

ICT Investment Evaluation and Mobile Computing Business Support for Construction Site Operations



KTH School of Industrial
Engineering and Management

Alexander Löfgren

Project Communication

Department of Industrial Economics and Management

Royal Institute of Technology (KTH), Stockholm, Sweden

The 5th annual Mobility Roundtable conference

Helsinki, Finland

1 June, 2006

The ICT productivity paradox

“You can see the computer age everywhere but in the productivity statistics” (Solow, 1987)



KTH School of Industrial
Engineering and Management

- Investment lags
- Redistribution
- Mismeasurement
- Mismanagement

→ *“what gets measured gets managed” (Willcocks & Lester, 1996)*

Technological shortsightedness of ICT investments in firms



KTH School of Industrial
Engineering and Management

- Strong financial focus on ICT investments – ‘hard’ benefits
- Neglecting intangible benefits and the long-term performance perspective
- A narrow focus on improving the efficiency of current business activities instead of seizing the business innovation opportunities of the technology
- Immediate operational **benefit** vs. strategic business **value**

ICT investment evaluation approaches



KTH School of Industrial
Engineering and Management

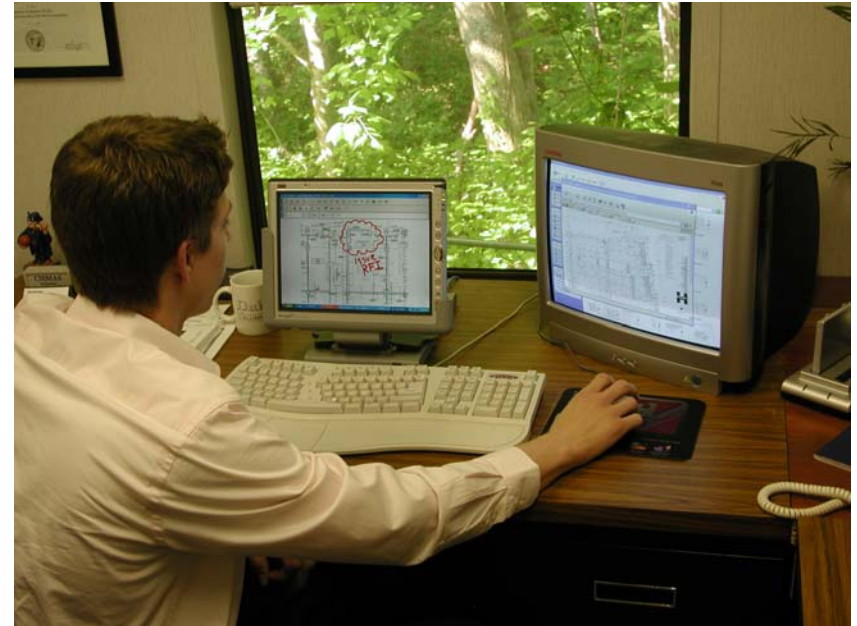
- Financial evaluation
 - Payback period (PP), Return on investment (ROI), Internal rate of return (IRR), Net present value (NPV), etc.
 - Focus on financially measurable operational efficiency
 - Leave out intangible benefits and improvement of business processes
 - Have an investment **appraisal** perspective rather than a complete technology life-cycle **evaluation** approach
- Integrated evaluation
 - Information economics (IE), Balanced scorecard (BSC), etc.
 - Combines quantitative and qualitative measures
 - Looks specifically at improving business processes and future orientation of an organization
 - No generic approach – case-by-case evaluation design

ICT mobility and construction: The information and communication dilemma of construction site management

- To be out on the production site
- To be at the computer



KTH School of Industrial
Engineering and Management



The dynamics of project communication in construction site operations



KTH School of Industrial
Engineering and Management

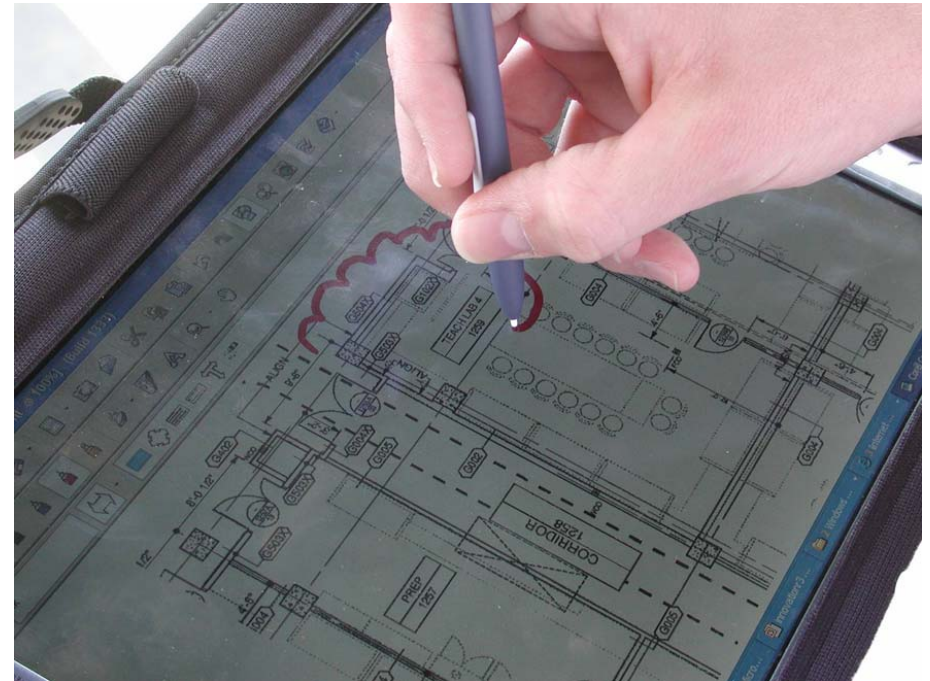
- Work **assignment** and **synchronization**
- Activity **planning** vs. real-time critical **adaptations**
- The role of **informal communication** in collaborative problem-solving
- Flexibility and **mobility** of information handling
- Need for an information technology for production management
A semi-structured mobile system for effective project communication

Mobile production management at construction sites: The Skanska case

- Extension of existing communication resources and information systems out on the site, making them mobile and flexible
- Simple approach: Tablet computers and WLAN connections
- Objective: ONE information and communication platform for production management



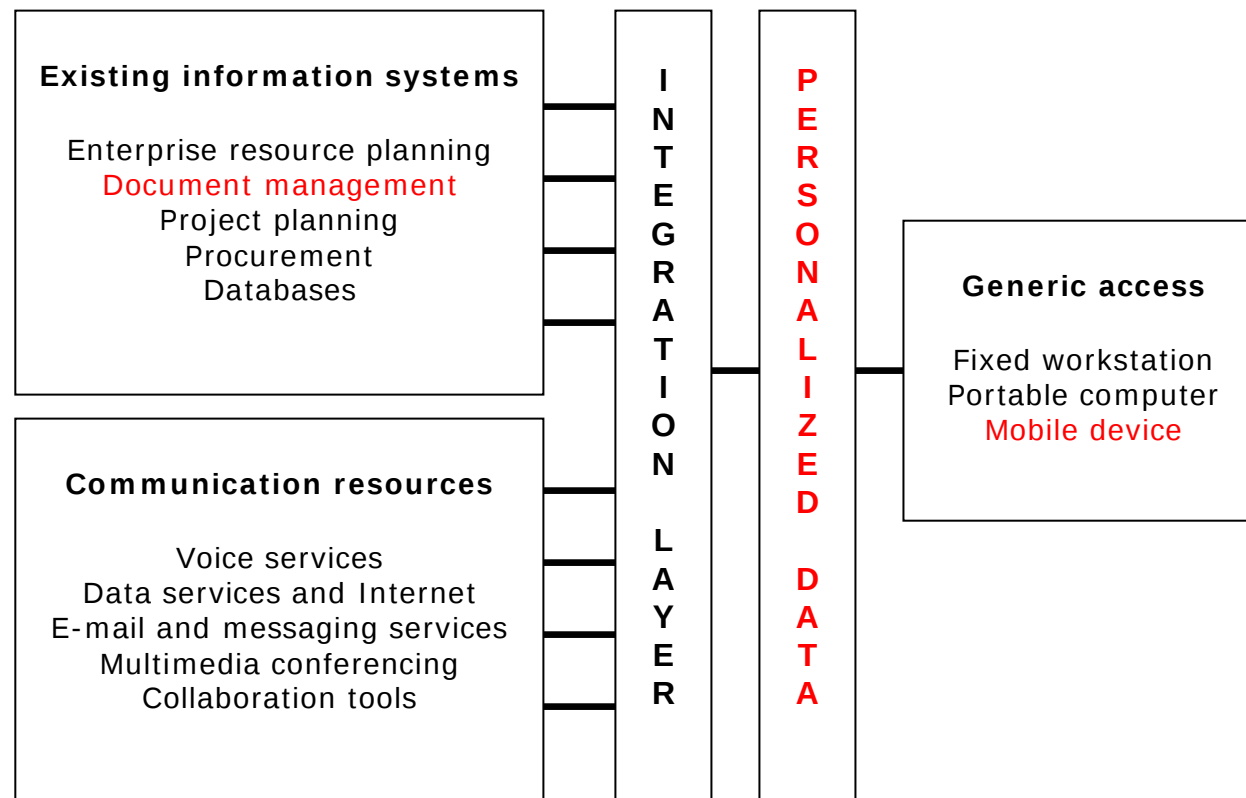
KTH School of Industrial
Engineering and Management



General system outline



KTH School of Industrial
Engineering and Management



Expected benefits of the 'on site' mobile computing platform



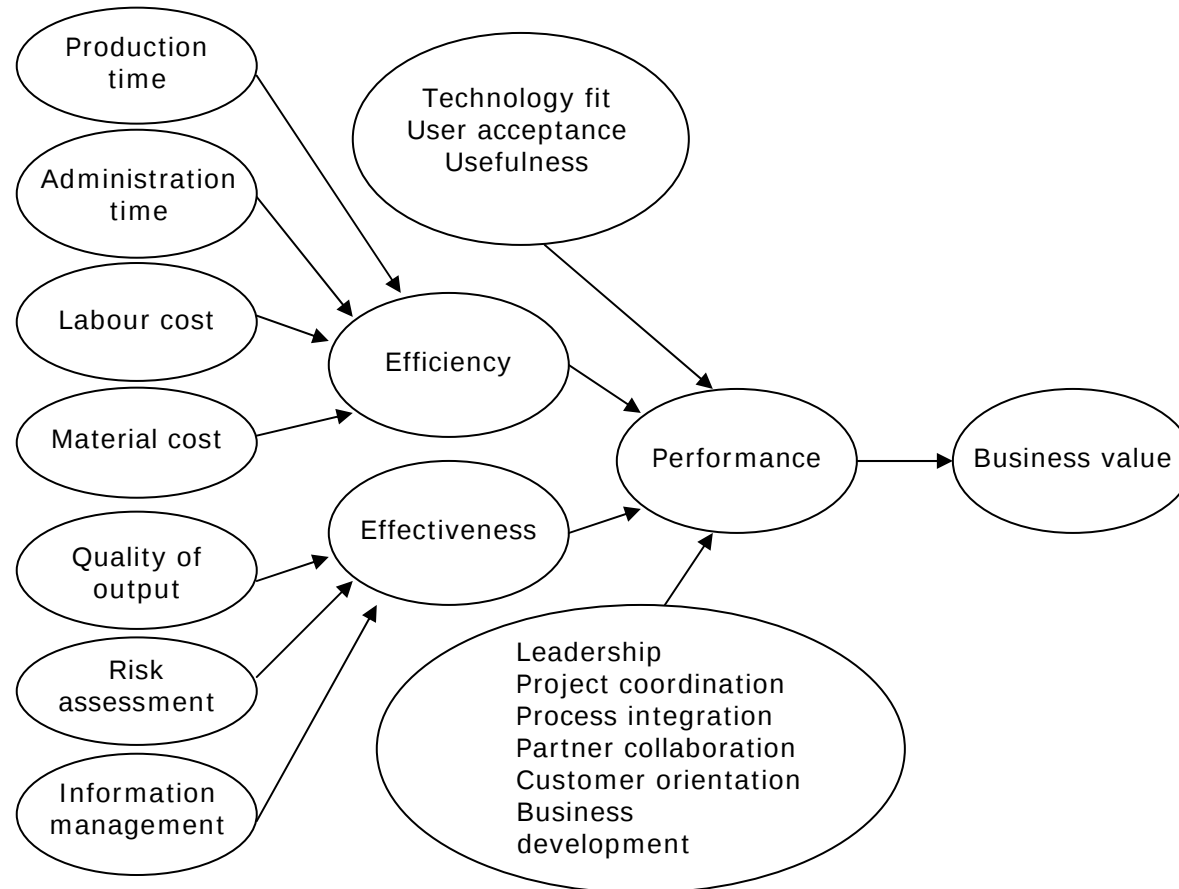
KTH School of Industrial
Engineering and Management

- Enable more effective on-site administration of construction activities
- Enhance real-time risk management and collaborative problem-solving in construction projects
- Facilitate improved on-site presence, involvement and leadership of production management
- Efficiency – 'doing things right'
- Effectiveness – 'doing the right things'
- Performance – 'doing better things better'

Benefit mapping – mobile computing at construction sites



KTH School of Industrial
Engineering and Management



The need for an integrated evaluation approach



KTH School of Industrial
Engineering and Management

- **Integrating** technology **implementation** with an on-going **evaluation** method - complementary view, life-cycle approach
- Creating an **implementation strategy** that tries to establish cause and effect relationships, mapping desired benefits and value to achieve.
- Including sufficient **generic outcome measures** as well as firm **specific performance drivers**.
- Identifying the **tangible** and **intangible** costs, benefits and business value of the investment.
- Seeking to link the evaluation model to **financial measures**, striving to translate improved operational ICT benefit and value to increased financial performance.
- **Risk analysis** and risk assessment – business impacts, probability of occurring and responding actions
- Understanding the **specificity of each case**. There are no generalized evaluation methods that suit all business organizations and all kinds of ICT investments.