# *Dynamic analytics for enhanced business decision making in the entertainment industry*

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pwc

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*The heart of the matter*

# Analytics applied consistently through your organization can boost business performance

Analytical solutions have become an important component in addressing complex and strategic issues, and are used increasingly throughout the Entertainment and Media (E&M) industry. In fact, companies that have extensively implemented analytics have used it as a differentiator and are three times as likely to outperform their competitors.[1]

The industry is in a period of significant and rapid change brought about by evolving digital distribution technologies and the widening range of products and services they have engendered. This paper will briefly explore the range of analytical techniques available today, present a proposed structure for a successful analytics project, and then focus on simulation modeling as an effective tool to address E&M macro strategic decisions in a rapidly changing world.

1 Lavalle, Steve, et al. "Analytics: The New Path to Value." MIT Sloan Management Review (2010).

The paper provides two case study examples. The first case, Feature Film Lifecycle Simulation, illustrates how simulation is used to forecast and optimize the revenues generated by movies across the full spectrum of release windows. This model incorporates the real-world dynamics of the system, including marketing strategies, environmental factors (e.g., GDP, disruptive technologies), and intrinsic characteristics of the movie. Executives can use this to simulate and test various release and distribution strategies prior to launch and throughout the lifecycle.

The second case, Television Content Value Simulation, uses a holistic approach to simulation modeling to provide a comparative value for series-level television programming scenarios. The model considers the impact of relationships between key players in the system (e.g., service providers, consumers, advertisers) and factors that influence their behavior. Program networks can use this to make content decisions based on overall financial and brand impact, and test program placement and distribution options.

*An in-depth discussion*

# Apply the right analytical solution to the business problem to drive value

## *Leverage analytics as a differentiator*

Companies across industries are trying to understand and connect to the consumer at a more personalized level. E&M companies are creating new products and services and adjusting or reconstructing their business model in response to the technical transformation of content delivery platforms and the changing demands of the digital, social consumer. Some are using technology advances to begin to shift their business model from a B2B (business-to-business) focus to a B2C (business-to-consumer) focus. E&M companies are especially concerned with answering this question:

- *How do we offer products and services across the multitude of new distribution channels and consumer engagement opportunities to yield the greatest financial return?*

In other words:

- *How do we optimize revenue return on our content investment and participate in growth areas while preserving traditional revenue streams?*

Today, companies are awash in data to aid in discovery. However, data are often inaccessible; lack common definitions, structure, and governance; and are often not available to the right people, at the right time and place, in the right way to translate to understanding and timely action. Companies that find a way to overcome these obstacles and harness the power of their information will be more in control of their business and have an advantage over the competition. Top-performing companies are twice as likely to use analytics to inform strategic and operational decisions, and those that do outperform their competitors by three times.[2]

In addition to accessing data, many analytical techniques and tools are available to isolate the relevant data sets that correlate to the issue, and correctly relate them. The right tool(s), applied to the right data, are needed to generate valid insights. A structured approach is an effective way to help businesses master their toughest information analytics challenges by addressing root causes, determining the business value of available data, and realizing benefits more rapidly. The structured approach provides an efficient means to minimize the time (and expense) to value. PwC's approach follows three principles:

1. **Align on well-defined problems and hypotheses:** Invest time and effort upfront in developing a clear definition of questions to be answered or problems to be solved, the related hypotheses, and the corresponding business value potential. This facilitates the prioritization of analytics efforts based on the value add from each initiative. Based on this, define an analysis "path" that outlines the data sourcing, data request, and logistical planning.

2. **Gather relevant data and perform the right analysis:** Early on in the process, define the data requirements necessary to support the analysis path. Then, use creativity to collect, assemble, and corroborate data from internal and third-party sources. *The right analysis needs to be applied to the business problem to effectively drive value.* Generally, it's best to start with smaller, simpler analyses and increase analytical complexity as conditions and value warrant. To get the most value, leverage the right combination of hard (e.g., segmentation, optimization) and soft (e.g., sentiment analysis, competitive intelligence) analytics during the analysis.

3. **Derive value through execution:** After conducting the analysis, use the insights derived to develop a list of strategic recommendations for action. These recommendations should drive at the core root causes of the business issue. Prioritize the recommendations based on impact to inform the design of a future roadmap. The roadmap should include a test and measurement approach: pilot tests with systematic implementations consistently accompanied by a measurement approach to track results.

2 Lavalle, Steve, et al. "Analytics: The New Path to Value." MIT Sloan Management Review (2010).

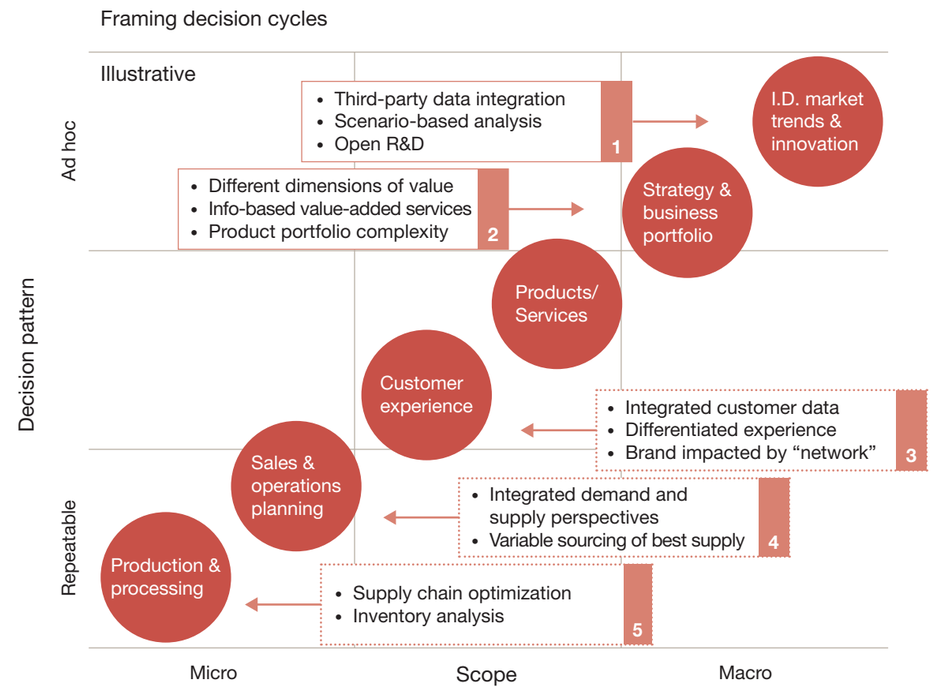
This three-principle approach provides a structured methodology for conducting analytics to yield fast, practical, and durable business insights, with the ability to implement and scale analytical recommendations.

Given the wide range of analytical solutions available, it's extremely important to fully understand the business need when designing the analytical approach. Businesses can call upon techniques such as:

- **Data collection and visualization:** Structured and unstructured data (e.g., live call data, online data) are extracted. Analytical techniques are applied to validate the reliability and effectiveness of the data. The data are then presented using visualization techniques, such as graphics, animation, and 3-D displays, to make information available in a visual manner for executives to prioritize and focus on the right areas.
- **Segmentation:** Techniques (e.g., cluster analysis, principal component analysis) applied to internal and external data to effectively target a group of customers with specific characteristics. Segmentation is often used in conjunction with market research.
- **Market research:** Primary market research through designing and analyzing surveys that identify customer attitudes, interests, opinions, and behaviors.
- **Predictive analytics:** Statistical and artificial intelligence algorithms (e.g., neural networks, regression, decision trees) are used to prescribe and predict actions.
- **Advanced computational methods:** Approaches such as optimization, simulation, and profitability modeling. These approaches use techniques such as genetic algorithms, mixed integer programming, and system dynamics to tackle complex, macro, ad hoc, or one-time decisions.

PwC leverages our experience in applying multi-disciplinary thinking and solutions to different types of business problems. Applying the appropriate form of analytics is essential to laying the groundwork for results for the business (see Figure 1).

**Figure 1: Types of decisions/associated value and the need for new thinking and solutions**

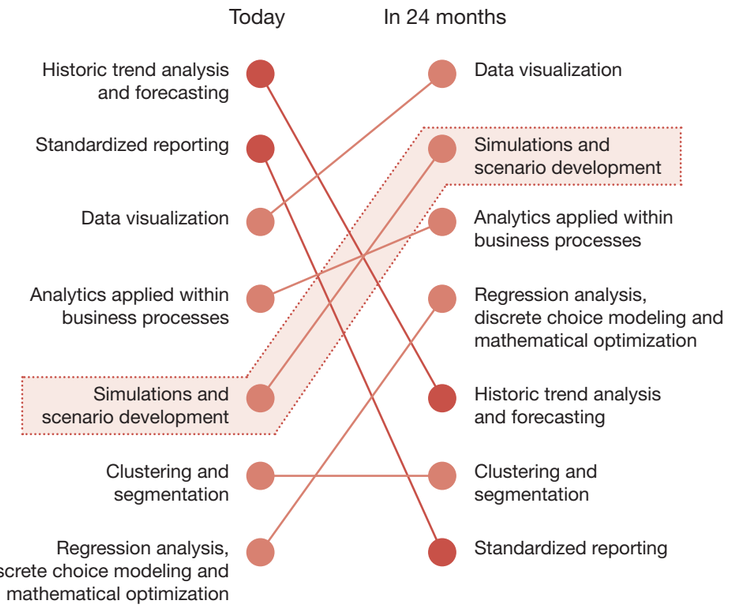



Some of the most challenging questions that E&M companies should consider are ad hoc macro strategic decisions (see box 1 and 2 of Figure 1) that involve designing distribution strategies, creating the right mix in product portfolios, and understanding market trends. These high-level decisions benefit from advanced analytical tools, such as simulation modeling, that capture the complex dynamics at play while allowing for scenario-based analysis. Scenario planning is particularly effective because it provides powerful tools for the user to leverage their experience, test assumptions, and validate conclusions before incurring risk. The two model examples presented in this paper outline how simulation can be used to provide more holistic and comprehensive insight into E&M business issues.

## *Use simulation to make better decisions*

A joint survey conducted by MIT and IBM revealed that new techniques and approaches in analytics are becoming increasingly important for adding value. The survey asked nearly 3,000 executives across 30 industries to (1) identify the top three analytics techniques that add the most value today and (2) identify the top three analytics techniques that they believe will add the most value in 24 months.

**Figure 2: Top three analytics techniques creating value today and in the next 24 months** [3]




3 Lavelle, Steve, et al. "Analytics: The New Path to Value." *MIT Sloan Management Review* (2010).

The survey results illustrated (see Figure 2) the increasing importance of data visualization and simulation over the next 24 months. Simulation is a form of modeling where the underlying dynamics of real-life situations are replicated in a simulated environment. Simulation provides insights into systems with non-linear and dynamic trends by simulating the key relationships and attributes of system components over time. Simulation can then be used to run "what-if" scenarios to understand the implications of alternative conditions in the system. Simulation takes advantage of growing computational power, availability of "big data," and data visualization to model macro/micro economic conditions, consumer behavior, varying product attributes, and other forces that influence the business system.



## *Background on simulation techniques*

Simulation uses the latest technology and statistical methods to build on and extend traditional analytical techniques and can be applied to strategic and operational decision making. Simulation can help companies move away from typical predictive analytics based solely on prior historical data toward forward-looking simulations. It is particularly powerful in macro, ad hoc decision-making situations that have complex non-linearities and interdependencies in the business system. PwC chose two key questions for the film and broadcast industries around which to create simulations:

1. How do I optimize the release, windowing, and distribution strategy for a film to maximize revenue across its lifecycle?
2. What is the overall value (financial and brand) of a television series, and how can I improve that?

These questions were addressed by combining two simulation techniques: agent-based modeling and system dynamics. Combining these two techniques captures system complexities that traditional techniques cannot. For example, agent-based modeling and system dynamics can be used to model:

a. Systems highly dependent on individual interactions and behavior. Techniques such as agent-based modeling are required to capture micro-level activity to understand macro-level trends.
b. Systems that have conflicting pressures with direct and indirect forces at play
c. Systems with attributes such as delays, tipping points, non-linearities, feedback loops, and interdependencies between components
d. Business issues that require scenario analysis to test the impact of multiple strategies

The two examples included in this paper illustrate such complex issues.

### Agent-based modeling

Agent-based modeling is a new technique that uses advances in artificial intelligence and behavioral economics to simulate behavior at an individual level to analyze the overall, aggregate outcomes. The modeler uses their "mental model" assumptions to define the decision rules and interactions at the individual level. Then, the model is used to simulate the simultaneous operations and interactions of multiple "agents" to re-create a system and predict complex phenomena. This process results in emergent behavior at the macro-level from the micro-level system interactions. That is, mass behavior is predicted from the myriad individual agents' actions and interactions.

Agent-based models are composed of:

1. Multiple types of agents or entities (e.g., people, cars, homes)
2. Decision-making rules for each agent
3. Learning rules for adaptive processes
4. Interaction effects between agents (e.g., spreading awareness of a product through word of mouth)
5. An environment that the agents reside in

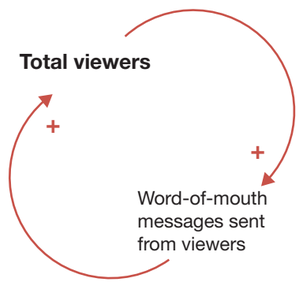
Individual agents in the model dynamically interact based on rules specified to create a real-world-like complexity. The concept is that simple behavioral rules that define the software agents' actions generate complex behavior at the macro level. For example, in the Television Content Value Simulation case outlined in Example 2, the model simulates consumers, cable providers, and network providers as different types of agents or entities. These agents interact following real-world patterns (e.g., consumers interact with other consumers to spread opinions on recently viewed television shows). Each entity has unique attributes, decision-making rules, and learning rules (e.g., each consumer simulated has a gender, race, and memory that impact their viewership behavior). The individual actions and interactions are aggregated to analyze the system as a whole to more accurately model viewership behavior, channel ratings, and show ratings.

**System dynamics**

System dynamics provides insight into behavior of complex systems by modeling the internal relationships, feedback loops, and time delays within the system. These elements capture complexities such as non-linearity that other types of analytical models do not account for. System dynamics was originally developed to improve corporate managers' understanding of industrial processes, but is now being used throughout the private sector for strategic analysis and design.

The system dynamics approach involves defining problems dynamically and thinking of all concepts or components in a system as interconnected, as done in a mental model. The feedback concept is the root of the system dynamics approach. Diagrams are designed to conceptualize a system in terms of circular causality and information feedback. A feedback loop exists when information resulting from some action impacts other components in the system, eventually influencing the point of its origin. A basic example of the feedback concept is the word-of-mouth effect in the Feature Film Lifecycle Simulation case (see Example 1). As total viewers who like a specific film increase, more people begin spreading positive messages about the film, ultimately increasing the total number of viewers.

**Figure 3: Viewership word-of-mouth positive feedback loop**




If the impact is reinforcing the initial action, then the relationship is referred to as a positive feedback loop. Positive feedback loops are sources of growth or accelerating collapse. If the impact is to oppose the initial action, then the relationship is called a negative or balancing feedback loop. Negative feedback loops will stabilize the system over time.



## *Example 1: Feature film lifecycle simulation*

**Objective**

The Feature Film Lifecycle Simulation model forecasts the revenue that movies generate across the full spectrum of release windows and physical and digital media platforms. The simulation allows an enterprise to experiment with a variety of release and marketing strategies in a risk-free environment before going to market, and then adjust the strategy during execution in response to market feedback. Simulation activities could benefit the business in two ways: help improve overall revenue return and make the marketing spend, which today is often between one-third and one-half of overall budget, more effective and efficient.

The model provides a basis to:

1. Estimate the potential revenue streams generated by different marketing and release strategies
2. Assist in the pre-release planning
3. Identify and track leading performance indicators
4. Evaluate and modify either or both strategies based on near-real-time feedback as social feedback and consumption data emerge

**Model description**

The Feature Film Lifecycle Simulation model is a decision support tool for better planning and monetizing movies. The relative success of any given movie is determined by its ability to engage the interest of potential viewers and move them through consideration to intent and into action. This simulation model presents a framework for tracking these levels of interest and estimating their impact on the film's performance over time. This model accounts for four sets of factors:

1. Intrinsic characteristics of the movie and the historical performance of comparable films
2. Marketing and distribution strategy and its influence on:
   a. Demand attrition over time
   b. Synergies between media platforms
   c. Cannibalization of sales between media platforms
3. Current and upcoming competitive releases
4. Environmental factors such as the prevailing political, environmental, and social attitudes, and the diffusion of disruptive technologies

The model combines agent-based and system dynamic modeling techniques to forecast any given movie's lifetime performance. The model contains two key modules:

1. Movie module: to capture the dynamics of individual movies over their lifecycle
2. Market module: to capture the competitive dynamics behind the market demand for all movies

Together the two modules are able to forecast the future performance of movies by quantifying the impact of the four sets of factors noted in the previous paragraph.

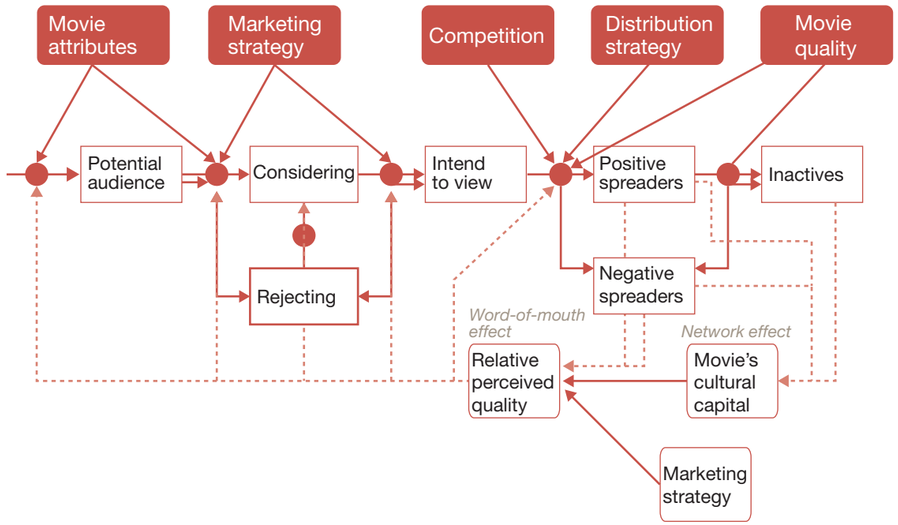
**Movie module**

The movie module captures the dynamics of individual movies. Each movie shares a structure that captures the movie's individual:

1. Intrinsic characteristics (e.g., lineage, creative, genre)
2. Marketing and release strategy
3. Behavior of the potential audience in response to the information available to them

The core of the movie module is an audience flow structure that captures the evolving interest in each movie over its lifecycle. Figure 4 displays a simplified audience flow structure that progresses the population through a set of mutually exclusive behavioral states (Potential Audience, Considering/Rejecting, Intend to View, Positive/Negative Spreaders, and Inactive) representing different levels of interest in the movie.

**Figure 4: Audience flow structure**




The formulas that drive how a particular audience population transitions through the audience flow structure are influenced by the movie's perceived quality, the network effects attributed to the movies potential contribution to the viewer's cultural capital, and the quantity and quality of information about the movie. This structure constrains the movement of people through the behavioral states to the speed that new information spreads through the population. The drivers behind this dynamic adjustment process are the current flows of marketing and word-of-mouth messages.

People spread information through direct word-of-mouth messages (WOM). The impact of WOM can be positive or negative, depending on the sender's impression of the movie. The number of WOM conversations depends on the number of people in each behavioral state and the frequency they discuss the movie. The frequency of discussion for any given movie depends on a number of intrinsic factors, including its quality and genre. The model can be used to simulate and compare potential strategies for rekindling consumer interest when WOM is declining to inform marketing investment decisions. For example, the model can simulate the impact of having marketing give-a-ways in a particular region versus investing in billboards or advertisements.

Marketing plays a strong role in a movie's performance at the early stages of its lifecycle. Marketing messages are typically the first source of information to reach the population, and therefore the film's marketability sets its initial perceived quality, which significantly impacts the public's interest in the film before its release. The impact of marketing on the perceived quality of a movie declines over time as WOM information becomes available.

**Market module**
The market module captures the competitive dynamics of past, present, and future movie releases. The key components of the market module are the:

1. Set of movies the audience is aware of
2. Ability of the audience to access the movies
3. Environmental factors that impact the audience's overall demand for movies

Movies compete against each other for individual viewers as they simultaneously contribute to a collective interest in watching movies across all potential viewers. For example, a surge in the demand for a summer blockbuster may cause spillover into competitive films in the current period, as well as increase the market awareness for movies released in subsequent periods. Alternatively, a long stretch of unappealing films may diminish the pool of potential viewers and detract from the performance of the next big release. The model accounts for the impact of competition by allowing interest in multiple movies to build simultaneously, but the actual attendance can be positively or negatively affected by the perceived quality of alternative choices available to potential viewers.

The availability of a movie is another pivotal factor in a moviegoer's choice. Although technology is rapidly expanding the consumer's viewing choices and lowering costs to search for those choices, the consumer's choice remains highly constrained by the strategically planned release windows. The primary constraint in a typical exclusive theatrical first release scenario is the number of screens the movie is playing on. When more data are available on exhibitor behavior, the model will capture this constraint by simulating the number of screens exhibitors allocate to each movie according to the movie's expected future performance and the upcoming slate of competitive releases.

The ultimate impact of capacity constraints on a movie's performance is extremely non-linear. While missed sales at any point in time will immediately (and linearly) reduce revenue, it is possible that a portion will be recovered in the following weeks because the interest is delayed but not lost. But even a potential sleeper hit may not get its chance. Capacity constraints can stymie a film's revenue potential by preventing the critical audience mass it needs to build on WOM and network effects before exhibitors lose hope and pull the plug. The model accounts for the potential non-linear effects of the capacity constraints induced by different release window strategies on the film's total revenue.

The environment that the film is released into is the third major component of the market module. How much money people have to spend on entertainment, how well or poorly the film resonates with the prevailing social/political climate, and the potential effect of any technological enhancements or disruptions (e.g., 3D) are taken into account by identifying their impact on each stakeholder in the model (e.g., the audience, the exhibitor, competitive films). The model uses Monte Carlo simulation techniques to forecast a range of likely futures according to the prevailing environmental factors, their trends, and their level of uncertainty. The Monte Carlo technique relies on repeated random samplings of variable values to infer a solution based on the collective results. The random samplings are used to compute probability distributions of possible outcomes.

## Benefits of approach

The modeling approach provides a framework for analyzing how films generate revenue throughout their lifespan. By simulating the awareness, consideration, and intention to watch a movie over time, the model is able to explore alternative release strategies and the associated costs, revenues, and risks. Once the model has been calibrated to historical data, it can be used to estimate a future movie's revenue as a function of the audience's interest and consumption preferences and the movie's availability across media platforms.
The simulation approach provides executives with a tool for:

1. **Optimizing revenue across release windows.** The model estimates the revenues generated by each type of media platform depending on the release strategy deployed. Because the model calculates revenue as a function of the population's level of interest and consumption habits, the tradeoffs of any number of release strategies can be explored to see the influence on: (1) the number of interested purchasers and (2) the price purchasers are willing to pay for each type of media at each moment in time. The model helps executives to both plan the initial release and to monitor and manage the release as information becomes available and new questions can be clearly articulated. Some example questions might include:
   - What would be the net effect of introducing a Premium VOD window?
   - To what magnitude does an early VOD release erode the anticipated DVD sales? Which strategy will net the highest revenue at the end of the movie's lifetime?
   - Do overlapping release windows spur enough word-of-mouth communication to overcome the potential cannibalization of sales?
   - Are the gains of shifting the DVD release up two weeks to avoid competing against a strong competitive film worth the costs of expediting the release?
   - Do the characteristics of the movie indicate a sleeper hit?
   - How does the availability of streaming sites impact consumer viewing preferences?
2. **Planning media campaigns.** The model can be extended to include the impact of targeted media campaigns on viewership to determine how to create the right impressions in front of the most important audiences.
3. **Adjusting in-flight campaigns and release strategies.** As a future enhancement, the model will use sentiment analysis techniques to mine the social media space for the quantity and direction of the word-of-mouth messages sent. The model will translate these comments into leading indicators of the movie's ability to attract future revenue. And to help identify and fund potential sleeper hits faster, the model will timely quantify the impact of the social media space.

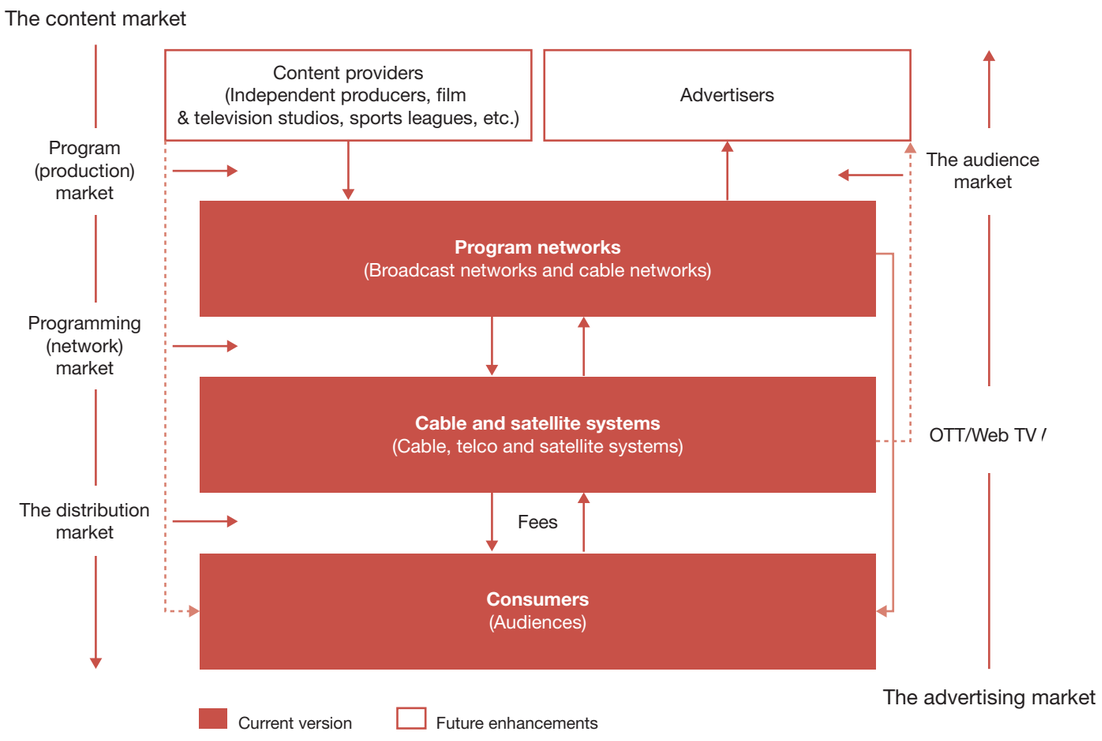
## *Example 2: Television content value simulation*

### Objective

The purpose of the model is to develop a method for evaluating television programming. Traditional valuation techniques factor in direct revenues and costs of a specific show without considering the impact of other factors at play. Simulation is used to model the relationships between key components in the system (multiple television shows, channels, providers, etc.) to more effectively output:

1) Total show viewership
2) Comparative content value at the individual program series level, including brand value
3) Program-level financials (revenue, costs, and return on investment from factors such as advertising rates and subscription fees)

**Figure 5: Key market players**




### Model description

The model uses an agent-based approach that simulates key players in the market as they make individual decisions. Their individual decisions are a result of unique attributes, behaviors, and interactions with other players in the system. The model simulates decisions at an individual level to understand the dynamics at the aggregate level.

The players simulated in the model include:

- **Consumers**—Consumer choice of shows, networks, media (linear vs. non-linear), and time of day to watch TV are simulated in the model. This consumer behavior depends on brand equity, awareness, emotional valence, and unique consumer attributes (e.g., age, income, race, lifestyle). Consumers also have memory of their viewership history, watching experience, missed episodes, and information exposed to during the show, all with a memory decay rate. Consumer behavior will change over time with new experiences and interactions with other players in the model.
- **Service providers** (Cable, Telco, and Satellite Systems)—The players in the distribution market are simulated as a layer in between consumers and program networks. The shows that a platform distributor airs are simulated by each channel offered. The age, syndication, ratings, and subscription fees for the channel are modeled over time. Similarly, the schedule, attractiveness, ratings, episode quality, and advertising rate for each show are simulated.
- **Program networks**—Program networks are simulated interacting with the content and service providers, and with aggregators or directly with the consumer through digital distribution channels. The indirect and direct costs/revenues are calculated to output the financials for the program networks.

The current version includes the actions and interactions between the consumers, service providers, and program networks, but does not include the relationship dynamics added by the advertisers and content providers. However, these additional players will be captured in future enhancements:

- **Advertisers**—Advertising rates will be simulated as a function of the size and demographics of the audience of a specific show.
- **Content providers**—Content providers will be simulated offering a unique list of shows. This allows the content provider to have an overall attractiveness rating based off of the brand equity, content value, and ratings of individual shows provided. This attractiveness score will change over time as the content provider takes various initiatives to increase its ratings.

The individual interactions and decisions of key players are then used to compute the resulting content value and revenue of specific shows.

**Dynamic relationships between market players**

The model includes a network of feedback relationships that link each actor in the model. Feedback loops and dynamics between system components are important to include when valuing a show, because the relationship between quality of the show and revenue brought in by that show is most likely non-linear. Understanding the relationships between system components can provide more accurate analysis on the expected consumer relationship with a show, providing insight into the fees worth paying for that content. Figure 6 maps four of the key feedback loops that drive the viewership of a TV program.

Taking a high-quality program as an example, the program's quality increases the probability that the consumer will watch the show again in the future (R1), and generates positive word of mouth between individuals and online (R2). The increased awareness attracts new viewers who increase the program's base viewership in each subsequent turn (R3). Finally, when the consumer positively associates the program with the channel, the brand equity of the channel grows and the likelihood the consumer will watch other shows on the channel increases. Over time, the increased viewership in the previous shows builds larger and larger lead-in audiences (R4), increasing the base viewership of the focal program. Working together, these four feedback loops form a structural framework for understanding the impact of individual shows on the channel, as a function of the many simultaneous decisions made by consumers.

There are also self-reinforcing loops that connect linear and non-linear viewership platforms available for consumers. For example, satisfied TV viewers are more likely to watch the show online if they miss an episode or want to watch it a second time. Online watching increases top-of-mind awareness and allows potential viewers to access past episodes of shows and "catch up" to the current season. This engagement with the show online increases the likelihood that the viewer will continue to watch the show. These dynamics will be modeled to test

**Figure 6: Example causal loop diagram illustrating relationships between system components**

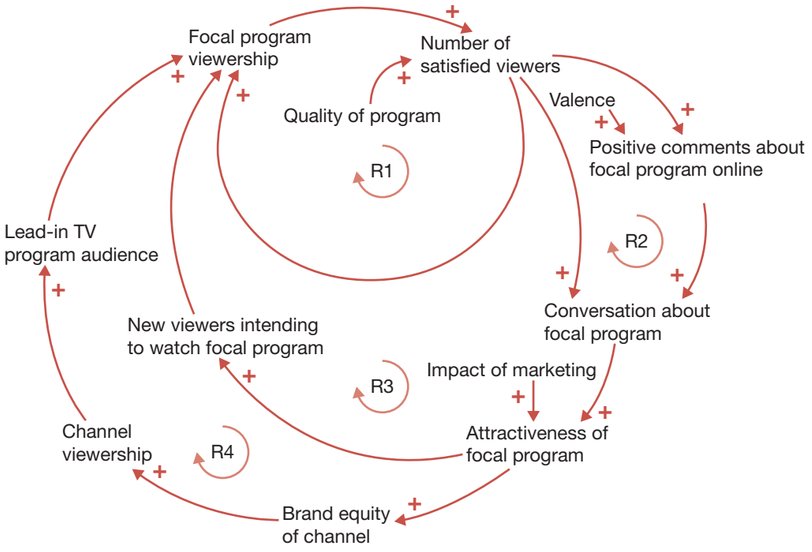
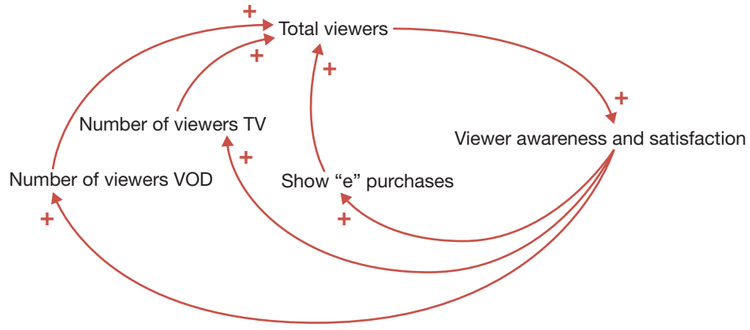



**Figure 7: Example causal loop diagram illustrating the impact of non-linear vs. linear viewership platforms**



the impact of making a show available on linear versus non-linear platforms.

**Model outputs**

Although the model is simulating the behavior of the individual market players and their relationships to each other, the final model outputs are the aggregate results of individual decisions. The model outputs include the following values over a multiyear time span:

- Consumer viewership:
  - Total viewers
  - Viewership by platform, race, and gender
- Comparative content value (financial and branding)
- Program series financials across all outlets (revenue, costs, and return on investment):
  - Subscription fees
  - Advertising rates
  - Licensing fees (from non-linear distribution)

In addition, the model includes a number of parameters that can be varied during the simulation to conduct "what-if" scenario analysis. This set of parameters is selected based on the specific decision the scenario analysis is informing. For example, for insights on segment-specific marketing, parameters can be included to change marketing dollars spent for a particular segment.

## Benefits of approach

The modeling approach provides a framework for understanding how consumers select shows and share their opinions with the market. By simulating the many micro-decisions made at the individual level, the model generates the macro-level patterns seen in the historical data. Once the model is developed and calibrated to historical data, it can be used to calculate the contribution each show makes to the channel's bottom line, guide strategies to increase the revenue generated by the channel's current set of shows, and forecast the value new shows will contribute to the channel.

Through simulation, the model addresses the following issues:

1. **Estimates the total value created by existing programs** by analyzing each show's impact on the channel's brand equity and viewership. The ability of each show to attract and retain an audience is measured and used as a basis for calculating its contribution to the streams of revenue generated by each program on the channel. The model also simulates lead-in effects to show the impact of a hit show on surrounding programs.

2. **Tests policies to improve the value generated by current shows in the context of the entire ecosystem of the enterprise.** One of the core advantages of the modeling approach is its ability to trace the impact of a policy change across all platforms. The impact of feasible policies on the ratings of programs can be analyzed in depth. Further, the resource requirements to support proposed policy changes can be calculated. For example, the model can determine the marketing cost required to alert the key consumer segments of an appealing new block of shows and forecast the impact of the marketing initiative on program ratings, such as:
   - Impact of increased promotion, and if so, where
   - Impact of schedule change
   - Impact of release windows for new distribution modes and platforms

3. **Forecasts the potential value new programs could contribute to the enterprise** by estimating their appeal to: (1) the audience watching the previous show, (2) the population of potential viewers who are just tuning in, and (3) loyal viewers with existing expectations on the type of shows that will be broadcast. In this manner, the contribution each program makes to the brand equity and total viewership can be calculated, including:
   - Expected value of new shows
   - Expected value of related content (e.g., apps, syndication, merchandise)

In addition to the three issues discussed above, the model can stress test new management policies against an array of future scenarios. For example, what would be the effect of streaming content online? How will the coming retirement of the baby boomer population or the adoption of new technologies affect the distribution and consumption of entertainment media? The model will make use of Monte Carlo simulation techniques to determine the baseline, best-case, and worst-case projections for each new strategy proposed.

*What this means for your business*

# Using advanced analytical techniques can vastly improve decision making

The entertainment industry has a full line-up: a wide array of consumer delivery choices, new product and service offerings, changing consumer behavior, information overload, and, in general, increasing business complexity. And to deal with this plethora of issues, the entertainment industry needs new techniques to help make strategic decisions. With the rate and magnitude of change, companies need a way to model the future that doesn't merely extend past data. Simulation modeling provides a powerful tool for representing the non-linear, dynamic relationships that are fundamental to the industry and not captured by traditional approaches.

For example, the Feature Film Lifecycle Simulation forecasts the revenues generated by movies across the full spectrum of release windows. This approach incorporates the key dynamics of the system, such as the intrinsic characteristics of the movie, marketing strategies, and macro environmental factors (e.g., social attitudes, disruptive technologies). Including these dynamics provides a more realistic test bed to simulate a variety of marketing and release strategies.

Similarly, in the Television Content Value Simulation, the model evaluates television programming with a much more holistic approach. The simulation model considers the impact of relationships between key components in the system and factors that influences these to more effectively determine the overall value of content at the individual program level, factoring in financial value, overall consumer engagement, and brand value. This can be done across any mix of distribution scenarios.

Executives across industries are beginning to realize that simulation models are becoming a key tool in strategic decision making. Leveraging simulation in the entertainment sector can be a differentiator as it more realistically adapts to change and captures the complexity of the industry to better inform decision making and reduce risk.

# *Additional relevant PwC publications*

1. *Putting Predictive Analytics to Work*
   Good business sense—but where do you begin

   If your company is ready to leverage predictive analytics for a specific problem or decision, first ask yourselves: What will the cost be to our company if management makes a 'wrong' business decision? What types of business decisions are we looking to inform with predictive data? Is there a correct tool we should plan on using? The answers to these and other key question will help you identify and successfully engineer a solution to your company's specific analytic goals. The information garnered during this process will contribute, in large part, to a "how-to" guide that will serve as a strong foundation on which to build your company-specific predictive analytics initiative.

2. *Achieving an Information Advantage*
   The ability to make better business intelligence and information strategy investments can shift the competitive balance.

   Companies achieve an "information advantage" when they use outstanding information management, analytics, and decision-making to drive superior operating performance and demonstrable economic value. But with a clear economic case for action and plenty of expert advice available, why do companies often struggle with business intelligence (BI) and information strategy efforts? In this paper we identify several key actions as fundamental components of our Information Capability Engineering ("ICE") Methodology which we have seen increase the likelihood that a BI or information strategy initiative is successful.

**Note:** This publication is not available online. Please contact Oliver Halter at oliver.halter@us.pwc.com to obtain a copy.

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