Student
International
Business Council

Spring 2018 Bosch Project
The University of Notre Dame

SIBC

- Student International Business Council
- Largest student-run organization on campus
- Amidst 27th academic year

"Peace Through Commerce"

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AGENDA: APRIL 20TH

1. Team & Project Introduction
2. Bosch & The Transformation Journey
3. Recommendations
    - A. Integrated Digital vs. Independent Digital
    - B. Insourcing vs. Acquisitions vs. Alliances
    - C. Innovation Center Push
4. Conclusion
5. Question & Answer

Bosch is in the midst of a digital transformation and with this would like to understand how other companies have made the shift from manufacturing-first companies to digital-first product-focused companies.

2) BOSCH & THE TRANSFORMATION JOURNEY

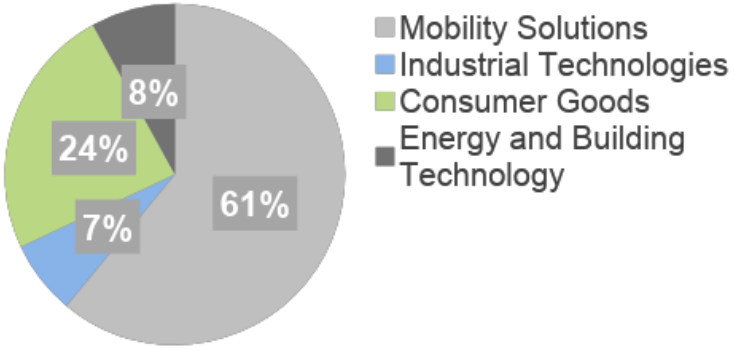
Bosch Overview

Bosch has four main business sectors that are focused on being innovative and digitally focused providers of goods and services

Company Objectives

- Deliver innovations for a connected life
- Play a major part in shaping the IoT
- Focus on environment & sustainability

Product Industries Sales



Main Sectors

Mobility Solutions
- Automotive Parts for OEM and Aftermarket
- Smart Transport
- Electrification

Industrial Technology
- Manufacturing equipment
- Packaging Tech
- Control Tech

Consumer Goods
- Appliances
- Power Tools
- Heating

Energy and Building Technology
- Surveillance and Security
- Building Management Systems

Sources: Bosch, Garberson.org

A Closer Look

Digital transformations are on the forefront of Bosch's mission, as they invest heavily in developing technology for commercial and residential applications

SWOT Analysis

Strengths

- High quality products
- International foothold
- Strong focus on R&D

Weaknesses

- Need to transform diesel departments
- Slower response to market demand

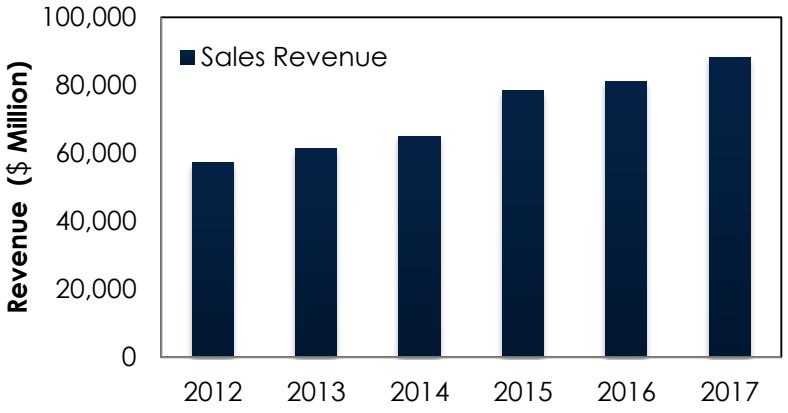
Opportunities

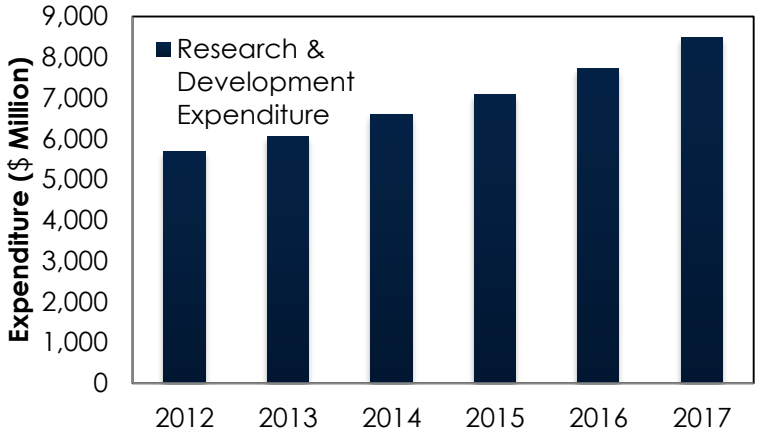
- New tech with high growth potential
- Increased demand for long-serving products

Threats

- New players in the automotive sector
- Transportation system changes in the coming decades

Recent Financial Performance





Sources: Bosch, Fortune, Economic Times

Bosch's Digital Transformation

In an industry where mobility is evolving, Bosch is digitally transforming in order to remain successful in the future

Recent Market Trends

Diesel engines held 48% of market in 2016; will decline to 36% of market in 2020

Battery costs down 73% from 2010; will decrease to record low in 2030

Goals to end internal combustion engine vehicle production

Digital Benefits

Makes lives of customers, citizens, or employees safer, easier, and more comfortable

Generates value through new business models and revenue streams

Improves the way of running a business through streamlining and automating processes

Transformation Plan

Clear Strategic Focus	• Aiming to web-enable all products
Full-Line IoT Provider	• Bosch's own IoT Cloud and IoT Suite
Open Platform Strategy	• Cooperation for best solution

Sources: Bosch and Deloitte

3) RECOMMENDATIONS

RECOMMENDATION OVERVIEW

A. Integrate Digital Into Business Unit

B. Utilize Insourcing and Partnerships

C. Make an Innovation Center Push

3A) INTEGRATED DIGITAL VS. INDEPENDENT DIGITAL

Bosch Digitalization Options

Bosch and CI need to evaluate their options and identify where to position the company relating to its digital transformation

Key Decisions

- Where the business should go
- Who will lead the effort
- How to sell the vision to key stakeholders
- **Where to position the firm within the digital ecosystem**
- How to decide during the transformation
- How to allocate funds rapidly and dynamically
- What to do when

Two Strategy Options

SIEMENS

Implementing digital into each business unit

Introducing a separate business unit that specifically tackles the digital transformation process

GE Digital

Sources: Bosch, McKinsey

Siemens' Plan: Integrated Digital

By creating a sound cloud platform and carefully selecting acquisitions, Siemens has set itself up for the digital future

Cloud Platform

- **MindSphere** – secure cloud infrastructure for IoT
  - Makes it possible to improve efficiency of plants and allows for rapid app development
  - Siemens plans to make all electronic products IoT-enabled by 2020

Digital Projects

- Personalized Healthcare (BioNTech, personalized cancer vaccines)
- Factory of the Future (digital optimization of machinery)
- Online Offshore (digital solutions for offshore rigs)

Defining Digitalization

2005
- Identified future business drivers

2007
- Acquisition of UGS Corp.

2008
- New corporate structure

2014
- New focus in Vision 2020

2015
- Acquisition of Dresser-Rand

2016
- Founding of Next47

2017
- Acquisition of Gamesa

Sources: Siemens, Siemens Press Release

Results of Siemens' Integration

Siemens' company-wide transformation is slow, yet it has proven be successful thus far

Digital Factory Benefits

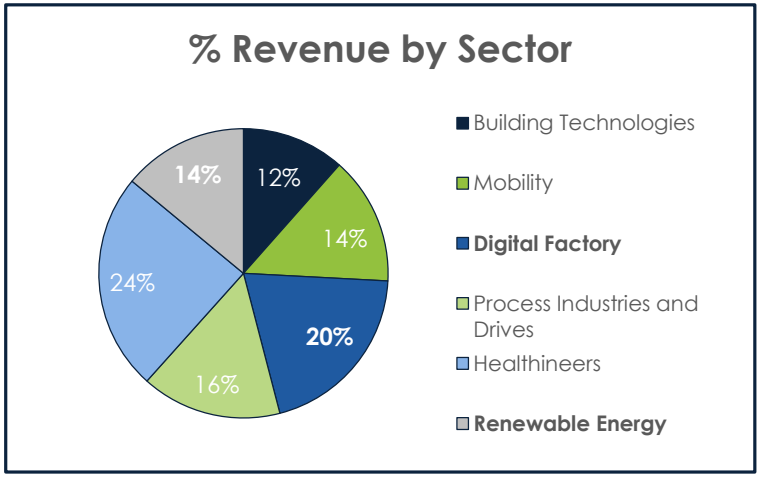
- Development times reduced by 40%
- More flexible to customer requirements

Reasons for Success

- Proceeding in cautious manner, especially with MindSphere
- Sticking closer to company roots
- Decentralized structure for decision making

Revenue by Sector

Sector	2016 Revenue ($ mil)	2017 Revenue ($ mil)	% Change
Building Technologies	6,956	7,241	5.96%
Mobility	8,842	8,990	3.50%
Digital Factory	**11,494**	**12,630**	**11.86%**
Process Industries and Drives	10,213	9,852	-1.79%
Healthineers	15,295	15,306	1.88%
Renewable Energy	**6,753**	**8,793**	**32.56%**



Sources: Autoblog, Reuters, digitaljournal, Siemens, Economist, Global/Handelsblatt, Advanced Manufacturing

Case Study: GE Background

GE created GE Digital as a separate entity with the goal of effectively consolidating their existing digital functions

The Plan

Formulation
Market trending towards cloud-based and Internet of Things related products

GE Digital

Mission
"A unified corporate organization—consolidating existing digital functions into a single organization"

Setup
GE Digital was established in California in 2015

PREDIX

- GE's software platform launched externally
- Extracts/uses data from industrial machines
- Increased efficiency, performance
- GE & Enel: used at 14 thermal plants for predictive diagnostics

Sources: Bosch, HBR

Case Study: GE Results

The core idea of creating a separate entity for a digital transformation failed here, due to the problem-solution model it created and its location far from the rest of the business

Problems

Communication	• Geography • Collaboration/innovation hindered
Problem-Solution Model	• Not streamlined • Waits for problems to arise before they're addressed
Not built for long term success	• Short term goals • Much of the revenue came from other GE sectors

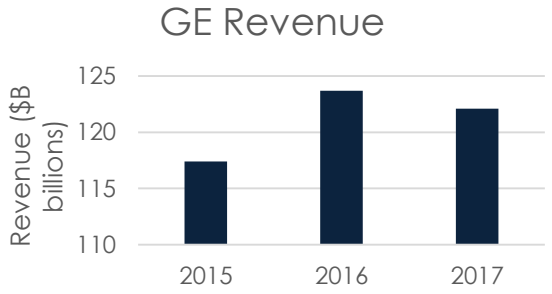
Fallout

CEO "resigned" in 2017

New CEO John Flannery has failed to get the company to bounce back

Reduced expectations

Expecting $3 billion less than originally predicted for 2020



Sources: Reuters, HBR, WSJ, GE, Inc.com

First Recommendation

Based on the results of GE and Siemens' digital transformations, we suggest that Bosch should avoid the separate entity model that GE implemented and focus on the horizontal integration of digital technology that Siemens has excelled with.

3B) INSOURCING VS. ACQUISITIONS VS. ALLIANCES

INSOURCING VS OUTSOURCING

Insourcing & Outsourcing

Large companies such as GE and General Motors have begun to make the switch towards insourcing, or using one's own personnel and resources to complete a job

INSOURCING:

- Talent needed, and specialized IT talent is hard to find.

-Costly

-Needs a drastic workplace environment change

OUTSOURCING:

- Possible loss of security or transparency

-Time needed to develop proper relationship with outsourced companies

-Less control of a company

Sources: Deloitte, ComputerWeekly, CIO, GE, General Motors, N-iX

GM's Digital Transformation

In the midst of a comeback, General Motors' announced plans to move from 90% outsourced to 90% insourced IT

Elements of the Transformation

Massive manpower insourcing
- More than 10,000 insourced IT pros hired
- Four new GM 'innovation centers' near IT incubators & universities

Data center and application consolidation
- 23 legacy data centers collapsed into two
- Retired 60% of 4,000-plus applications

Enterprise data warehouse (EDW) built
- More than 200 data marts consolidated into one EDW
- Holds production, customer, and all other data that was once scattered

Shadow IT Centralization
- Pulled thousands of "shadow IT" applications from under Global IT
- Redeveloped 70 brand websites

IT Overhaul

	2012	2017
Operations outsourced	90%	5%
In-house IT employees	1,400	11,500
Data centers	23 out-sourced	2 internal
Time spent on innovation	25%	80%

GM General Motors

Sources: Forbes, OracleVoice, Autonews, Fortune, informationweek

GE's Insourcing

GE's insourcing transformation was marked by a push from executives and involved all sectors of the company

Executive Push

- Ex-CEO Jeff Immelt recruited tech leaders & software engineers
- Immelt challenged every employee to learn to code

New Workplace Structure

- New tools and approach coined "Fast Works"
- New CDO for each major business
- New Digital Foundries to further talent & applications

GE recruited marketing talent to speak, analyze & sell digitally

Machine learning with business data: Partnership with TAMR data curation firm saved GE > $80 million

Acquired > $2 billion in startups:

- Wise.io: identifies trends in industrial sensor data

Sources: Deloitte, Wall Street Journal, Forbes, Fortune, GE

COMPANY ACQUISITIONS

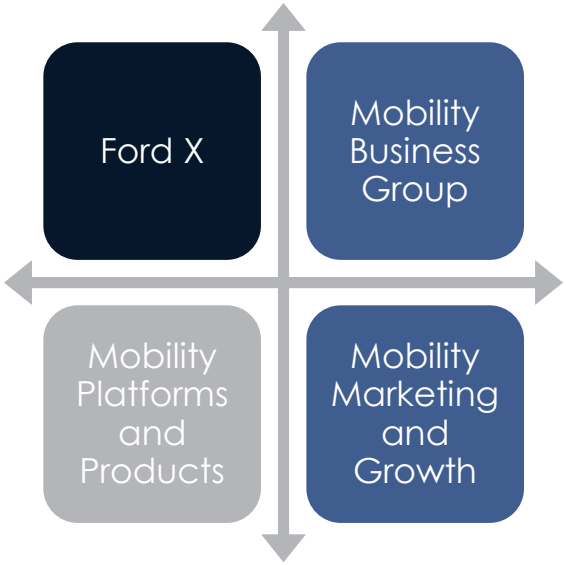
Ford Acquires New Talent

Ford's acquisition of TransLoc and Autonomic has given them resources to reconstruct their Mobility Initiative, but has also created a strong dependency on the start-ups

Ford's New Initiatives

Ford Smart Mobility	• Subsidiary of Ford Motor Company • Design and invest in new mobile services
TransLoc	• Helps cities manage transit services • Real-time tracking and response analysis
Autonomic	• Cloud platform for transportation • More sustainable transportation network

Realignment



Steps to Acquisition

1. Ford acquires two startup companies
2. Rebuilds Ford Smart Mobility Scheme around new acquisitions
3. Puts new hires from the companies to work
4. Dependencies from Fords need for the two new companies

Sources: TechCrunch, Fortune

Effects of Acquisition

The acquisition of new companies can lead to dependencies that negatively affect the culture and mission of the company

Ford's Need to Buy

Bad Investments
- Lost $299 million on investments in mobility services
- 2018 shares expected to decline from 2017

Rebuild
- New Ford Smart Mobility with TransLoc and Autonomic
- Specialize in transportation cloud

Dependencies
- Restructured Ford Smart Mobility around new companies
- Expect new employees to perform at the highest level

Downfalls of Acquisition

- Not enough resources from smaller companies
- Clash in corporate culture
- Increased debt if acquisition funded by borrowed money
- Approximately 50% of merger deals will fail

Sources: The Hartford, Reuters

COMPANY ALLIANCES

Alliances: Rockwell Automation

Bosch has already benefitted from its partnership with Rockwell Automation, and can further its digital transformation by utilizing Rockwell's newest technologies

Rockwell & Bosch: VersionWorks

Before	After
Central file server	Reduced workload for internal staff
Manually save programs	Direct access to central data management system
Delay between program creation and storage on central server	Easier maintenance
Potential overlaps	Safer machine optimization

Rockwell & Microsoft

2013: Rockwell began to outgrow capacity

Used Microsoft Azure to manage large data sets

Complex data orchestration with less programming → cut development time by 80%

Data processed ahead of customer demand instead of on-demand → cut costs by 90%

Five Core Alliances

FANUC

Microsoft

Endress+Hauser

CISCO

PANDUIT

Source: Rockwell Automation

Second Recommendation

We suggest that Bosch continue strengthening internal operations through insourcing while seeking alliances with other companies who are eager to accelerate their digital standing.

3C) INNOVATION CENTER PUSH

Waymo's Success by Innovation

Waymo, a subsidiary company of Google, has seen success implementing Google's innovation principles in a start-up environment in Silicon Valley

Timeline

2009: Building

- Launch self driving car program in R&D
- Identified in the market

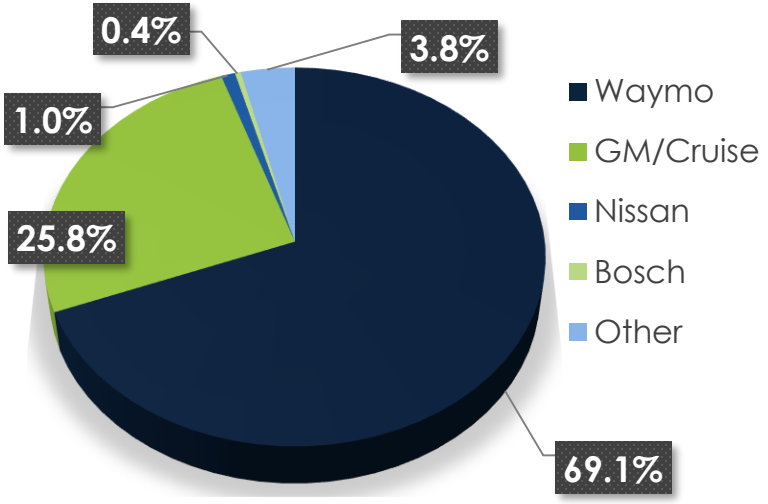
2015: Initial Release

- First ground-up model with no brakes or wheel

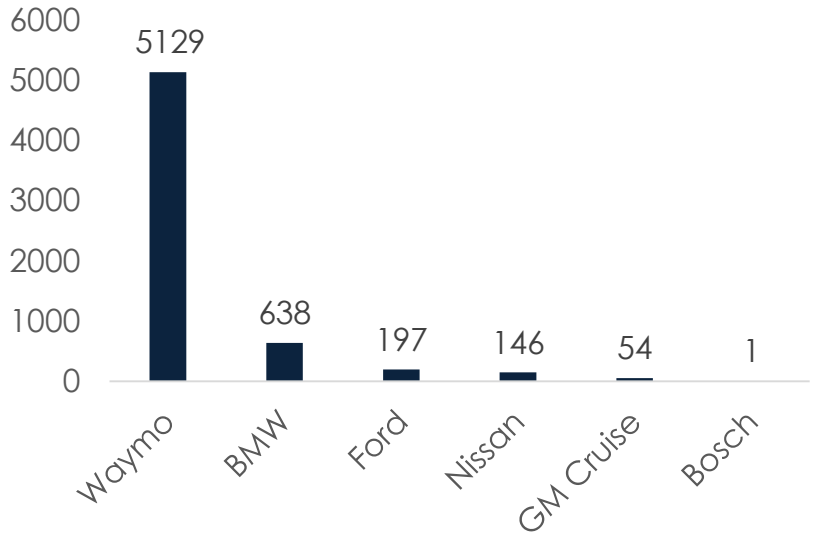
2016: Implementation

- Became subsidiary company
- Released first vehicle built in mass production with 'fully-integrated hardware suit'

Autonomous Miles Driven: CA 2016



Miles Driven per Disengagement 2016



Sources: McKinsey,Ford , BMW, Electrek,EuropeAutoNews, The Verge, Driverless World

Ford in Silicon Valley

Ford is expanding its Silicon Valley presence and accelerating development of technologies, putting the focus on getting it right instead of rushing to deliver

2015 Silicon Valley Expansion

- Research and Innovation Center opens in Palo Alto
- 150,000 sq. ft. of work and lab space
- 260 researchers, engineers, and scientists
- 40 start-ups in surrounding area

Priorities

- Lower cost, release capital, financially grow
- Connected, smart vehicles and services
- Re-allocated capital for the future

Actions

- Redesign focused on customers
- Collaborations
- 100% connectivity by 2019
- Lower volume passenger car lineup
- Increase investment in electrification

Mahindra Domino's POSTMATES lyft ZOTYE

Sources: Ford.com, Ford 2017 Annual Report, nytimes.com, fortune.com

Ford in Silicon Valley

While Ford's recent push into Silicon Valley has yet to reap significant financial benefits, there are clear factors necessitating this transformation

The Push

Ford auto sales drop 6.1% with 25% drop in passenger vehicle sales

Short Term: reset revenue and attack costs

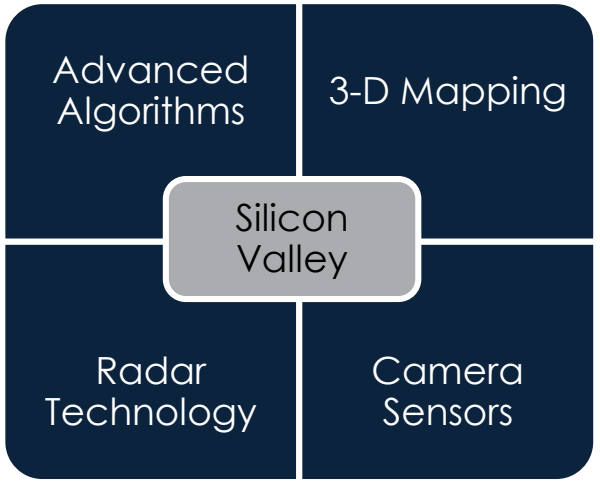
Long Term: redesign to compete in future

→ Hired Dragos Maciuca

"We went all in. It's not an outpost. We want to be part of the Silicon Valley ecosystem." -Ken Washington

RISKS

- Low Market Acceptance
- Defects & Recall Campaigns
- Increased Regulations
- Cybersecurity Risks



Sources: Ford.com, Ford 2017 Annual Report, nytimes.com, fortune.com

Walmart eCommerce

In order to grow in e-commerce, Walmart has invested in startups to embrace innovation and technology

Jet.com

One of the fastest growing and most innovative e-commerce startups in the US

Acquired by Walmart for $3.3 billion in 2016

Uses smart-cart technology to let customers see how they can save money on shipping and other costs as they build bigger baskets

Store No. 8

Silicon Valley-based ecommerce investment firm focused on incubating new startups in the US

Launched by Walmart in 2017

Strong focus on futuristic technology, such as in-store drones, beacon technology, and virtual reality (VR) enabled shopping

Sources: Walmart, Business Insider, eTail

Walmart eCommerce

Such investments have resulted in an innovative culture and an overall increase in e-commerce sales for Walmart

Benefits

Jet

- Made Walmart "Think Like a Startup"
- Acted as innovation pilot for Walmart

Store No. 8

- Successfully launched its first 3 startups
- "We can disrupt rather than have others disrupt us"

Financials

44% increase in e-commerce sales in 2017

Year-over-year growth in sales, by quarter in 2017

Sources: Walmart, Business Insider, eTail

Third Recommendation

Investment in innovation is important to companies' future survival amidst their digital transformations. Forming partnerships, being open to technologies, and having an organized plan are all key to this step.

4) CONCLUSION

Recommendation Summary

Integrated Digital

- Integrating a digital transformation horizontally across all of Bosch's entities will be the most successful path to transitioning their company towards the digital realm.

Insourcing and Alliances

- A combination of insourcing and creating alliances with companies already well established in the digital sector is the most cost and time effective move for Bosch to transition into the Internet of Things seamlessly.

Innovation Center Push

- Bosch should take the initiative to invest resources in Silicon Valley in order to jump start their transition into the world of technology.

5) QUESTION & ANSWER

THANK YOU!