Reasons for software failures

By Andrew Short

Introduction

Does any one know the failure rate for IT projects?

Introduction

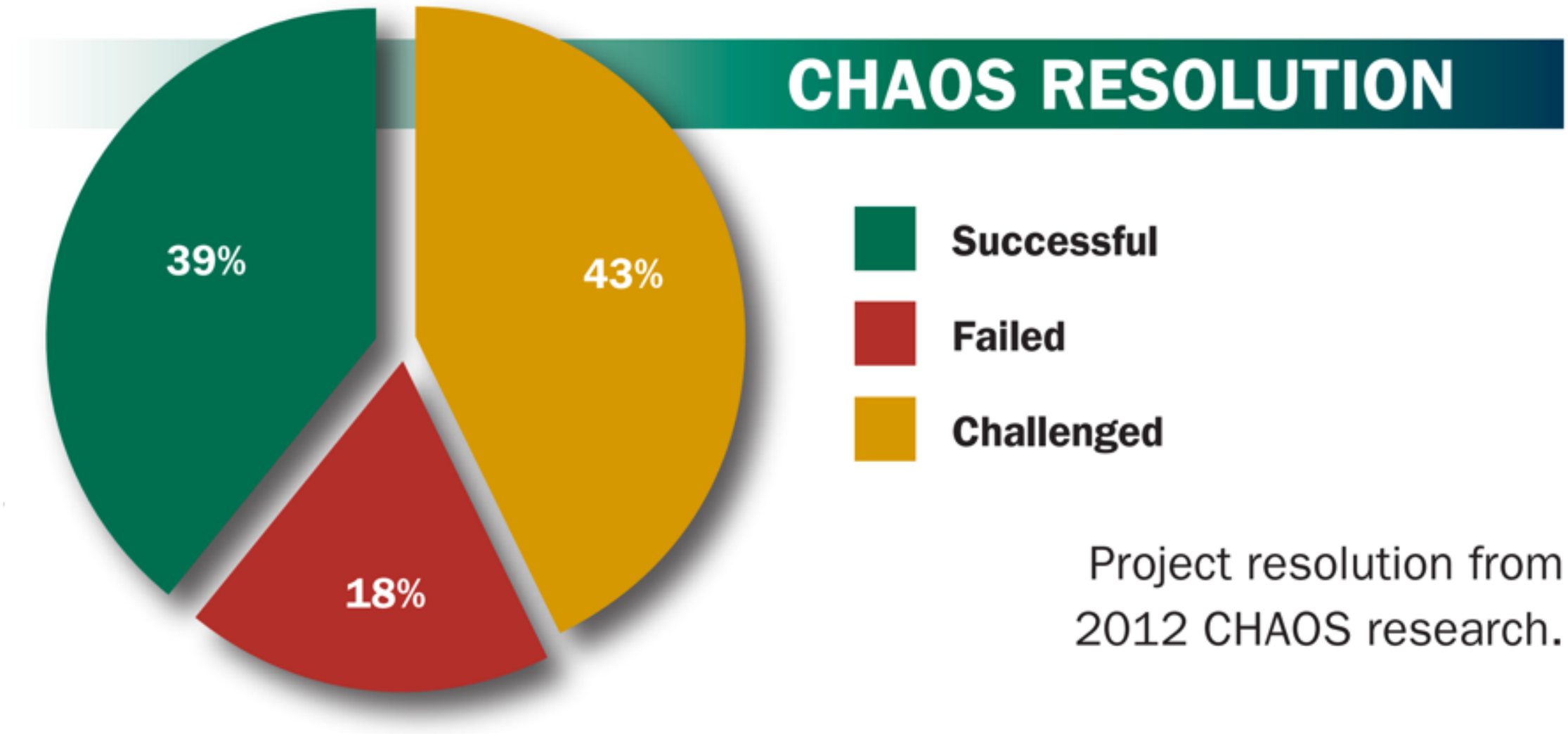
- Information system projects frequently **fail**. Some failure rates of **large projects** are reported as being between **~40% to 80%**.

  "*This is a catastrophe. As an industry we are failing at our jobs.*"

  Dr. Paul Dorsey

- Much of the research in the field is performed by the Standish Group in their CHAOS report, and Top 10 Reasons Why Systems Projects Fail by Paul Dorsey.

Project failure rates



Project resolution from
2012 CHAOS research.

Project failure rates

39% succeeded

Delivered on time, on budget, with required features and functions.

43% challenged

Late and/or over budget, and/or with less than the required features.

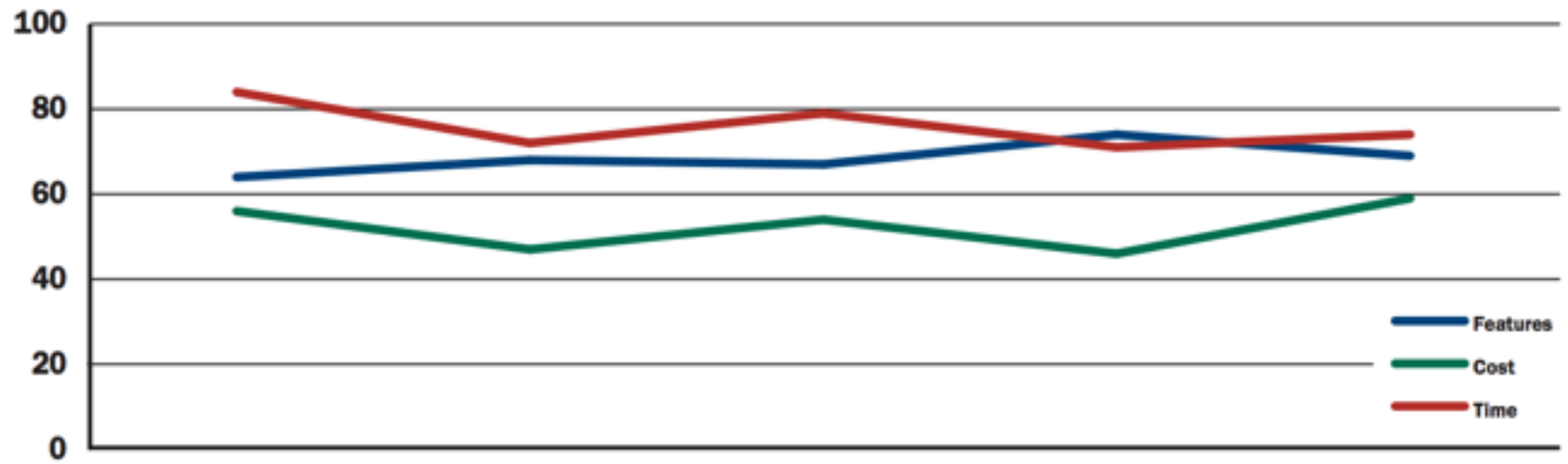
18% failed

Cancelled prior to completion or delivered and never used.

Reasons for failure

OVERRUNS AND FEATURES

Time and cost overruns, plus percentage of features delivered from CHAOS research for the years 2004 to 2012.



	2004	2006	2008	2010	2012
TIME	84%	72%	79%	71%	74%
COST	56%	47%	54%	46%	59%
FEATURES	64%	68%	67%	74%	69%

Reasons for failure

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TIME	84%	72%	79%	71%	74%
COST	56%	47%	54%	46%	59%
FEATURES	64%	68%	67%	74%	69%

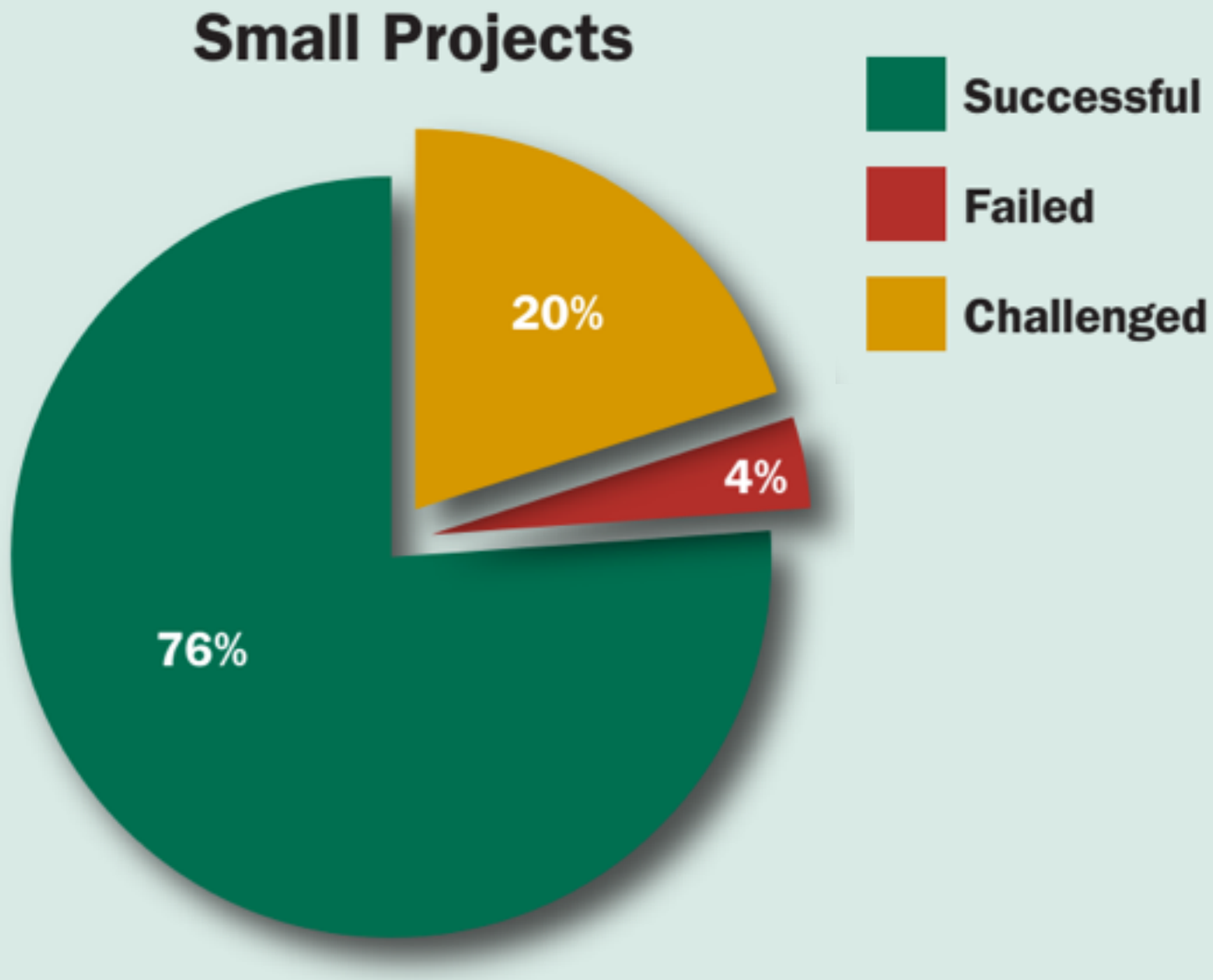
- About 10% in fluctuation in failure rates
- 20% of features are frequently used
- 50% of features are hardly ever or never used
- Reduction (74%-69%) in features seen as a good thing (focusing)

Failure rates by project size

Your turn to be asked questions….

Does any one know the failure rate for **SMALL** IT projects?

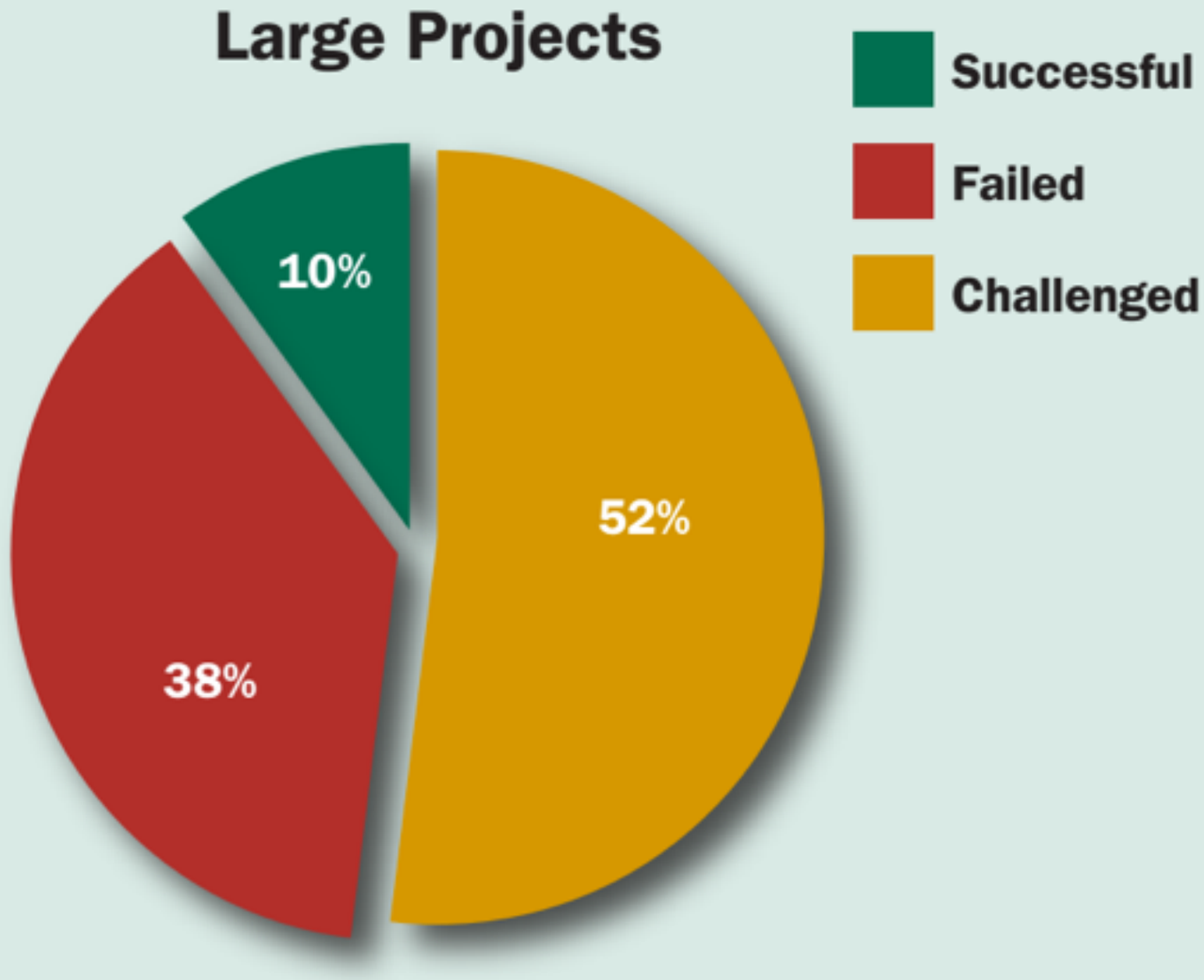
Failure rates by project size



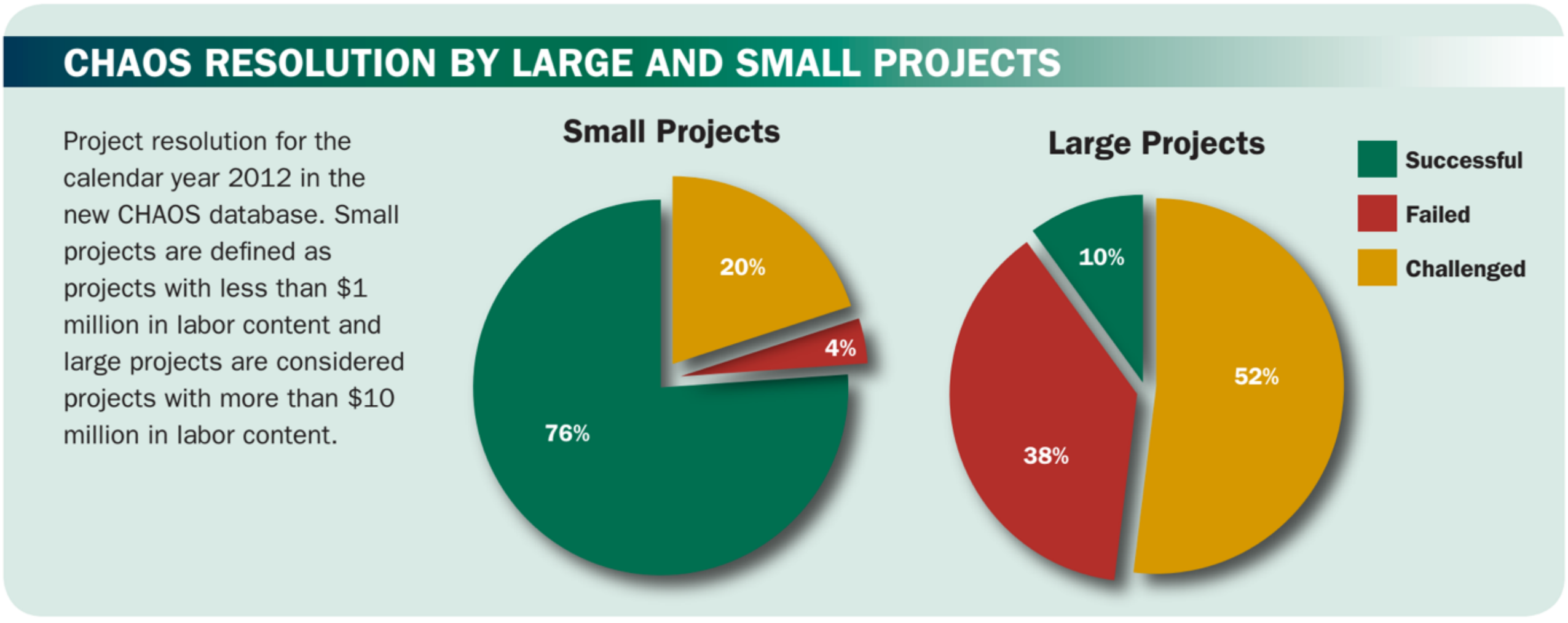
Failure rates by project size

Does any one know the failure rate for **LARGE** IT projects?

Failure rates by project size



Failure rates by project size



$1 million = ~€730,000

$10 million = ~€7.3 million

Failure factors

Project Plan

Key areas of failed project plans

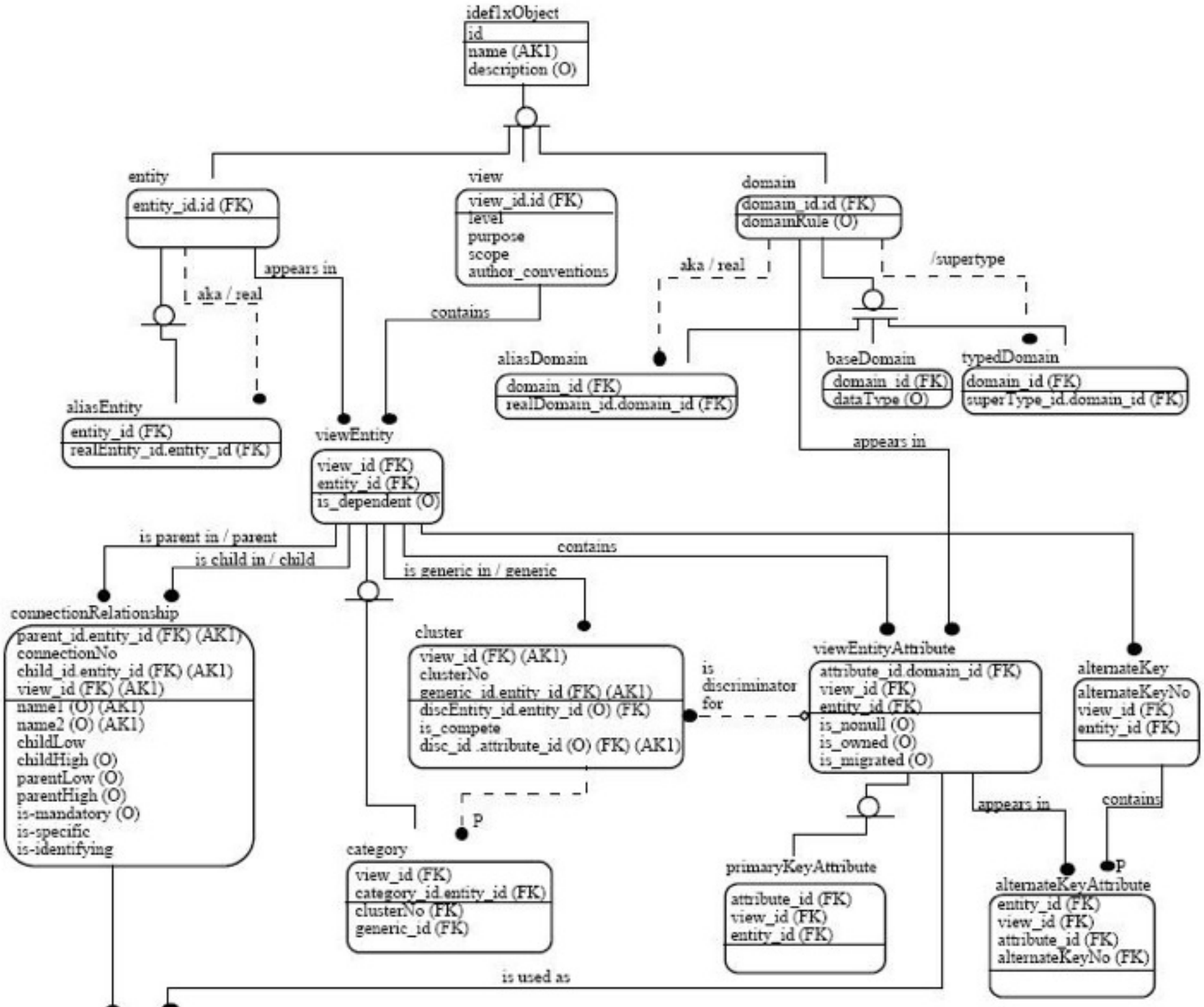
- Failure to perform careful analysis
- Failure to take data migration into account
- Failure to accurately assess the political climate of the organization
- Failure to enlist approval at all levels of the user community

Migrate data too late

"The data migration phase of a project can consume up to 30% of the total project resources."

Dr. Paul Dorsey

Data Models


idef1xObject
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name (AK1)
description (O)
entity
entity_id.id (FK)
view
view_id.id (FK)
level
purpose
scope
author_conventions
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domain_id.id (FK)
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aliasDomain
domain_id (FK)
realDomain_id.domain_id (FK)
baseDomain
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name2 (O) (AK1)
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childHigh (O)
parentLow (O)
parentHigh (O)
is-mandatory (O)
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appears in
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entity_id (FK)
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is used as

Data Models

We saw the data warehouse presentation the importance of planning you data structure

Its the core of the system which everything depends on.

Check your data models with an external source

Skip testing

- Not like testing a car in crash tests
- No system was ever created completely bug free
- Testing now saves time in the future
- We can only show the presence of bugs, not the absence

Buy and customise…
A lot

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A lot

"The only successful way for a commercial off-the-shelf (COTS) implementation to be successful is to decide at the outset that you are going to reengineer your business to fit the limitations of the COTS business to fit the limitations of the COTSbusiness to fit the limitations of the COTS package."

Dr. Paul Dorsey

NHS case study

- National Health Service (NHS) (≈ Sistema Nacional de Salud)
- UK, government run
- National Program for IT (NPfIT) 2002 - 2011
- Believed to be the largest IT healthcare system in the world
- >14 billion euros spent… 14,000,000,000!
- Designed to reform the way the NHS uses data

NHS case study

Leadership and management changes

- Main project leader left taking valuable expertise

Staff expressed usability concerns

- Users involved too late
- When finally involved they expressed serious concerns

Skills and capacity shortages

- Left inexperienced project leaders to take over

Complexity

- Failed to split the project into smaller tasks
- Goals were not achievable

FBI case study

- Federal Bureau of Investigation (FBI)
- US, government run
- Virtual Case File (VCF) 2000 - 2005
- Would replace several older software systems
- ~123 million euros spent… 123,000,000!
- Designed to modernise IT system

FBI case study

Leadership and management changes and expertise

- Lack of training, experience and micromanagement
- Contributed to specification problems
- Micromanagement of software developers

Users complained system was unusable

- Users involved too late

Lack of Skilled Resources

- Personnel who had little or no training
- Lack of training, experience and micromanagement

Missing clear objectives

- Requirements were continually added to the system even as it was falling behind schedule

case study

- National Aeronautics and Space Administration (NASA)
- US, government run
- Mars Climate Orbiter 1998 - 1999
- Built by Lockheed Martin
- ~238 million euros spent
- Designed to study martian climate and atmosphere

case study

Insufficient testing

- Testing missed failed to find the issue.

Lack of requirements understanding

- It was assumed that metric units would be used.