Predictive Planning:
Managing Uncertainty

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Predictive planning is "the extensive use of data, statistical and quantitative analysis, to develop predictive models to facilitate fact-based decisions and actions."

Adapted from Thomas H. Davenport, analytics thought leader

① Planning in Uncertain Times

Traditional planning is inadequate with increasing levels of uncertainty

For financial planning and analysis (FP&A), planning is a key activity that supports an organization's decision-making process. It typically takes place as an annual activity, where budgets and investments are agreed upon, but it is often supported by monthly reports and quarterly forecasts to check that everything is on track.

Recent events have shown this planning approach to be totally inadequate as **organizations try to grapple with increasing levels of uncertainty**. The uncertainty is driven by:

    a) technology that enables organizations and consumers to make choices faster, and

    b) unpredictable events such as COVID-19.

Both of these factors can totally change a market within weeks, thereby rendering the best crafted plan obsolete.
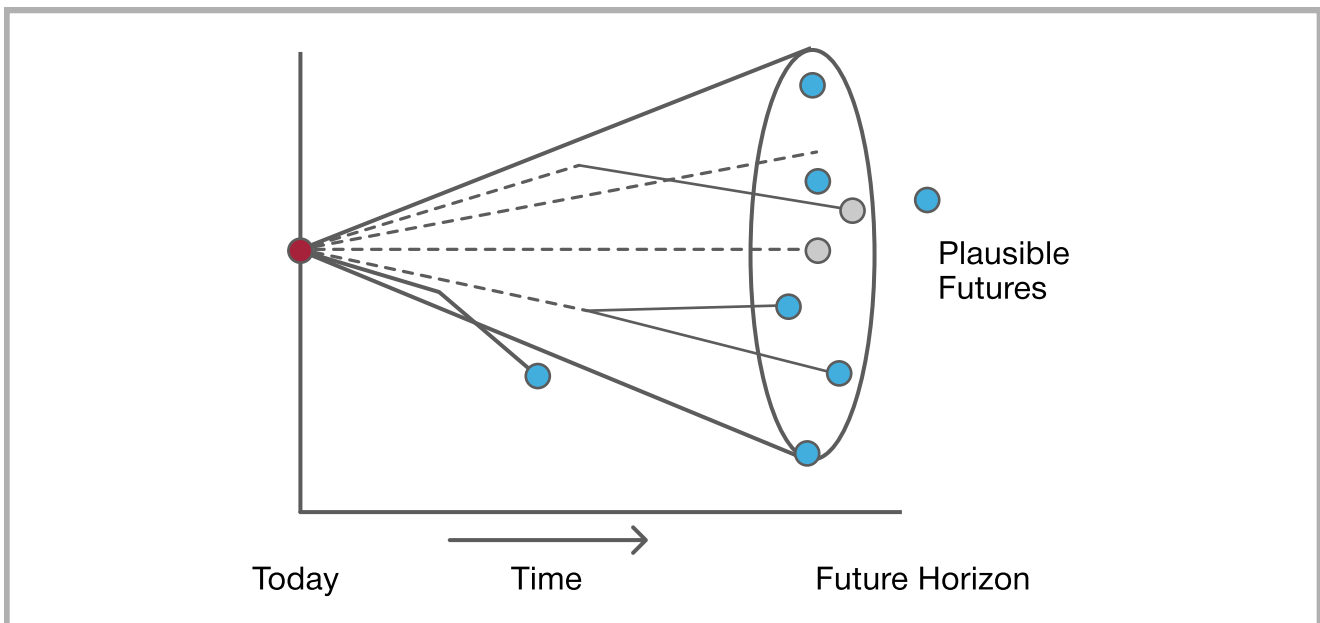

Fig. 1: The Uncertainty Cone by Paul Schoemaker

The 'Uncertainty Cone' (Fig. 1), shows why traditional planning no longer works:

a. The span of predictability is decreasing

Management planning, which includes 5-year plans, annual budgets and quarterly forecasts, is typically fixed on one date that looks into the future for a set period. Organizations can have confidence in these plans when the forecast period is within their span of predictability. However, the span of predictability has been decreasing year on year and the latest situation with COVID-19 has accelerated this reduction significantly.

b. Traditional planning processes do not work outside of the span of predictability

As the cone shows, outside the predictable period can lead to any number of plausible futures. These come into play at different times, and typically not during the organization's natural planning cycle. To manage the multiple futures effectively, an organization must have an ability to re-forecast quickly, to re-plan as needed and to play scenarios in real-time at different levels of the organization. This is where FP&A must play.

To cope with uncertainty, planning has to change. In a world where you cannot predict the future, FP&A professionals need to be focused on the business drivers, scan the business environment for risks and opportunities, and have the ability to re-forecast and re-plan on demand for a variety of future scenarios. All of which could happen.

Nonetheless, many organizations are not prepared for this 'new normal' and are unable to foresee or respond quickly to plan-changing events. According to <u>FP&A Trends Survey 2020</u>:

- 56% of organizations surveyed still spend between 1 to 3 months creating a plan.

- 44% take more than 4 days to produce a forecast, while 25% spend 10 days or more.

- Only 38% believe the accuracy of forecasts are good or great.

This raises several important questions for FP&A:

- How do we move away from fixed-term planning cycles to more agile ones?

- How do we evaluate potential scenarios in real-time?

- How do we forecast and re-plan on demand?

Many of the answers lie in the adoption of a predictive planning approach as outlined in this short paper.

2   Traditional Planning Vs. Driver-Based and Predictive Planning

Predictive planning is not about producing a single plan, but about generating a playbook of those things most likely to happen

Traditional planning (Fig. 2) is typically financial and based around an organization's chart of accounts and a fixed business structure. These structures are usually organized by department and cover the organization's main income streams and related costs.
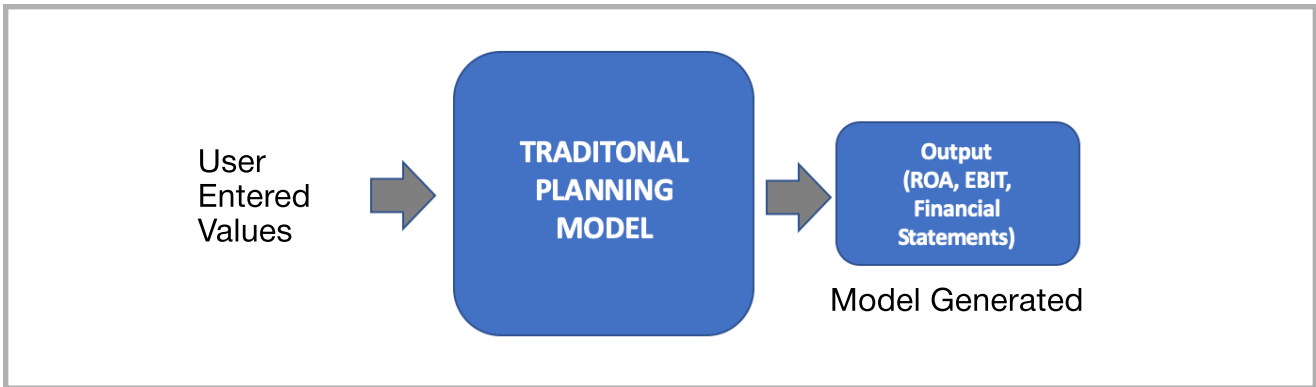
Fig. 2: Traditional Planning

Traditional plans come with several challenges:

- **Bias:** Plans are developed by users who input estimates based on what income they believe can be achieved along with the necessary resources to support it. These values are influenced by a range of factors including company politics, senior management aspirations, bonus schemes, subjective game-playing and business bravado. Often with little connection to facts about past performance, the interrelation of business areas or any expectation of the current or future business environment.

- **Time:** The traditional planning process is lengthy and inefficient. It is often setup as a 'numbers guessing game' where participants attempt to guess the figures needed to meet an arbitrary consolidated goal. 'Game playing' is completely unproductive, greatly increases the time spent and adds to the inaccuracy of the final figures.

- **Flexibility:** Plans often bear little relationship to reality. If something happens during the year, such as a pandemic or an unexpected competitor taking market-share, then the whole process needs to be repeated, generally with little impact to organizational objectives.

Driver-based planning

In order to overcome inefficiencies, many organizations have adopted the use of driver-based models (DBM). These form a mathematical connection between key business drivers and the goals that need to be achieved. Typically in a financial format such as Return on Assets, EBIT, and so on.
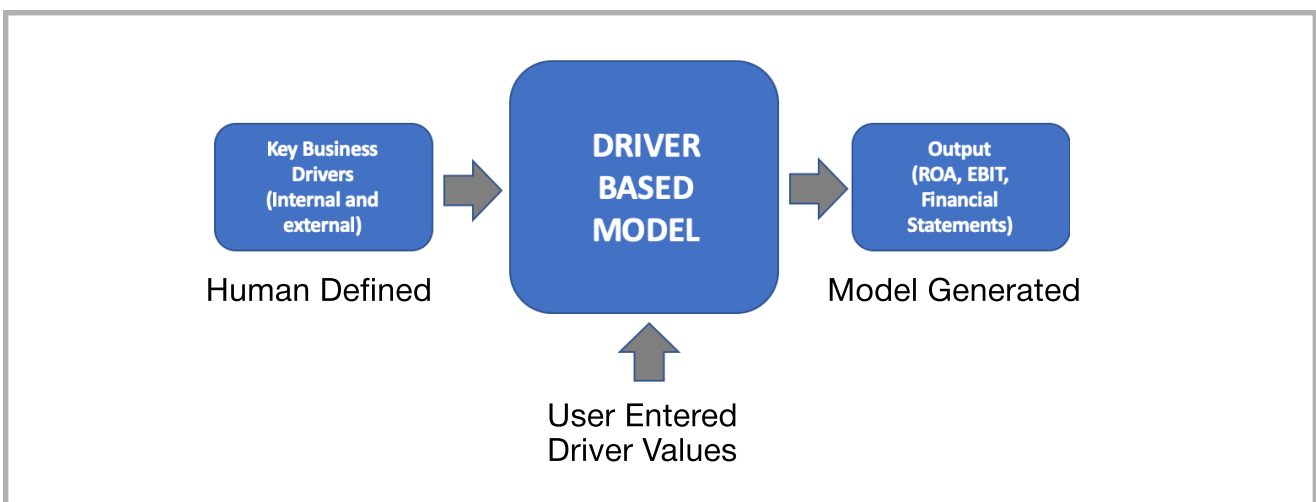

Fig. 3: Driver Based Planning

Drivers are kept to a minimum using the Pareto principle where 20% of the drivers explain 80% of the results. For example, headcount can be used to 'drive' training and office costs, while sales volumes can be used for revenue and cost of sales, all without someone having to enter these detailed values.

By doing this, organizations are able to generate plans simply by entering the value of a few drivers. The mathematical formula produces much of the supporting detail. This can still produce inaccurate forecasts and is still prone too subjectivity in selecting the real drivers of the business.

Predictive Planning: Expanding the power of Driver Based Modelling (DBM)

Predictive planning (Fig. 4) builds on DBMs. As indicated in our definition at the start of this paper, they provide additional capabilities that are essential in today's uncertain world. These include:

- **Statistical techniques** for seasonal and time-series analysis, that can be used to populate future values.

- **Machine learning (ML) algorithms** that can help discover hidden drivers and their impact on future goals.
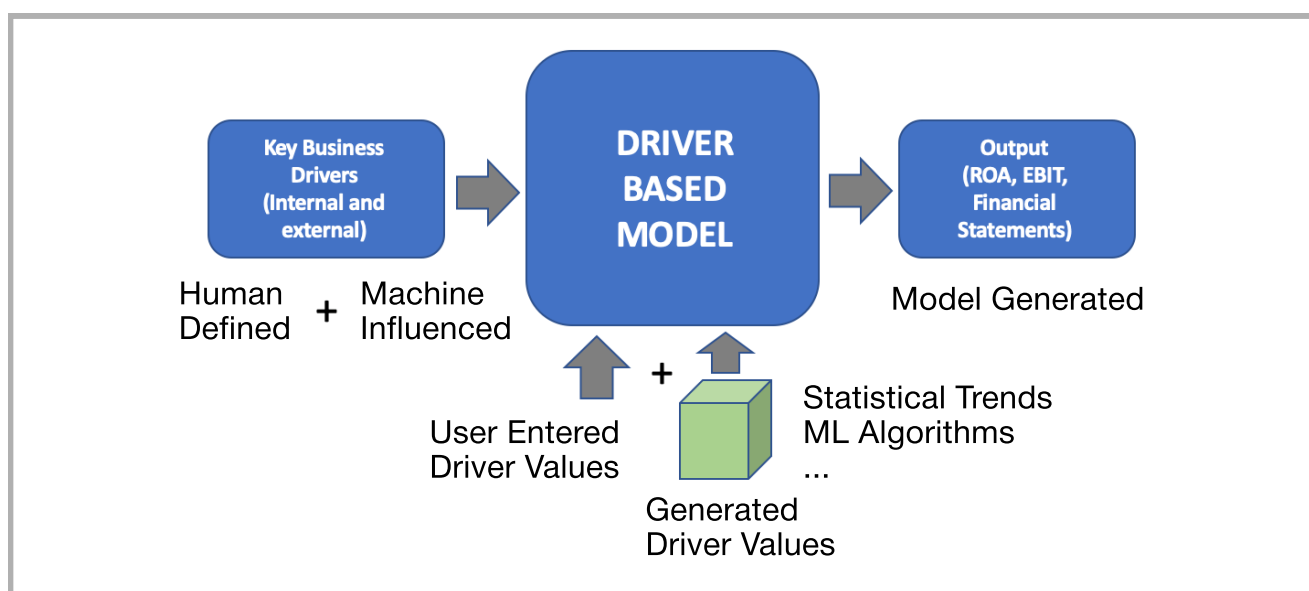

Fig. 4: Predictive Planning

These capabilities are accessed by DBMs and typically work better at a much lower level of detail. For example, at a location, customer and transaction level they often provide more accurate forecasts. Results from these modules are then passed back into the DBM where related values are calculated.

With traditional DBMs, the drivers chosen are mostly internal and are agreed based on past results or by management discussion. In an environment of extreme uncertainty, predictive planning models need to take into account external drivers. Similarly, planning just the profit and loss account is not enough. Organizations need to adopt a 3-way planning methodology, where models take the form of a complete profit & loss account with connected balance sheet and cash flow statement.

Predictive Planning: The basis for scenario analysis

It's worth noting that **predictive planning is not about producing a single plan, but about generating a playbook of those things most likely to happen**.

This is where scenario analysis comes in by allowing organizations to assess a range of outcomes, for example 'best case' and 'worse case'. These allow management to decide on which scenario is most likely, and therefore form plans accordingly.

The key benefits of this approach are more timely, accurate plans, numbers less influenced by game-playing, and an ability to re-plan quickly should things change.

3 Predictive Planning Maturity Model

The different stages of model development to manage uncertainty

Predictive planning has evolved over the past few years. This has been made possible due to a number of factors. These include better access to data sources, increased computer power and new sophisticated computer analysis programs that are accessible to finance staff.

As a result, a predictive planning approach can be implemented in many ways. Ultimately the levels of detail and analysis employed determines the content and sophistication of the model produced. From our experience the following maturity model describes the different stages that lead to the development of a fully integrated model which manages uncertainty most effectively.
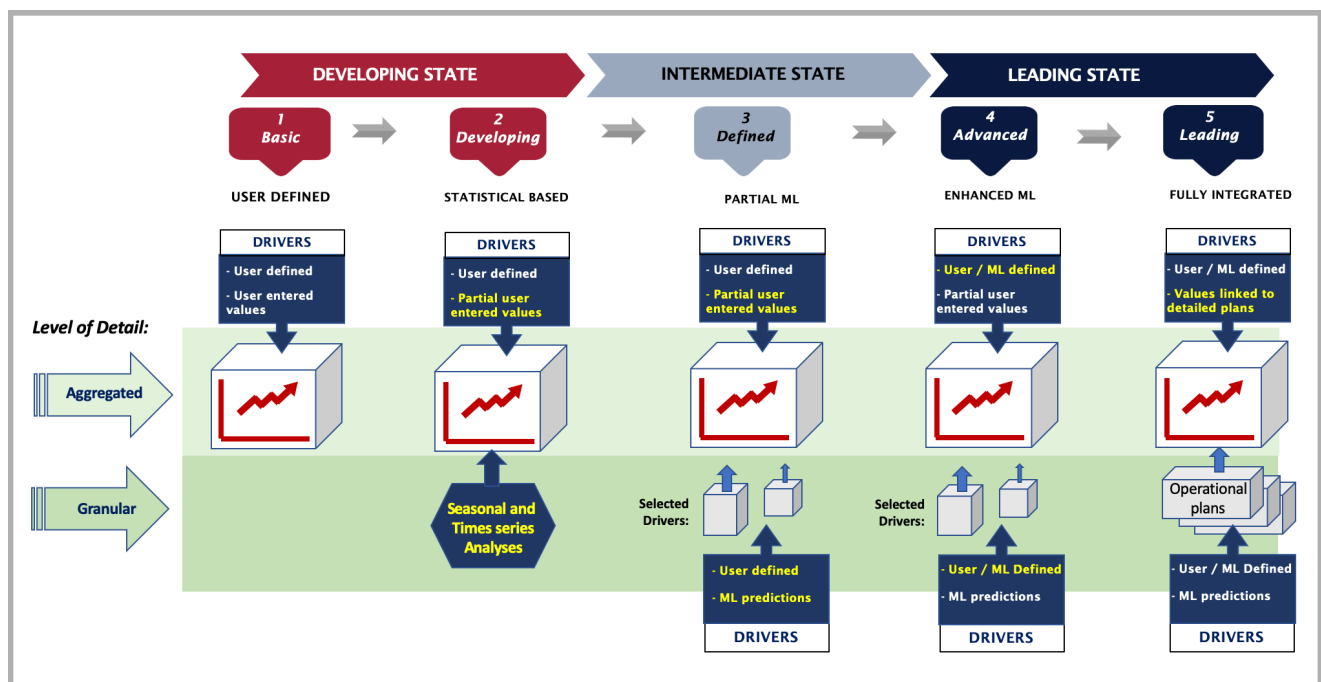

Fig. 5: Predictive Planning Maturity Model (FP&A Trends Maturity Model)

Level 1: User-defined

At this basic level, a DBM is created that has drivers set by human intelligence. Planning takes place at an aggregated level and many of the measures are populated via mathematical formula driven by a few 'driver' values. Although this lacks sophistication and can be inaccurate because

the relationships chosen may be incomplete, it does have the benefit of requiring less time and effort as well as removing some of the bias and game-playing that can happen.

Level 2: Statistical based

This level enhances the DBM by using statistical capabilities that look at the past performance of a few drivers to generate future values. This analysis typically takes place at a more detailed level for certain measures within a separate model. The results are passed back into the DBM which then generates the rest of the financial statements.

Level 3: Partial machine learning (ML)

This is where the DBM models make use of ML algorithms to predict future values for some measures. This type of analysis is also performed at a detailed level, for example for individual customers, products or within specific geographical regions. It is typically just for specific revenue and cost streams. Results are then put back into the aggregated model where relationships between other measures are still decided by management. This approach can greatly increase the accuracy of predicted values.

Level 4: Enhanced ML

At this level, ML algorithms replace human intelligence to uncover drivers that influence results. This is typically the domain of FP&A data scientists who are able to take a range of other factors into account, and use the relationships uncovered as 'rules' to generate future values. The results are used to both adapt the drivers in the aggregated plan as well as to supply the values at a detailed level.

Level 5: Fully integrated

This final stage of maturity is where the financial plan is fully integrated with an organization's operational plans. Operational plans are typically made at a detailed level using statistics and ML capabilities and are then automatically fed into the aggregated financial plan. A change within the operational plan is reflected immediately in the financial plan without users having to transfer data or update rules.

4 Advanced Predictive Planning Architecture: Considerations for Choosing a Platform

Requirements of a predictive analytics technology platform

To achieve the more mature levels of predictive planning, a predictive analytics technology platform is required. This will consist of a number of software services that are designed to work together in order to support a totally integrated application.

This platform should include the following capabilities:

Model builder: This allows users to build driver-based models that reflect the way the organization operates. These models should support different levels of detail and recognize that each department will have different drivers. They should also allow automatic transfer of results from one model to another if required.

Models are built using standard definitions relating to accounts, measures and structures. If any of these definitions change then the models will be automatically updated. This greatly simplifies system maintenance and eliminates many integrity issues.

Integration: Account and business structures can be imported directly from an organization's transactional systems. Integration also allows for the automatic import and summarization of data from internal and external systems, often even when this includes a variety of data formats. This result is that plans always use the most up-to-date information, thereby creating a single version of the truth that everyone can trust.

Advanced analytical capabilities: These allow models to access a range of:

- **Statistical functions** including time-series analysis, linear regression and multiple regressions

- **Specialized functions** such as Holt-winters and Monte Carlo simulations to understand the impact of risk and uncertainty in forecasts

- **Machine-learning algorithms** to forecast future values and to uncover driver-relationships

Collaboration: This provides control over how users interact with the system, what they can see and what they can do. It also defines their requirements, their associated deadlines and sends reminders if actions are not carried out in time.

Scenario analysis: This capability allows management to run multiple scenarios using different driver values and then compare the results.

Analytical presentation: This allows insights to be generated from data and presented to users. These insights can warn of potential issues based on current trends, identify events that have caused certain results and reveal the consequences of a range of 'what if?' scenarios. Users should be guided through this analysis with appropriate context and explanations should be provided to ensure that the key messages are seen and understood.

Fortunately, with today's cloud-based technology platforms, predictive planning only requires a relatively small IT footprint. Best in-class solutions come with predictive planning capabilities built-in and also allow access to a range of machine learning algorithms. This can lessen the need for data scientists and leaves the development of models in the hands of FP&A planners. These models are quick to set up and accessible throughout the whole organization which makes it is easy to get started.

5 Starting Predictive Planning

Key questions to ask when implementing predictive planning

Predictive planning is a valuable tool that can not only save time and improve forecast accuracy but **can also provide a platform to help organizations address obstacles to growth in the medium and long-term,** such as commoditization and disruptions.

Since predictive planning recognizes today's reality and allows decisions to be made quicker and more efficiently, organizations can make sure that any case put forward is linked to solving both short and long-term issues.

Regardless, **organizations new to predictive planning should start by answering the following questions**:

1. What do you want to achieve? Do you want to focus on a particular item such as sales volumes or cash flow? Perhaps the whole P&L or maybe a complete set of financial statements? Much of this will depend on your organization, its focus and the amount of resources available. In general, it is best to start with just one or two measures to gain experience and confidence before taking the project forward.

2. What are the basic principles that govern your plan? For example, how do front-line staff act and what drives performance. Alternatively, think backwards from what you want to achieve. If you want to avoid a particular situation such as closing a factory or expanding the business to a new country, then think about those drivers that will achieve this result.

3. Are the drivers chosen adequate for plan's purpose? Involve others to check that the selected drivers are right and that suitable data is available.

4. Are there any unnecessary measures in the model? In building the model, remove any measures that are immaterial. Including them will just introduce noise.

5. Does the plan have material measures that do not vary? If so, then you can use the trend or run-rate of these material measures as a forecast. If the variability of measures is high, then consider using statistical functions or ML algorithms to predict trends. This will require historic data and some knowledge on how these functions work.

Once you feel comfortable with answers to the above questions, you can move onto other levels of predictive planning where ML takes a more central role.

6 Six Main Benefits of Predictive Planning for FP&A

Why predictive planning is an essential part of FP&A

Predictive Planning has enormous benefits for organizations. Here are just a few of them:

- **Acceptance:** Predictive planning is based on drivers that are relatively easy to understand. Stakeholders can easily relate to them and comprehend what they do. This increases the ownership of both the plan and the data.

- **Speed:** It requires far less user interaction and plans become agile. With just a few key-strokes, new plans can be produced and made available instantly.

- **Simplicity of reforecasting:** Plans can be constantly re-evaluated for reality, based on the latest forecasted trends.

- **Quality of forecasting and planning:** This is greatly improved as game-playing and emotions have far less influence. Most organizations that use predictive planning report an increase in forecast accuracy.

- **Agility:** It can increase the agility of the organization in response to external events. For example, there are more opportunities to perform 'what if?' analyses that allow the business to explore different scenarios.

- **Insightful decision-making:** Driver-based models allow assumptions to be challenged and allow finance to received non-judgmental feedback from stakeholders. They also help FP&A explain to staff how one part of the organization can affect the other, and therefore their role in achieving both the short and long-term objectives of the organization.

7 Summary

Today's uncertain times mean that it is no longer good enough for organizations to have one fixed plan and forecast. Historic data by itself cannot help predict the future, nor can classical planning methods and standard variance analysis provide sufficient information to manage a business. It is time to change and adopt a fact-based mind-set towards business decisions.

Predictive planning, when done correctly, helps organizations cope and gain advantage in times of uncertainty. It is a logical next step for those wishing to improve their decision-making process.

Most organizations have systems that answer the standard reporting questions such as 'What happened?' and 'Why did it happen?'. It is now time to use more intelligent predictive analytics that answers question relating to the future. For example, 'What will happen?' and 'What is the best outcome that could happen?'.
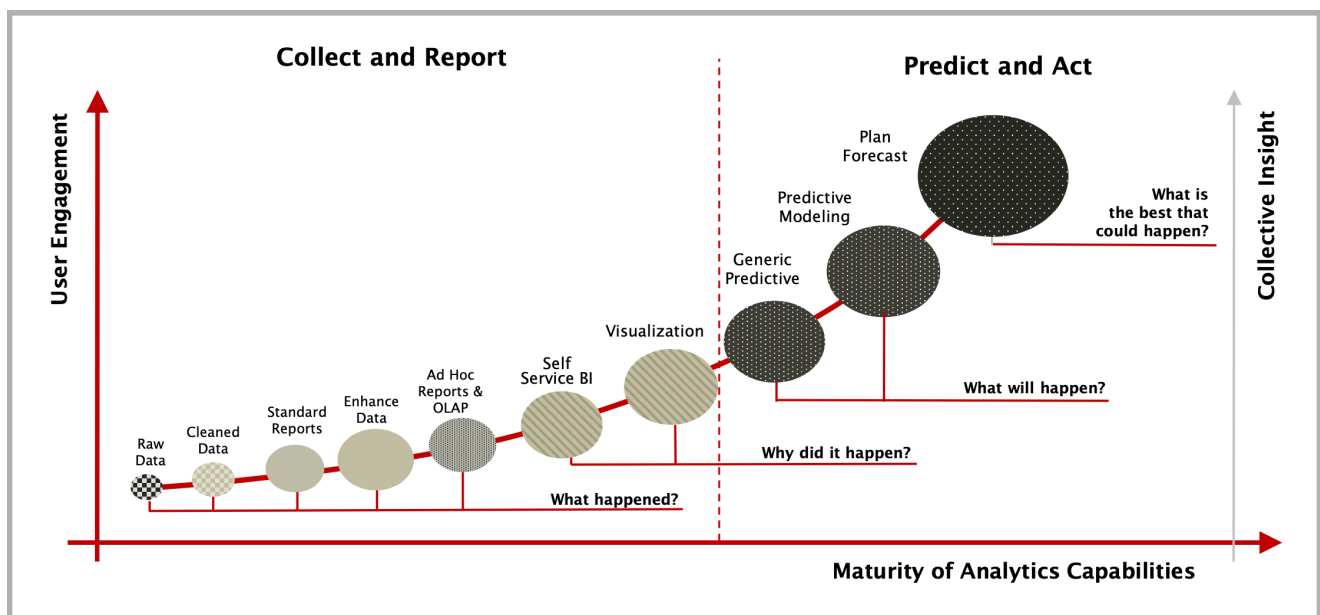

Fig. 6: Evolution of analytic adoption (SAP Presentation)

To do this effectively, while remaining agile, an organization requires all data, systems and models to be on a single analytic platform. This is not something that can be accomplished with spreadsheets or outdated consolidation systems. Fortunately, the new breed of cloud-based solutions provide the necessary analytical platforms. They provide models that are quick to set up, have predictive capabilities, are simple to distribute, and require little investment.

There has never been a better time to start exploring predictive analytics given that the business world we live in requires a radical change from traditional planning.

Larysa Melnychuk

Larysa is a passionate Financial Planning & Analysis (FP&A) professional and influencer who has held senior FP&A roles at leading organizations before setting up the International FP&A Board in 2013. In the last three years, she successfully expanded the Board into 27 chapters in 16 countries across 4 continents.

Larysa is also the founder and CEO at the FP&A Trends Group, the leading online resource for FP&A professionals. She chairs the Global AI FP&A Committee and runs a number of high-profile initiatives in the area of modern financial analytics.

Larysa holds a Master of Science degree in physics of materials and is a qualified chartered management accountant (CIMA), chartered global management accountant (CGMA) and is a holder of an FP&A certification. She is also a member of the exam content writing team for the Association of Finance Professionals (AFP) FP&A certification.

Michael Coveney

Michael Coveney has over 40 years of experience in designing and implementing software solutions that combine 'best management practices' with technology to improve the efficiency and effectiveness of planning, budgeting, forecasting and reporting processes.

He has conducted senior management workshops with leading organizations around the world and led courses for the American Management Association and Antwerp Management School on the topic of Corporate Performance Management.

His energetic style and extensive experience led him to become a regular speaker at many international events and the author of many articles and books. His latest, 'Budgeting, Planning and Forecasting in Uncertain Times' is published by John Wiley & Sons. In recent years he has focused on the role of IT within FP&A departments.

If you have any questions or comments, please feel free to contact us via email info@fpa-trends.com.