# Why Finance IT Solutions for Analytics – a Quantitative Assessment

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## Executive Summary

*The speed and scope of the business decision-making process is growing because of several emerging technology trends in Cloud, Analytics, Social, Mobile and the Internet of Things (IoT). Of these intertwined trends, Analytics is a game-changing business opportunity.*

*With successful Analytics solutions, companies can deliver exceptional customer experience, enhance marketing effectiveness, increase operational efficiencies, reduce financial risks, improve product quality and reliability, etc. But these businesses are also challenged to make a compelling financial business case and manage the higher than normal risks and rewards inherent in their Analytics investments. Financing is an effective way to do this.*

*With financing, companies can conserve cash, get early access to new technologies, refine precise solution needs and stage investments before committing large capital outlays, exit unprofitable projects and minimize losses, and economically upgrade to the most current hardware without worrying about outdated technologies. Financing also allows clients to better align their cash outflows with benefits as they progress on their Analytics journey from descriptive to predictive to prescriptive and cognitive computing.*

*As the world's largest captive information technology (IT) financier, IBM Global Financing provides a simple single financing solution with necessary funding approved upfront for IBM and appropriate non-IBM components. Cash outlays can be matched to benefits and specific milestones with attractive interest-rate protection. IBM Global Financing also provides asset disposition solutions and refurbished equipment to help clients with environmental and other corporate responsibilities. IBM Global Financing is an excellent choice for financing Analytics initiatives.*

*The three year business case analysis presented in this paper compares typical IBM Global Financing with the alternative of paying upfront for three Analytics solution sizes and investments – small, medium and large. The quantitative model incorporates scaling factors for lower failure risks and greater rewards in later years as the solution succeeds and matures. Unsuccessful projects contribute to sunk costs which are smaller with Financing even when early termination costs are taken into account.*

*These reduced sunk costs along with other attractive benefits of IBM Global Financing over Upfront Payments contribute to IBM Global Financing's much higher (2-3 times) Internal Rate of Return (IRR) and lower (by 5-20 percent) Payback Period reported in this paper. Consequently, with IBM Global Financing clients can build a more compelling financial business case for their investment and improve their risk-reward profiles as they progress on their Analytics journey. IBM Global Financing is a very effective way to close a business case for investing in Analytics.*

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*Optimizing Business Value*

# Analytics Helps Organizations Produce High Value Insights …

The relentless rate and pace of technology-enabled business transformation and innovation are astounding. Several fast-growing intertwined technology trends – Cloud, Big Data Analytics, Social, Mobile and Internet of Things (IoT) – continue to be profoundly disruptive, reshaping the economics of the information technology (IT) industry and the needs of customers. With more than 2.5 exabytes ($10^{18}$ bytes) of data created daily, customer spending on Data and Analytics is growing annually at 30% and is expected to reach \$114 billion in 2018.[1]
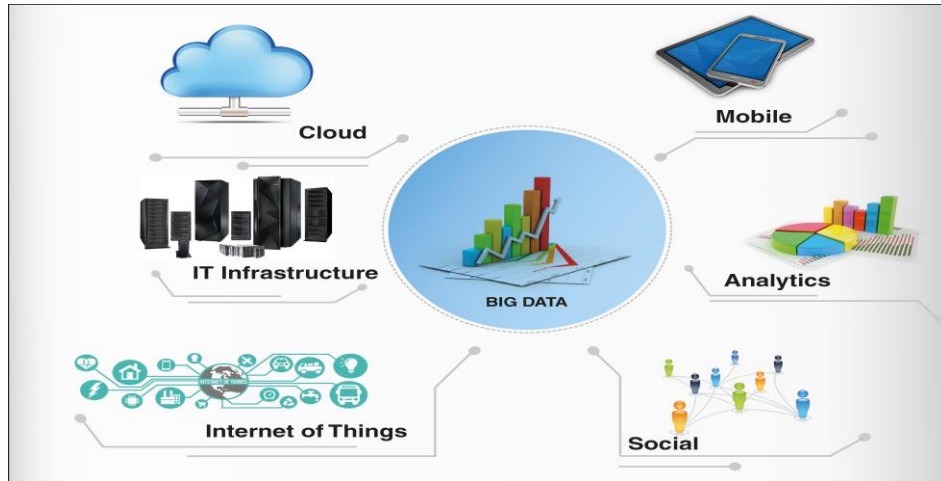


**Figure 1: The Intertwined Technologies of Cloud, Social, Mobile, IoT and Analytics**

Organizations have a lot of internal data in the back office (Systems of Records) and are gathering a lot more through stakeholder interactions (Systems of Engagements). All this voluminous data can be static or dynamic and exist in a variety of forms: structured (in existing enterprise IT systems like customer relationship management (CRM), inventory, and billing, etc.), unstructured (audio, video, social media, email, chats, etc.). Analytics enables organizations to frame strategic business questions and combine Systems of Records with Systems of Engagements to produce new High Value Systems of Insights.
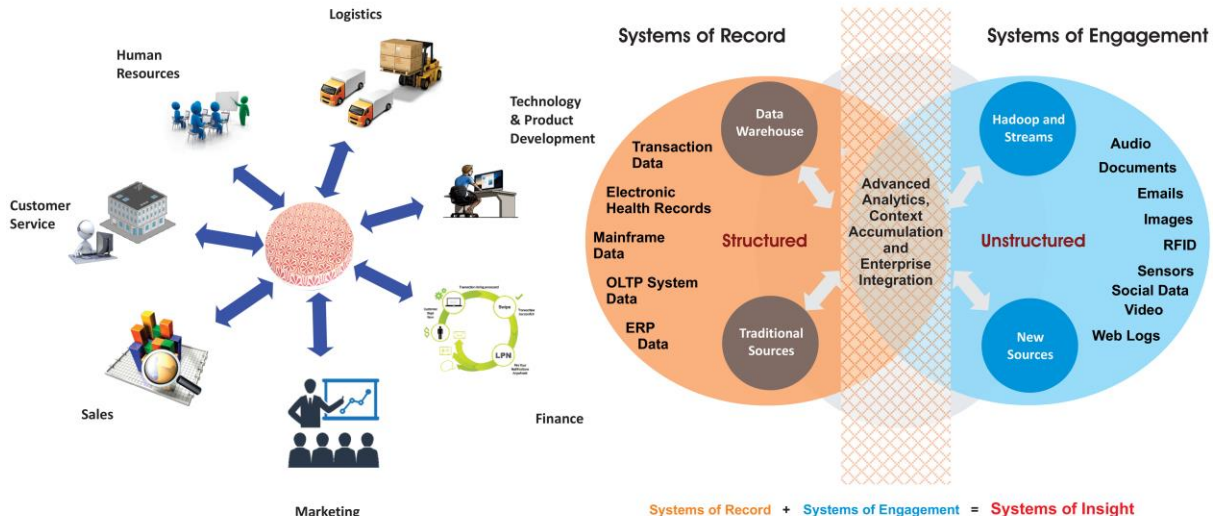
**Figure 2: High Value Insights from Enterprise Integration of Structured and Unstructured Data**

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[1] A. T. Kearney and Carnegie Mellon University, "Beyond Big: The Analytically Powered Organization", January 2014.

Businesses are investing in Analytics to improve customer experience and loyalty, discover new revenue opportunities, detect fraud and breaches, enhance product quality, improve patient outcomes, mitigate financial risks, and more. Likewise, Analytics helps governments respond faster to emergencies, analyze terrorist threats better and more accurately predict the weather – all of which are vital for national security, public safety and the environment. The economic value of Analytics is immense.

## … But Financial Justification of Analytics Investment is Crucial

Financial justification is becoming crucial with the increasing involvement of business users and executives in the buying process of IT solutions especially Analytics.[2,5] Figure 3 below reinforces this conclusion and depicts the results of a recent spot survey conducted by Cabot Partners – we asked over 30 respondents involved in Analytics initiatives the following two questions:

1. What is Your Top Challenge for an Analytics Initiative?
2. How important is a Business Case for Your Analytics Initiatives?

Figure 3: Spot Survey Results Indicating the Importance of a Business Case for Analytics Initiatives

Not surprisingly, the lack of skills was the top challenge, followed by the need to build a quantitative business case – over 70% of the respondents indicated this was important or very important.

There are several recent studies quantifying the business value and return on investment (ROI) obtained from Analytics solutions that range from 250% to over 1000%.[3,4]; with a substantial increase in ROI as the solution matures. But, there are also associated risks of failure which could be substantial with Analytics implementations. In fact, a recent Cap Gemini survey[5] indicated that even well planned Big Data Analytics implementations had a success rate of just 53%. This is not surprising, as most emerging technologies in early adoption phases typically have a high risk to reward ratio; making the associated financial business case even more critical. Financing IT Analytics solutions is one effective way to lower risks while keeping the rewards intact.

[2] https://www.idc.com/eagroup/download/accelerating-new-buyers-journey.pdf
[3] ftp://public.dhe.ibm.com/software/analytics/spss/marketing/events/idc-business-value-pa.pdf
[4] http://nucleusresearch.com/press/roi-of-business-analytics-increases-significantly-as-solution-matures/
[5] https://www.capgemini-consulting.com/resource-file-access/resource/pdf/big_data_pov_03-02-15.pdf

## Why Finance IT Analytics Solutions?

Many businesses particularly medium-sized businesses implementing IT solutions face an important decision on whether to buy or finance. There are many technical and business considerations that may influence this key decision. Businesses must use a comprehensive cost-benefit analysis framework to evaluate their IT investments objectively. Relevant financial metrics such as ROI, Total Value of Ownership (TVO), Net Present Value, Internal Rate of Return (IRR), etc. over several years must be computed and compared. This helps justify investment decisions, improves the IT organization's effectiveness, and deepens collaboration between Business and IT.

For IT solutions including Analytics, some key benefits of financing include:

- Cash conservation through financing allows businesses to hold onto more cash to take advantage of other investment opportunities and navigate changing business conditions
- Lowers acquisition price barriers, providing early access to new technologies to develop and nurture additional innovative business opportunities
- Better handle on true IT solution needs before committing a lot of capital to a purchase
- Staged financial commitments with early exits for unprofitable projects to mitigate losses
- No burdens with disposing of used and out of date equipment
- Greater flexibility of choice to economically upgrade to the most current technologies to help drive additional business value and greater productivity and efficiencies.
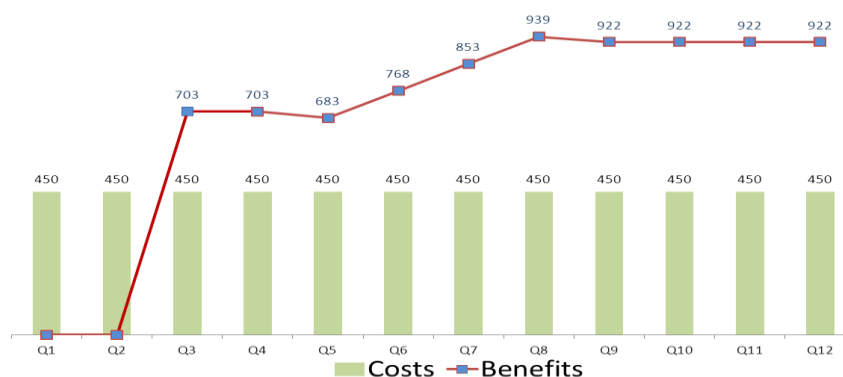
**Figure 4: Quarterly Cash Outflow with Financing Aligns Better with Benefits Realized ($K)**

Many successful Analytics projects begin generating significant benefits after an initial ramp-up period of about two to three quarters. Financing allows companies to better align their cash outflows to the benefits as the solution becomes successful and matures (Figure 4 depicts a typical medium sized analytics configuration). If benefits do not accrue, with financing, the company typically has flexibility to either terminate the lease or loan for a fee or try out an alternative solution approach. Whether the Analytics project is successful or not, with financing, companies can minimize risks while maximizing their business benefits.

There are several choices to finance IT solutions. But if a company has already decided to implement an IBM Analytics solution, they would be better served by financing from IBM Global Financing, the world's largest captive IT financier.

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# IBM Global Financing – the Right Choice

IBM Global Financing offers custom payment plans to companies manage their capital and highly-skilled resources very effectively. With a global reach, deep technology expertise and industry-leading financial services, IBM Global Financing is the right choice for credit-qualified clients of all sizes for the following reasons:

- Reduces complexity and provides a simplified single solution and financing for IBM and non-IBM content
- Mitigates a range of business and technology risks inherent in purchasing and deploying IT solutions for Analytics initiatives
- Improves critical time-to-business value, because all necessary funding is approved and available, up front
- Lowers net cash outlay (sometimes even zero cash outlay) from the initial installation period to the projected realization of operational benefits with budget certainty by:
  - Matching cost outlays to anticipated benefits with tailored repayment terms
  - Consolidating and structuring payments in line with expected project milestones and funding requirements, helping better manage the uncertainties of project timing and cash outlays
  - Providing for fixed-rate financing, with interest-rate protection as required.

IBM Global Financing also understands the environmental issues that affect business and IT, and can help clients with corporate responsibility and profitability. By providing comprehensive funding solutions, asset disposition strategy, and refurbished equipment as an alternative, IBM Global Financing helps clients optimize data-center space, minimize energy consumption, and reduce costs for Analytics projects for the entire solution stack (Figure 5).

**Figure 5: Big Data Analytics Solution Stack Ranging from Services, Software and Systems**

Since Analytics solutions are still evolving and have a higher risk-reward profile than typical IT solutions, IBM Global Financing offers some unique value[6] that clients should seriously assess and consider using a quantitative business case model.

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[6] http://www.ibm.com/financing/us/big-data-and-analytics/index.html

## Considerations for a Quantitative Business Case Model

The majority of data doesn't offer much value unless iteratively and progressively analyzed by the user and the system to produce powerful insights and recommended actions to produce the best outcome. In today's Analytics holy grail, the system (IBM Watson is a notable example) constantly sifts through data, discovers insights and tells the user the best course of action.
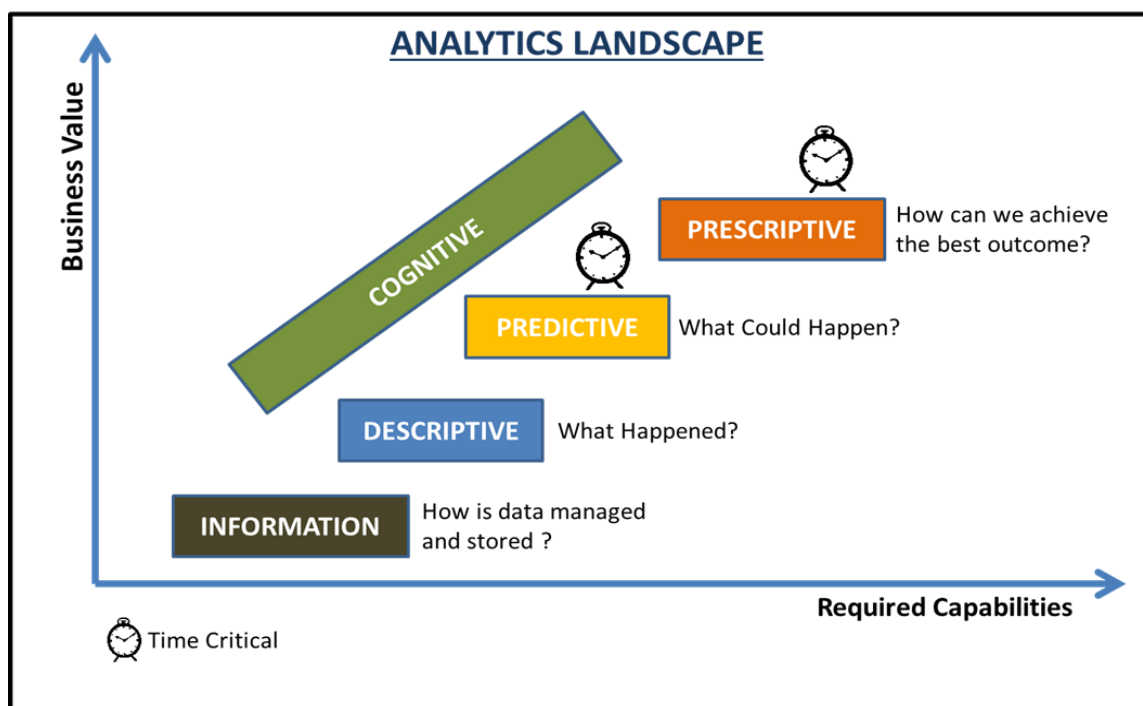


**Figure 6: A Client's Analytics Journey from Data to Insights to Knowledge to Best Actions**

The Analytics landscape continues to evolve rapidly; giving clients unprecedented capabilities to progressively solve complex problems and get higher rewards. But the risks are also higher. Figure 6 depicts this current landscape by analytics type, risk, reward and time-criticality.

**Data** is fundamental in any Analytics initiative. A data warehouse is typically built to capture, store, secure, retrieve and manage the raw and processed data. Today, data warehousing is widely used by clients and traditional implementations are usually low risk activities. Modern warehouses with newer technologies such as Hadoop[7] and Apache Spark are riskier to implement. But unless data is converted to insights, there is little reward.

**Descriptive** analytics is dominant today and with low to medium risk and reward.  It condenses data into nuggets of insights summarizing what happened. Social media analytics is one prominent descriptive analytics example.

**Predictive** analytics (medium risk and reward) uses a combination of several statistical, modeling, data mining, and machine learning techniques to analyze data to make probabilistic time-critical forecasts about the future. Weather prediction and customer sentiment analysis are some noteworthy predictive analytics examples.

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[7] http://cabotpartners.com/Downloads/TCO-Study-Pure-Data-versus-Hadoop-May-2015.pdf

**Prescriptive** analytics goes beyond descriptive and predictive analytics. It recommends one or more courses of action and the likely outcome of each action, including the usually time-critical "next best action". IBM's Predictive Customer Intelligence solution is one example.[8]

**Cognitive** computing systems continuously build knowledge over time by processing natural language and data. These systems learn a domain by experience just as humans do and can discover and suggest the "best course of action"; providing highly time-critical valuable guidance to humans. IBM's Watson is the premier cognitive system in the market today.[9]

Prescriptive analytics and cognitive computing have the highest risk-reward profiles and generally require larger investments.

**Figure 7: Integrating Analytics across the Enterprise – Large Investment, Risk and Reward**

Another key determinant of investment and risk-reward level is the size of the organization. A small investment with lower risks and rewards may suffice for small and medium businesses (or specific departments in an enterprise). However, larger enterprises that integrate Analytics deployments across multiple deployments (Figure 7) may require larger investments and could be riskier but with greater reward potential.

The quantitative model developed here considers a wide range of Analytics solution scenarios and configurations for payments upfront and for financing from IBM Global Financing.

## IBM Global Financing Produces Superior Returns

The cost-benefit analysis model developed here is for a three year horizon. It starts with the size of the solution and investment. Three sizes are considered: **Small, Medium and Large.** Solutions with and without hardware are considered for each size for a total of six cases. Table 1 in the details the solution sizes and associated costs assumed.

| Investment | Small | Medium | Large |
|---|---|---|---|
| Hardware | $60,000 | $200,000 | $1,000,000 |
| Software | $120,000 | $400,000 | $2,000,000 |
| Services | $120,000 | $400,000 | $2,000,000 |
| Total | $300,000 | $1,000,000 | $5,000,000 |

**Table 1: Analytics Solution Sizes and Associated Costs**

8 http://cabotpartners.com/Downloads/infrastructure-for-predictive-customer-Intelligence-June-2015.pdf
9 http://www.ibm.com/smarterplanet/us/en/ibmwatson/?re=CS1

The model then estimates the corresponding risk-weighted benefits from the ROI percentages consistent with the previously referred industry studies. The larger the solution/investment size, the greater the ROI and risk. This ROI percentage is distributed as risk-weighted benefits in the form of quarterly cash inflows. These inflows accrue quickly after an initial ramp-up period of two quarters; stabilizing to a uniform value in latter quarters. Table 2 depicts the scaling factors assumed for the risks and rewards by solution size and time period in years.

| RISK / REWARD | Small | Medium | Large |
|---|---|---|---|
| Probability of Success Y1 | 90% | 80% | 75% |
| Probability of Success Y2 | 95% | 90% | 85% |
| Probability of Success Y3 | 98% | 95% | 90% |
| Benefit Percentage | 200% | 300% | 400% |

**Table 2: Scaling Factors for Risk and Reward by Solution Size and Time Period**

For clients paying **upfront**, cash outflows are all lumped at the beginning of the three year horizon. Clients using **IBM Global Financing** make quarterly payments that include the financing charges for the three year horizon. IBM Global Financing rates typically vary for hardware, software and services. Table 3 lists these quarterly payment rates as a fraction of the Purchase Price Financed (PPF) and also includes early termination costs. It is assumed that these payments include maintenance and all other associated charges for the three year horizon. The following US example is presented for illustrative purposes only. Actual rates and availability may vary based on client credit rating, financing terms, offering type, product type and vary by country.

| Option 1 : $300k Purchase Price Financed (PPF) | Purchase Price Financed | Quarterly Payment Factor | Quarterly Payment in Advance, 36 Months | Early Term After 12 Months | Early Term After 24 Months |
|---|---|---|---|---|---|
| System p 9119/MME | $60,000 | 0.0773105 | $4,639 | 61.85% of PPF | 30.92% of PPF |
| IBM Software | $120,000 | 0.0890966 | $10,692 | 71.28% of PPF | 35.64% of PPF |
| IBM Services | $120,000 | 0.0891947 | $10,703 | 71.36% of PPF | 35.68% of PPF |
| Total | $300,000 | | $26,034 | | |

| Option 2 : $1M Purchase Price Financed (PPF) | Purchase Price Financed | Quarterly Payment Factor | Quarterly Payment in Advance, 36 months | Early Term After 12 Months | Early Term After 24 Months |
|---|---|---|---|---|---|
| System p 9119/MME | $200,000 | 0.0770958 | $15,419 | 61.68% of PPF | 30.84% of PPF |
| IBM Software | $400,000 | 0.0886437 | $35,457 | 70.91% of PFF | 35.46% of PPF |
| IBM Services | $400,000 | 0.0887416 | $35,497 | 70.99% of PPF | 35.5% of PPF |
| Total | $1,000,000 | | $86,373 | | |

| Option 3 : $5M Purchase Price Financed (PPF) | Purchase Price Financed | Quarterly Payment Factor | Quarterly Payment in Advance, 36 Month | Early Term After 12 Months | Early Term After 24 months |
|---|---|---|---|---|---|
| System p 9119/MME | $1,000,000 | | $76,810 | 61.45% of PPF | 30.72% of PPF |
| IBM Software | $2,000,000 | | $176,433 | 70.57% of PFF | 35.29% of PPF |
| IBM Services | $2,000,000 | | $176,628 | 70.65% of PPF | 35.55% of PPF |
| Total | $5,000,000 | | $429,871 | | |

**Table 3: Detailed Assumptions on IBM Global Financing Rates and Early Termination Fees**

Figure 8 depicts the annual Internal Rate of Return (IRR) and Payback Period (in quarters) for Analytics solutions with hardware by solution size. IRR is a metric used in capital budgeting measuring the profitability of potential investments. It is used to rank multiple investments. The higher the IRR, the more desirable it is to invest in the project. The ratio of hardware, software and services investment is assumed to be 1:2:2. Total solution investments for small, medium and large configurations are assumed to be $300K, $1M and $5M respectively. Clients get credit for hardware residual value (20%) at the end of the three years.
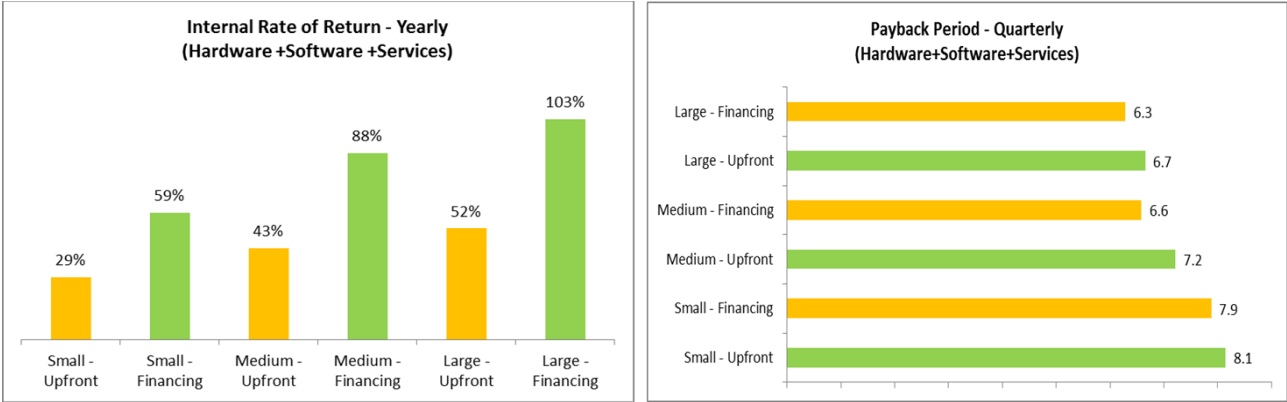


**Figure 8: IBM Global Financing IRR and Payback Period Better for Analytics with Hardware**

Figure 8 makes a very compelling case for clients to choose IBM Global Financing. The IRR with IBM Global Financing is about two times greater compared with the upfront payment alternative and IRR increases as the solution size grows. The Payback Period with IBM Global Financing is also less.

As the cost of hardware continues to drop, the software and services components in Analytics solutions become more central. Many clients leverage existing hardware resources and invest only in software and services. To model this scenario without hardware costs, investments for small, medium and large solutions are assumed to be $240K, $800K and $4M respectively with equal investment in software and services.

Figure 9 depicts the annual IRR and Payback Period (in quarters) for Analytics solutions with no hardware. The IRR with IBM Global Financing is again about three times greater compared with the upfront payment alternative and IRR increases as the solution size grows. The Payback Period with IBM Global Financing is also less.
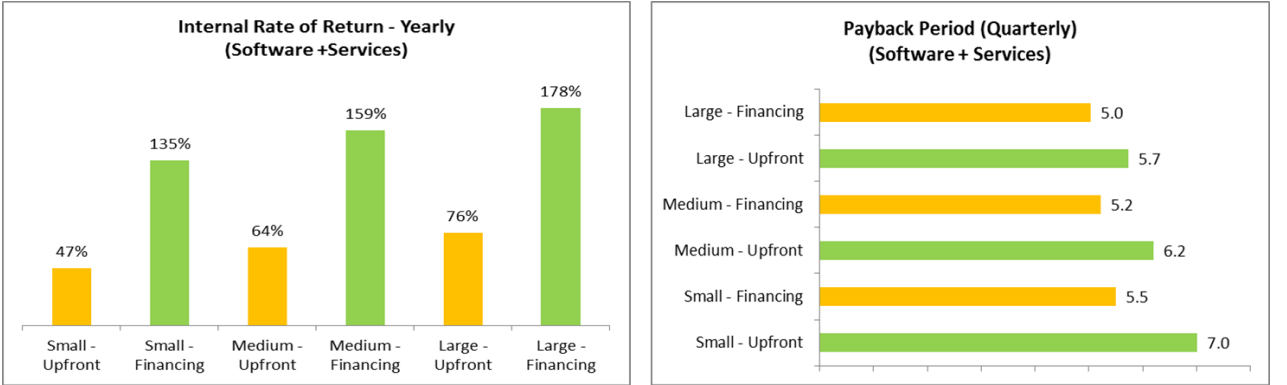
**Figure 9: IBM Global Financing IRR and Payback Period Much Better without Hardware**

Compared with the previous case with hardware, this software and services-only scenario produces greater IRR and lower Payback Periods; highlighting the value of software and services in Analytics. This case for IBM Global Financing is even more compelling.

## Conclusions

Investing in Analytics is a game-changing opportunity for companies. But the risks of failure are also high especially with higher value predictive, prescriptive and cognitive computing solutions and larger deployments. As the world's largest captive IT financier, IBM Global Financing helps companies better manage these risks and rewards and close the business case for Analytics investments by:

- Staging financial commitments with early exits for unprofitable projects to mitigate losses
- Aligning cash outflows to value as the solution becomes successful and matures
- Lowering acquisition price barriers; providing early access to new innovative technologies
- No burdens with disposing out of date equipment
- Providing a simplified single solution for financing with interest-rate protection.

Our cost-benefit analysis clearly establishes the advantages of IBM Global Financing over upfront payments. The case for solutions with only software and services is even more compelling.

The other advantages with IBM Global Financing include cash conservation which allows businesses to hold onto more cash to take advantage of other investment opportunities with greater ROI and navigate changing business conditions. If these additional sources of value are considered, the business case for IBM Global Financing will be even more compelling.

With global reach and deep technology expertise and a track record of deploying successful Analytics solutions, clients should seriously consider IBM Global Financing for funding their Analytics investments.