CHAOS Chronicles, focusing on failures and possible improvements in IT projects

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ABSTRACT

The Standish Group started in 1985 in the business of IT market forecasts and predictions using Artificial Intelligence and cased-based reasoning technology. In 1994, we turned to predicting project outcomes, improving software development, and building a world-class database. Standish's cumulative research encompasses 22 years of data on why projects succeed or fail, representing more than 50,000 active completed IT projects. In this paper we clarify how we got here, where we are, and how academia next to practitioners can be part of the next stage of the CHAOS journey. The vehicle that drives our journey is the CHAOS University System.

Keywords: Information Technology projects; research of success, failure, and value factors; education and research.

INTRODUCTION OF THE JOURNEY

8:31 a.m., Nov. 26, 1968. I drove my 1967 Volkswagen Bug into the upper Parker Street parking lot of the old mill building. It was a crisp fall day. The dried leaves crunched under my feet as I walked from my car into Digital Equipment Corp.'s then one and only executive office and manufacturing facility. *"You know, Jim, we only have today to get the project done and turn it over to the owner tomorrow for his final acceptance," said Al.* Thus began my journey and fascination with software projects [1]. Over the next 18 years my life would be around building, and sponsoring, software projects to help grow the IT industry. These projects included the job bank for the unemployed, trading systems for both traders and stock exchanges, bank ATM and retail payments systems, manufacturing and ERP, airplane and airport monitoring systems, and many other types of applications.

START YOUR ENGINES

In 1985, The Standish Group started with the simple premise that if you wanted to understand the marketplace you would have to ask a lot of people a lot of questions up and down the spectrum. We needed to do in-depth research to really understand the marketplace and the potential directions. From then until about the year 2000, our

major business was predicting future trends, and we had about an 80% success rate. However, in 1994, we started the transition from a market research firm to a project advisor organization. In 1994, we did our normal three-stage research, which consisted of interviews, focus groups, and surveys to gain a basic understanding of the issues around project success. This basic research created the original 1994 *CHAOS Report* [2].

At the time, we expected this report would be a one-time event and we would move on to continue to look at emerging technologies. That would not be the case, as people wanted more; and the more *they* wanted to understand, the more *we* wanted to understand. The more curious they were, the more curious we were to find the answers for them and us. During the next ten years we created many different events and instruments to understand more about the issues and try to come up with solutions. We would write many research papers and even books on the subject of project success and failure. We wanted to dive deep into the abyss to find that Holy Grail that would make software projects successful. By 2004, we realized there is no Holy Grail; there are no right answers. There are only more questions with some very clear directional signposts.

THE STANDISH DATABASE

So, what is new and what seems to remain the same in IT projects over the last 20 or 30 years? It has been 22 years of CHAOS. During this time we have examined 110,000 projects, countless workshops, and numerous benchmarks. It has taken this long to create "the winning hand" for project success.

There are five things you need to do to create a winning hand. First, a project needs to be small. This means six team members (maximum) with a time box of six months or less. Second, the process must agile, such as the Scrum methodology. Third, the agile team must be highly skilled in both the agile process and the technology. Fourth, the product owner or sponsor must be highly skilled. And fifth or last, the organization must be highly skilled at emotional maturity [3].

FINDINGS FROM THE CHAOS DATABASE

If you do these five things and do them well you have an 81% chance that a project will come in on time and on budget, with satisfied customers. You have only a 1% chance the project will fail and only an 18% chance it will be challenged in some way or other. More importantly, the project will have a 64% chance of returning very high to high value and only a 15% chance of returning no to low value. If you do not do these five things well, however, the chances of a failed, challenged, or low-value result increase. On the other hand, everything else you do (outside of these five things) is most likely a waste of time and money or has very low to negative impact.

Now let's look at the opposite spectrum, or a losing hand. First, it is a large project with hundreds of team members. Second, you use waterfall methodology with a mature process. Third, the team is moderately to poorly skilled in the process and technology.

WINNING HAND VERSUS LOSING HAND

	SUCCESSFUL	CHALLENGED	FAILED	HIGH VALUE	LOW VALUE
WINNING HAND	81%	18%	1%	64%	15%
LOSING HAND	1%	35%	64%	9%	79%

Results of a winning hand versus a losing hand. A winning hand is defined as: a small, agile project with a skilled team, sponsor, and an emotionally mature environment. A losing hand is defined as: a large, waterfall project with an unskilled team, sponsor, and an emotionally immature environment. The results are a segment of the 25,000 projects in the CHAOS database from Fiscal Year 2012 to 2016. Success is defined as OnTime, OnBudget, and with satisfied customers. Challenged is defined as late or overbudget, with less than satisfied customers. A failed project is always canceled before resolved, or resolved and not used.

(source: THE WINNING HAND, CHAOS REPORT, The Standish Group, 2016)

Fourth, the product owner or sponsor is also moderately to poorly skilled. Fifth, the organization has moderate to poor emotional maturity skills. If you do have these things you will have a 1% chance that a project will come in on time and on budget, with satisfied customers. You have a 64% chance the project will fail and a 35% chance it will be challenged in some way or another. More importantly, the project will have a 79% chance of returning very low to no value and less than a 10% chance of returning high value. Let's look at how we got to the winning hand. Project size has always been a major element in the CHAOS research. It was clear from the very beginning of the CHAOS research that size was the single most important factor in the resolution of project outcome. It is also clear that the larger the project, the less valuable the return rate. In many cases larger projects never return value to an organization. The faster the projects go into production, the quicker the payback starts to accumulate.

We often hear people say, "*The size is the size, and the size is dictated by the requirements*." This is far from the truth. One of the major services of our Value Portfolio Optimization and Management Service is to break up large software projects into multiple small projects, with early delivery for success, quicker return on value, and greater customer and user satisfaction. We have found that most software projects only require a small team for a short duration in order to deliver value to the organization; only in very rare cases do projects need to be bigger and longer.

BIG BANG BOOM

The "Big" in Big Bang Boom means a project has a very large labor component, with many people doing many different parts of it. The "Bang" is that all projects within the overall project must come together at once and work the first time. There is absolutely no wiggle room; all facets must go live everywhere at the same time or there could be serious consequences for the organization. The "Boom" is the likelihood that the application or system

will fail or be challenged. Such an event will cause those serious consequences to be realized by many if not all participants. These serious consequences could be financial (lost sales and customers, driving up costs) or damaging to the corporate brand if the application or system is core to the organization, causing untold heartache for years. In 2014, we wrote about a new Number Portability Administration Center (NPAC) system that required delivery of the software and all the other services and operations to be done in a big bang [4]. That project is currently still in development and experiencing many challenges.

In 2016 we still look at potential Big Bang Boom projects. As we did in the 2014 paper, we use our standard single project assessment method that first profiles the project (or in this case a portfolio of projects) and then matches that profile against our CHAOS database of 50,000 active projects. The project profiles are in-depth cases with over 25 discrete multilevel attributes and 12 environmental worksheets.

Currently, Standish's research is used more than ever before, recently in the hearings of the Dutch Parliament [5], [6]. Major changes in the way software projects were accomplished have resulted directly from the findings of the Standish research since 1999: "*The numbers even found their way to a report for the President of the United States to substantiate the claim that US software products and processes are inadequate.*" [7]. Some of these changes improved project performance, while others have exacerbated the problem. Therefore, the overall results show very little improvement for the last years.

CHAOS UNIVERSITY SYSTEM

During the last 22 years The Standish Group has held the data private and no outside access was permitted. However, on March 8, 2016, at the Antwerp Management School, The Standish Group presented a view into the workings of the CHAOS database [8]. The purpose and outcome of the presentation was that The Standish Group and Antwerp Management School (AMS) created a non-profit organization known as the CHAOS University System (CUS) consortium. CUS will develop a doctoral and graduate and master's educational programs around the updating and extending of the world-renowned CHAOS database. The university will have access to the CHAOS database for research and teaching purposes as a charter school member of the CUS working group.

The purpose of opening the CHAOS database for greater academic and practical use by CUS universities is to find new and compelling information to improve and measure project success and value. We expect CUS universities will discover new innovation through the access of the database. We expect CUS universities will extend the CHAOS database far beyond the current use and well into the future.

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