What about the Benefits? A Missing Perspective in Software Engineering

10th International Symposium on Empirical Software Engineering and Measurement

Professor Joe Peppard
Ciudad Real, Spain | September 2016
ESMT’s quick facts

Founded: 2002

Purpose: Research-based, postgraduate professional school of management

Rankings:
- Full-time MBA:
  - FT 2016: 64th worldwide, Bloomberg
  - 2015: 15th worldwide, The Economist
  - 2015: 49th worldwide and 12th in Europe
- Executive MBA:
  - FT 2014: 30th worldwide, 13th in Europe
  - The Economist 2015: 8th worldwide
- Executive Education:
  - FT 2016: 12th worldwide, 8th in Europe, 1st in Germany

Accreditation:
- AACSB, AMBA, EQUIS, FIBAA

Executive education:
- Executive development programs in English and German
- Customized programs
- Postgraduate Diploma in Management
- Postgraduate Diploma in Advanced Management

Faculty:
- 34 faculty members from 18 nations
- > 40 visiting faculty

Degree programs:
- Full-time MBA
- Executive MBA
- Executive MBA MPA (starting 2016)
- Master’s in Management
- PhD program

Employees:
- > 150 (full-time equivalents)

Locations:
- ESMT Berlin Campus
- ESMT Berlin Campus Schloss Gracht, near Cologne
In Executive Education ESMT are number 12 worldwide, number 8 in Europe and number 1 in Germany – ranked between Stanford and the MIT

ESMT Berlin in the press

"The powerhouse of Europe.”

"A business school founded by business.”

"European MBA Programs: Hidden Gems.”

"Die Business School der deutschen Wirtschaft.”

"A reputation in the making.”
Where do I sit?

“Born digital”

- Software product companies
- Traditional media companies
- Logistics companies
- Banks, insurance companies
- Public administration, product companies, hospitals, lawyers, etc.

“Established analogue”
“You go to bed an industrial company – you wake up in the morning a software company.

“We believe that every industrial company will become a software company.”

Jeff Immelt, Chairman and CEO, GE
**Software is steering the car industry**

By John Gapper

**FINANCIAL TIMES**

19th February, 2015

**What about the Benefits?**

Google is building self-driving cars. But the benefits are for everyone.

Google is making self-driving cars. But the benefits are for everyone.

The idea is that they will be safer, cheaper and more efficient. They will also make it easier for people with disabilities to get around. But there is another benefit: they will change the way we think about cars and cities.

**INTELLIGENT CARS**

Google's cars are not just any cars. They are designed to be as smart as possible. They have computers and sensors that can detect other cars, traffic lights, and even pedestrians. They can also communicate with each other, so they can work together to avoid accidents.

**SAFER CARS**

Self-driving cars are safer because they can brake and accelerate much faster than human drivers. They can also react to events that are too quick for humans to notice, like a car suddenly coming out of traffic.

**CHEAPER CARS**

Self-driving cars will be cheaper to produce because they require less labor and materials. They will also be cheaper to own because there will be no need for insurance or maintenance.

**EFFICIENT CARS**

Self-driving cars will be more efficient because they can drive more efficiently than human drivers. They can also be programmed to drive in the most energy-efficient way.

**EFFECTIVE CARS**

Self-driving cars will be effective because they can help solve some of the most pressing problems of our time. They can help reduce traffic congestion, air pollution, and even improve public safety.

When the same thing happened in computers—the essence of the machine became hardware, because the hardware needs software and software needs hardware—there was a rush to buy new computers, even if the new computers were no better than the old ones.

The same thing is happening now in cars. There is no reason to believe that the cars being built today will be any better than the cars being built yesterday. But there is a rush to buy self-driving cars, even if the self-driving cars are no better than the non-self-driving cars.
One OEM response

BMW: ‘Our competitor is not Audi, Jaguar Land Rover or Mercedes but consumer electronics players’

BMW is internalising formerly outsourced IT operations to get better control of its digital footprint

By Margi Murphy | Computenworld UK | Published 13:39, 24 June 15
"The car will become a computer network on wheels - we want data security on every level."

"Bosch is a software company: 40,000 people work in R&D for mobility solutions, one third of them are software engineers"

V. Denner, CEO Bosch
Frankfurt Motor Show 2015
Where do I sit?

“Born digital”

- Software product companies
- Traditional media companies
- Logistics companies
- Banks, insurance companies
- Public administration, product companies, hospitals

“Established analogue”
Where do I sit?

Building great software

MEASUREMENT
• Meets spec (i.e. it works!)
• On time
• To budget

Delivering value for money

MEASUREMENT
• Benefits
Value for money from IT

Need to improve
Realisation of IT benefits

Current focus of attention
Reduce IT costs

This is where the problem lies!
The promise of technology to solve business problems
Magic Bullet Thesis

Technologists develop robust technology and shoot it at the problem and expect it to resolve problems, create the required change and penetrate users.
What the media reports...

Gartner: firms waste £351bn each year on ill-conceived IT projects

Labour's computer blunders cost £26bn

NHS scraps £90m EDS email contract

Supplier to sue health service for £11m compensation

Labor's computer blunders cost £26bn

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The relationship between IT (software) and business benefits
Benefits and change....

Benefits cannot be delivered without change ...

... change without benefits cannot be sustained
Despite the advances in technology...

**The Connected Business**

**Financial Times Special Report | Wednesday October 19, 2011**

It’s about information, not technology

Chief executives and chief financial officers are becoming more involved in IT decision-making, says Paul Taylor.

How much do company chief executives need to know about IT? Traditionally, many business leaders outside the technology sector have had only a limited understanding, preferring to rely on their IT departments and chief information officer (CIO).

According to a recent report by Booz & Co, the consultancy, the average age of chief executives is now about 51. That means that many grew up in the PC era and have witnessed the impact of technology on almost every part of business.

“Chief executives do need to know more about IT – but not the detail,” says Mark Rankino, a research fellow at Gartner, the IT consultancy.

“They need better understanding of how technology can improve the firm, but they can delegate a lot of the specifics.”

“For example, they need to understand how mobility, social networking or dynamic business process management could change the effectiveness or parts of their business models.”

Unfortunately, the consultancy’s latest survey of chief executives suggests that even this level of understanding is often lacking.
How will organizations choose to leverage information (data)

“The best way to put distance between you and the crowd, is to do an outstanding job with information. How you gather, manage, and use information will determine whether you win or lose.”

Bill Gates
Founder of Microsoft
Three different types of change

Strategic change (dependent on customer) → Impact on value proposition/business model

Organizational change (new processes and practices) → Impact on operating model

Cognitive change (how people work with data) → Impact on knowledge, understanding and learning

Executive + Information = Decision/insight

Executive + Better/more Information = Better decision/More insight
Reframing the challenge

Increasingly complex change that is both shaped and enabled by digital technologies

Digital Investments

Investments in Change
Satisfying the digital investment objective

**ORGANISATIONAL CONTEXT**

**CONTENT**
Software Functionality

**OUTCOME**
Business changes

**BENEFITS**
Positive outcomes

**INTENT**
Benefits
Investment objectives

- Enables
- Delivers
- Achieves
- Satisfies

**PROCESS OF CHANGE**
The process of organising and managing such that the potential benefits arising from the use of IT\* are actually realised

* It is a process which integrates the realization of benefits with change management and can be applied to all types of change programs as well as IT investments
Stages and activities of the Benefits Management Process

- Use the project team and other key stakeholders to identify any new benefits and initiate action to realise them.

- Formally assess whether the investment objectives and benefits were achieved.
- Initiate action to gain outstanding benefits still achievable.
- Identify lessons for other projects.

- Analyse the drivers to determine the objectives for the investment.
- Determine the types of benefits that will result by achieving the objectives and how they will be measured.
- Establish ownership of the benefits.
- Identify changes required and stakeholder implications.
- Develop outline case for investment.

- Finalise measurements of benefits and changes.
- Determine the change actions that will produce the improvements.
  - with accountable stakeholders and timescales.
- Do a risk assessment/analysis.
- Submit investment case for funding.

- Manage the change programmes – pursuing benefit delivery as well as technical implementation.

Potential for further benefits

Identify & structure benefits

Plan benefits realisation

Execute realisation plan

Review & evaluate results
(IT) Benefits Management toolset

Identify & structure benefits

Plan benefits realisation

Execute realisation plan

Review & evaluate results

Potential for further benefits

Driver Analysis

Benefits Dependency Network

Stakeholder Analysis

Risk Analysis

Post Investment Review

Project Report on Delivery Status

Business Case

Project Report on Costs & Benefits Status

Factor | Range
--- | ---
A.1 Business impact | 1 2 3 4 5
A.2 Degree (scale, scope, size) of change | 1 2 3 4 5
A.3 Pace of change | 1 2 3 4 5
A.4 Technology innovation | 1 2 3 4 5
A.5 Novelty of solution | 1 2 3 4 5
A.6 Clarity of vision | 1 2 3 4 5

Category A kind of change | 1 2 3 4 5

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Mapping and understanding how benefits will be achieved: the Benefits Dependency Network

- IT System
- Launch sales drive
- Attract new customers
- Improve marketing
- Increase productivity
- Reduce overheads
- Examine margins
- Increase sales vol.
- Reduce costs
- Improve margin
- Increase profits!
- Increase ROCE
Benefits dependency network: linking IT with benefits

IT System
Software Functionality
Enabling changes
Sustaining changes
Business benefits
Investment objectives

IT System
IT System
IT System

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Benefits dependency network: linking IT with benefits

To increase sales volume from new customers

To improve effectiveness of A&P spend

Reduce cost by avoiding waste on irrelevant customers

Increase response rate from A&P campaigns

Increased rate of follow-up of leads

Increased conversion rate to sales

Business benefits

Investment objectives

IT System

Software Functionality

Enabling changes

Sustaining changes

IT System

IT System

IT System

IT System
How to get the benefits....

- **Project management package**
- **Customer prospect database**
- **Campaign response tracking**
- **IS/IT Functionality**
- **Enabling changes**
- **Redefine customer segments**
- **Reduce marketing time on admin**
- **Introduce proj. mgmt for A&P campaigns**

**Measure outcome of campaign re. objectives**

- **Reduce cost by avoiding waste on irrelevant customers**
- **Increased rate of follow-up of leads**
- **Increased conversion rate to sales**

**Use database to improve targeting in segments**

- **Increase response rate from A&P campaigns**
- **Increased rate of follow-up of leads**
- **Increased conversion rate to sales**

**Measure outcome of campaign re. objectives**

- **Reduce cost by avoiding waste on irrelevant customers**
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**To increase sales volume from new customers**

**To improve effectiveness of A&P spend**

**Sustaining changes**

**Business benefits**

**Investment objectives**
Benefits Dependency Network – CRM investment

- Evidence of achievement
- Responsibility
- Timescales

- Introduce project management for all A&P campaigns
- Measure outcome of campaigns re objectives
- Identify most appropriate communication channels
- Reduced cost by avoiding waste on irrelevant customers

- Reduce staff time on administrative activities
- Database to target customers more effectively
- Co-ordinate sales and marketing activity in follow-up
- Increased response rate from A&P campaigns

- Redefine customer segments
- Realign sales activity with new customer segments
- Allocate sales time to potential high value leads
- Increased conversion rate of leads-to-orders

- Introduce new account management processes
- New sales staff incentives
- Use system to target sales activity/contact time
- Increase sales time with customers

- Release sales time from post-sales activity to pre-sales
- Measure outcome of campaigns re objectives
- Increase sales time with customers
- Use system to target sales activity/contact time

- Portable PCs for sales staff
- SW functionality
- Enabling changes

SW functionality

Enabling changes

Sustaining changes

Benefits

Investment

Objectives

- To improve the effectiveness of Advertising & promotion spend
- To increase sales value and volume from new customers

- New sales staff incentives
- Increased conversion rate of leads-to-orders
- Benefit owner
- Measures

- Evidence of achievement
- Responsibility
- Timescales

- Reduced cost by avoiding waste on irrelevant customers
- Increased response rate from A&P campaigns
- Increased rate of follow up leads

- Reduced cost by avoiding waste on irrelevant customers
- Increased response rate from A&P campaigns
- Increased rate of follow up leads

- Evidence of achievement
- Responsibility
- Timescales

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Example: X-Ray Booked Appointments Project

**Software Functionality**

- Initial training of GPs
- IT trainer in primary care
- National Standards for encryption / security
- User involvement and communication

**Enabling Changes**

- Security and Encryption
- Interface to medical records
- E-scheduling
- Adopt clinical governance best practice

**Sustaining Changes**

- Identify patients not booking
- Patient information service to support care
- X-rays to be read in 24/48 hours
- Referral protocols developed, reviewed and monitored

**Business Benefits**

- Reduced cost due to lack of referral letters/calls
- Improved GP’s ability to track patients - fewer enquiries
- Improved patient experience, choice, access and information
- Better clinical care
- Reduced inappropriate X-rays
- Reduced unit cost / X-ray due to less DNAs

**Investment Objectives**

- 100% electronic referrals
- Reduce rejection rate for inappropriate referrals
- Patients can arrange mutually convenient appointment
- Improve utilisation of X-ray department

12-Sep-16
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A Partial Benefit Dependency Network for an RFID Investment at a European Retailer

This exercise helped the company identify what it would need to do differently in order for its digital investment to be a success.

**Role of Technology**
- Cabling
- RFID tags
- Antennae
- RFID readers
- Integration with existing systems
- Design new packaging

**Enabling Organizational Changes**
- Redefine buying algorithms
- Supplier engagement
- New supplier agreements
- Supplier training/development
- Define EPC inlay size requirements
- “Smart shelves” in stores

**Sustaining Organizational Changes**
- Buyer demand forecasting
- Attach tags to products
- Dist. center inventory receiving processes
- Store receiving processes
- In-store operations processes
- In-store inventory management
- Eliminate checking of stock

**Objectives and Expected Benefits**
- Reduced buying volumes
- Improved working capital
- Increased sales
- Reduced cost of markdowns
- Lower operational expense
- Improved merchandise planning
- Improved operational efficiency
- Improved inventory reduction
- Accurate inventory
- Better “track and trace”

**Business Drivers**
- “Always available” promise
- Multichannel enablement
- Return on capital employed

**Source:** Joe Peppard

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Promoting collaboration: the benefits and why wanted

- More efficient use of People’s time
- Speedier completion of business and admin processes
- Improved staff satisfaction
- Improved, speedier decision making
- People working effectively across org. boundaries
- Improved organisational knowledge and best practices
- Access to all documents and information required by role
- Reduction in online document storage costs
- Admin costs cut by 5% pa
- 3rd stream revenue increased to 30%

To improve collaboration between people, teams, depts and orgs
To improve /streamline business administration processes
To improve use, sharing and interchange of information and documents
Provide facilities for people to work more effectively with less effort
Cut administration costs
Increase 3rd stream income

- Poor collaboration across the organisation
- Inappropriate business admin processes
- Need to improve performance – work smarter not harder
- Poor access to, and poor ability to create documents & information
- Poor sharing of knowledge and best practice
- Treat information as a valuable product
- Commercially exploit intellectual capital and information products
- Provide access to documents and information on a 24x7 basis
- Reduce admin support costs
Collaboration: how to make the benefits happen

- Develop robust security, authorisation, and access procedures
- Develop culture to work across organisational boundaries
- Develop information sharing culture
- Delegation of approval processes
- Develop a consolidated structured information store
- Introduce document management and sharing facilities
- Develop a strategy and plans to manage the growth of structured information
- Introduce easy to use/change web based admin applications
- Introduce UKU wide document workflow management facilities
- Develop a knowledge and intellectual capital management strategy and architecture

Benefits:
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Promoting collaboration: the complete picture

Document repositories
- Develop a Data and Information Architecture
- Develop an Infrastructure Architecture
- Develop robust security, authorisation, and access procedures
- Introduce Document management and sharing facilities
- Develop Portal functionality for information/document access
- Develop a strategy and plans to manage the growth of structured information
- Introduce easy to use/change web based admin applications
- Introduce UKU wide document workflow management facilities
- Develop a knowledge and intellectual capital management strategy and architecture

Develop culture to work across organisational boundaries
- Develop Information sharing culture
- Delegation of approval processes
- Develop a self-service personal admin culture
- Manage information as a valuable resource
- Develop a document sharing, rather than a document copying, culture
- Use intellectual capital commercially
- Adopt a self-service "pull" approach, rather than "push" approach, to the use of documents and information

More efficient use of people’s time
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To improve collaboration between people, teams, depts. and orgs
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Drivers
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Business benefits
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Investment objectives
- To improve/streamline business administration processes
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- Increase 3rd stream income

IS/IT Functionality
- Enabling changes
- Sustaining changes

Drivers
- 12-Sep-16
- What about the Benefits? | ESEM 2016

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Benefits Dependency Network: summary

The benefits and why we want them

IT System

IT System

IT System

IT System

IS/IT Functionality

Enabling Changes

Sustaining changes

Business benefits

Investment objectives

DRIVERS
Benefits Dependency Network: summary

How new ways of working can deliver the benefits and how to make happen

IT System

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Business benefits

Investment objectives
How it all ties together: why a digital strategy is necessary

The Components

Portfolio
Are comprised of a selection of…

Programs
Are comprised of the necessary…

Projects

Helps the Enterprise to Bring About

Value
Manage investment decisions to optimise…

Benefits
Creates and enables…

New Capabilities
Lead to and enables…

Deliver to the enterprise…

Provide structure and focus to proactively manage achievement of……