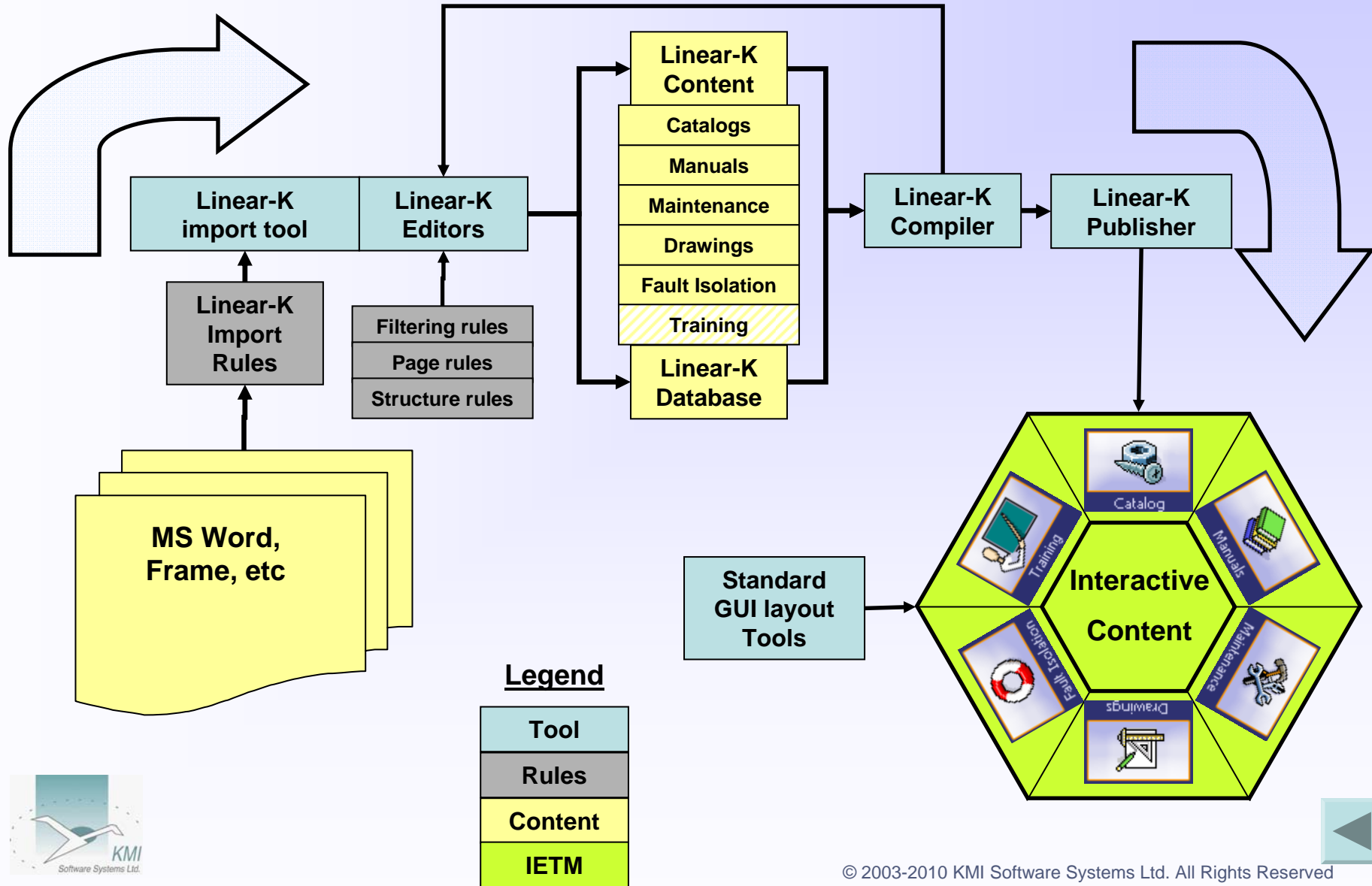
- An IETM is a system that contains all **information** required by technicians to perform system maintenance in addition to the **tools** that make this maintenance easily accessible and manageable.
- **Classes of IETM**
 - **Class 0** - Paper with multiple volumes not linked or integrated. Maintainer searches for data. High false removals rates probable.
 - **Class I/II** - Page turners and scrolling documents with indexing and some hyper linking. Maintainer searches for data. High false removals rates probable.
 - **Class III** - SGML-tagged documents, some level of intelligence added, hyper linking through linear structure. Maintainer searches for data. High false removals rates probable.
 - **Class IV** - Authored directly to database for interactive electronic output, authored for maximum viewing ease. False removal rates non-existent, hierarchical structure.
 - **Class V** - IETM linked to EQUIP and/or maintenance network, integrates with equipment diagnostics and expedites, troubleshooting, spares ordering and maintenance planning for increased equipment availability



From Documents to Interactive Content



From Documents to Interactive Content



Linear-K Editor Suite

- Powerful Application Generator
- Produces Class IV level IETMs
- Single sourcing for technical content
 - Maintenance, training, operation
- Catalog creation and linking to content
- Usage of standard authoring tools
- Powerful import utilities
- Sophisticated consistency checks
- Indications for updates



Linear-K – Benefits in creating content

- Management and reuse of technical content
 - Improved Time-to-Delivery
 - Keep “single source of the knowledge”
- Usage of standard authoring and cataloging tools, with the resulting content going into Linear-K.
- Ease in converting existing content to electronic documentation
- Support for military and industrial standards
- Built-in implementation of the business processes involved in documenting, operating and maintaining equipment



Linear-K User Package

- The resulting content consists of several modules:
 - CATALOG
 - DESCRIPTION AND OPERATION MANUALS
 - MAINTENANCE MANUAL
 - ELECTRICAL DRAWINGS
 - FAULT ISOLATION
- Modules are interconnected at all content levels, enabling immediate access to related information.
- Access to data is fully filtered on roles and effectivities
- Open platform - integrates with enterprise systems – PLM, ERP, training systems, etc
- Provides indications of revisions



Linear-K - additional features

- Enhanced usability
 - Personal sticky-notes
 - Personal bookmarks
 - Searches
 - Context-based help
- Technology
 - Zero client install - usage of standard web browser
 - Fully modular
 - Standalone or web-based
 - Uses XML and standard media formats

