



# Evaluating Disruptive Innovations of the Past and Present

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## INTRODUCTION

This research hopes to determine both how disruptive innovations affect industries as well as how they have affected people's daily lives. We look at the personal computer, the eBook reader, and the smartphone to determine a definitive way of recognizing a technology's impact. Evaluating whether a technology is disruptive has many difficulties as its impact is also based on people's perception of that technology.

## BACKGROUND AND SIGNIFICANCE

From the printing press to smartphones, innovation has always been seen as a creation of possibilities. However, as much as innovation creates, it also has the power to destroy businesses that choose not to follow along. To understand disruptions, it is important to distinguish three types of innovation as described in *The Innovator's Dilemma* by Dr. Clayton Christensen, a leading economist and Harvard professor.

The first type is **sustaining innovation**: new products replacing old counterparts. (Examples: iPhone 6S replacing iPhone 6, updated version of an app)



The second type is **efficiency innovation**: selling established products at lower prices. (Examples: Walmart's low-price guarantee, wholesalers)

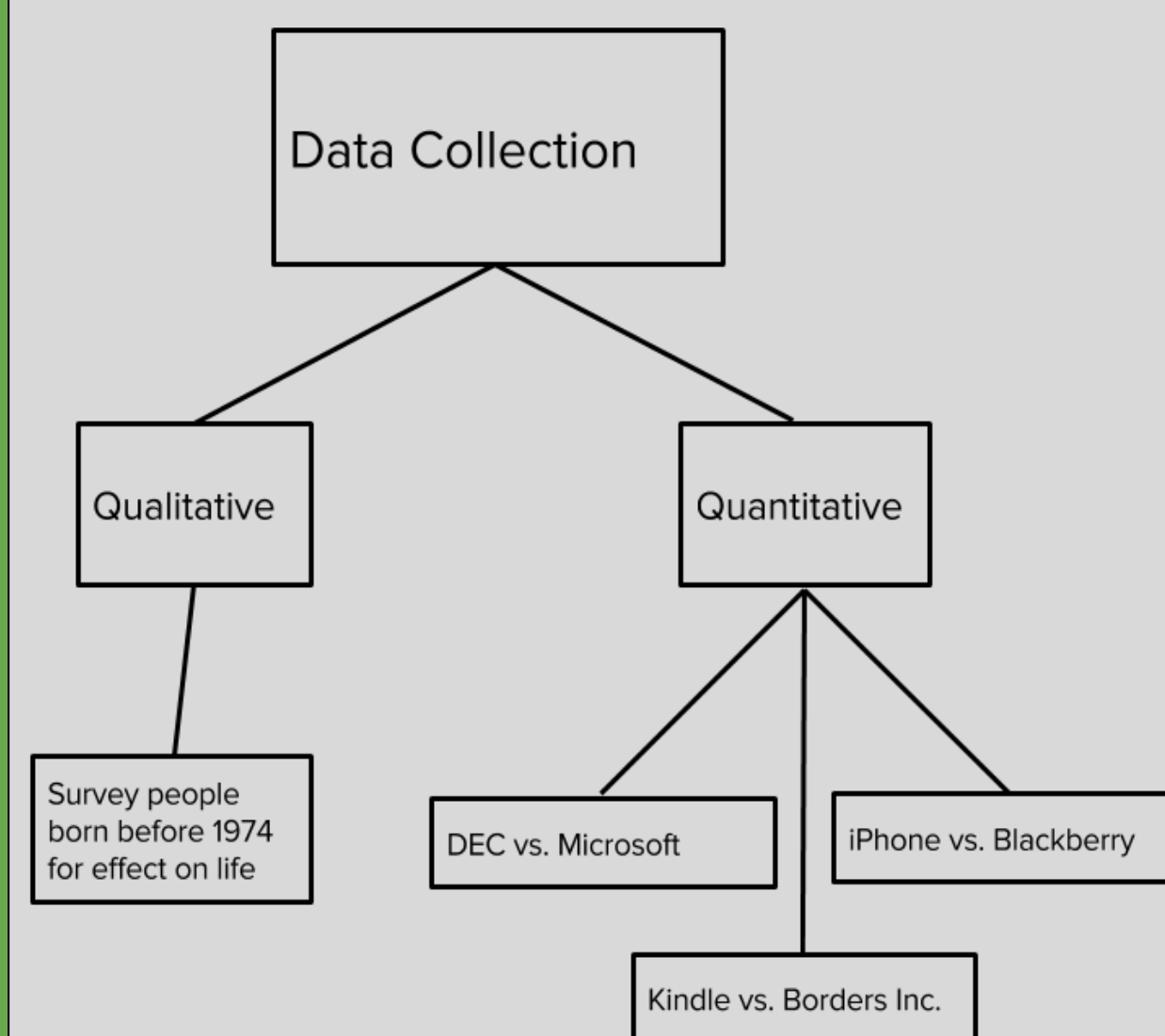


These two types of innovation are crucial for **market-creating innovation**: introducing previous non-consumers of a product to its marketplace. (Examples: Uber, PCs)



In particular these three industries were disrupted financially and affected the daily lives of common people. Our analysis will take into account how businesses and people were affected. This will help to create conditions for determining the disruptiveness of a technology. This research hopes to at least provide a starting platform for any future work.

## RESEARCH METHODOLOGIES



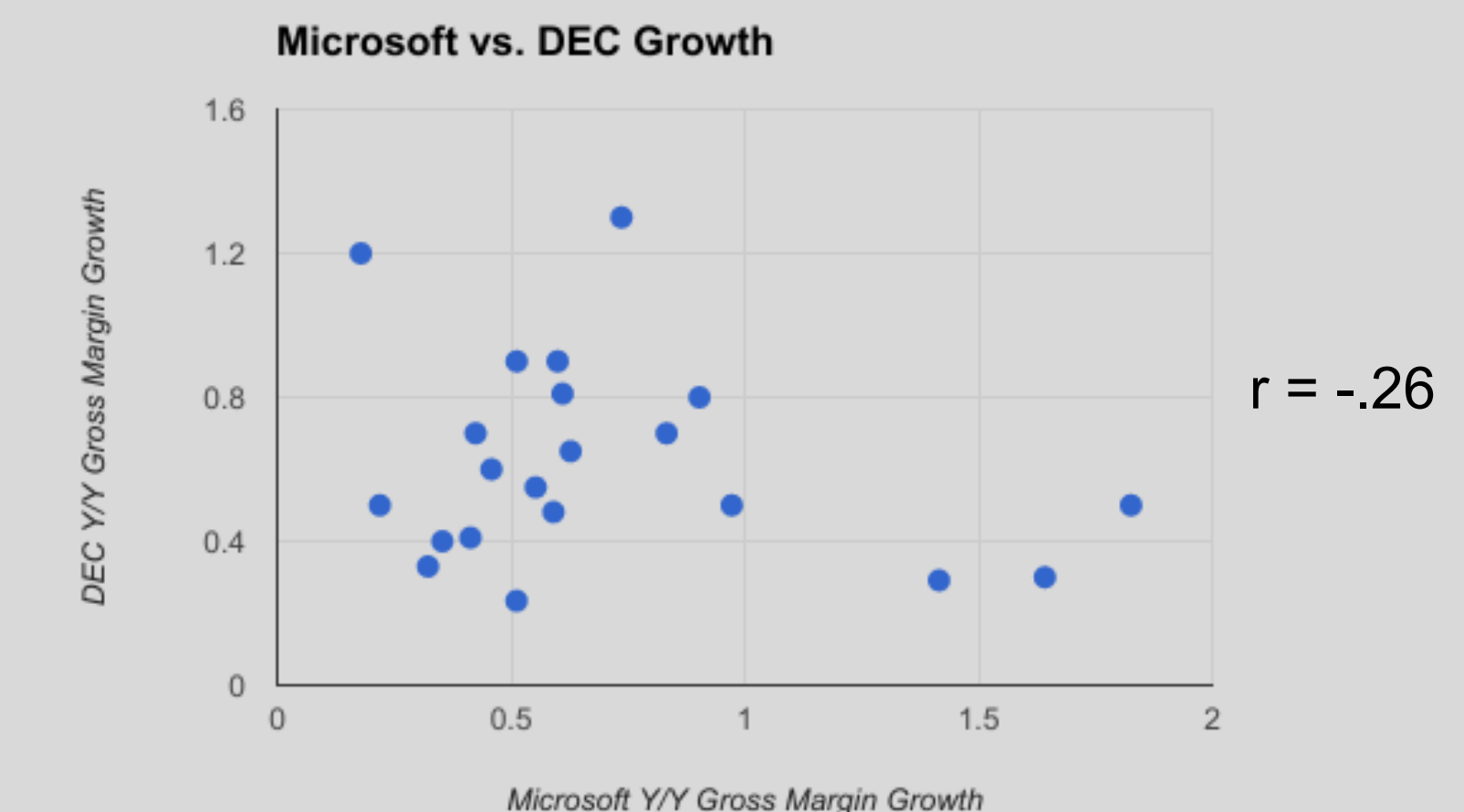
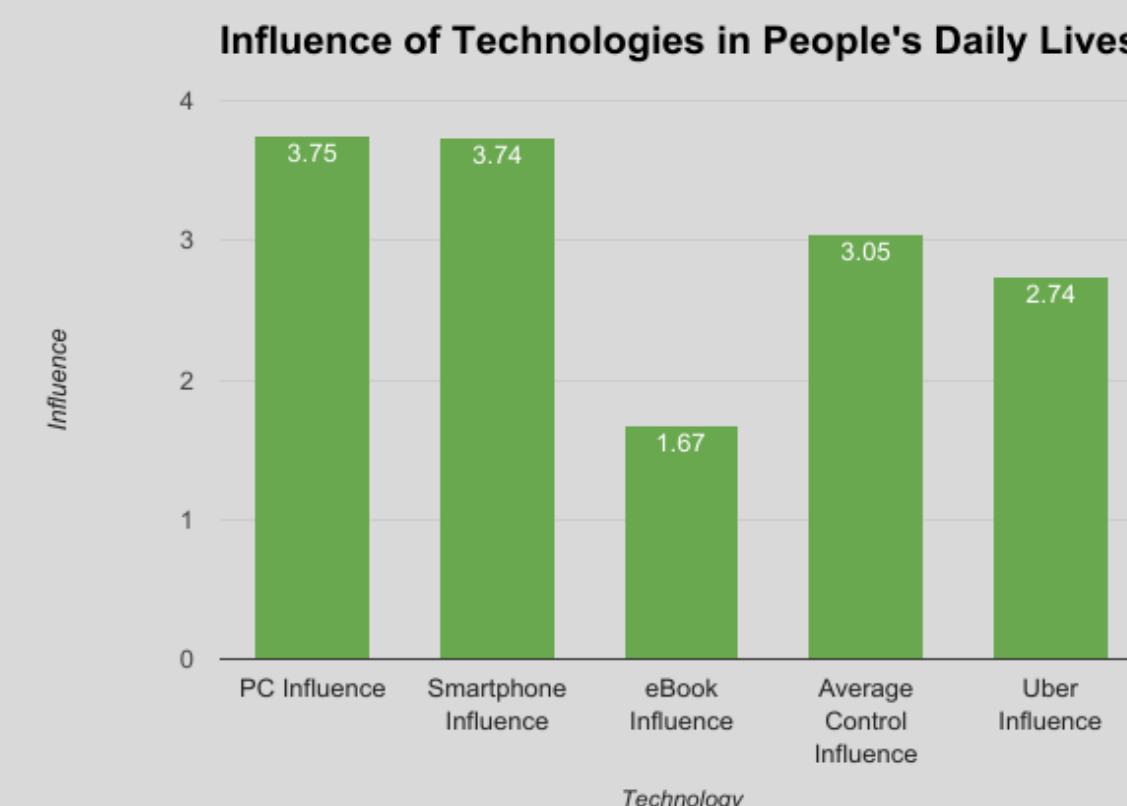
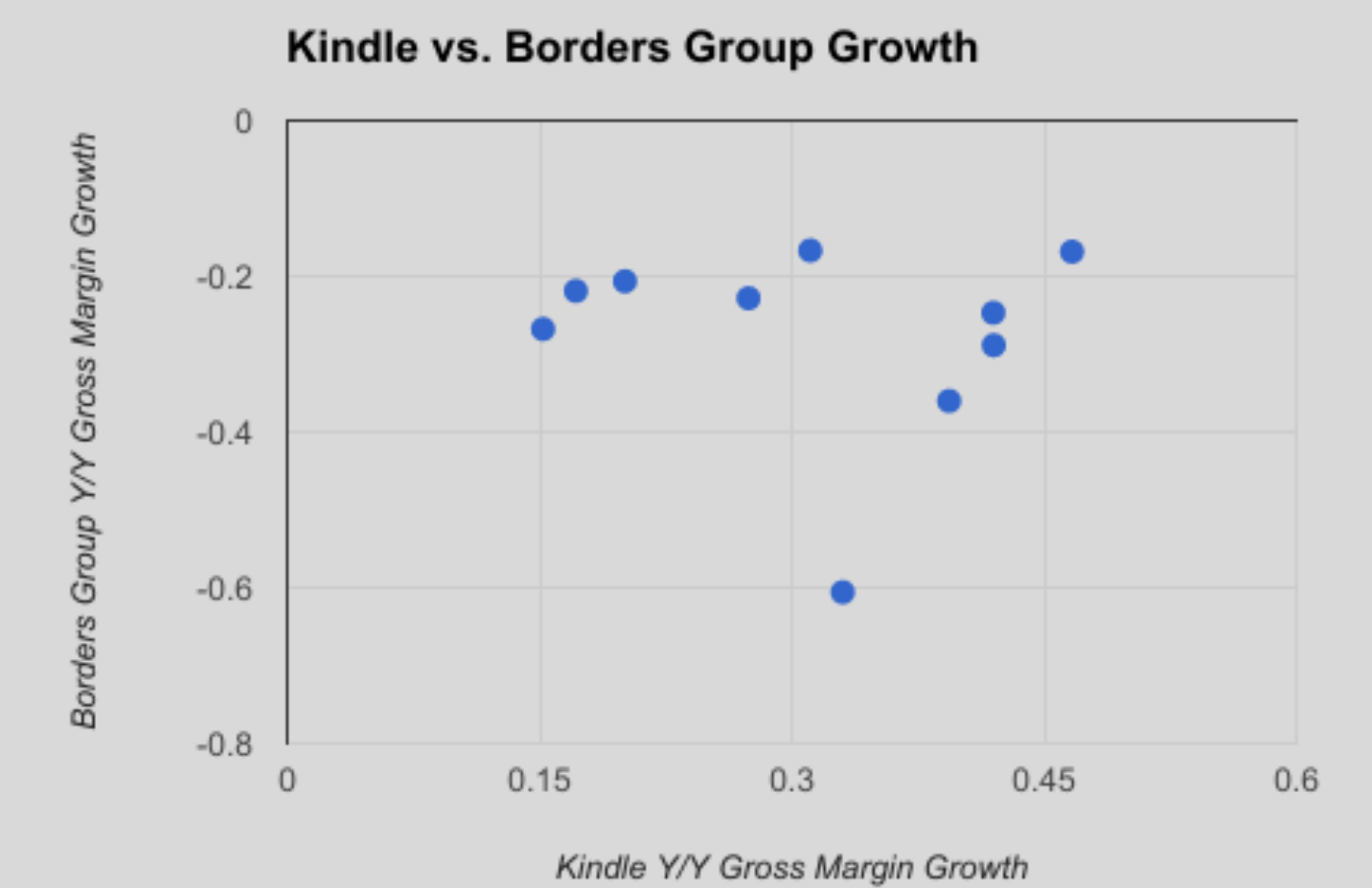
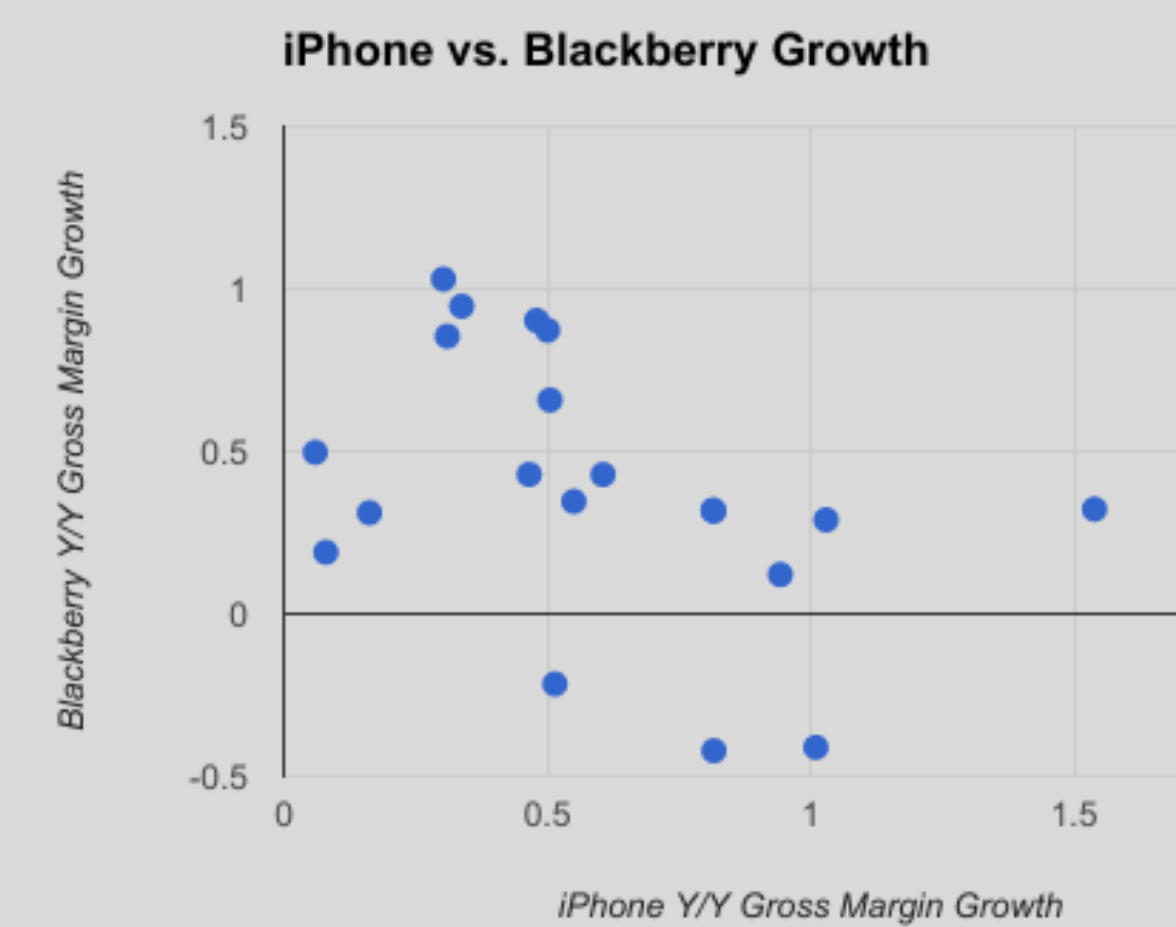
The research is pure, and uses both quantitative and qualitative methods.

Qualitative data: This data was a survey taken by 39 adults who were alive during all disruptions. They assessed the impact of the three control disruptions on their daily lives during their selected five year span.

Quantitative data: This data consists of statistical comparisons between financial reports of selected representative companies.

## DATA ANALYSIS AND RESULTS

Disruptions	Beginning of 5 year span (average)
Personal Computer	1986.666667 (Q3)
Mobile Phone	2007.552632 (Q3)
eBook Reader	2008.382353 (Q2)
Uber	2014.012821 (Q1)



## CONCLUSION

### CONDITION ONE:

- INFLUENCE > 2.66

The conditions to run a confidence interval are met. With 95% confidence it can be said that the true population mean of influence of any disruptive technology lies between 2.66 and 3.49. This means that if a sample mean is greater than 2.66, it can be considered influential.

### CONDITION TWO:

- CORRELATION COEFFICIENT (r) IS NEGATIVE

In order for a disruption to occur, the industry that rises should rise at the same time that the replaced industry falls. Thus, it is logical that as growth of the disruptive company increases, the growth of the traditional company is declining. The correlations were -.41, -.10, and -.26 for the smartphone, eBook, and PC disruptions respectively.

### CONDITION THREE:

- P-VALUE < .18

The p-values of .37, .03, and .13 were obtained for linear regression tests. Averaging these values, the population average p-value is .18. Thus, when running a linear regression t-test we should set the alpha value to 0.18 and have the alternative hypothesis be that the slope is less than 0. If the technology under question has p-value less than 0.18 this condition is met.

## ACKNOWLEDGEMENTS / REFERENCES

Christensen, Clayton M., and Derek van Bever. "The Power of Market Creation." *Foreign Affairs*, vol. 94, no. 1, Jan.-Feb. 2015. Points of View Reference Center, eds.a.ebscohost.com/eds/detail/detail?vid=6&sid=59c601c4-e2ec-4e9a-9dab-946cc88744c6%40sessionmgr4010&hid=4210&bdata=JnNpdGU9ZWRzLWxpdmU%3d#AN=99960185&db=pwh. Accessed 18 Sept. 2016. Journal by Clayton Christensen

Christensen, Clayton M. *The Innovator's Dilemma*. Harvard Business Review Press, 2016.

Nightingale, Paul. "Schumpeter's Theological Roots? Harnack and the Origins of Creative Destruction." *Journal of Evolutionary Economics*, 69th ser., vol. 25, no. 1, 2015, pp. 69-75. EBSCO eBook Collection, eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?vid=22&sid=6ae101a7-3d42-4ba6-a52a-261abf2a3112%40sessionmgr4006&hid=4211. Accessed 2 Oct. 2016.

Cox, John. "Watching the Creative Destruction of the Mobile Industry at MWC." *Network World, IT World*, 19 Feb. 2010, www.itworld.com/article/2761436/personal-technology/watching-the-creative-destruction-of-the-mobile-industry-at-mwc.html. Accessed 6 Oct. 2016.

Wheeler, Thomas Edgar. "Disruptive Technologies Demand Innovation by Broadcasters and Regulators." *Vital Speeches of the Day*, pp. 180-83. EBSCO eBook Collection, eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?vid=3&sid=59c601c4-e2ec-4e9a-9dab-946cc88744c6@sessionmgr4010&hid=4210. Speech by Tom Wheeler, head of Federal Communications Commission, on Disruptive Innovation

Thank you to Nickhil Jakatdar for his mentorship through this research.