CHATCHAI

KONGDACHUDOMKUL (Tee)

084-751-9857

ChatchaiK@PTTEP.com

WORK EXPERIENCES

24 years: Oil & Gas

- **18** (Present) — PTTEP
- **6** — Shell

9 years: Overseas

Areas of Expertise

- Petroleum Production
- Project Commissioning
- Well Engineering
- Drilling Operations
- Strategic Operations Planning
- Transformation

Work Environments

ACHIEVEMENT

- U.S. Patent; DeepLift™
- International Papers; SPE, IADC
- International Awards; S&P Global Energy
- National Awards; SPE, Found. Promotion Science-Tech

CONTRIBUTIONS TO COMMUNITY

- Advisory Board to AIBP; ASEAN Innovation Business Platform
- Technical Program Committee; SPE, IADC, NSTDA IoT
- Guest Lecturer; DMF Drilling School, TPTI
- Knowledge Sharing Speaker; EGAT, PTT, IRPC, GPSC, etc

PTTEP | ENTERPRISE

Digital Transformation towards Competitive Performance and Sustainable Future

PTTEP

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“ComMunication is CrUcial”

DIGITAL TRANSFORMATION

PTTEP

Purpose

Value

Benefit

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SDG & ESG

SDG Mapped Against Environmental, Social, and Governance Categories

PTTEP Digital Solutions Thriving ESG Value for Thailand Energy Sustainability

PTTEP

Environment Portal

Robotic Subsea IRM

Oil Field EIA

Pipeline Integrity Management

iSSHE

Online Barrier

GRC One Platform

Risk Intelligence Management

iBCM

VUCA → BANI

BUSINESS
CHANGE LINEAR

PTTEP
COVID-19
Economic Collapse
Oil Price Crisis
Emerging Technologies
& Energy Transition
OIL

Energy Partner of Choice - PTTEP

PTTEP

1 From JV to Operator

2 International Expansion

3 Maintain Performance during Oil Price Crisis

4 Grow New Foundation for PTTEP's Sustainability

Ready to Regional & International Supplier ESG & Energy Transition

From GOOD…… To GREAT

PTTEP

TRANSFORMATION…
Enabled us to withstand the challenge…

… TRANSFORMATION will enable us to ride disruptive waves

STRONG
STABLE
EFFICIENT

AGILE
RESILIENT
PREPARED

PAST – SURVIVAL MODE

FUTURE – ADAPTIVE MODE

ENTERPRISE Transformation

Digital Transformation

+ Digital acceleration & Scale up

Efficiency improvement for long term through digital initiatives

New Normal Transformation

New way of working

+ COVID19 and Oil price

Organization Transformation

+ People and Process

Change Mindset & One Team One Goal

People capability and Process improvement

มหาวิทยาลัยเชียงใหม่
Chiang Mai University

In collaboration with
Deloitte University Press

Strategy, not Technology, Drives Digital Transformation

Becoming a digitally mature enterprise

"…"

Cited 1,001

Sector	Digital maturity[1]	Digital technologies enable employees to work better with:[2] Customers	Partners	Employees	Select digital qualities[2] Clear strategy	Strategy to transform	Skills provided	Manager encourages use	Leaders have skills
IT and Technology	6.23	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5
Telecommunications	5.89	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5
Entertainment, Media	5.49	Top 5	Top 5		Top 5	Top 5	Top 5	Top 5	Top 5
Professional Services	5.39		Top 5		Top 5		Top 5	Top 5	Top 5
Transportation, Tourism	5.18	Top 5		Top 5		Top 5		Top 5	
FSI – Asset Management	5.18	Bottom 5			Top 5		Top 5		Top 5
FSI – Banking	5.14			Bottom 5					
Retail	5.03	Top 5	Bottom 5			Top 5	Bottom 5		
Auto	5.01		Bottom 5			Bottom 5	Bottom 5	Bottom 5	
Pharma	5.00			Top 5					
Consumer Goods	4.90			Bottom 5			Bottom 5		Bottom 5
FSI – Insurance	4.80	Bottom 5	Bottom 5	Bottom 5					
Education	4.71				Bottom 5				Bottom 5
Oil & Gas	4.68	Bottom 5				Bottom 5		Bottom 5	
Health Care Provider	4.67		Bottom 5	Bottom 5	Bottom 5		Bottom 5	Bottom 5	
Manufacturing	4.54	Bottom 5	Bottom 5	Bottom 5	Bottom 5	Bottom 5		Bottom 5	Bottom 5
Public Sector – Federal	4.51	Bottom 5			Bottom 5	Bottom 5	Bottom 5	Bottom 5	Bottom 5
Construction and Real Estate	4.50		Top 5	Top 5	Bottom 5	Bottom 5			Bottom 5

1. Digital maturity is calculated as the average maturity of responses from a given sector. Respondents were asked to rate their organization's digital maturity on a 10-point scale with 1 being least mature and 10 being most mature.

2. Correspond to specific survey questions in the study. Percentage of respondents who agree/strongly agree their organization has the relevant digital skills or capabilities.

Type of Innovation

IMPACT ON THE MARKET

Sustaining A significant improvement on a product that aims to sustain the position in an existing market.	**Disruptive** Technology or new business model that disrupts the existing market.
Incremental Gradual, continuous improvements on existing products and services.	**Radical** Technological breakthrough that transforms industries, often creates a new market.

LOW — TECHNOLOGY NEWNESS — HIGH

Benefits

PTTEP

Cash Benefits

VS

Non-Cash Benefits

VS

Investment

Digital Transformation Benefit vs Cost

Cash Benefit: Cost reduction in current and future years, Revenue uplift in current and future years
Non-cash Benefit: Cost avoidance, Manpower Optimization

ROI	2	4.3	5.8	5

5X ROI

Non - cash

Cash

Cost Avoidance

Maintenance:
- Avoid unplanned shutdown *(Predictive Maintenance)*
- Maximize pipeline performance *(PIMs)*

Revenue Uplift

Offshore operation:
- Increase condensate production *(APEX)*

Cost Reduction

Offshore operation:
- Maximize hydrocarbon resources *(WHP location optimizer)*
- Optimize FDP for project NPV *(GoT iFDP)*

Drilling:
- Optimize well cost *(Discovery, Chatbot)*

Maintenance: Optimize maintenance cost and preventive Maintenance plan *(MIT)*

PTTEP Digital Acceleration Index (DAI)

- Often unclear vision
- Isolated initiatives
- Organization not yet digitally enabling

- Clear vision/strategy
- Roadmap defined
- Digitally enabling governance in place

- Key digital capabilities
- Digitalized processes
- Strong digital mindset and agile culture

- Digital visionaries
- Pure digital business
- Most revenue from dig. business models

Source: PTTEP DAI Survey Results 2019-2020, BCG DAI Assessment Database

TOPUNIVERSITIES

QS World University Rankings

QS World University Rankings | World | 2022

Keyword: Thailand

Search

Results **1** - **8** of **8**

QS World University Rankings 2022

	World Rank	Institution	Country
1	215	Chulalongkorn University	
2	255	Mahidol University	
3	601-650	Chiang Mai University	
4	601-650	Thammasat University	
5	801-1000	Kasetsart University	

UNIVERSITY

ในยุค Tecnology Disruption

ภาคธุรกิจเองก็ต้องปรับตัวอย่างมาก

ในขณะเดียวกันก็ต้องคิดเรื่องสิ่งแวดล้อมมากขึ้น

เพื่อความยั่งยืนขององค์กร

ในอนาคต.....อาชีพบางอาชีพจะหายไป อาชีพใหม่ๆจะเข้ามา

สถาบันการศึกษาก็ต้องปรับตัวให้ทัน

นายนพปฎล เดชอุดม

ประธานคณะผู้บริหารด้านความยั่งยืนองค์กร

เครือเจริญโภคภัณฑ์ (ซีพี)

www.yimwhanfamily.com

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UNIVERSITY
Yim Whan Family
• ความรู้มีวันหมดอายุ
• อีก 4-5 ปีเด็กจบใหม่จะตกงาน
• ตลาดผู้สูงอายุจะเติบโต 20-25%
• ทักษะ soft skill ยังคงสำคัญ
• เก่ง.....แต่พูดภาษาอังกฤษไม่ได้
ความเก่งหาย 50%
ศาสตราจารย์คลินิก เกียรติคุณ นายแพทย์อุดม คชินทร

World Economic Forum Future Skills

Top 10 skills of 2025

WORLD ECONOMIC FORUM

1 Analytical thinking and innovation
2 Active learning and learning strategies
3 Complex problem-solving
4 Critical thinking and analysis
5 Creativity, originality and initiative
6 Leadership and social influence
7 Technology use, monitoring and control
8 Technology design and programming
9 Resilience, stress tolerance and flexibility
10 Reasoning, problem-solving and ideation

Type of skill

- Problem-solving
- Self-management
- Working with people
- Technology use and development

Source: Future of Jobs Report 2020. World Economic Forum

Thailand 4.0 New S-Curve

STI & TIM

Cost Advantage
(Low-cost Country)

Knowledge-based Economy
(High-income Country)

1 Biological and Cultural Diversity

2 High-value Services

3 Advanced Technology Industries

OEM, ODM, OBM

Reference: Harris & Wonglimpiyarat (2019)
ยุทธศาสตร์การพัฒนาอุตสาหกรรมไทย4.0 ระย20 ปี (พ.ศ. 2560 -2579)
Ministry of Industry, Thailand

The Exponential Change

How to Think Exponentially and Better Predict the Future
By Alison E. Berman, Jason Dorrier and David J. Hill - Apr 05, 201658,011

The Age of Acceleration

Reference: Thomas Friedman, Thank You for Being late: An Optimist's Guide to Thriving in the Age of Accelerations

“

I think there is a world market for may be five computers.

”

- Thomas J. Watson

Chairman and CEO of IBM 1914-1956

1956

5MB

2005

128 MB

2014

128 GB

2016

360 TB

Change before you have to.

Jack Welch

quotefancy

WHY YOU NEED CHANGE

PTTEP

- Strategy
- Scope, DT only?
- Key Focus
- Roadmap

ENTERPRISE Transformation

Digital Transformation

+ Digital acceleration & Scale up

Efficiency improvement for long term through digital initiatives

New Normal Transformation

New way of working

+ COVID19 and Oil price

Organization Transformation

+ People and Process

Change Mindset & One Team One Goal

People capability and Process improvement

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Chiang Mai University

Transformation is one of the key enablers to achieve the HPO

PTTEP

2018 - 2020 | **2021 - 2023**

Digital Transformation (DT)

- Digital initiatives
- Cloud platform with Structured data

- Integrated digital solutions
- New advanced initiatives

100 MMUSD net benefit / year

5 Digital Platforms

Subsurface & Field Development | Asset Production (Offshore & Onshore) | Support Functions

Drilling & Well Services | Engineering & Maintenance

Organization Transformation (OT)

- One Team One Goal
- Mindset

- Innovative culture
- Digital citizen

1000 staff attended in 3 years

Digital Citizen

12 Bootcamps

Deliverables

- Data Analytics (A.I.)
- Visualization for Decision
- Digital Work Process

New Normal Transformation (NT)

- New way of working
- Spend Smart

- Cross-function process improvement
- Push the Limit (competitiveness)

100 MMUSD net benefit / year

3i

- **Increase** SPSM initiatives scale up — International assets (Malaysia, Myanmar)
- **Improve** cross-functional processes — Domestics assets (S1) & Corporate
- **Innovate** paradigm shift — Top tier functional units

HPO

through top-quartile work-cost efficiency with AI assisted operations

One of the key enablers for HPO

ENTERPRISE Transformation Focus

PTTEP

Organization

System

Process

Agile, Lean, Learning, Innovative,
Data-driven Organization

OT

Organization Transformation

DT

Digital Transformation

Digital Transformation Across E&P Value Chain

PTTEP

Engineering
- Improve engineering project & supply chain efficiency

Maintenance
- Increase machine reliability (predictive maintenance)

Cloud Platform
- Build data foundation platform

HR
- People analytic visualization for staff management

Finance & Accounting
- Automated invoice indexing, matching, and transaction recording
- Analytics and visualization for monthly performance review

Procurement & GRC
- GRC one platform including RM, BCM, IC, NC, and CG

- Reduction of hydrocarbon loss
- Condensate production maximization
- Advance analytics for well configuration optimization

Enhance drilling time and efficiency

Speed up subsurface data (seismic processing)

Digital Integration

PTTEP

23 Initiatives	21 Initiatives	25 Initiatives	23 Initiatives	31 Initiatives
Engineering & Maintenance	Subsurface & Field Development	Drilling & Well Services	Asset Production (Offshore & Onshore)	Support Functions

Consultant: IBM

- Integration conceptual design
- Integration deep dive
- Interfaces prioritization

Timeline: Jan. – May 2022

(Progress = 50%)

Consultants (under procurement process)

Timeline: May – Dec. 2022

Foundation

- Centralized API management gateway & application integration standard
- Modernized application framework & platform (DeLorean)
- Data governance & data lake for analytics
- Cloud Data platform
- Cyber security & data security
- Hybrid cloud platform & infrastructure

Legacy Systems

มหาวิทยาลัยเชียงใหม่

Digital Transformation Across E&P Value Chain

(Competitive Performance and Innovation for Long-term Value Creation)

PTTEP

Digital solutions

(30+ initiatives per year)

Build **data foundation platform**

Optimize **asset** performance (well and surface facility)

Increase **machine** reliability (predictive maintenance)

Enhance **drilling** time and efficiency

Speed up **subsurface** data (seismic processing)

Improve **engineering project** & **supply chain** efficiency

Results

$100+ Million/year net benefit (including work process efficiency improvement)

Digital Literate maturity level (DAI Digital Acceleration Index)

5x return on investment

Top-quartile work-cost efficiency

Key Enablers

Organization Transformation:
People, Process, Mindset, Capability

(mindset transformation camp, digital academy, design thinking, etc.)

ENTERPRISE Transformation Execution Focus

People, Culture & Mindset +

- Digital citizen
- Innovative culture
- Change mindset

+ Digital Solution

- Digital initiatives
- Initiative scale-up
- Integrated digital platform

+ Data Foundation

- Data governance
- Data architecture
- Data platform including open-source

ENTERPRISE Transformation Activities

DESIGN THINKING

Initiative Development

CAMP FOR CHANGE

DIGITAL CITIZEN BOOTCAMP

Digital Execution Roadmap

	2019 - 2020	2021 - 2022	2023 - 2024
Digital Initiatives	► **Digital initiatives** by function groups	► **Integrated** digital initiatives across function groups ► **New** digital initiatives	► **Full suite** digital solutions
Digital Infrastructure	► **Cloud platform** establishment	► **Standardized & Open** platform ► Enhanced IT **cyber security**	► **Global** infrastructure with advanced applications and features
Data	► **Shared** data access	► **Structured & Centralized** data governance	► **Data-driven** organization and **Digital citizen**

Aspiration

AI-assisted Operations

Fast and Reliable Infrastructure

(International standard)

- People
- Process
- Technology
- Ecosystem

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Chiang Mai University

Organization Structure, People, Team

- More flattening structure
- Decentralized decision-making
- Greater collaboration & coordination
- Faster knowledge transfer
- Collaboration / Teamwork / Networking
- Proactive approach
- Hyper-connected environment
- Horizontal communication
- Adaptability & Flexibility
- Speed & Agility
- Culture & Mindset

Table 1: Organizational models for digital transformation

The Tactical Model
Key Moto: Opportunism
Description: Operating units use digital technologies in order to achieve desired goals. Organizations that use this approach made significant investments in digital technology but they use this technology in one or few number of organizational units. This approach creates organizational silos, leads to non-coordinated approach and there is no real digital strategy.

The Centralization Model
Key Moto: Agenda setting
Description: Digital initiatives and ideas are centralized in one unit (usually named Digital unit) which operates and shares its resources with all operating units which need digital support. In this way organizational silos are broken down and priority initiatives for digital transformation are selected.

The Champion Model
Key Moto: Transformation
Description: Digital strategy is effectively communicated across all organizational units and is focused on key initiatives. The key goal is to share knowledge and possibilities regarding digital transformation across the entire organization.

The Business as Usual Model
Key Moto: Normality
Description: In this model, using digital technology is no longer something new and unusual, but it is something fully embedded in everyday working life. In such organization, each employee uses digital technologies in daily activities.

Source: Adapted from Sommerfeld, B., & Moise-Cheung, R. (2016)

Governance Structure, Role & Responsibility

- Data Scientists
- Data Architects
- Data Engineers
- Software Developers
- Data Management
- Agile Coaches

- Executive Sponsors
- Initiative Leads
- Cross Functional Engineers
- Functional Data Controllers
- Subject Matter Experts

- Information technology infrastructure
- Operational technology connectivity

We incubate Digital Innovation

Innovators
(Business Units)

Incubators
(ENTERPRISE)

PTTEP Innovation Incubation Model

TODAY
TO-BE
PTTEP
HOW
Empowerment, LEAN
ORGANIZATION, PROCESS & PEOPLE
LOW agility
EXPERIENCED based decision
FIXED mindset
SILO
MANUAL-based
Fragmented data
TECHNOLOGY
Enhanced
Data Analytic
Capability
Culture
Change
Digital
Initiatives
Google Cloud
ORGANIZATION, PROCESS & PEOPLE
AGILE organization
Data Driven based decision
GROWTH mindset
WINNING team
AUTOMATION-based
Real time, Single source
TECHNOLOGY
"When the HEART feels good, the HEAD plans & the HAND can do"

Digital Transformation Initiative Working Model

PTTEP

IDEAS

Pain point
+
Use Case
+
Business Impact

IDEATION

- Ideas Evaluation

- Executive Sponsor Endorsement
- CET

ACTIONS

PLANING

- Budget, AFE, PO
- Enterprise Architecture Review Board

- Executive Sponsor Approve
- CET, ODE, OMS

EXECUTION

- User Acceptance Test
- System Change & Security Review

- Initiative Lead
- ODE, OMS

OPERATION

- Benefits Evaluation

- CET, Business Unit

Common technologies applied across initiatives

Common Technologies	Tools/solutions under consideration
Data Visualization	tableau, Power BI, Google Data Studio, QlikView, Spotfire (TIBCO Software)
Big Data & Analytics	Programming language: python, C++, Java, R, sas BDMS: Spark + R, PySpark, Google Big Query, HIVE
Cognitive Computing (AI/ML/NLP)	ML solution: Spark MLlib, mahout, Google CloudML DL library: TensorFlow, H_2O.ai, Google AutoML, OpenCV
Others[1]	Internet of Things: , E-commerce: VROOZI Gamification: LSP, Cloud computing:

Potential benefits

Economies of scale

Sharing of licenses, common training across all employees, volume discounts

Build up of deep specialist skills

Enable staff to build up deep proficiency in one particular tool

User friendliness & familiarity

Management only need to access one application to view all types of data visualizations across PTTEP

1. Others include Internet of Things, Robotics, Blockchain, E-Commerce, Cloud Computing, Collaborative Platform, Online Platform, and Gamificaton. Analysis to be refined and verified by PTTEP BDE

Source: BCG Analysis

ENTERPRISE: High-Level Initiative Linkage

PTTEP

	Subsurface	Drilling	Production	Engineering	Maintenance	Support
Data Analytics	Amplify, Autorank	TA-TEP, True Offset, AFP Archer, Discovery, One Trip	G1&G2 Gas sales allocation and Rig planning optimizer, Archer, Smart Formation Pressure, MDT Prediction, iDCA, iGAS	Digital Survey, Cost Excellence	Predictive Maintenance	Support base, D-Sure, Payment Plus, Clean & Clear, Workforce Planning & People Analytics, Talent Game, iPredict, iLearn
Process Automation	RRIMS		Auto Well Proposal	Engineering Center		Happy FRIDAY
Search, Monitoring & Collaboration	Quick Match	Chatbot	S1 Reservoir Monitoring, Thailand Energy Market		Maintenance cockpit, AR for operation, Subsea IRM	The Jungle, Environment Portal, eMOC, Tech. scraping tool, Barrier Management, Digitalizing risk profile, Digitalizing Internal Audit
Data Foundation Initiatives	PANORAMA	WELL SAFVY	APEX, iFDP (on/off-shore)	Collaborate, EDC	MIT	One Procurement, Chain Link, One SSHE, We Connect, Jarvis
Data Lake	Subsurface data	Drilling data	Production data	Engineering data	Maintenance data	Enterprise data

DATA CENTER
On-Premise

CLOUD DATA PLATFORM
(Google Cloud)

(EDRMS)

Digital Linkage Across Initiatives

5 Digital Platforms

DEMO DAY

Expanding company-wide impact

70% of Staff Attended

ENTERPRISE Transformation Activities

PTTEP

DESIGN THINKING

Initiative Development

ENTERPRISE

CAMP FOR CHANGE

DIGITAL CITIZEN BOOTCAMP

Increase Innovators (Roger’s Curve)

PTTEP

ENTERPRISE

Digital Citizen

BUILD INNOVATION & DIGITAL CAPABILITIES

PTTEP | Microsoft | Google Cloud | NIDA WISDOM for Change | depa

Triple Helix Model + DCB

Source:
Etzkowitz (2004), Etzkowitz and Leydresdorff (1998, 2000)

Source:
Pharmapolis Innovative Pharmaceutical Cluster, University of Debrecen

Money ≠ Motive

Maslow Hierarchy of Needs Theory

PTTEP Official

YouTube

https://www.youtube.com/watch?v=TG4r8G-tuzE

https://www.youtube.com/watch?v=IWszPoA1_pY&t=22s

https://www.youtube.com/watch?v=6iUpgmIh1qQ

Digital Transformation Lesson Learned from Failure

- Leadership; lack of understanding, commitment, support, alignment
- Purpose; Unclear of goals, strategy
- Culture & Mindset; culture eats strategy for breakfast
- Alignment & Silo; management alignment and expectation, buy-in
- Etc.; focus only technology, communication, involvement, metrics

DT Failure: Culture / Mindset / Communication / Gaps

DT Failure: Culture / Mindset / Communication / Gaps

Change Management Model

PTTEP

- Transformation the journey
- Show your impact
- Let people tell your success

SPEED

EFFICIENCY

AGILITY

COLLABORATIVE

PRODUCT
45% is SALE!
Start Up
transportation
ENTREPRENEURIAL MINDSET

HAPPINESS

Digital Transformation Across E&P Value Chain

(Competitive Performance and Innovation for Long-term Value Creation)

PTTEP

Digital solutions

(30+ initiatives per year)

Build **data foundation platform**

Optimize **asset** performance (well and surface facility)

Increase **machine** reliability (predictive maintenance)

Enhance **drilling** time and efficiency

Speed up **subsurface** data (seismic processing)

Improve **engineering project** & **supply chain** efficiency

Results

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Key Enablers

Organization Transformation:
Mindset, Culture, Capability

(mindset transformation camp, digital academy, design thinking, etc.)

Digital Transformation Across E&P Value Chain

PTTEP

Engineering
- Improve engineering project & supply chain efficiency

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Cloud Platform
- Build data foundation platform

HR
- People analytic visualization for staff management

Finance & Accounting
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Digital Transformation

PTTEP

2019-2021

ONSHORE

EOR AI scale up dashboard
iFDP onshore
EIA database visualization dashboard
Reservoir Monitoring
S1 Monitoring
D-SURE
MMS+
iPOS
i-Gas
S1 Hookup dashboard
Well Condition Visualization
S1 Artificial lift dashboard
S1-Subsurface Information system
iDCA onshore
i-Pump
S1 DSQ + IAP + Official DSQ Dashboard

HQ

OSOG
IPM
Environment Portal
BCM Digitalization
Avatar
iSSHE
Data Lake
Digital Risk
Online Barrier
Powerful Budgeting
DAS Transformation
BTM Workflow
i-Board
Automated AR
AI for talent management & HR succession planning
Cash Forecasting
Workforce Data Analytic Dashboard
One Design
One Procurement
Journey The Mission
Cost Excellence
EDMS
Chain Link
Integration of Corporate Applications & Data with MY GCP
Cost Analytic
Jarvis

MYANMAR

Payment Plus Myanmar
iDCA Myanmar
APEX Myanmar surface bottle neck analysis
Zawtika Monitor
Zawtika FDP

OFFSHORE

Predictive Maintenance
Onetrip
GFDP
Smart Crude
TA-TEP
Drilling fluid system
APEX
Bit Forecaster
iDCA Offshore
PDS
Archer
Subsea IRM
Auto Well Proposal
Drilling Cost
SNIPER
iFDP offshore
Automated Petrophysics Well log
GoT DSQ + IAP
WAIT
Auto well planning
WHP Location optimization

All OPERATIONS

Discovery
Well configuration optimizer
nUWI
PIMS
MITS
Well Safvy
Maintenance cockpit
WARPBOT
WWIM
PDP Dashboard

PSB

Support Base

MALAYSIA

APM

100+

Digital Initiatives

100+

Million USD/year net benefit

High Impact Solutions for Thailand's Sustainable Energy Resources

(Digital Transformation Across Exploration & Production Value Chain)

PTTEP

Asset Production

Drilling & Construction

Subsurface

Maintenance

Asset Planning

APEX (Advanced Production Excellence)

Asset operations optimization tool analyzing 1500+ producing wells with CO_2, mercury, and arsenic impurities constraints for **minimum environmental impact** & maximum natural gas and condensate supply

Benefits

$10 Million/year from production uplift & cost reduction

TATEP (Text Analytics for Transition Erawan Project)

Cutting-edge technology of text analytics and RPA to analyze the challenging & huge unstructured data of 4,000 wells and 200,000 report pages in a few months

Benefits

Avoid the catastrophic risk of more than **$60 Million** from consequence of impaired well decommissioning and ensure the smooth transition of **natural gas supply for Thailand's energy security**

APFD (Advanced Petroleum Field Development)

AI technology integrating core value chain activities to advise the ultimate field development scenarios with **highest resources utilization and best economic condition**

Benefits

$22 Million/year from asset value maximization via wellhead platform no. reduction, pipeline layout optimization, and best-in-class offshore drilling well performance

AI-PM (Advanced Predictive Maintenance)

Predictive analytics to pre-alert critical machines' condition for offshore platform reliability, **continuity of gas supply, and country electricity blackout avoidance**

Benefits

$20 Million/year from unplanned equipment downtime & plant shutdown

PTTEP Digital Solutions Thriving ESG Value for Thailand Energy Sustainability

PTTEP

Environment Portal

Environment condition prediction system for protection and **reduction of environment harmful impacts** to stakeholders and societies

Robotic Subsea IRM

Automated robot for subsea inspections, repairs, and maintenance tasks on petroleum pipelines to **minimize severe pipeline leakage incidents** and **avoid country & corporate reputation damage**

Oil Field EIA

Sirikit field environmental data analytics system supporting EIA process to ensure **local health, environment, and their living quality**

Pipeline Integrity Management

Predictive pipeline integrity management system to ensure pipeline operational safety and reliability, and **prevent any unanticipated leakages or explosion consequences** to communities

iSSHE

The integrated Safety, Security, Health, and Environment system to ensure employees, contractors, and stakeholders of the safety standards under **zero work-related accidents**

Online Barrier

Digital alert system of all Safety Critical Elements for decision making and immediate actions to **avoid occurring of the Catastrophic Accident Events**

GRC One Platform

Integrated GRC system for executives' prompt decision making to ensure that all corporate activities exercise **under laws & regulations, with good governance control and business ethics**

Risk Intelligence Management

Risk intelligent management system to raise emerging & high risks with immediate mitigations for **business operational success, stakeholder value creation, and sustainability**

iBCM

Digitalized business continuity management system with real-time visualization, required actions, and **executives' instantaneous responses during critical business disruption**

Vision: "Energy Partner of Choice" through Competitive Performance and Innovation for Long-term Value Creation

PTTEP

Our Exploration & Production

40+ Projects

15 Countries

Corporate Performance

- Sales Volume **36%** BOE/Day increased from 2018
- Unit Cost **11%** reduction against 2018
- Net Income **8%** increased from 2018
- TRIS: **AAA** Rating

ENTERPRISE Transformation

From 2018

Digital Transformation

New Normal Transformation

Organization Transformation

Digital Transformation Success

100+ Digital Initiatives (Thailand & scale up to Myanmar & Malaysia)

1000+ Digital Citizen

Transformation Benefits

Result — **500+** MMUSD In 3 years (from 2019)

Target — **200+** MMUSD per year

International & National Awards

2019	2020	2020 & 2021	2021	2021
SPE International	SET AWARDS	S&P Global Platts Global Energy Awards	AIBP	Most Innovative MIKE Global Knowledge Enterprise
Digital Transformation Honorable Award	Best Innovation Company Award	Award of Excellence: Upstream Transformation (Finalist)	ASEAN Enterprise Innovation Award (Finalist)	Gold Level

Our Partners

depa, NIDA WISDOM for Change, Chulalongkorn University, Mahidol University, Thammasat University, King Mongkut's University of Technology Thonburi

Microsoft, IBM, KPMG, Google Cloud, HALLIBURTON, AI AND ROBOTICS VENTURES

20+ Developers/ Vendors

PRIME MINISTER'S

DIGITAL AWARDS 2021

Digital Organization of the Year 2021: PTTEP

Hall of Fame

Energy New Normal

- Cleaner Gas
- Carbon Reduction
- Future Energy

New Thing
New Way

Digital
Transformation

Bongkot & Erawan
Arthit, Onshore Asset

Malaysia, Myanmar,
Middle East, Algeria,
Mozambique and LNG

PTTEP

"ENERGY PARTNER OF CHOICE"

through Competitive Performance and
Innovation for Long-term Value Creation

Key Success & Key Takeaway

Transformation is a **journey**, let’s start….

BACK-UP

New S-Curve

New Business – Innovation, Technology, and Power

AI AND ROBOTICS VENTURES

Technology & Business

AI and Robotics Ventures

ROVULA

varuna

SKYLLER

CARIVA

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Our Key Projects as of 30 July 2021

15
Countries of operation

Note:
Gas-based project
Oil-based project
Exploration project

Asset value of 23.23 billion USD by region as of 30 June 2021

Find out more from the corporate website: Our Business

S&P Global Platts
Global Energy Awards
2020 & 2021 Finalist

PTTEP Named Finalist in

Award of Excellence: Upstream Transformation for 2020 & 2021 S&P Global Platts Global Energy Awards

SPE Thailand E&P Awards 2019:
Digital Transformation Honorable Award

SET Award 2020:
Best Innovative Company Award

MIKE Award:
Most Innovative Knowledge Enterprise

Digital Transformation®

20% of leaders are not sure what to do when it comes to digital transformation
2018 Digital Transformation Index

40% of companies have a dedicated digital transformation team in place
2018 Digital Transformation Index

50% of companies contributed the success of their digital transformation strategy to their technology partners
2018 Digital Transformation Index

I-ology's 5 Stages of Digital Transformation

Traditional
- No KPI's
- No intergrated site
- No Strategy

Emerging
- Individual department strategies
- Verbal leadership support
- Mobile responsive site

Growth
- Emerging digital acquisition
- Quality based metrics by audience
- Partially Integrated Systems

Sophisticated
- Business aligned strategy
- Active leadership & investment
- Quantifiable ROI at project level

Fully Integrated
- Agile strategic approach
- Leadership is integrated into strategy
- Fully personalized user experience

I·ology®

3 Stages Digital Transformation Development Roadmap

Data Digitization, Processes Digitalization, Society

Digitization of Information

Moving from analog data (paper documents, records, IDs etc.) into digital form (files, scans).

Digitalization

Organizational processes supported by computer technology.

Digital Transformation

The total effect on society caused by digital changes (online presence, access, transparency, data privacy, security etc.)

Get these slides & icons at www.infoDiagram.com

Based on Wikipedia Digital Transformation article

DIGITAL TRANSFORMATION STRATEGY: THE WHAT, WHY AND WHO

Many executives feel like they have a good jigsaw puzzle that they have to finish, and they have a bunch of pieces but they don't know if they have all the pieces, and they don't know what the finished picture looks like (Professor Michael Wade)

What do "we" want to achieve?

- What is the long-term objective?
- What are intermediate objectives?
- What do we need to do first?
- What knowledge do we need?
- What needs to be connected?
- What skills do we have and need to do so?

Why do we want to transform and whom else do we need?

- Why did "we" see a need to transform?
- Who can validate this?
- Who do we need to involve?
- Who do we have and what capabilities do they have?
- What other capabilities do we need from whom?
- Who can connect what?

Who can help us with the "what"?

- Who can help with gathering insights?
- How do we bring various 'informers' together?
- How is the customer involved?
- Who does what? Who takes the lead for what?
- Have we involved the right 'external' parties?
- Who can help with the building blocks and barriers?
- What ecosystems can augment our goals?
- Who signs off the strategy, means and KPIs to achieve the what?

Quote source:
http://www.slideshare.net/CiscoBusinessInsights/future-of-it-podcast-digital-transformation-closing-the-gap-between-now-and-the-future

AI Multiple

Digital Transformation Framework

info@aimultiple.com

1 IDENTIFY	Identify digital transformation objectives
2 FORMULATE	Formulate a digital transformation strategy
3 TECH SELECTION	Decide on the necessary technologies enablers
4 LEADERSHIP	Establish competent technology leadership
5 DIGITAL CULTURE	Train the staff and integrate a digital culture among the organization

Source: ARC Advisory Group

Four Dimensions to Consider When Developing a Digital Transformation Strategy

High
Impact
Low
"Quick Wins"
"Major Projects"
"Fill Ins"
"Thankless Tasks"
Low
Effort
High

Short-Term Wins for
Long-Term Goals

Cited 600

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Digital transformation: A multidisciplinary reflection and research agenda☆

Peter C. Verhoef[a,*], Thijs Broekhuizen[a], Yakov Bart[b], Abhi Bhattacharya[a], John Qi Dong[a], Nicolai Fabian[a], Michael Haenlein[c]

[a] University of Groningen, Groningen, the Netherlands
[b] Northeastern University, Boston, United States
[c] ESCP Europe, Paris, France

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ABSTRACT

Digital transformation and resultant business model innovation have fundamentally altered consumers' expectations and behaviors, putting immense pressure on traditional firms, and disrupting numerous markets. Drawing on extant literature, we identify three stages of digital transformation: digitization, digitalization, and digital transformation. We identify and delineate growth strategies for digital firms as well as the assets and capabilities required in order to successfully transform digitally. We posit that digital transformation requires specific organizational structures and bears consequences for the metrics used to calibrate performance. Finally, we provide a research agenda to stimulate and guide future research on digital transformation.

Fig. 1. Flow Model for Discussion on Digital Transformation.

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DIGITAL TRANSFORMATION: CONCEPTUAL FRAMEWORK

Natalja VERINA, Jelena TITKO*

Ekonomikas un kulturas augstskola, Lomonosova Str. 1/5, LV1019, Riga, Latvia

**E-mail: jelena.titko@eka.edu.lv*

Abstract. *Purpose* – the main goal of the current research was to provide a deep understanding of the concept of digital transformation, specifying its key elements/components/categories.

Table 1. Definitions of the term "digital transformation" (source: authors' compilation)

Source	Definition
European Commission (2019)	"Digital transformation is characterized by a fusion of advanced technologies and the integration of physical and digital systems, the predominance of innovative business models and new processes, and the creation of smart products and services."
OECD (2018)	"Digital transformation refers to the economic and societal effects of digitization and digitalization. Digitization is the conversion of analog data and processes into a machine-readable format. Digitalization is the use of digital technologies and data as well as their interconnection which results in new or changes to existing activities."
Ismail, Khater, and Zaki (2017)	[Digital transformation is a] "process through which companies converge multiple new digital technologies, enhanced with ubiquitous connectivity, with the intention of reaching superior performance and sustained competitive advantage, by transforming multiple business dimensions, including the ***business model***, the ***customer experience*** (comprising digitally enabled products and services) and ***operations*** (comprising processes and decision-making), and simultaneously impacting ***people*** (including skills talent and culture) and ***networks*** (including the entire value system)."
Schwertner (2017)	"the application of technology to build new business models, processes, software and systems that result in more profitable revenue, greater competitive advantage, and higher efficiency."
Deloitte (2018)	"Digital transformation is the use of technology to radically improve the performance or reach of an organization. In a digitally transformed business, digital technologies enable improved processes, engaged talent, and new business models."
Bloomberg (2018)	"Digital transformation requires the organization to deal better with change overall, essentially making change a core competency as the enterprise becomes customer-driven end-to-end. Such agility will facilitate ongoing digitalization initiatives but should not be confused with them."

Figure 2. Vocabulary list for Hamlet (source: authors' development)

Figure 5. A conceptual model of digital transformation (source: authors' development)

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DIGITAL TRANSFORMATION MATURITY: A SYSTEMATIC REVIEW OF LITERATURE

Roman Teichert[1]

[1] Department of Management, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic

VIII: *Most common digital maturity areas identified in included studies (n = 22)*

Maturity area	Attributes & characteristics
Digital Culture	Attributes enhancing digital transformation efforts: risk-taking, test & learn, no-blame culture, customer centric, open to change, agile, autonomy of employees, ...
Technology	ICT, IT architecture/systems and new digitalization-based IT systems, agility of supporting systems, digital data processing, ...
Operations & Processes	Process digitization and automation, flexibility/agility of processes, bringing processes to an industrialized standard, operations excellence, ...
Digital Strategy	Development/execution of a strategy using digital technology to do business in fundamentally new ways, bold long-term orientation, linked to business strategy, I4.0 roadmap, ...
Organization	Management structure/practices supporting digital business, cross-functional collaboration, digital skills embedded throughout the organization, roles/tasks related to digitalization defined, adequate resource allocation, cross-functional teams to implement digital business priorities, flexible communities, agile management, ...
Digital Skills	Digital skills, expertise, experience and interest; personnel dedicated to I4.0, ICT competencies of employees, data empowered decision making, openness to new technologies, employees have access to digital skills/expertise as needed, ...
Innovation	Capabilities enabling a more flexible/agile way of working, development of disruptive business models, using agile methods, involving customer into innovation process, funding innovation, innovation conducted regularly, ...
Customer Insight & Experience	Customer benefit from digitization; personalization of products/services; utilizing digital services to engage customers; focus on customer value; digitization of customer touchpoints; creating value out of data, customer participation and empowerment, ...
Governance	Ensuring comprehensive/reliable execution of digital strategy; everyone has a mandate to think creatively and innovate, systematic approaches are taken to innovation/change management, engagement on different hierarchical levels, standards and regulations, adequate resource allocation, ...
Vision	Organization has defined an initial digital vision; digital technology realizes the vision of the organization; all staff work in sync with the digital vision, ...
Digital Ecosystem	The organization works as a part of a digital ecosystem; digitization/integration of vertical/horizontal value chains, digital connection with the business network (e.g. through API), interoperable technology platforms enable new/highly customizable solutions configured by end-users, ...
Leadership	Leadership team learning new technologies, leaders have a compelling long-term vision, leaders actively identify and realize new opportunities, foster collaboration, existence of central coordination for I4.0 or digital transformation, ...
Compliance & Security	IT security, digital security, IT compliance within organization and towards stakeholders, assessing risk factors, risk management, IP, optimizing value-chain network for compliance; avoid unauthorized access, ...
Products & Services	Smart products/services, digitization of product/service offerings, data analytics deployed for individualization, data-based services, digital features, ...
Business Model	Development of new and disruptive business models, integrated customer solutions across supply chain, digital product/service portfolio with SW, network (M2M) and data as key differentiator, digital initiatives are generating value, business models are expanding, ...

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DIGITAL TRANSFORMATION: DRIVERS, SUCCESS FACTORS, AND IMPLICATIONS

Research full-length paper

General Track

Osmundsen, Karen, Norwegian School of Economics, Norway, karen.osmundsen@nhh.no

Iden, Jon, Norwegian School of Economics, Norway, jon.iden@nhh.no

Bygstad, Bendik, University of Oslo, Norway, bendikby@ifi.uio.no

Pervasive and ubiquitous digitalization has brought new disruptive changes to the economy (Yoo, 2013), and environmental conditions are undergoing rapid change due to digital technology and digitalization (Hartl and Hess, 2017; Porter and Heppelmann, 2014). Digital technology, digital innovation, and digitalization are fundamentally altering business processes, products, services, and relationships (Karimi and Walter, 2015), and organizations need to fundamentally change the way they do business and employees' mindset, as well as restructure to survive (Hartl and Hess, 2017; Porter and Heppelmann, 2014). In other words, many organizations have undergone or are currently undergoing a digital transformation.

The concept digital transformation currently lacks a clear definition (Haffke, Kalgovas, and Benlian, 2016, 2017). However, researchers typically characterize digital transformation as a major organizational change driven by, built on, or enabled by digital technology, altering how business is conducted (Bilgeri, Wortmann, & Fleisch, 2017; Haffke et al., 2016, 2017; Hartl & Hess, 2017; Heilig, Schwarze, & Voß, 2017; Mueller & Renken, 2017). The concept digital transformation is often used interchangeably with concepts such as digitalization and digital innovation. However, although some similarities exist, it is important to distinguish the three to obtain a more informed dialogue based on a consistent use of terminology.

Figure 1. Conceptual model of digital transformation and related concepts.

Drivers and Objectives	Source Article ID
Drivers	
Customer behavior and expectations	8, 14, 18
Digital shifts in the industry	18
Changing competitive landscape	3, 5, 18
Regulative changes	18
Objectives	
Ensure digital readiness	18
Digitally enhance products	20
Embrace product innovation	18
Develop new business models	18, 20
Improve digital channels	15, 18, 19, 20
Increase customer satisfaction and dialogue	15, 18, 19, 20
Success factors	**Source Article ID**
A supportive organizational culture	9, 14
Well-managed transformation activities	18
Leverage external and internal knowledge	5, 11, 17, 19
Engage managers and employees	4, 5, 10, 13, 21
Grow IS capabilities	7
Develop dynamic capabilities	1, 16, 18
Develop a digital business strategy	2, 7, 8, 16
Align business and IS	2, 7, 8, 16
Implications	**Source Article ID**
Reformed IS organization	3, 5, 6, 14, 15, 19
New business models	11, 12, 20
Effects on outcome and performance	7

Table 2. Summary of findings.

Cited 118

Available online at www.sciencedirect.com

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51st CIRP Conference on Manufacturing Systems

Industrie 4.0 roadmap: Framework for digital transformation based on the concepts of capability maturity and alignment

Ahmad Issa[a,*], Bumin Hatiboglu[a], Andreas Bildstein[a], Thomas Bauernhansl[a]

[a]*Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Nobelstr. 12, 70569 Stuttgart, Germany*

* Corresponding author. Tel.: +49-711-970-1779 ; fax: +49-711-685-51858. *E-mail address:* ahmad.issa@ipa.fraunhofer.de

Abstract

Adopting digital transformation and Industrie 4.0 concepts is increasingly important for manufacturing companies acting in dynamic and competitive markets. In practice, however, these organizations struggle with implementing those concepts because Industrie 4.0 is rather a concept than a ready-to-implement solution. Additionally, its complexity hinders the achievement of successfully implementing Industrie 4.0 systems that truly incorporate all organizational aspects and levels. This paper introduces a framework to evaluate and guide Industrie 4.0 implementations, which build upon insights from capability maturity and alignment. Based on this, organizations can develop their own "roadmap" to increase the success of their Industrie 4.0 adoption.

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Chiang Mai University

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MIS Quarterly Executive

Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc.[1]

Rajiv Kohli
College of William & Mary (U.S.)

Shawn Johnson
Encana Oil & Gas (USA) Inc. (U.S.)

Executive Summary

Unlike digitally savvy banking and retail industries, oil and natural gas businesses are latecomers to digitization. With large capital investments in complex industrial operations, firms in latecomer industries are seeking ways to cut costs and become responsive to market demands. Executives in oil and natural gas companies are facing unprecedented pressure to cut costs due to market turbulence and need advice on how to undertake digitization; organizational changes needed; who should lead the digitization effort; and the role of the chief information officer (CIO) in executing a digital strategy.

DIGITIZATION IN LATECOMER FIRMS

Digitization has changed the way firms operate in many industries. Financial services underwent digital transformation in the 1990s, followed by retail and entertainment, and, more recently, the healthcare industry. Yet some industries, such as oil and natural gas, waste management and construction, have been slow to adopt digital technologies. We refer to these as *latecomer* industries. Although firms in latecomer industries have been automating operations and have digitized some administrative processes, such efforts have generally been local and segmented. In the healthcare industry, for example, localized automation occurred in laboratory, radiology and pharmacy services through best-of-breed information systems that, until recently, were not integrated. Once automation in these services was complete, it was possible for healthcare organizations to integrate various parts of their business and offer digital services such as online appointment scheduling by patients, remote access to patient health records and real-time emergency room wait times available via a website.

Latecomer industries include firms with specialized, complex industrial machinery involving large capital investments. These characteristics act as barriers to entry for other firms, which, when combined with cyclical product demand (e.g., commodities), create inertia in undertaking digital transformation—especially when firms are enjoying high profits. However, increasing market turbulence resulting from competition for resources, and stringent regulations, require senior managers to carefully evaluate digitization opportunities to control costs and to become more flexible.

MIS Quarterly Executive

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Options for Formulating a Digital Transformation Strategy

CIOs and other senior executives face the challenge of how to handle the opportunities and risks of digital transformation. To help managers address this challenge more systematically, we describe how three German media companies successfully approached digital transformation. Based on their experiences, we provide a list of 11 strategic questions and possible answers managers can use as guidelines when formulating a digital transformation strategy.[1]

Thomas Hess
Ludwig-Maximilians-Universität München
(Germany)

Christian Matt
Ludwig-Maximilians-Universität München
(Germany)

Alexander Benlian
Technische Universität Darmstadt
(Germany)

Florian Wiesböck
Ludwig-Maximilians-Universität München
(Germany)

Table 1: Overview of the Three Cases

	P7S1	Mittelbayerische	Ravensburger
Core business	TV broadcaster	News publisher	Board games and print publisher
Size	4,200 employees $2.9 billion (2014)	500 employees 110,000 units per day (2014)	1,600 employees €359 million (2013)
Headquarters	Munich (Germany)	Regensburg (Germany)	Ravensburg (Germany)
Founded	2000[11]	1945	1883
Market focus	Europe	Regional	Europe, U.S.
Digital transformation overview	From linear TV broadcasting to video-on-demand and online-gaming, and mergers & acquisitions	From print to digital publishing	From analog to digitally enhanced products (books, puzzles and games)
Start of digital transformation	2011	2010	2009
Digital transformation success	20% of revenues through digital business	Defense of market leadership through digital enrichment of analog core product	Digitally enriched products successfully stabilized core business
Organizational scope of digital transformation	Company-wide	Mostly products	Products and processes

11 P7S1 originated from the former Kirch Group, which was founded in 1955.

Table 6: Key Decisions for a Digital Transformation Strategy

Use of technologies					
1. Strategic role of IT?	Enabler			Supporter	
2. Technological ambition?	Innovator		Early adopter		Follower
Changes in value creation					
3. Degree of digital diversification?	Electronic sales channels	Cross-media	Enriched-media	Content platforms	Extended business
4. Revenue creation?	Paid content		Freemium	Advertising	Complementary products
5. Future main business scope?	Content creation	Content aggregation	Content distribution	Management of content platforms	Other
Structural changes					
6. Responsibility for digital transformation strategy?	Group CEO		CEO of business unit	Group CDO	Group CIO
7. Organizational positioning of new activities?	Integrated			Separated	
8. Focus of operational changes?	Products and services		Business processes		Skills
9. Building of competencies?	Internally		Partnerships	Company takeovers	External sourcing
Financial aspects					
10. Financial pressure on current core business?	Low		Medium		High
11. Financing of new activities?	Internal			External	

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FINDINGS FROM THE 2015 DIGITAL BUSINESS GLOBAL EXECUTIVE STUDY AND RESEARCH PROJECT

Strategy, not Technology, Drives Digital Transformation

Becoming a digitally mature enterprise

By Gerald C. Kane, Doug Palmer, Anh Nguyen Phillips, David Kiron and Natasha Buckley

FIGURE 1: To assess companies' digital maturity, we asked respondents to rate their company against an ideal organization — one transformed by digital technologies and capabilities — on a scale of 1 to 10. Three groups emerged: "early" (1–3), "developing" (4–6) and "maturing" (7–10).

FIGURE 2: While a lack of strategy hinders early and developing companies, security issues become a greater concern for maturing digital companies.

	Early (26%)	Developing (45%)	Maturing (29%)
Top Barriers by Maturity Stage	1. Lack of strategy	1. Too many priorities	1. Too many priorities
	2. Too many priorities	2. Lack of strategy	2. Security concerns
	3. Lack of management understanding	3. Insufficient tech skills	3. Insufficient tech skills

	EARLY	DEVELOPING	MATURING
Barriers	*Lack of strategy* More than half cite "lack of strategy" as a top-three barrier	*Managing distractions* Nearly half indicate "too many competing priorities" is a top-three barrier, "lack of strategy" still a challenge for one-third	*Security focus* Nearly 30% cite security as a top-three barrier; managing too many competing priorities remains a top concern for 38%
Strategy	*Customer and productivity driven* Approximately 80% cite focus on customer experience (CX) and efficiency growth	*Growing vision* CX and efficiency growth; over 70% cite focus on transformation, innovation and decision making	*Transformative vision* Over 87% cite focus on transformation, innovation and decision making
Culture	*Siloed* 34% collaborative; 26% innovative compared to competitors	*Integrating* 57% collaborative; 54% innovative compared to competitors	*Integrated and innovative* 81% collaborative; 83% innovative compared to competitors
Talent Development	*Tepid interest* 19% say their company provides resources to obtain digital skills	*Investing* 43% say their company provides resources to obtain digital skills	*Committed* 76% say their company provides resources to obtain digital skills
Leadership	*Lacking skills* 15% say leadership has sufficient digital skills	*Learning* 39% say leadership has sufficient digital skills	*Sophisticated* 76% say leadership has sufficient digital skills

1. Digital maturity is calculated as the average maturity of responses from a given sector. Respondents were asked to rate their organization's digital maturity on a 10-point scale with 1 being least mature and 10 being most mature.

2. Correspond to specific survey questions in the study. Percentage of respondents who agree/strongly agree their organization has the relevant digital skills or capabilities.

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