Information Kitting:

Strategy, tactics, and examples for taking information to task

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Presenters Bio

Brian Laughlin, Ph.d, TF, Systems Engineer
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Biography:

Dr. Laughlin, has 33 years in Aerospace, 29 at Boeing across a plethora of roles, providing him both breadth and depth of expertise: Sheet Metal/ Composites Mechanic, Liaison Planner/Engineer, Tool Coordinator, Computing Analyst, Software Developer, Lean coach, IT Architect, and Course Developer/ Instructor/ consultant on: Human Centered Design, Systems Thinking, Lean, Innovation, Leadership/ Coaching/ Mentoring, Internet and Mobile Computing. He also pioneered web technologies as a GRA at the NIAR software lab in the mid 90s.

Laughlin is a prolific inventor, with many invention disclosures and patents that have resulted in a plethora of awards for his innovative and impactful work. His awards include: 2 Technical Replication, 3 Special Invention, 6 Meritorious Invention, and an Ed Well's Initiative Award, for his work that has resulted in Billions of dollars in savings across the enterprise for Boeing and the Aerospace market, as well as created new Revenue Generation opportunities for Boeing. His expertise and diverse background, coupled with his passion for problem solving and teaching have provided him many opportunities to speak, author articles, create and teach technical and leadership courses, serve on multiple advisory boards, and mentor across educational and industrial sector.
Laughlin holds a Bachelors in Psychology, a Masters in Experimental Psychology, and a Ph.D. in Human Factors Psychology, all from Wichita State University.

Situation: Dispersed, disorganized information

Information exists in disparate systems, repositories and formats, often requiring excess time and effort in order to find all necessary information needed to accomplish a given business task.

In addition to the time wasted gathering information, the disruption in mental flow compounds the problem, due to human limitations of ability to multi-task when completing mentally demanding tasks.

This increases business costs.

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Target: Decrease time, confusion, frustration

Improve the efficiency of our information workers by streamlining business processes required to complete business tasks.

- Create quality by assuring adherence to better business practices
- Reduce reliance on Tribal Knowledge
- Reduce cognitive burden on already stressed employees.
- Reduce the time needed to do business tasks.

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Proposal: Information Kitting at the Point of Use

Create, implement, and leverage Information Kits that enable commonly done, complex, and high importance business tasks to be done more efficiently, effectively and in a standardized way.

This is known as

“Information Kitting.”

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Information Kitting : Concept

The concept of Information Kitting
Is the provision of required resources in a logical, organized arrangement, that enables business tasks to be accomplished effectively and in a straight forward manner. This helps us to maximize our end user's efforts in getting tasks accomplished, instead of wasting time and mental capacity searching for resources to get something done.

Ultimate goals are:
"Attention Management & Actionable Visibility"

Don't just help me to understand what to do, provide me the resources to immediately act on the need.

Lets consider some ways to better understand this valuable concept

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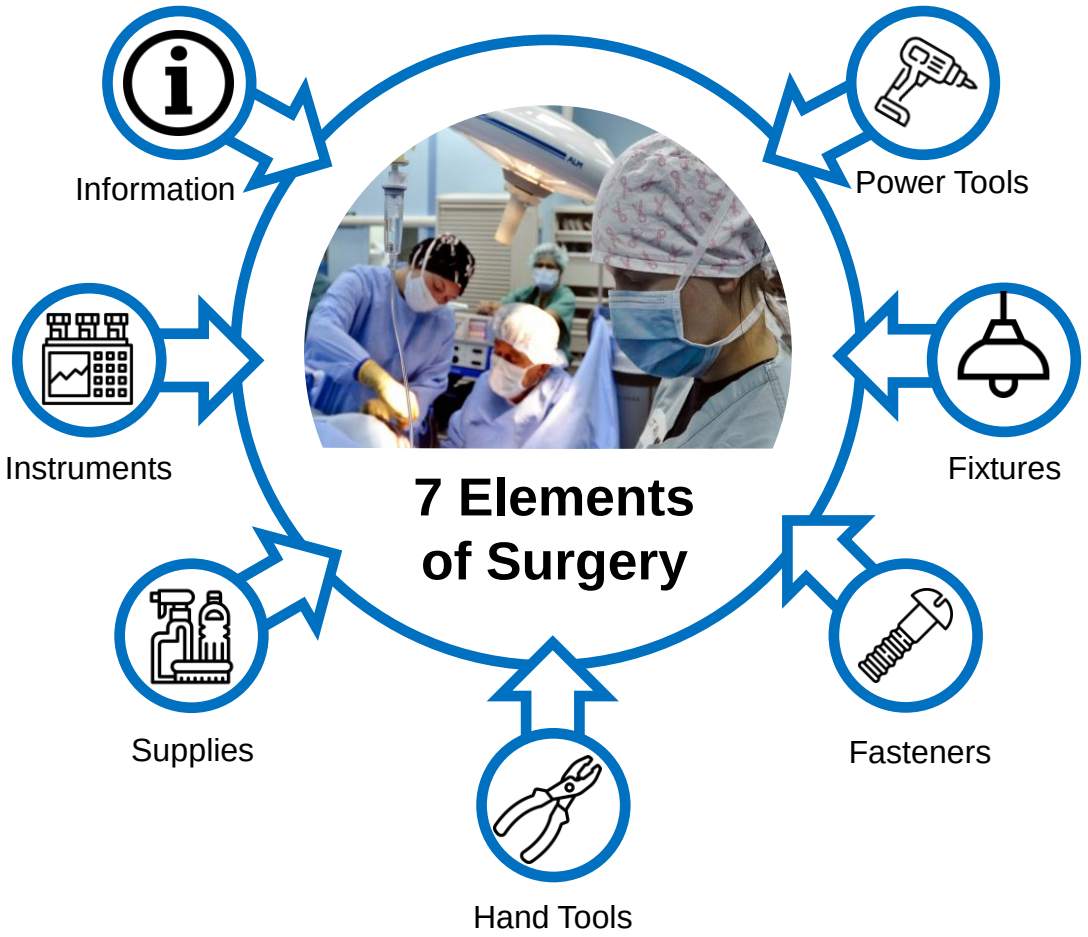
Information Kitting- Seven Elements of Surgery

Seven elements of surgery refers to the set of all things required to perform a particular job or operation, that should be available at the point of use.

- NO time spent finding resources
- Mental Flow preserved
- Provides a level of quality control for the procedure
- Eliminates waste of redundant items
- Manages expectations – time, complexity, etc.



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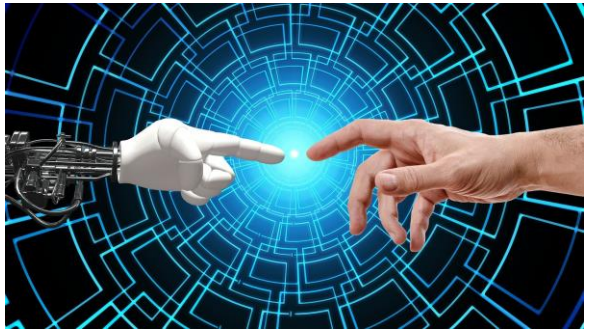
Information Kitting : Point of Use and Time of Need

Information Kitting includes a lean, user centric, information access strategy, "Findability", and is focused on providing the end user with the appropriate information, when at, where at, through the use of contextualization.

Findability consists of 3 legs as follows:

- Taxonomy and Ontology Development- Tagging and organizing of data to make it more easily retrievable.
- Federated Search- Single query searching of all appropriate info repositories. Includes ALL info resources (experts, files, etc.)
- Information Kitting- Organization of information around completion of business tasks.

*__Smart Information Kits- Gen AI, IoT, Big Data-__ Automated scripting provides critical contextually-based information at Point-of-use and Time of need, on the fly. Yields freshest information.



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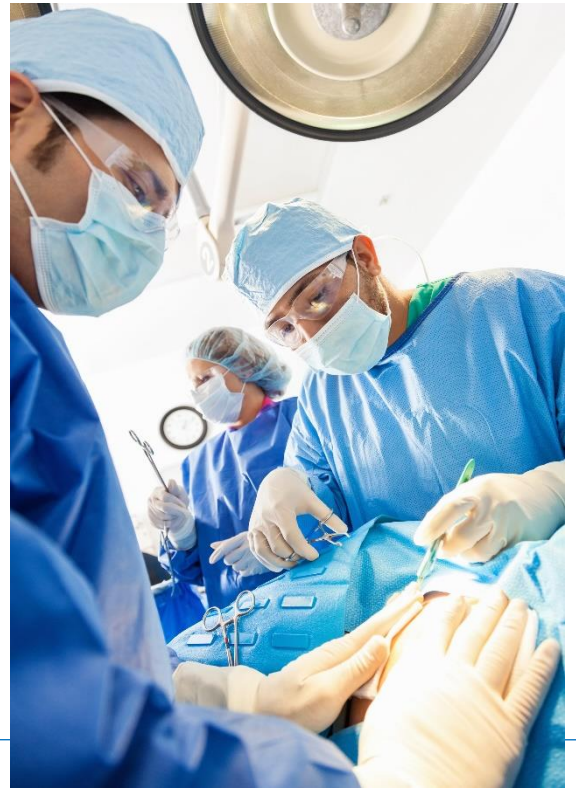
Information Kitting- Leveraging Design Patterns

A Design Pattern, is a general reusable solution to a commonly occurring problem in software design. A design pattern is not a finished design that can be transformed directly into code. It is a description or template for how to solve a problem that can be used in many different situations

Information Kits provide specific tactical support for the strategy proscribed by Design Patterns, by organizing resources necessary for accomplishing a specific task.

Problem - Appendix rupture
Design Pattern - Basic Surgical process
Information Kit - Appendix removal process info, patient health charts, test results, equipment needed.



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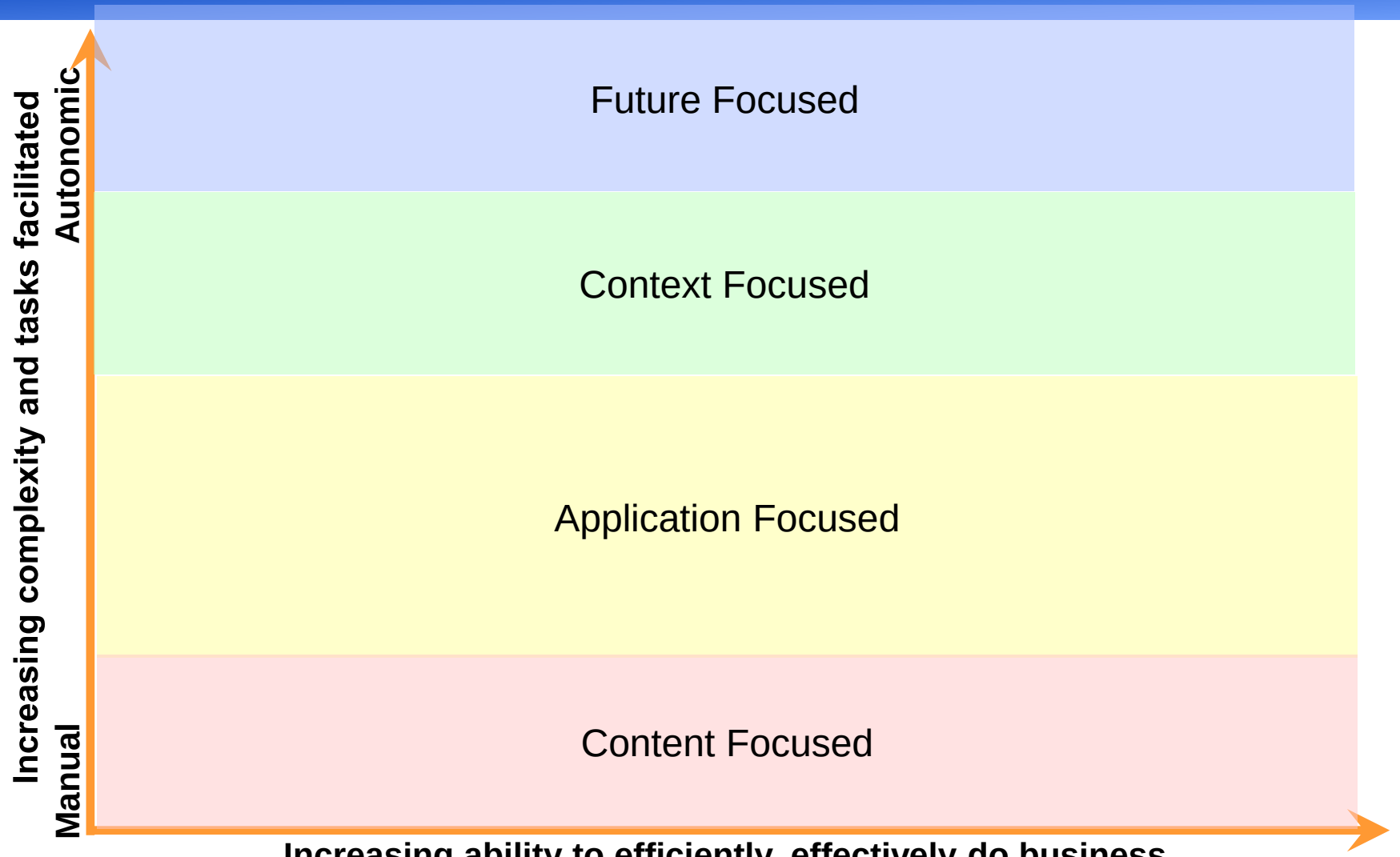
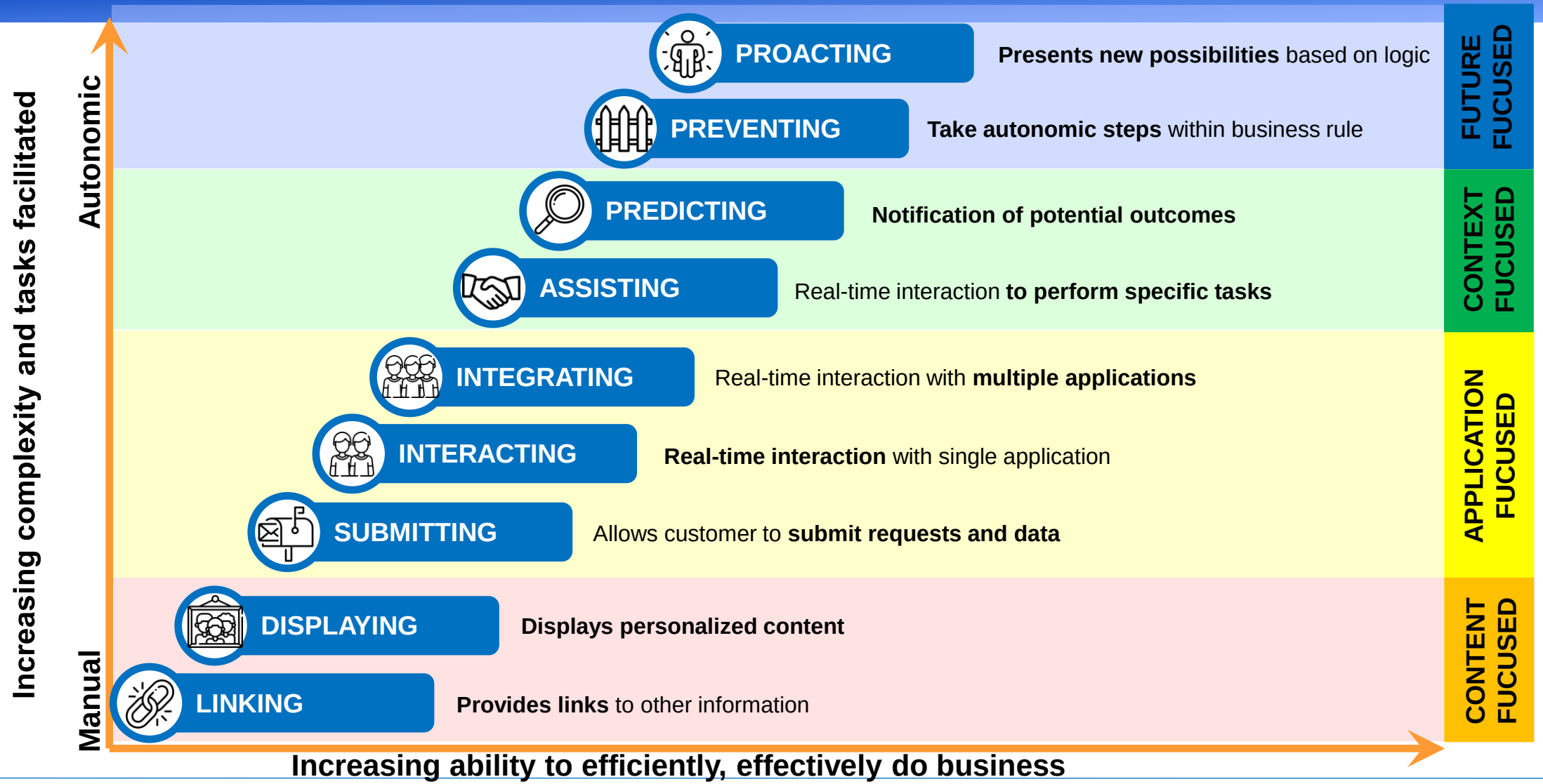
Systems Enabling Model



Systems Enabling Model



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Interface evolution

Virtual System- Spread across applications systems, no primary interface, embedded in whatever you do, communicates in most effective way, per need. System becomes invisible, *user focuses on completing tasks*.
Separate interface potentially becomes log for activities

Interface Based System - Uses a separate interface (the portal, for example) as the primary interface, UI is in the foreground, and is seen as the system. User initiates all actions through the UI.
User attention focused on UI.

Autonomically seeks out information on behalf of

Assisting

Real Time user focused interaction, across portlets, offering user tools to perform specific tasks.

Integrating

Real-time interaction with **multiple integrated applications** and processes via single portlet

Displaying

Displays personalized content inside the portlet

Linking

Provides links to other information outside of the portlet

Increase in complexity and number of task facilitated

Autonomic

Manual

Increase in Customer's Ability to efficiently, effectively, do business

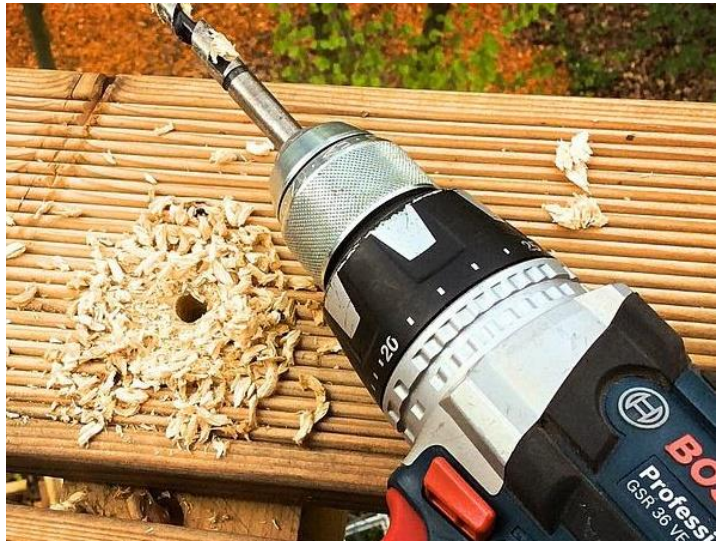
Localized, Visible → Distributed, Invisible

Information Kitting : Benefits

Benefits of Information Kitting include:

- Less looking, more DO-ing
- Improve quality of task completion-done right the first time, each time
- Capture and reuse of “Tribal Knowledge” and Best Practices
- Assure correct information is used in the process
- Simplify task completion
- Increase process visibility
- Supported, reusable architecture makes kits easy to develop and deploy

“Nobody whoever bought a drill, wanted a drill…
they needed a hole.”



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Successful Production Examples:
767 Tanker Wiring (Mfg)

Situation: Production is suffering quality and cost issues, due to the need to do extensive research before beginning work

- Production information is scattered across many sources and systems
- The complexity of the work causes an exorbitant amount of stress on the mechanics
- Translation of text and graphical instructions to real world procedures is very complex and difficult to understand

Target: Mechanics need all drawing data to be contextually visible

- Need to be highly visual to deal with the high complexity and spatial nature
- Must be intuitive and easy to access/use
- Info needs to be accurate and complete relative to task
- Must be easily delivered and updated

Successful Production Examples:
767 Tanker Wiring (Mfg)

Action: multiple LEAN workshops were performed to assure understanding of the wiring process. A task team was assembled to partner with mechanics, inspectors, engineers, etc. utilized AGILE to develop an AR solution that dramatically streamlined the process of Tanker Rewiring.

Results:

- Increased in Quality- Over 50% improvement.
- Decreased time to prewire- reduced by approx. 50%
- Greater user satisfaction for mechanics
- Training- Almost no training required to use the system.
- Reduces cognitive overload on mechanics, by simplifying process.
- Enables mechanics to focus on performing the job, not research.
- Recommended best practice for complex, highly visual-spatial tasks.

Bottom Line: User-friendly, visualized work instructions offer dramatically reduced time and frustration, while increasing quality and user satisfaction.

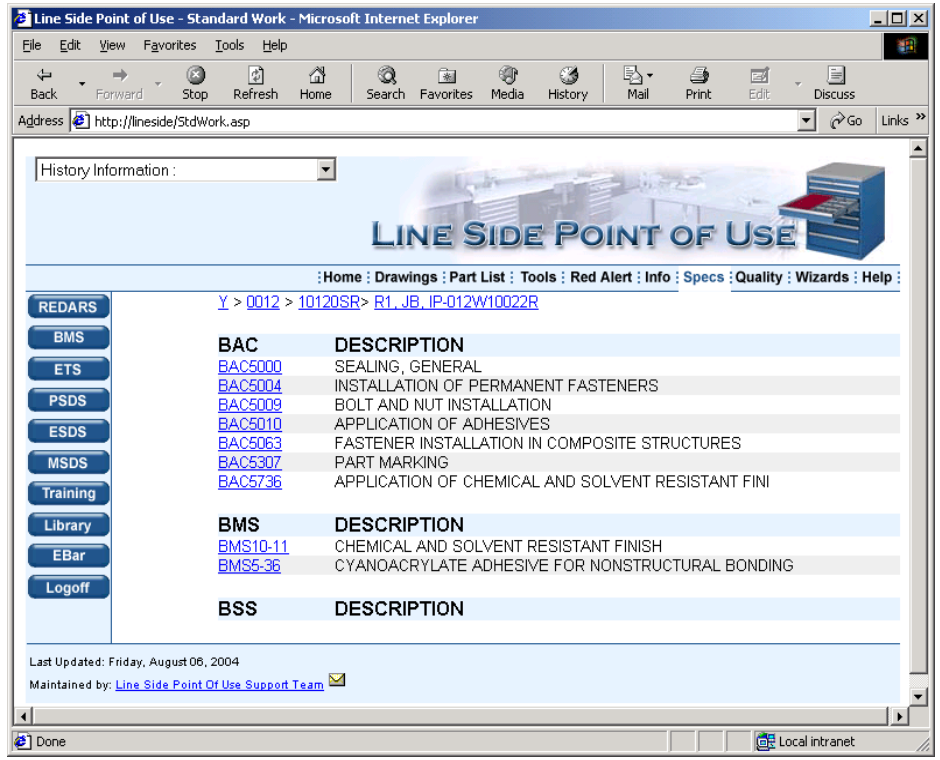
Successful Production Examples:
Line Side Point-of-Use (Mfg)

Situation: Production information is cumbersome to access for mechanics on the shop floor.

- Unacceptable flow times for production lines, due to time required to find necessary information
- Need to improve quality and clarity of information

Target: Mechanics need a way to pull together all required production data.

- Must be easy to access/use
- Info needs to be complete relative to production needs
- Must be easily delivered and updated
- Need to increase information maturity based on “7 elements”, and FAA compliance audits



Successful Production Examples:
Line Side Point-of-Use (Mfg)

Action: LSP was designed to provide mechanics with an automated information kit, based on job role and part produced. Information such as: Planning, Info, Specs, Drawings, Certification records, etc., in a single, intelligent, easy to use interface, via the web, at the point-of-use.

Results:

- Defect Avoidance- liked and used
- Cost savings- Access time
- Compliance- audits, Red Alert.
- Training- Captures/reuses “tribal knowledge”, level set, quicker to speed
- Communication- Improved QCDSM visibility, directs issues to appropriate area.
- Recommended best practice

Bottom Line: User-friendly, custom kitting of accurate and production info, through common UI. *ISO 9000 Best Practice

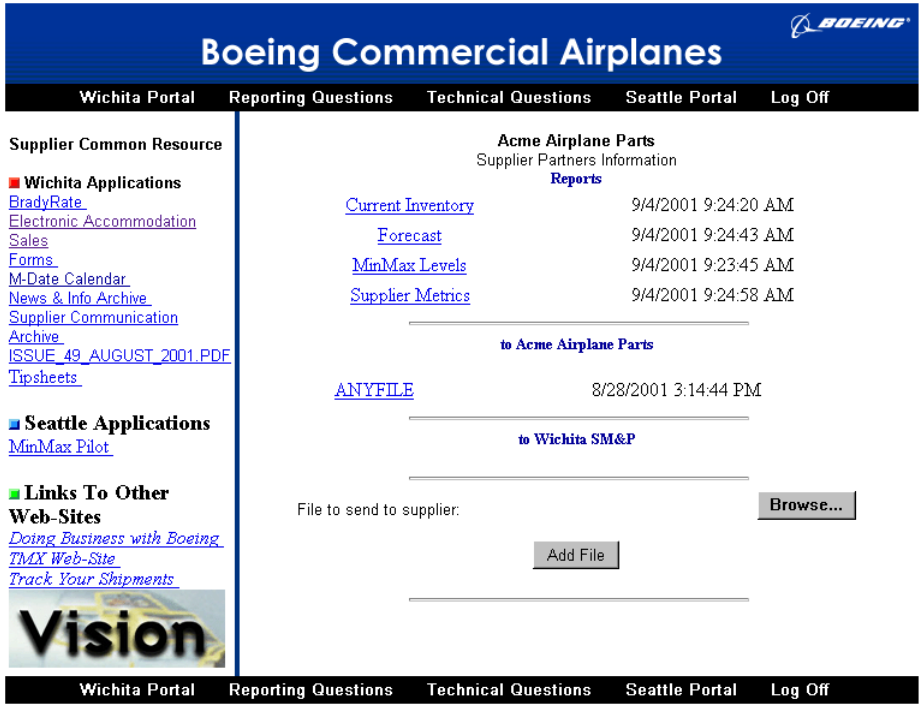
Successful Production Examples:
Min/Max (Procurement)

Situation: Supply chain was Broken, not able to make rate/deliveries.

- 737 line at highest production rate in history (.875/day rate)
- Highest amount of inventory and shortages
- Slow to incorporate production changes
- Highest cost part provider in the industry

Target: Deliver quality planes, while making cost and delivery targets.

- Must guarantee part availability
- Need to improve communications & relationship between buyers and suppliers



Successful Production Examples:
MinMax (Procurement)

Action: Redesign our procurement processes/relationships

- Partner with suppliers, problem solving, positive relationship
- Communicate openly, accurately- Forecast, actual inventory position, agreed upon Min/Max levels, appropriate metrics
- Change from Push scheduling to Pull based consumption replenishment triggers
- Share via secured Extranet: Boeing Partner's Network

Results:

- >$700M inventory reduction
- Reduces cost of money
- Decreased shortages
- Improved Quality
- Reduces Rework
- Part# per buyer <250 to>450
- Improvement in Non Min/Max'd parts
- Turn increase: 2 to 30, to 250 (daily)
- Reduced labor hours, floor space
- Great partnering relationships

Bottom Line: Enabled us to make scheduled deliveries, avoided additional late charges, used pervasively across Boeing and Aerospace industry, created a *New Market Niche. * 1 Tech Rep, 2 SIAs, 5 US patents, plus other countries.*

Proposed Example: “Just Had a Baby” (Administrative)

Situation: Employee has a baby, lots of things change

- Number of dependents; health insurance; LOA, pay allocations, etc.
- All these elements about an employee exist across organizations, not conveniently within an org.

Target: Simplify and streamline the process for required updates multiple systems containing employee info

- Must be easy to access/use
- Must be comprehensive relative to the task at hand
- Must require minimal input possible.
- Has to tie into authoritative data sources.

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Proposed Example: “Just Had a Baby” (Administrative)

Proposal: Make all necessary information available through a single information kit.

- The form would pre-populate with all known info about the employee from authoritative sources.
- End user enters only ad hoc info that can’t be previously known by the systems (Baby’s name, etc.)
- All systems are updated via a single session with this system, making it relatively easy to do.
- Accessible via stable link through total access.

Bottom Line: Dramatically reduce user frustration, increase system accuracy, ease of use, etc. “Empower our customers” to take care of their business.

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Kitting Information: What makes a good kit?

Information Kits are best suited for business tasks that are:

Highly scripted and standardized
- Easiest to do these, but many processes that are not represent lean process improvement opportunities.

Done by many people
- Helps standardize and refine processes to better leverage better practices, improves quality, simplicity.

Highly important and involved
- Processes that require many steps that can be missed or incorrectly performed.

Require resources from multiple organizations that must be coordinated
- e.g “Just had a Baby”, New employee, scheduling changes for planners, etc.

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Next Steps

Identify Opportunity
Leverage LEAN + AGILE

<u>Determine and rank task candidate list</u>

- Use TOC to help determine bottleneck areas.
  - Build a matrix of task candidates and attributes
  - Determine which areas of control & greatest pain
  - Degree of pain- Low-Medium-High
  - Sphere of Influence- Low-Medium-High
  - Monetary Impact
  - Frequency of use or number of users
  - Complexity of process

<u>Plan Implementation</u>

- Schedule ranked list of customers
  - Shadow end users
  - Verbal Protocol Analysis
  - Baseline VSM/Future state process dev.
  - Collect info requirements, build kit using AGILE
  - AGILE project management
  - Move towards production

In Summary

Situation Info is scattered, takes time, mental effort, not leveraging better practices, losing IP
Target Less time searching, more time DO-ing. Leverage better practices, preserve mental flow.
Proposal Develop and Implement Information Kitting.

A closer look at Information Kitting

- Definition- Concept
- Seven Elements of Surgery
- Essential part of “Findability”
- Patterns embodied
- Benefits

Next Steps, one final thought…

In Closing… a final thought

"The more perfect a machine becomes, the more they are invisible behind their function. It seems that perfection is achieved not when there is nothing more to add, but when there is nothing more to take away. At the climax of its evolution, the machine conceals itself entirely.“

-- Antoine de Saint-Exupery,
Wind, Sand and Stars

Questions / Discussion

Please send any inquiries to:

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Back up details