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White Paper

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Impact of Mobility in the Chemical Industry

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Advances in mobile technology have significantly influenced the chemical industry. Their effects are observed on all components of the supply chain including procurement, manufacturing, distribution and selling. Organizations embracing mobility transform into lean, flexible and quick decision makers. Mobility enables the organization to stay connected real-time, become more productive in the use of working capital, establish better links with suppliers and customers and offer employees a flexible work environment and modern lifestyle. However, the success of mobile technology depends on correctly identifying business requirements and needs as well as the technology selection and adoption to meet these needs.

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Introduction

The business scenario for chemical companies is transforming very rapidly. The prime mover behind the same is the relentless pressure by the market to shed flab, be flexible, improve customer focus, reduce product development cycle and remain profitable. The business need is clearly identified to improve speed and efficiency of the business processes. Implementation of mobile computing technologies is expected to help companies achieve an adaptive and flexible supply chain. The paper explores opportunities and solutions in making the traditional chemical industry processes and applications mobility enabled.

Mobility

Mobility technologies can be used to keep the mobile elements connected to the business process. The mobile elements include man, material and machinery. The business application needs necessitates information sharing with these elements when they are mobile. For example, the business manager may need to be alerted about a business criticality when he is on a business trip and there are options to provide him the business data or information on the devices, which he would be carrying like cell phone, PDA or Laptop.

The mobility technology includes the following:

- Mobility Devices
  - PDAs, TabletPCs, Cellular Phones, Smart Phones, Laptops and Notebooks
- Network Technologies
  - Wireless Local Area (Legacy, 802.11b), Wide Area (GPRS, CDMA-1X, CDPD, Mobitex)
- Network enabled Services
  - Messaging & Alerts (SMS, MMS, E-Mail), Location (GPS, E-OTD), VPN
- Mobile Computing
  - WinCE.NET, PocketPC, PalmOS, Symbian, Legacy (DOS, TCAL)
- Smart Instrumentation
  - RFID devices, Infrared sensors, Barcodes Scanning, Biometrics, Telemetry devices, Wireless transmitters
- Mobility Middleware
  - Thin-Client Interactive Architecture – browser and device specific Transcoding
  - Thick Client Disconnected Architecture - store & forward data transfer & synchronization
  - Voice Recognition Architecture
- Mobile Application Technologies
  - Thin Client Applications – WML, XHTML, Microsoft .NET Compact Mobile Internet Toolkit
  - Thick Client Applications – Microsoft .NET Compact SDE, J2ME, PalmOS specific SDK
  - Voice Applications

Mobility Applications in Chemical Industry

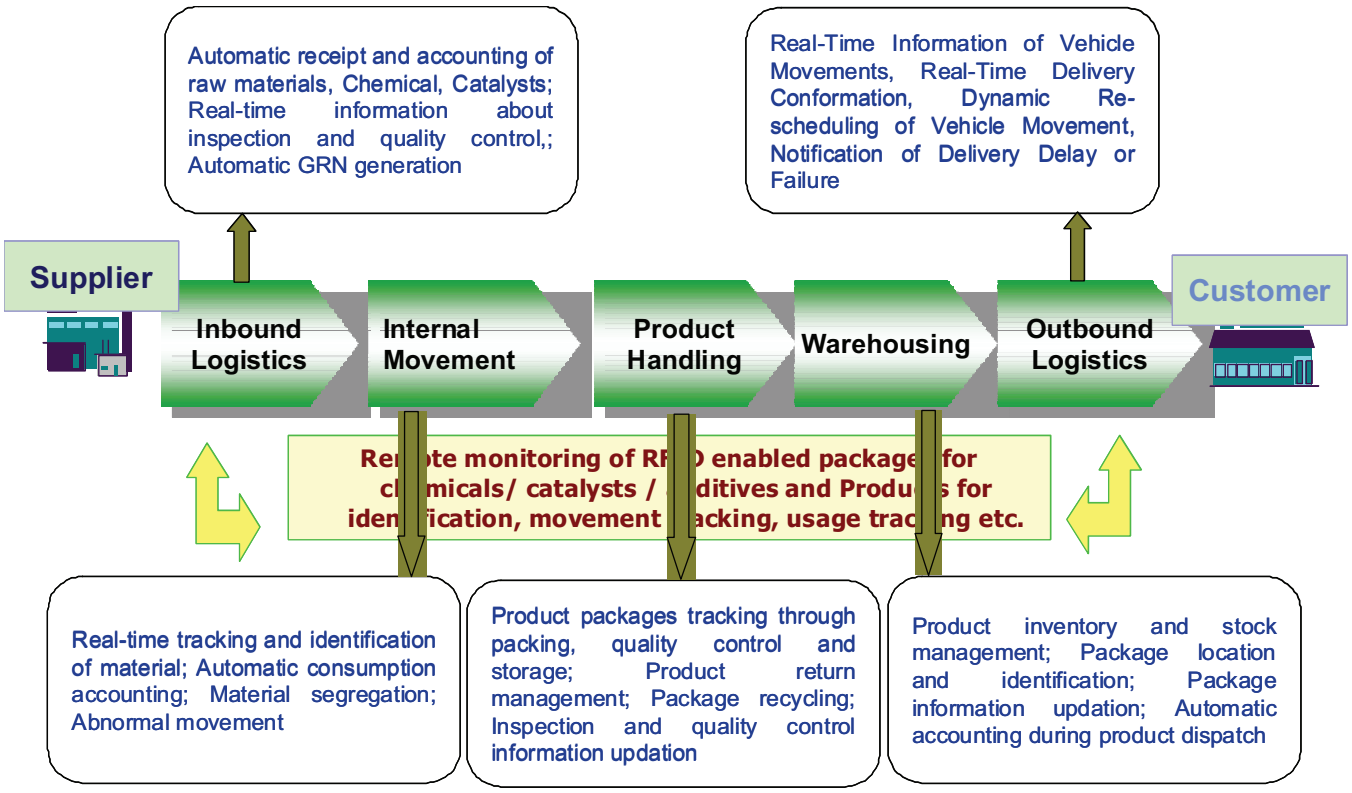
Mobility technologies have emerged as very powerful enablers for a lot of business applications. These applications are useful in all areas including enterprise management, supply chain management, manufacturing management, asset management, sales management, emergency management etc. These all application areas are very critical for the chemical industry and are benefited immensely by mobility technologies.

Supply Chain Transformation with RFID

The supply chain processes which can benefit intensely by mobile computing include product handling and inventory management, warehouse management, inbound and outbound logistics, distribution, etc.

RFID (radio frequency identification) provide a very good opportunity to transform the supply chain. The RFID tags can be put on bags, packages, pallets and containers, which can be identified and tracked during receipt, movement and dispatch. This information can be used for improved package visibility, real-time status report, improved inventory management and improved reusable container /pallet recovery and reuse.

Another big opportunity is real-time tracking of trucks and tankers. This real-time tracking can be real-time information of vehicle movements, real-time delivery conformation, dynamic rescheduling of vehicle movement, notification of delivery delay or failure etc. Please refer Figure 1.



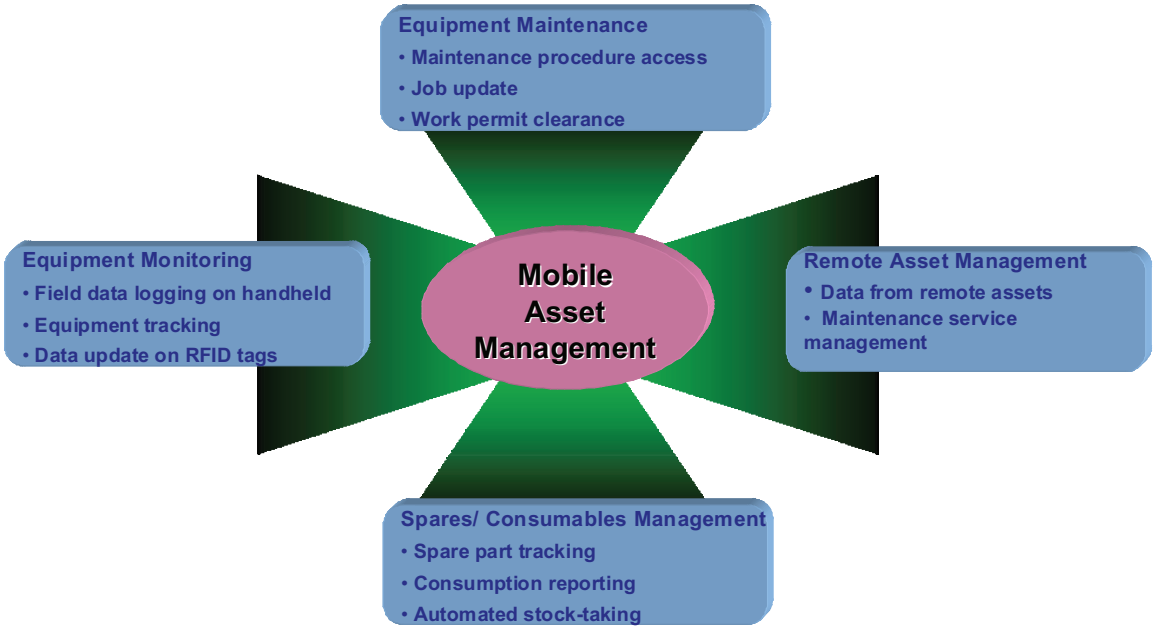
Manufacturing Effectiveness with Mobility

Manufacturing effectiveness can be increased with the adoption of mobility devices. The operators can use handhelds for field data gathering. RFID enabled chemicals and catalysts bags can be identified, tracked and accounted. Wireless transmitters can be used for on-line data transmission from fixed or portable field instruments.

Mobile Asset Management

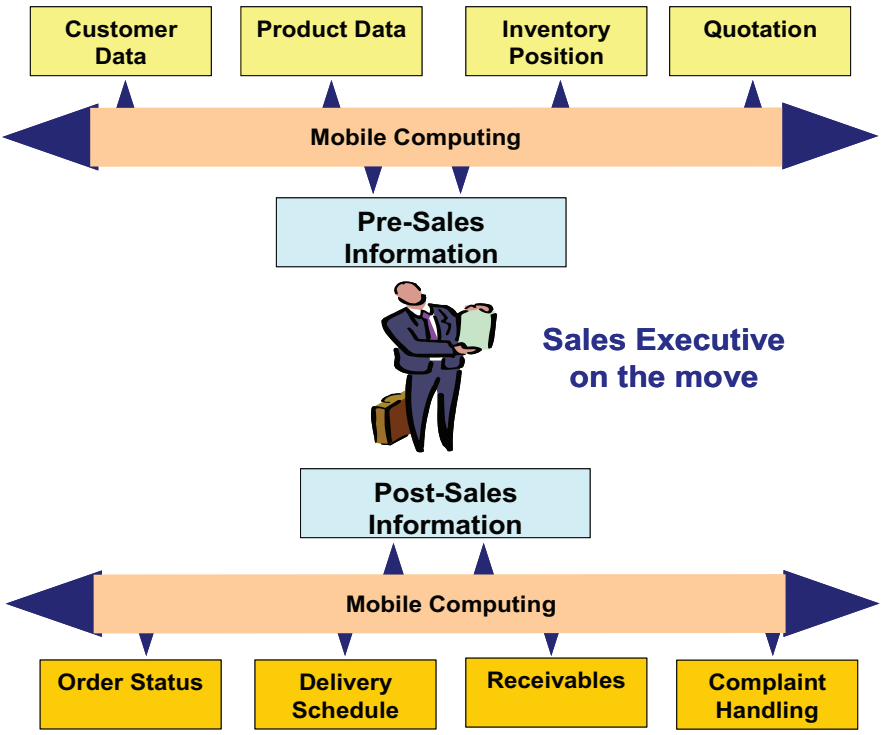
Asset management can be improved in multiple ways with mobility technologies. The equipment and spare parts can be fitted with RFID tags. Thus the equipment can be identified, their location can be tracked and confirmed, RFID data can be updated and removable parts can be tagged for tracking during removal and reinstallation.

The performance of the maintenance technicians can be improved by providing them with handheld devices. While on a field trip, they can record asset performance data like motor temperature, lubrication levels, abnormal sound etc. They can also get maintenance job details and maintenance procedures on the handhelds and update the maintenance job details as well. See Figure 2.



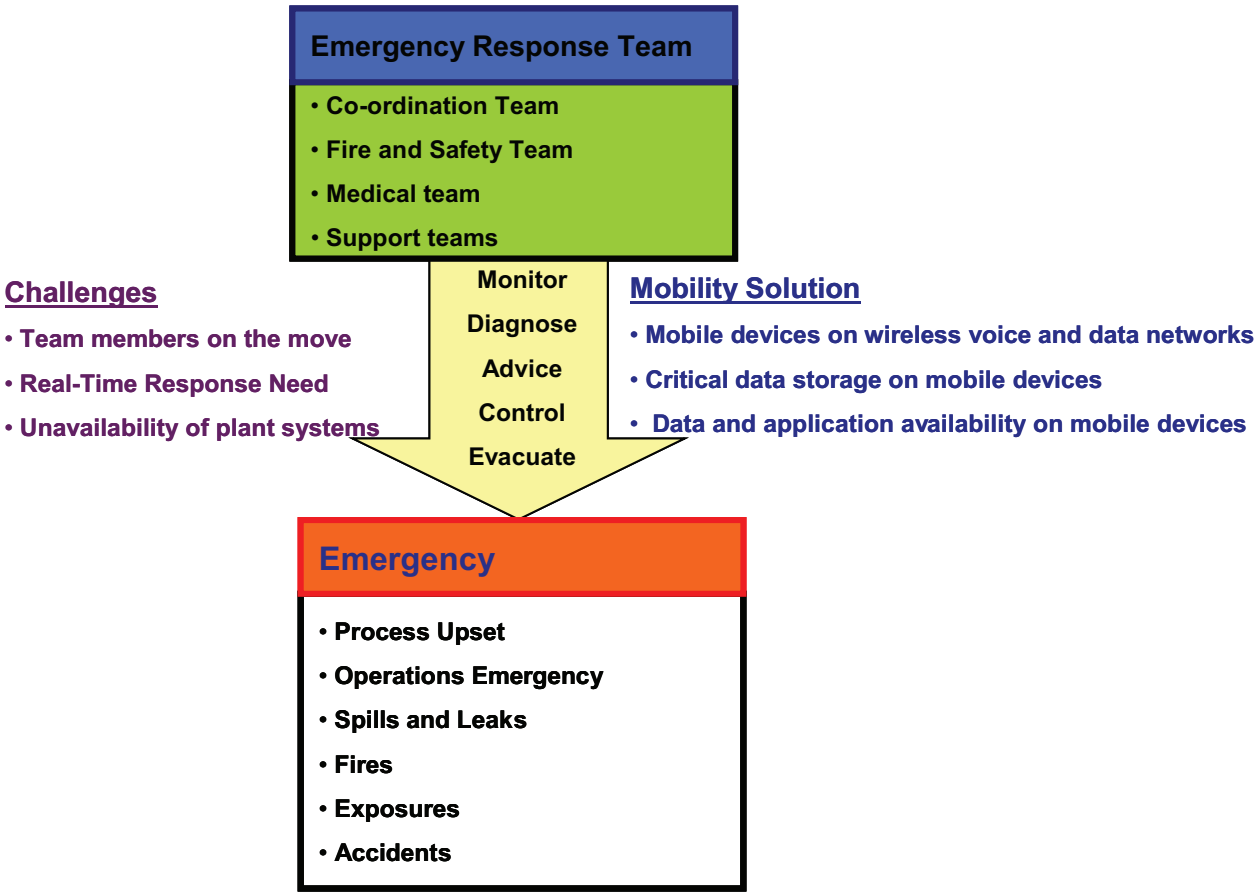
Sales Force Automation

The sales executive when on move cannot access their company network to access the application; however they have an innate need to do so. Mobility can help them in meeting this challenge. They can access the application like e-mail, product availability and price data, order status, payables status to improve the quality of client interaction. In an advanced application scenario, they can analyze the client requirements and suggest a solution including a quotation.
Please refer figure 3.



Real-Time Emergency Response System

The emergency response can be critically improved by adoption of mobility technologies. The emergency response team is characteristically on the field during an emergency response. If they carry mobile/portable devices on which the information related with the incident /event, critical emergency response data like MSDS, medical data and contact details for responsible roles etc. They can also do real-time coordination of the emergency response. Please see figure 4.



Adoption of Mobility

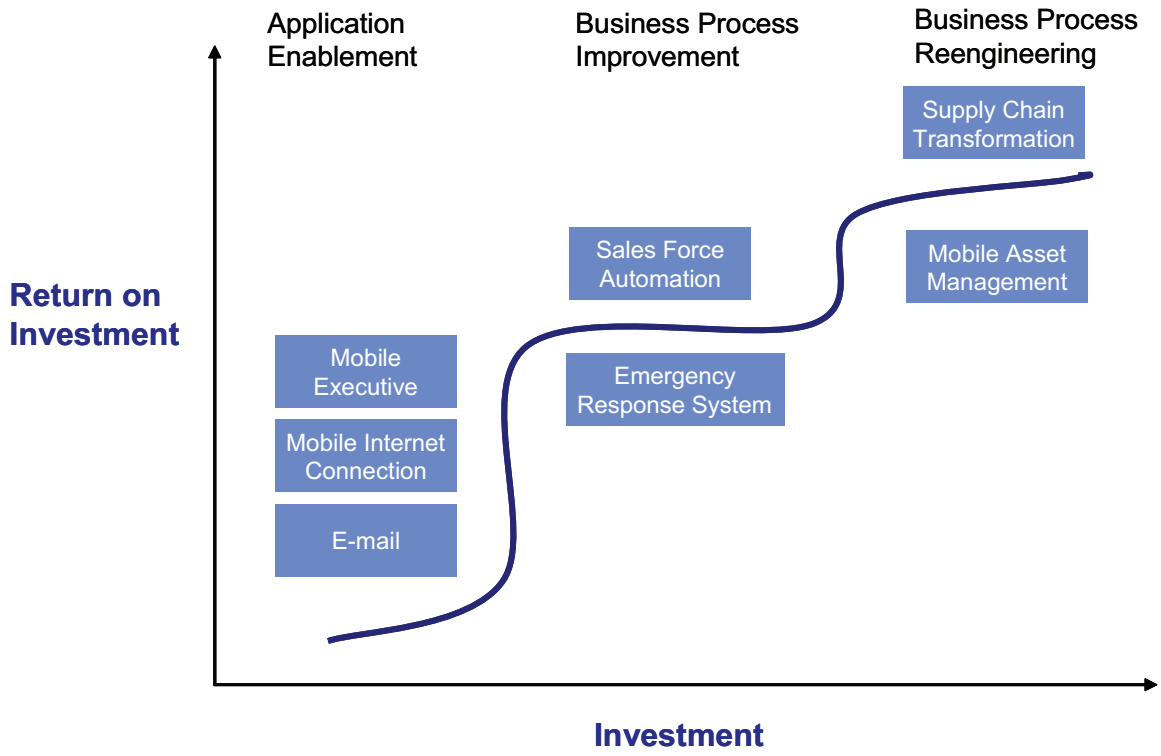
The applications of the mobile technologies can be categorized as following:

- Application Enablement through Technology Adoption
  - Business Process Improvement through Improved Software Applications
  - Reengineered business processes

The application enablement can be achieved with little investment and with mature and proven technology adoption. It does not impact the business process significantly and thus the business benefits are also moderate.

More advanced technology adoption is needed for business process improvements. But more importantly, the project management methodology needs significant investments. The returns on investment are also significant.

However the maximum benefits are achieved through adoption of innovative or reengineered business processes. This needs to be significantly investment both in terms of project management and technology expenses. This helps a company to obtain competitive advantage in the market. The associated risks are unproven technologies, change management and market acceptability.



Recommended Approach

The mobility adoption should be treated as any other project and the focus needs to be clearly the business needs and the business value proposition. The key steps are following:

- Business Imperatives
  The adoption of mobility should typically be driven by the business imperatives. The business imperatives could be competitive positioning, project benefits of real-time information availability or business process innovation.
- Business Case
  The business imperative should then evolve into a business case like any investment decision. The focus of the perceived benefits should be business processes not technology benefits. An assessment is needed whether the existing applications be modified or enhanced or needs to be replaced by new applications. It is important not to make technology choices upfront.
- Project Management
  The success of the business case is contingent on effective project management. The scope of the project should be limited to technology but on the business process. The active participation of business users even for ostensibly technology driven project improves the odds of success significantly. As-is and To-be business process mapping would provide the right value proposition. It is quite possible that the earlier perceived mobility needs may not be validated fully. After establishing the mobility needs like other technology needs, technology choices should be made. The user inputs for the ease of use, technology comfort and relevance to their activities provides a very useful input to effective project implementation. The successful project completion would pose an effective change management challenge and this should be provided for.
- Benefit Analysis
  The benefit analysis provides very useful estimates for benefits achieved as well as business imperatives fulfilled. It should be based on user feedbacks, application utilization numbers and enhanced business value. The exercise can also provides a useful inputs to business imperatives by identifying other potential improvement areas as well as by proving project success.

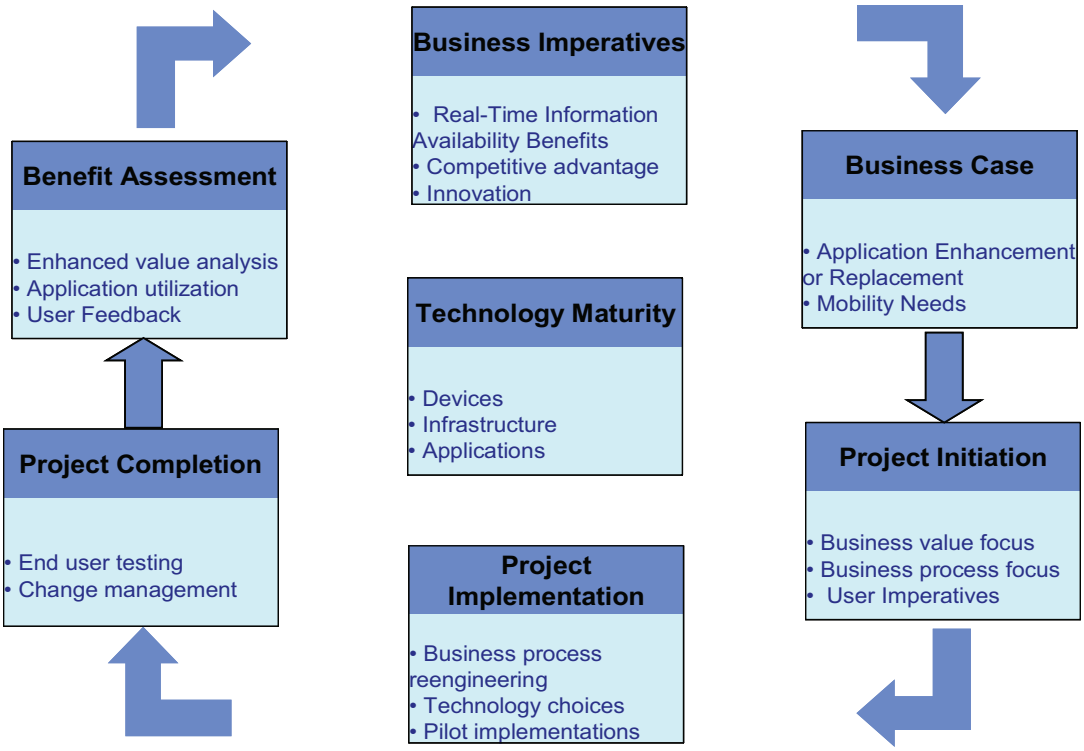


Figure 6 - Recommended Approach for Mobility Adoption

Conclusion

Mobility technologies are becoming a critical element of real time information solution for modern enterprise. There are tremendous benefits of mobility for chemical industry as well. The adoption of these technologies bring benefits like real-time collaboration, real-time decision making, critical data availability on the move, mobile asset tracking, faster response from business users and improved business application use through multiple choice application interfaces.

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